

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

- Key**
N No (not deviating sample)
Y Yes (deviating sample)
NSD Sampling date not provided
NST Sampling time not provided (waters only)
EHT Sample exceeded holding time(s)
IC Sample not received in appropriate containers
HP Headspace present in sample container
NCF Sample not chemically fixed (where appropriate)
OR Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
101192-1	TP-TH-15	2.50	Y	All (NSD)

APPENDIX K1: ENVIRONMENTAL LABORATORY CERTIFICATES - SOIL



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CERTIFICATE OF ANALYSIS

Date of report Generation: 26 February 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210212-109
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 588423

We received 4 samples on Friday February 12, 2021 and 3 of these samples were scheduled for analysis which was completed on Friday February 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210212-109 **Client Reference:** B025563 **Report Number:** 588423
Location: Cambridge South East Transport Order Number: 7000964 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23717112	BH - PTR - 26	ES1	0.20 - 0.20	10/02/2021
23717113	BH - PTR - 26	ES2	0.30 - 0.30	10/02/2021
23717114	BH - PTR - 26	ES3	0.50 - 0.50	10/02/2021
23717115	BH - PTR - 26	ES4	1.00 - 1.00	10/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210212-109 Client Reference: B025563 Report Number: 588423
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23717112	23717113	23717114
	Customer Sample Reference		BH - PTR - 26	BH - PTR - 26	BH - PTR - 26
	AGS Reference		ES1	ES2	ES3
	Depth (m)		0.20 - 0.20	0.30 - 0.30	0.50 - 0.50
	Container		250g Amber Jar (ALE210)	250g Amber Jar (ALE210) Kone Cup	60g VOC (ALE215) 250g Amber Jar (ALE210)
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X		X
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X
Boron Water Soluble	All	NDPs: 0 Tests: 2	X		X
CEN Readings	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 3	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1		X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X
Fluoride	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X		X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210212-109 Client Reference: B025563 Report Number: 588423
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23717112	23717113	23717114
	Customer Sample Reference		BH - PTR - 26	BH - PTR - 26	BH - PTR - 26
	AGS Reference		ES1	ES2	ES3
	Depth (m)		0.20 - 0.20	0.30 - 0.30	0.50 - 0.50
	Container		250g Amber Jar (ALE210)	250g Amber Jar (ALE210) Kone Cup	60g VOC (ALE215) 250g Amber Jar (ALE210)
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1		X	
Mercury Dissolved	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X		X
PAH by GCMS	All	NDPs: 0 Tests: 2	X		X
pH	All	NDPs: 0 Tests: 2	X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 3	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 2	X		X
Total Sulphur	All	NDPs: 0 Tests: 2	X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X
VOC MS (S)	All	NDPs: 0 Tests: 2	X		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23717112	BH - PTR - 26	0.20 - 0.20	Light Brown	Silty Clay Loam	Stones	None
23717113	BH - PTR - 26	0.30 - 0.30	Light Brown	Silty Clay Loam	None	None
23717114	BH - PTR - 26	0.50 - 0.50	Light Brown	Sandy Clay	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH - PTR - 26	BH - PTR - 26	BH - PTR - 26			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.		0.20 - 0.20	0.30 - 0.30	0.50 - 0.50			
tot.unfilt	Total / unfiltered sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
*	Subcontracted - refer to subcontractor report for accreditation status.		10/02/2021	10/02/2021	10/02/2021			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		12/02/2021	12/02/2021	12/02/2021			
(F)	Trigger breach confirmed		210212-109	210212-109	210212-109			
1-445@	Sample deviation (see appendix)		23717112	23717113	23717114			
			ES1	ES2	ES3			
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	21	25	17			
Catechol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05		<0.05			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015		<0.015			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015		<0.015			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06		<0.06			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13		<0.13			
Sulphur, Total	<0.02 %	TM132	<0.02		<0.02			
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0184		0.011			
pH	1 pH Units	TM133	8.45		8.42			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6		<0.6			
Cyanide, Free	<1 mg/kg	TM153	<1		<1			
Chromium, Trivalent	<0.9 mg/kg	TM181	20.5		12.1			
Antimony	<0.6 mg/kg	TM181	1.13		0.855			
Arsenic	<0.6 mg/kg	TM181	14.1		8.45			
Barium	<0.6 mg/kg	TM181	86.6		62.8			
Beryllium	<0.01 mg/kg	TM181	0.857		0.758			
Cadmium	<0.02 mg/kg	TM181	0.0631		<0.02			
Chromium	<0.9 mg/kg	TM181	20.5		12.1			
Copper	<1.4 mg/kg	TM181	13		9.56			
Iron	<1000 mg/kg	TM181	30500		23900			
Lead	<0.7 mg/kg	TM181	14.4		8.86			
Manganese	<0.13 mg/kg	TM181	335		218			
Mercury	<0.1 mg/kg	TM181	<0.1		<0.1			
Molybdenum	<0.1 mg/kg	TM181	0.521		0.467			
Nickel	<0.2 mg/kg	TM181	20.3		22			
Selenium	<1 mg/kg	TM181	<1		<1			
Vanadium	<0.2 mg/kg	TM181	40.4		38.4			

SDG:	210212-109	Client Reference:	B025563	Report Number:	588423
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210212-109	Client Reference:	B025563	Report Number:	588423
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BH - PTR - 26						
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 10/02/2021 . 12/02/2021 210212-109 23717112 ES1					0.50 - 0.50 Soil/Solid (S) 10/02/2021 . 12/02/2021 210212-109 23717114 ES3
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-456	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	102	101					
Toluene-d8**	%	TM116	96.6	98.5					
4-Bromofluorobenzene**	%	TM116	72	81.4					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M					
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 3 M	<8 3 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M					
Benzene	<9 µg/kg	TM116	<9 M	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M					
Toluene	<7 µg/kg	TM116	<7 M	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M					

VOC MS (S)

Results Legend			Customer Sample Ref.		BH - PTR - 26		BH - PTR - 26					
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.20 - 0.20		0.50 - 0.50					
M	mCERTS accredited.				Soil/Solid (S)		Soil/Solid (S)					
aq	Aqueous / settled sample.				10/02/2021		10/02/2021					
dis.filt	Dissolved / filtered sample.											
tot.unfilt	Total / unfiltered sample.											
*	Subcontracted - refer to subcontractor report for accreditation status.											
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery				12/02/2021		12/02/2021					
(F)	Trigger breach confirmed				210212-109		210212-109					
1-4-6@	Sample deviation (see appendix)				23717112		23717114					
					ES1		ES3					
Component	LOD/Units	Method										
1,3-Dichloropropane	<7 µg/kg	TM116	<7				<7					
			M				M					
Tetrachloroethene	<5 µg/kg	TM116	<5				<5					
			M				M					
Dibromochloromethane	<10 µg/kg	TM116	<10				<10					
			M				M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10				<10					
			M				M					
Chlorobenzene	<5 µg/kg	TM116	<5				<5					
			M				M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10				<10					
			M				M					
Ethylbenzene	<4 µg/kg	TM116	<4				<4					
			M				M					
p/m-Xylene	<10 µg/kg	TM116	<10				<10					
			#				#					
o-Xylene	<10 µg/kg	TM116	<10				<10					
			M				M					
Styrene	<10 µg/kg	TM116	<10				<10					
			@ #				@ #					
Bromoform	<10 µg/kg	TM116	<10				<10					
			M				M					
Isopropylbenzene	<5 µg/kg	TM116	<5				<5					
			#				#					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10				<10					
			#				#					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16				<16					
			M				M					
Bromobenzene	<10 µg/kg	TM116	<10				<10					
			M				M					
Propylbenzene	<10 µg/kg	TM116	<10				<10					
			M				M					
2-Chlorotoluene	<9 µg/kg	TM116	<9				<9					
			M				M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8				<8					
			M				M					
4-Chlorotoluene	<10 µg/kg	TM116	<10				<10					
			M				M					
tert-Butylbenzene	<14 µg/kg	TM116	<14				<14					
			M				M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9				<9					
			#				#					
sec-Butylbenzene	<10 µg/kg	TM116	<10				<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10				<10					
			M				M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8				<8					
			M				M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5				<5					
			M				M					
n-Butylbenzene	<11 µg/kg	TM116	<11				<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10				<10					
			M				M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14				<14					
			M				M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10				<10					
			#				#					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20				<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20				<20					
Naphthalene	<13 µg/kg	TM116	<13				<13					
			M				M					

VOC MS (S)

Results Legend		Customer Sample Ref.	BH - PTR - 26		BH - PTR - 26				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 10/02/2021 . 12/02/2021 210212-109 23717112 ES1	0.50 - 0.50 Soil/Solid (S) 10/02/2021 . 12/02/2021 210212-109 23717114 ES3				
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
+	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-44\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20 #	<20 #					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20	<20					
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02	<0.02					
Sum of BTEX	<40 µg/kg	TM116	<40	<40					

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH - PTR - 26ES1 0.20 - 0.20 SOLID 10/02/2021 00:00:00 12/02/2021 09:30:00 210212-109 23717112 TM048	24/02/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH - PTR - 26ES3 0.50 - 0.50 SOLID 10/02/2021 00:00:00 12/02/2021 09:30:00 210212-109 23717114 TM048	24/02/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 210212-109 Client Reference: B025563 Report Number: 588423
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Test Completion Dates

Lab Sample No(s)	23717112	23717113	23717114
Customer Sample Ref.	BH - PTR - 26	BH - PTR - 26	BH - PTR - 26
AGS Ref.	ES1	ES2	ES3
Depth	0.20 - 0.20	0.30 - 0.30	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low		24-Feb-2021	
Anions by Kone (soil)	23-Feb-2021		23-Feb-2021
Anions by Kone (w)		24-Feb-2021	
Asbestos ID in Solid Samples	24-Feb-2021		24-Feb-2021
Boron Water Soluble	26-Feb-2021		26-Feb-2021
CEN 10:1 Leachate (1 Stage)		20-Feb-2021	
CEN Readings		23-Feb-2021	
Chromium III	26-Feb-2021	25-Feb-2021	26-Feb-2021
Cyanide Comp/Free/Total/Thiocyanate	24-Feb-2021		24-Feb-2021
Dissolved Metals by ICP-MS		24-Feb-2021	
Dissolved Organic/Inorganic Carbon		25-Feb-2021	
EPH CWG GC (S)	23-Feb-2021		23-Feb-2021
Fluoride		24-Feb-2021	
GRO by GC-FID (S)	24-Feb-2021		24-Feb-2021
Hexavalent Chromium (s)	24-Feb-2021		24-Feb-2021
Low Level Cyanide (W)		25-Feb-2021	
Low Level Hexavalent Chromium (w)		25-Feb-2021	
Mercury Dissolved		25-Feb-2021	
Metals in solid samples by OES	26-Feb-2021		26-Feb-2021
Moisture at 105C		20-Feb-2021	
PAH by GCMS	23-Feb-2021		23-Feb-2021
pH	22-Feb-2021		22-Feb-2021
pH Value of Filtered Water		24-Feb-2021	
Phenols by HPLC (S)	23-Feb-2021		24-Feb-2021
Phenols by HPLC (W)		25-Feb-2021	
Sample description	19-Feb-2021	19-Feb-2021	19-Feb-2021
Total Organic Carbon	25-Feb-2021		25-Feb-2021
Total Sulphur	25-Feb-2021		25-Feb-2021
TPH CWG GC (S)	24-Feb-2021		24-Feb-2021
VOC MS (S)	24-Feb-2021		24-Feb-2021



CERTIFICATE OF ANALYSIS

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ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2371
Ammoniacal Nitrogen as N	TM099	100.8 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2321	QC 2397
Chloride (soluble)	TM243	148.7 86.68 : 115.67	151.3 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00	158.88 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2379
Chloride	TM184	96.8 91.40 : 109.10
Sulphate (soluble)	TM184	98.0 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2399
Water Soluble Boron	TM222	91.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2330	QC 2398
Free Cyanide	TM153	96.04 79.00 : 115.00	94.36 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89	97.44 94.09 : 113.89
Total Cyanide	TM153	96.5 73.07 : 107.47	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2348
Aluminium	TM152	96.33 90.78 : 110.89
Antimony	TM152	96.67 77.22 : 119.42
Arsenic	TM152	98.17 86.77 : 107.67



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Dissolved Metals by ICP-MS

		QC 2348
Barium	TM152	96.67 87.86 : 110.23
Beryllium	TM152	99.0 86.19 : 112.98
Bismuth	TM152	97.0 84.06 : 106.46
Borate	TM152	97.53 88.00 : 112.00
Boron	TM152	97.67 83.92 : 114.90
Cadmium	TM152	99.67 88.89 : 106.69
Calcium	TM152	97.33 80.24 : 117.95
Chromium	TM152	97.67 83.22 : 110.16
Cobalt	TM152	97.0 82.49 : 112.36
Copper	TM152	98.83 83.14 : 113.00
Iron	TM152	98.67 88.40 : 109.24
Lead	TM152	98.0 83.71 : 109.58
Lithium	TM152	97.0 84.50 : 114.28
Magnesium	TM152	94.0 87.56 : 114.57
Manganese	TM152	98.33 90.01 : 108.72
Molybdenum	TM152	95.33 85.53 : 107.42
Nickel	TM152	99.17 88.05 : 106.42
Phosphorus	TM152	97.83 82.76 : 107.72
Potassium	TM152	94.0 88.45 : 106.42
Selenium	TM152	98.17 85.61 : 111.03
Silver	TM152	95.0 88.48 : 110.48
Sodium	TM152	93.33 88.32 : 106.30
Strontium	TM152	96.67 83.77 : 107.87
Tellurium	TM152	94.33 82.83 : 104.73
Thallium	TM152	95.83 77.47 : 113.87
Tin	TM152	96.5 87.36 : 109.55
Titanium	TM152	100.83 87.29 : 108.31



CERTIFICATE OF ANALYSIS

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Dissolved Metals by ICP-MS

		QC 2348
Tungsten	TM152	96.0 68.27 : 122.97
Uranium	TM152	97.0 82.46 : 105.16
Vanadium	TM152	96.17 88.43 : 114.30
Zinc	TM152	98.67 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2331
Dissolved Inorganic Carbon	TM090	120.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2362
EPH >C8-C40 Raw	TM414	100.79 56.39 : 129.94
Total Aliphatics Raw	TM414	106.21 62.55 : 133.12
Total Aromatics Raw	TM414	118.94 57.00 : 150.27

Fluoride

Component	Method Code	QC 2359
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2329
QC	TM089	85.19 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2369	QC 2399
Hexavalent Chromium	TM151	96.0 92.00 : 111.20	96.0 92.00 : 111.20

Hexavalent Chromium (s)

Low Level Cyanide (W)

Component	Method Code	QC 2365
Free Cyanide - Low Level	TM279	77.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2334
Mercury Dissolved (CVAf)	TM183	97.5 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2377	QC 2312	QC 2300
Aluminium	TM181	83.45 77.46 : 123.98	114.16 73.56 : 108.85	100.0 73.56 : 108.85
Antimony	TM181	93.9 87.04 : 111.16	104.47 76.89 : 111.24	95.12 76.89 : 111.24
Arsenic	TM181	96.51 87.34 : 110.87	107.85 88.53 : 111.01	99.13 88.53 : 111.01
Barium	TM181	86.15 80.73 : 115.16	104.59 77.67 : 105.35	94.5 77.67 : 105.35
Beryllium	TM181	95.15 89.47 : 112.97	109.7 85.44 : 109.61	104.1 85.44 : 109.61
Boron	TM181	80.23 76.57 : 104.15	102.29 73.51 : 104.66	87.97 73.51 : 104.66
Cadmium	TM181	87.24 78.94 : 102.43	95.88 77.67 : 104.12	91.77 77.67 : 104.12
Chromium	TM181	81.34 77.55 : 104.47	96.96 77.55 : 104.47	90.87 77.55 : 104.47
Cobalt	TM181	88.99 82.95 : 107.41	99.69 84.60 : 104.13	91.51 84.60 : 104.13
Copper	TM181	110.56 84.36 : 106.14	100.0 82.40 : 105.45	95.6 82.40 : 105.45
Iron	TM181	88.1 81.43 : 115.79	108.73 82.95 : 110.58	98.41 82.95 : 110.58
Lead	TM181	88.29 81.95 : 107.63	99.55 78.24 : 104.05	92.34 78.24 : 104.05
Manganese	TM181	102.5 94.29 : 119.51	119.72 94.29 : 119.51	113.89 94.29 : 119.51
Mercury	TM181	92.51 82.73 : 106.36	104.83 83.16 : 107.81	98.07 83.16 : 107.81
Molybdenum	TM181	92.59 86.61 : 111.07	108.64 87.11 : 106.87	101.65 87.11 : 106.87
Nickel	TM181	89.73 79.72 : 103.80	100.98 80.26 : 102.28	96.33 80.26 : 102.28

Metals in solid samples by OES

		QC 2377	QC 2312	QC 2300
Phosphorus	TM181	105.66 92.65 : 125.47	121.62 94.56 : 124.28	111.11 94.56 : 124.28
Selenium	TM181	97.65 88.36 : 111.25	104.31 82.28 : 110.48	101.96 82.28 : 110.48
Strontium	TM181	84.41 78.06 : 99.91	100.67 79.13 : 102.79	92.2 79.13 : 102.79
Thallium	TM181	95.58 88.60 : 116.73	103.54 82.94 : 111.86	97.79 82.94 : 111.86
Tin	TM181	93.54 89.77 : 112.62	112.55 86.72 : 110.03	103.04 86.72 : 110.03
Titanium	TM181	66.41 66.29 : 105.96	87.79 66.23 : 102.06	57.71 66.23 : 102.06
Vanadium	TM181	89.74 75.51 : 108.87	108.42 75.51 : 108.87	98.9 75.51 : 108.87
Zinc	TM181	95.07 84.02 : 111.24	106.16 84.68 : 113.99	96.51 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2310
Acenaphthene	TM218	95.0 80.97 : 105.99
Acenaphthylene	TM218	91.5 74.76 : 107.36
Anthracene	TM218	90.0 73.04 : 106.97
Benz(a)anthracene	TM218	85.5 68.79 : 119.64
Benzo(a)pyrene	TM218	83.5 66.17 : 117.52
Benzo(b)fluoranthene	TM218	82.5 66.40 : 118.34
Benzo(ghi)perylene	TM218	82.5 67.68 : 112.07
Benzo(k)fluoranthene	TM218	86.0 72.84 : 114.66
Chrysene	TM218	84.0 68.39 : 115.56
Dibenzo(ah)anthracene	TM218	80.0 69.03 : 110.45
Fluoranthene	TM218	89.0 69.37 : 117.19
Fluorene	TM218	93.5 75.38 : 105.98
Indeno(123cd)pyrene	TM218	76.5 65.91 : 113.61
Naphthalene	TM218	96.5 71.40 : 105.87
Phenanthrene	TM218	91.5 74.04 : 109.30
Pyrene	TM218	90.5 69.68 : 115.27

pH

pH		
Component	Method Code	QC 2364
pH	TM133	100.92 98.71 : 102.32

pH Value of Filtered Water		
Component	Method Code	QC 2368
pH	TM256	99.87 99.33 : 102.54

Component	Method Code	QC 2392	QC 2356
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	105.84 53.34 : 140.63	106.49 53.34 : 140.63
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	94.15 82.04 : 114.37	97.08 82.04 : 114.37
Catechol by HPLC (S)	TM062 (S)	93.33 22.43 : 157.02	84.76 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	95.82 76.45 : 108.78	97.49 76.45 : 108.78
Napthol by HPLC (S)	TM062 (S)	108.57 75.62 : 124.38	112.14 75.62 : 124.38
Phenol by HPLC (S)	TM062 (S)	105.3 77.49 : 117.37	109.27 77.49 : 117.37
Resorcinol HPLC (S)	TM062 (S)	101.89 71.43 : 129.59	105.66 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	96.88 83.23 : 105.39	99.79 83.23 : 105.39

Component	Method Code	QC 2350
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	53.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	53.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	52.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	54.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	53.33 79.09 : 131.82

Total Organic Carbon

Total Organic Carbon		
Component	Method Code	QC 2361
Total Organic Carbon	TM132	99.22 87.02 : 113.45

Total Sulphur		
Component	Method Code	QC 2319
Total Sulphur %	TM132	88.08 61.64 : 114.47

Component	Method Code	QC 2338
1,1,1,2-tetrachloroethane	TM116	110.2 86.59 : 118.97
1,1,1-Trichloroethane	TM116	108.8 86.26 : 117.53
1,1,2-Trichloroethane	TM116	95.8 75.16 : 112.70
1,1-Dichloroethane	TM116	116.6 83.27 : 122.16
1,2-Dichloroethane	TM116	117.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	114.8 82.59 : 123.23
2-Chlorotoluene	TM116	102.2 66.81 : 118.43
4-Chlorotoluene	TM116	95.6 65.88 : 114.76
Benzene	TM116	103.4 93.16 : 123.63
Carbon Disulphide	TM116	106.4 75.11 : 124.81
Carbontetrachloride	TM116	104.4 82.35 : 126.46
Chlorobenzene	TM116	105.8 85.07 : 118.13
Chloroform	TM116	116.4 88.13 : 122.71
Chloromethane	TM116	121.2 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	111.8 78.27 : 128.90
Dibromomethane	TM116	94.8 77.47 : 121.29
Dichloromethane	TM116	117.2 87.89 : 134.72



CERTIFICATE OF ANALYSIS

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VOC MS (S)

		QC 2338
Ethylbenzene	TM116	95.8 79.92 : 110.05
Hexachlorobutadiene	TM116	58.0 16.78 : 153.29
Isopropylbenzene	TM116	85.6 64.20 : 119.59
Naphthalene	TM116	116.6 79.29 : 125.59
o-Xylene	TM116	90.0 72.86 : 102.10
p/m-Xylene	TM116	88.7 76.47 : 108.99
Sec-Butylbenzene	TM116	70.2 44.71 : 117.87
Tetrachloroethene	TM116	100.0 85.86 : 122.95
Toluene	TM116	94.4 87.82 : 116.21
Trichloroethene	TM116	103.2 79.80 : 112.33
Trichlorofluoromethane	TM116	119.4 80.52 : 132.12
Vinyl Chloride	TM116	114.4 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



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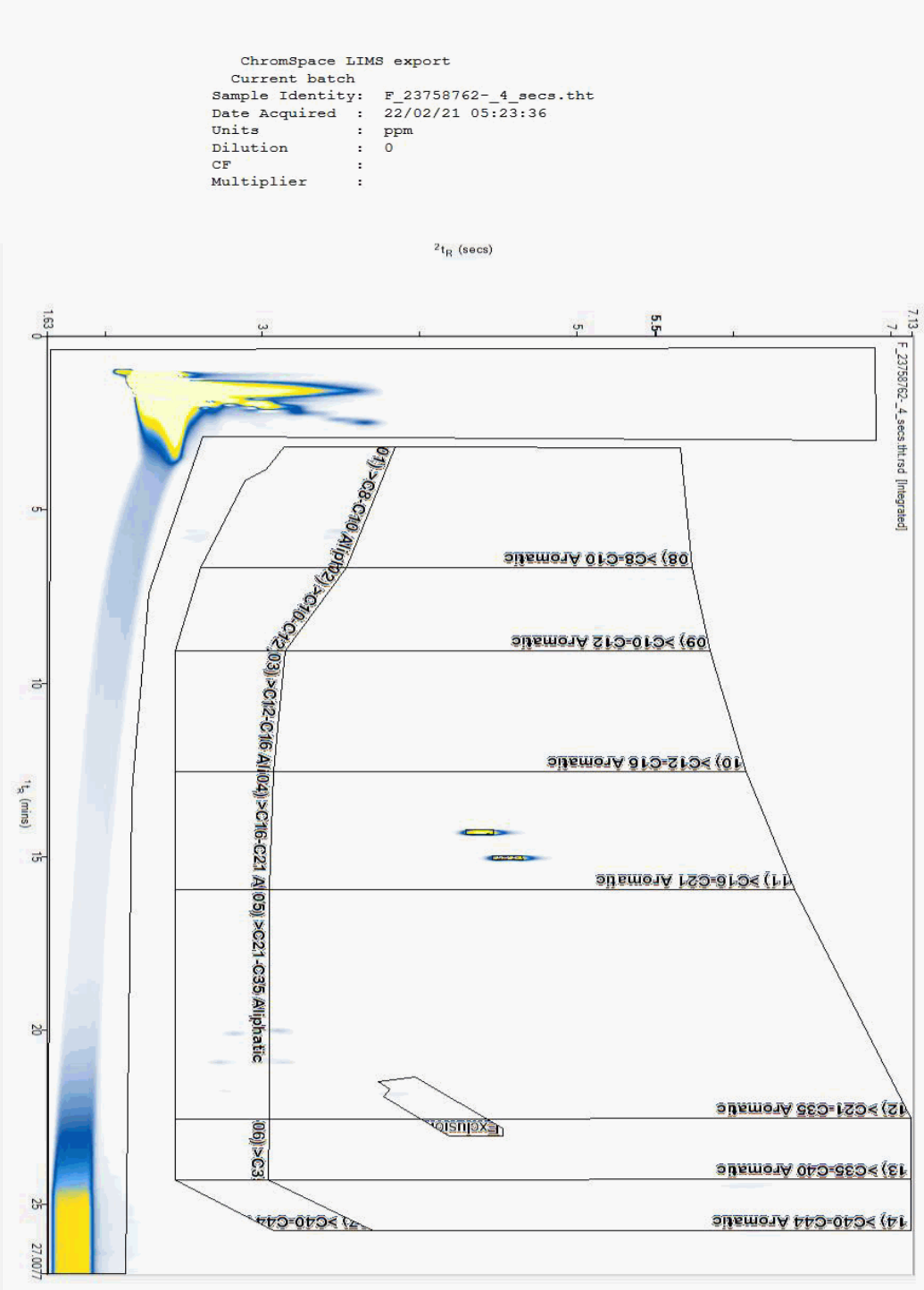
Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Chromatogram

Analysis:EPH CWG GC (S)

Sample No : 23758762Sample ID : BH - PTR - 26

Depth : 0.50 - 0.50





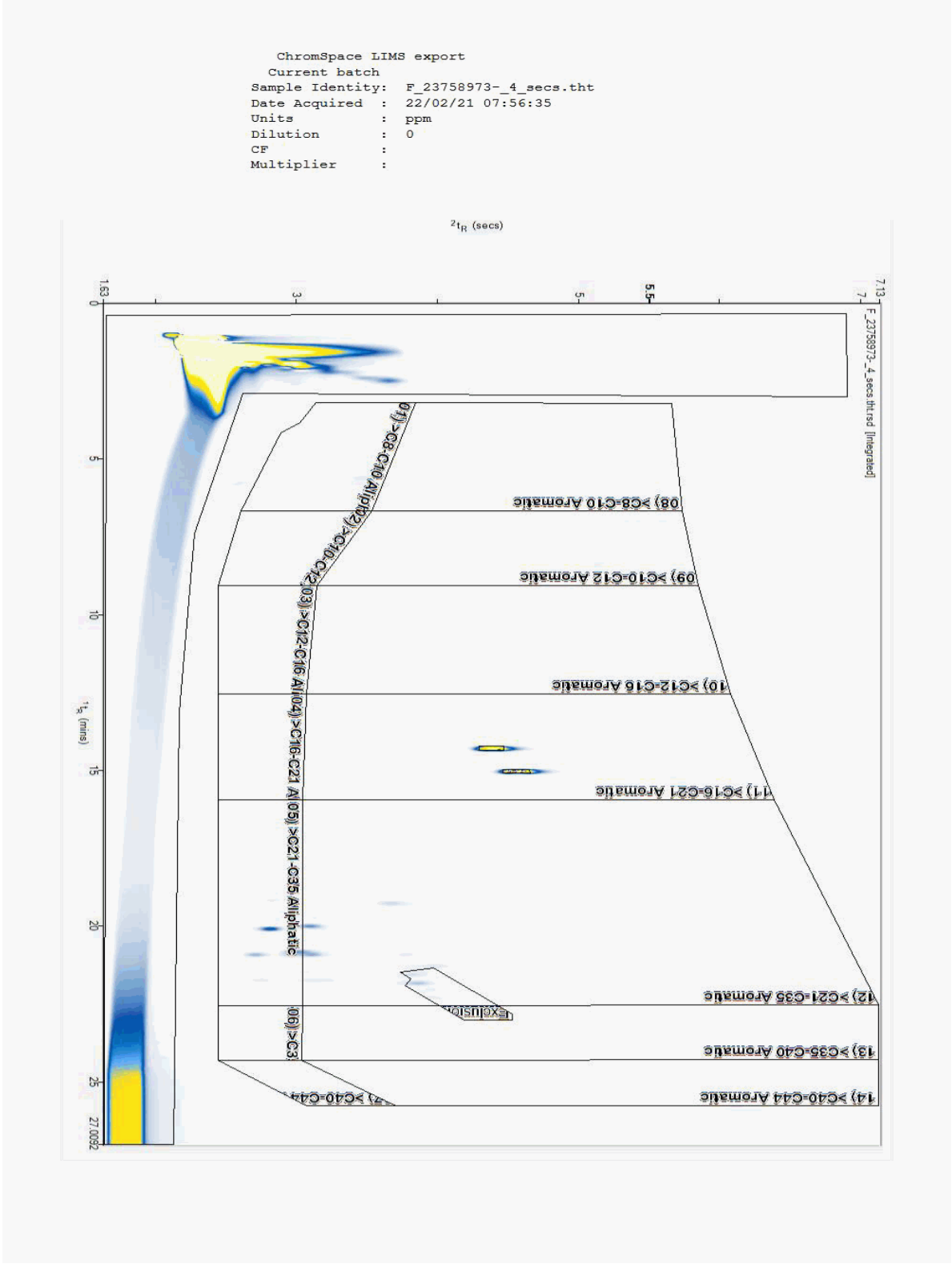
CERTIFICATE OF ANALYSIS

Validated

SDG:	210212-109	Client Reference:	B025563	Report Number:	588423
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23758973 Depth : 0.20 - 0.20
Sample ID : BH - PTR - 26



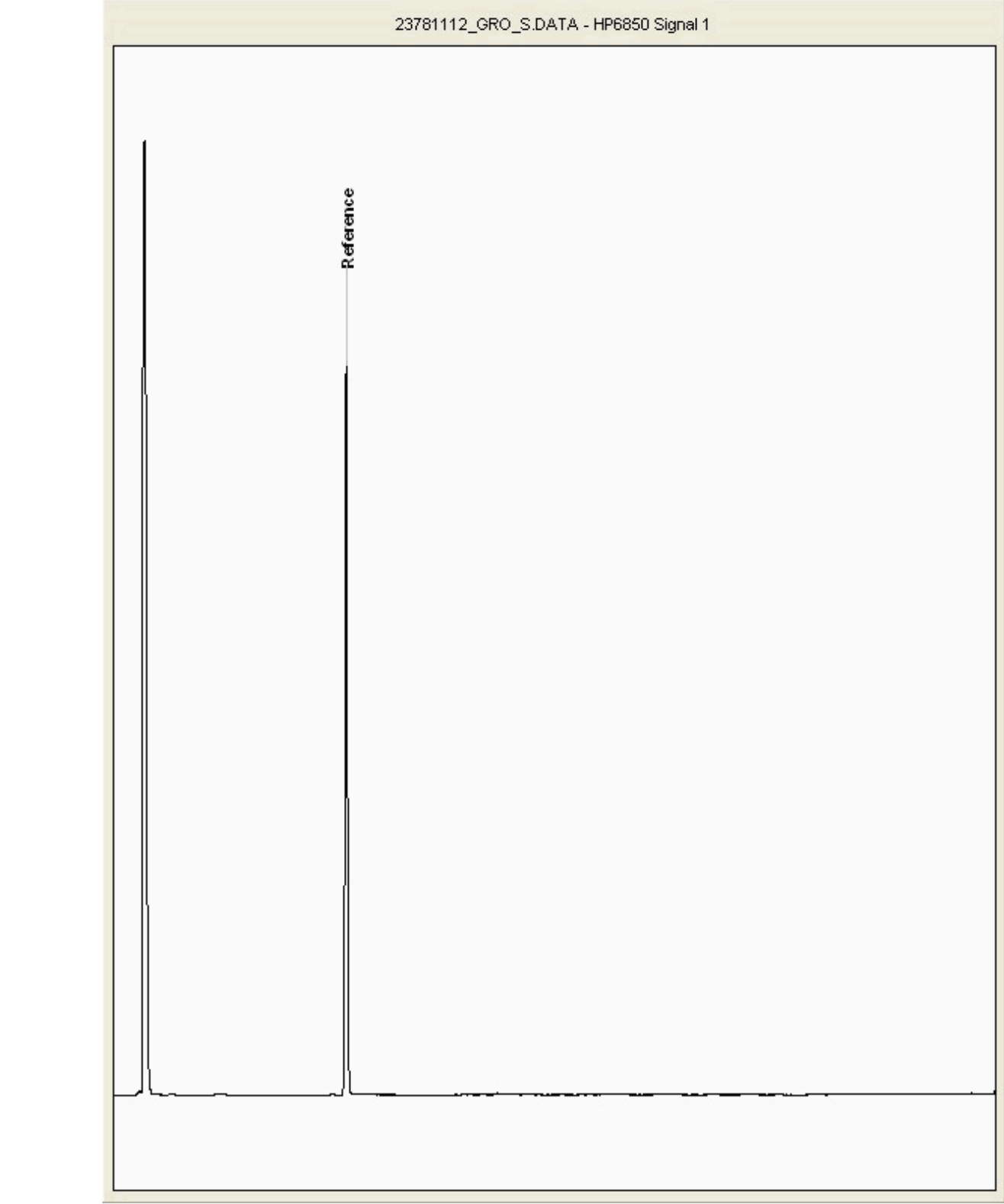
CERTIFICATE OF ANALYSIS

Validated

SDG:	210212-109	Client Reference:	B025563	Report Number:	588423
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23781112 Depth : 0.50 - 0.50
Sample ID : BH - PTR - 26





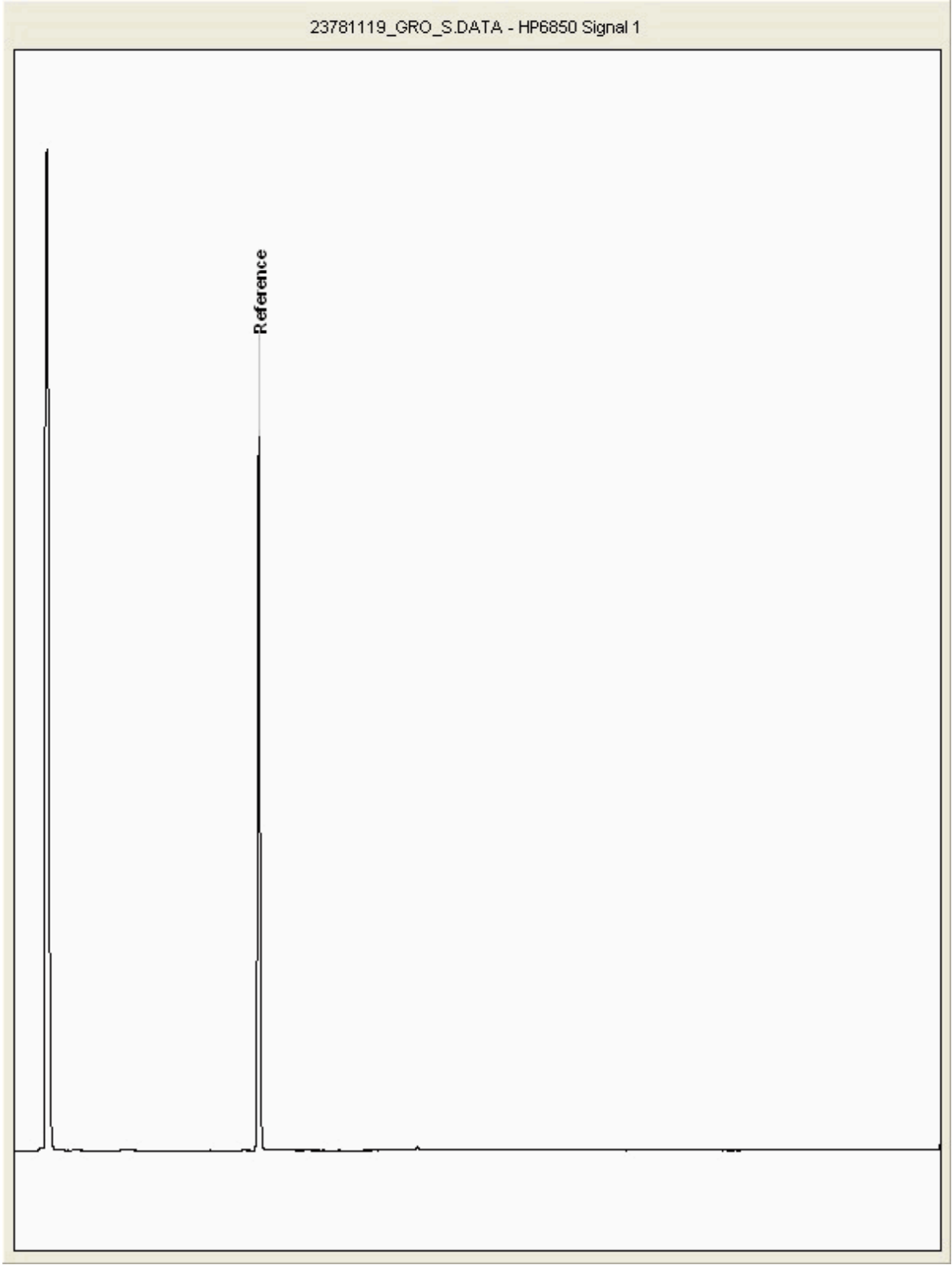
CERTIFICATE OF ANALYSIS

Validated

SDG: 210212-109 Client Reference: B025563 Report Number: 588423
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23781119 Depth : 0.20 - 0.20
Sample ID : BH - PTR - 26



CERTIFICATE OF ANALYSIS

SDG: 210212-109 Client Reference: B025563 Report Number: 588423
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS					Validated
SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23727171	BH-PTR-24A	ES1	0.20	12/02/2021
23727174	BH-PTR-24A	ES3	0.20	12/02/2021
23727173	BH-PTR-24A	ES2	0.30	12/02/2021
23727175	BH-PTR-24A	ES3	0.50	12/02/2021
23727178	BH-PTR-24A	ES4	1.00	12/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 03 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210215-10
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 588983

This report has been revised and directly supersedes 588843 in its entirety.

We received 5 samples on Monday February 15, 2021 and 3 of these samples were scheduled for analysis which was completed on Wednesday March 03, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210215-10 Client Reference: B025563
Location: Cambridge South East TraOrder Number: 7000964

Report Number: 588983
Superseded Report: 588843

Results Legend			Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
<div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>			23727173	23727175	BH-PTR-24A	BH-PTR-24A	ES2	ES3	0.30	0.50	250g Amber Jar (ALE210)	60g VOC (ALE215)	S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other														
Ammonium Low	All	NDPs: 0 Tests: 1		X										
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X									X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1				X								
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X					X						
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1								X				
Boron Water Soluble	All	NDPs: 0 Tests: 2	X									X		
CEN Readings	All	NDPs: 0 Tests: 1			X									
Chromium III	All	NDPs: 0 Tests: 3	X	X								X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X									X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1			X									
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1			X									
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X									X		
Fluoride	All	NDPs: 0 Tests: 1			X									
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X										X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X									X		



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SDG: 210215-10 Client Reference: B025563
Location: Cambridge South East TraOrder Number: 7000964

Report Number: 588983
Superseded Report: 588843

Results Legend			Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
<div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>			23727173	23727175	BH-PTR-24A	BH-PTR-24A	ES2	ES3	0.30	0.50	250g Amber Jar (ALE210)	60g VOC (ALE215)	S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other														
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1				X								
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1				X								
Mercury Dissolved	All	NDPs: 0 Tests: 1				X								
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X										X	
PAH by GCMS	All	NDPs: 0 Tests: 2	X										X	
pH	All	NDPs: 0 Tests: 2	X										X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1			X									
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X										X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1			X									
Sample description	All	NDPs: 0 Tests: 3	X			X							X	
Total Organic Carbon	All	NDPs: 0 Tests: 2	X										X	
Total Sulphur	All	NDPs: 0 Tests: 2	X										X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X										X	
VOC MS (S)	All	NDPs: 0 Tests: 2		X										X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23727173	BH-PTR-24A	0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation
23727175	BH-PTR-24A	0.50	Light Brown	Sandy Silt Loam	Vegetation	Stones
23727178	BH-PTR-24A	1.00	Light Brown	Sandy Clay	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PTR-24A	BH-PTR-24A	BH-PTR-24A			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.30	0.50	1.00			
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
dis.filt	Dissolved / filtered sample.		12/02/2021	12/02/2021	12/02/2021			
tot.unfilt	Total / unfiltered sample.		.	.	.			
*	Subcontracted - refer to subcontractor report for accreditation status.		15/02/2021	15/02/2021	15/02/2021			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210215-10	210215-10	210215-10			
(F)	Trigger breach confirmed		23727173	23727175	23727178			
1-445@	Sample deviation (see appendix)		ES2	ES3	ES4			
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	9.6	16	16			
Catechol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05		<0.05			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M	<0.015	M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	M		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M	<0.015	M		
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M	<0.06	M		
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13		<0.13			
Sulphur, Total	<0.02 %	TM132	<0.02		<0.02			
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00745	#	0.00579	#		
pH	1 pH Units	TM133	8.37	M	8.6	M		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#	<0.6	#		
Cyanide, Free	<1 mg/kg	TM153	<1	M	<1	M		
Chromium, Trivalent	<0.9 mg/kg	TM181	7.56		6.2			
Antimony	<0.6 mg/kg	TM181	<0.6	#	<0.6	#		
Arsenic	<0.6 mg/kg	TM181	8.54	M	13	M		
Barium	<0.6 mg/kg	TM181	40.2	#	50.8	#		
Beryllium	<0.01 mg/kg	TM181	0.451	M	0.489	M		
Cadmium	<0.02 mg/kg	TM181	<0.02	M	<0.02	M		
Chromium	<0.9 mg/kg	TM181	7.56	M	6.2	M		
Copper	<1.4 mg/kg	TM181	7.63	M	9.37	M		
Iron	<1000 mg/kg	TM181	155000	#	23500	#		
Lead	<0.7 mg/kg	TM181	9.53	M	7.43	M		
Manganese	<0.13 mg/kg	TM181	221	M	264	M		
Mercury	<0.1 mg/kg	TM181	<0.1	M	<0.1	M		
Molybdenum	<0.1 mg/kg	TM181	0.311	#	0.492	#		
Nickel	<0.2 mg/kg	TM181	11.7	M	15.1	M		
Selenium	<1 mg/kg	TM181	<1	#	<1	#		
Vanadium	<0.2 mg/kg	TM181	22.1	#	26.2	#		

CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-PTR-24A		BH-PTR-24A					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.30 Soil/Solid (S) 12/02/2021 . 15/02/2021 210215-10 23727173 ES2	1.00 Soil/Solid (S) 12/02/2021 . 15/02/2021 210215-10 23727178 ES4							
M	mCERTS accredited.										
aq	Aqueous / settled sample.										
dis.filt	Dissolved / filtered sample.										
tot.unfilt	Total / unfiltered sample.										
*	Subcontracted - refer to subcontractor report for accreditation status.										
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery										
(F)	Trigger breach confirmed										
1-4+5@	Sample deviation (see appendix)										
Component	LOD/Units										Method
Dibromofluoromethane**	%	TM116	106	104							
Toluene-d8**	%	TM116	94.7	99.7							
4-Bromofluorobenzene**	%	TM116	78.3	92.3							
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M							
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #							
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M							
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M							
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M							
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M							
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #							
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M							
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #							
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M							
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M							
1,1-Dichloroethane	<8 µg/kg	TM116	<8 3 M	<8 3 M							
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M							
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10							
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M							
Chloroform	<8 µg/kg	TM116	<8 M	<8 M							
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M							
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M							
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M							
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M							
Benzene	<9 µg/kg	TM116	<9 M	<9 M							
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #							
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M							
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M							
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M							
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M							
Toluene	<7 µg/kg	TM116	<7 M	<7 M							
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10							
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M							

CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-PTR-24A		BH-PTR-24A				
# M aq diss.flit tot.unfit + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.30 Soil/Solid (S) 12/02/2021 . 15/02/2021 210215-10 23727173 ES2	1.00 Soil/Solid (S) 12/02/2021 . 15/02/2021 210215-10 23727178 ES4					
Component	LOD/Units	Method								
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M						
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #						
Bromoform	<10 µg/kg	TM116	<10 M	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20						
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M						



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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

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SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-PTR-24AES2	24/02/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.30										
Sample Type	SOLID										
Date Sampled	12/02/2021 00:00:00										
Date Received	15/02/2021 08:05:00										
SDG	210215-10										
Original Sample	23727173										
Method Number	TM048										
Cust. Sample Ref.	BH-PTR-24AES4	24/02/2021	Agnieszka Chelmowska	Loose fibres in soil	Not Detected (#)	Trace (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	1.00										
Sample Type	SOLID										
Date Sampled	12/02/2021 00:00:00										
Date Received	15/02/2021 08:05:00										
SDG	210215-10										
Original Sample	23727178										
Method Number	TM048										



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SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Asbestos Quantification - Full

Results Legend							
#	ISO17025 accredited.						
M	mCERTS accredited.						
*	Subcontracted test.						
(F)	Trigger breach confirmed						
1-5&\$@	Sample deviation (see appendix)						
Cust. Sample Ref.	BH-PTR-24AES4	Additional Asbestos Components	None (#)	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation	Asbestos Quantification - Total - %
Depth (m)	1.00						
Sample Type	SOLID						
Date Sampled	12/02/2021 00:00:00						
Date Received	15/02/2021 08:05:00						
SDG	210215-10						
Original Sample	23727178						
Method Number	TM304						

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:210215-10

Client Reference: B025563

Report Number: 588983

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report: 588843

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.113

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site Location

Natural Moisture Content (%)25

Dry Matter Content (%)80

Cambridge South East Transport - f

Case

SDG210215-10

Lab Sample Number(s)23727175

Sampled Date12-Feb-2021

Customer Sample Ref.BH-PTR-24A ES3

Depth (m)0.50

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)		
	Result	Limit of Detection	Result	Limit of Detection	
Ammoniacal Nitrogen as N	0.013	<0.01	0.13	<0.1	- - -
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	- - -
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	- - -
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	- - -
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	- - -
Dissolved Organic Carbon	4	<3	40	<30	- - -
Fluoride	0.539	<0.5	5.39	<5	- - -
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	- - -
Arsenic	<0.0005	<0.0005	<0.005	<0.005	- - -
Barium	0.00761	<0.0002	0.0761	<0.002	- - -
Beryllium	<0.0001	<0.0001	<0.001	<0.001	- - -
Boron	0.0219	<0.01	0.219	<0.1	- - -
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	- - -
Calcium (Dis.Filt) mg/l	16.7	<0.2	167	<2	- - -
Chromium	<0.001	<0.001	<0.01	<0.01	- - -
Copper	0.00362	<0.0003	0.0362	<0.003	- - -
Lead	0.000539	<0.0002	0.00539	<0.002	- - -
Magnesium (Dis.Filt) mg/l	0.222	<0.036	2.22	<0.36	- - -
Manganese	0.0056	<0.003	0.056	<0.03	- - -
Molybdenum	0.00797	<0.003	0.0797	<0.03	- - -
Nickel	0.000694	<0.0004	0.00694	<0.004	- - -
Selenium	<0.001	<0.001	<0.01	<0.01	- - -
Vanadium	<0.001	<0.001	<0.01	<0.01	- - -
Zinc	0.00312	<0.001	0.0312	<0.01	- - -
Chloride	<2	<2	<20	<20	- - -
Sulphate (soluble)	<2	<2	<20	<20	- - -
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	- - -
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	- - -
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	- - -
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	- - -
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	- - -
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	- - -
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	- - -
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	- - -
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	- - -

Leach Test Information

Date Prepared20-Feb-2021

pH (pH Units)8.67

Conductivity (µS/cm)79.90

Temperature (°C)18.90

Volume Leachant (Litres)0.878

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:210215-10Client Reference: B025563Report Number: 588983

Location: Cambridge South East TraOrder Number: 7000964Superseded Report: 588843

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.113

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site Location

Natural Moisture Content (%)25

Dry Matter Content (%)80

Cambridge South East Transport - f

Case

SDG210215-10

Lab Sample Number(s)23727175

Sampled Date12-Feb-2021

Customer Sample Ref.BH-PTR-24A ES3

Depth (m)0.50

Eluate Analysis

C2Concⁿ in 10:1 eluate (mg/l)

A210:1 concⁿ leached (mg/kg)

ResultLimit of Detection

ResultLimit of Detection

Hardness dissolved42.7<0.65427<6.5- - -

Iron (Dis.Filt) mg/l0.355<0.0193.55<0.19- - -

Leach Test Information

Date Prepared20-Feb-2021

pH (pH Units)8.67

Conductivity (µS/cm)79.90

Temperature (°C)18.90

Volume Leachant (Litres)0.878

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23727173	23727175	23727178
Customer Sample Ref.	BH-PTR-24A	BH-PTR-24A	BH-PTR-24A
AGS Ref.	ES2	ES3	ES4
Depth	0.30	0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low		24-Feb-2021	
Anions by Kone (soil)	23-Feb-2021		23-Feb-2021
Anions by Kone (w)		24-Feb-2021	
Asbestos ID in Solid Samples	24-Feb-2021		24-Feb-2021
Asbestos Quantification - Full			02-Mar-2021
Boron Water Soluble	25-Feb-2021		26-Feb-2021
CEN 10:1 Leachate (1 Stage)		20-Feb-2021	
CEN Readings		23-Feb-2021	
Chromium III	25-Feb-2021	25-Feb-2021	25-Feb-2021
Cyanide Comp/Free/Total/Thiocyanate	24-Feb-2021		24-Feb-2021
Dissolved Metals by ICP-MS		24-Feb-2021	
Dissolved Organic/Inorganic Carbon		25-Feb-2021	
EPH CWG GC (S)	22-Feb-2021		22-Feb-2021
Fluoride		24-Feb-2021	
GRO by GC-FID (S)	24-Feb-2021		24-Feb-2021
Hexavalent Chromium (s)	24-Feb-2021		24-Feb-2021
Low Level Cyanide (W)		25-Feb-2021	
Low Level Hexavalent Chromium (w)		25-Feb-2021	
Mercury Dissolved		25-Feb-2021	
Metals in solid samples by OES	03-Mar-2021		01-Mar-2021
Moisture at 105C		20-Feb-2021	
PAH by GCMS	23-Feb-2021		23-Feb-2021
pH	22-Feb-2021		22-Feb-2021
pH Value of Filtered Water		24-Feb-2021	
Phenols by HPLC (S)	23-Feb-2021		24-Feb-2021
Phenols by HPLC (W)		25-Feb-2021	
Sample description	19-Feb-2021	19-Feb-2021	19-Feb-2021
Total Organic Carbon	25-Feb-2021		25-Feb-2021
Total Sulphur	25-Feb-2021		25-Feb-2021
TPH CWG GC (S)	24-Feb-2021		24-Feb-2021
VOC MS (S)	24-Feb-2021		24-Feb-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:210215-10Client Reference: B025563Report Number: 588983

Location:Cambridge South East TraOrder Number: 7000964Superseded Report: 588843

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2396
Ammoniacal Nitrogen as N	TM099	104.0 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2321
Chloride (soluble)	TM243	148.7 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2379
Chloride	TM184	96.8 91.40 : 109.10
Sulphate (soluble)	TM184	98.0 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2390	QC 2399
Water Soluble Boron	TM222	81.0 77.30 : 106.22	91.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2330	QC 2398
Free Cyanide	TM153	96.04 79.00 : 115.00	94.36 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89	97.44 94.09 : 113.89
Total Cyanide	TM153	96.5 73.07 : 107.47	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2348
Barium	TM152	96.67 87.86 : 110.23
Beryllium	TM152	99.0 86.19 : 112.98
Bismuth	TM152	97.0 84.06 : 106.46
Borate	TM152	97.53 88.00 : 112.00
Boron	TM152	97.67 83.92 : 114.90
Cadmium	TM152	99.67 88.89 : 106.69
Calcium	TM152	97.33 80.24 : 117.95
Chromium	TM152	97.67 83.22 : 110.16
Cobalt	TM152	97.0 82.49 : 112.36
Copper	TM152	98.83 83.14 : 113.00
Iron	TM152	98.67 88.40 : 109.24
Lead	TM152	98.0 83.71 : 109.58
Lithium	TM152	97.0 84.50 : 114.28
Magnesium	TM152	94.0 87.56 : 114.57
Manganese	TM152	98.33 90.01 : 108.72
Molybdenum	TM152	95.33 85.53 : 107.42
Nickel	TM152	99.17 88.05 : 106.42
Phosphorus	TM152	97.83 82.76 : 107.72
Potassium	TM152	94.0 88.45 : 106.42
Selenium	TM152	98.17 85.61 : 111.03
Silver	TM152	95.0 88.48 : 110.48
Sodium	TM152	93.33 88.32 : 106.30
Strontium	TM152	96.67 83.77 : 107.87
Tellurium	TM152	94.33 82.83 : 104.73
Thallium	TM152	95.83 77.47 : 113.87
Tin	TM152	96.5 87.36 : 109.55
Titanium	TM152	100.83 87.29 : 108.31



CERTIFICATE OF ANALYSIS

Validated

SDG:210215-10Client Reference: B025563Report Number: 588983

Location:Cambridge South East TraOrder Number: 7000964Superseded Report: 588843

Dissolved Metals by ICP-MS

Component	Method Code	QC 2348
Barium	TM152	96.67 87.86 : 110.23
Beryllium	TM152	99.0 86.19 : 112.98
Bismuth	TM152	97.0 84.06 : 106.46
Borate	TM152	97.53 88.00 : 112.00
Boron	TM152	97.67 83.92 : 114.90
Cadmium	TM152	99.67 88.89 : 106.69
Calcium	TM152	97.33 80.24 : 117.95
Chromium	TM152	97.67 83.22 : 110.16
Cobalt	TM152	97.0 82.49 : 112.36
Copper	TM152	98.83 83.14 : 113.00
Iron	TM152	98.67 88.40 : 109.24
Lead	TM152	98.0 83.71 : 109.58
Lithium	TM152	97.0 84.50 : 114.28
Magnesium	TM152	94.0 87.56 : 114.57
Manganese	TM152	98.33 90.01 : 108.72
Molybdenum	TM152	95.33 85.53 : 107.42
Nickel	TM152	99.17 88.05 : 106.42
Phosphorus	TM152	97.83 82.76 : 107.72
Potassium	TM152	94.0 88.45 : 106.42
Selenium	TM152	98.17 85.61 : 111.03
Silver	TM152	95.0 88.48 : 110.48
Sodium	TM152	93.33 88.32 : 106.30
Strontium	TM152	96.67 83.77 : 107.87
Tellurium	TM152	94.33 82.83 : 104.73
Thallium	TM152	95.83 77.47 : 113.87
Tin	TM152	96.5 87.36 : 109.55
Titanium	TM152	100.83 87.29 : 108.31

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Dissolved Metals by ICP-MS

		QC 2348
Tungsten	TM152	96.0 68.27 : 122.97
Uranium	TM152	97.0 82.46 : 105.16
Vanadium	TM152	96.17 88.43 : 114.30
Zinc	TM152	98.67 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2331
Dissolved Inorganic Carbon	TM090	120.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2359
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2329
QC	TM089	85.19 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2399
Hexavalent Chromium	TM151	96.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2365
Free Cyanide - Low Level	TM279	77.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2334
Mercury Dissolved (CVAf)	TM183	97.5 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2343	QC 2300	QC 2304
Aluminium	TM181	114.16 73.56 : 108.85	100.0 73.56 : 108.85	92.92 73.56 : 108.85
Antimony	TM181	100.41 76.89 : 111.24	95.12 76.89 : 111.24	89.02 76.89 : 111.24
Arsenic	TM181	105.52 88.53 : 111.01	99.13 88.53 : 111.01	95.64 88.53 : 111.01
Barium	TM181	101.83 77.67 : 105.35	94.5 77.67 : 105.35	90.92 77.67 : 105.35
Beryllium	TM181	108.21 85.44 : 109.61	104.1 85.44 : 109.61	94.78 85.44 : 109.61
Boron	TM181	101.15 73.51 : 104.66	87.97 73.51 : 104.66	87.39 73.51 : 104.66
Cadmium	TM181	96.3 77.67 : 104.12	91.77 77.67 : 104.12	90.95 77.67 : 104.12
Chromium	TM181	95.74 77.55 : 104.47	90.87 77.55 : 104.47	86.41 77.55 : 104.47
Cobalt	TM181	97.48 84.60 : 104.13	91.51 84.60 : 104.13	91.51 84.60 : 104.13
Copper	TM181	98.24 82.40 : 105.45	95.6 82.40 : 105.45	87.85 82.40 : 105.45
Iron	TM181	99.21 82.95 : 110.58	98.41 82.95 : 110.58	94.44 82.95 : 110.58
Lead	TM181	102.93 78.24 : 104.05	92.34 78.24 : 104.05	95.05 78.24 : 104.05
Manganese	TM181	118.33 94.29 : 119.51	113.89 94.29 : 119.51	105.83 94.29 : 119.51
Mercury	TM181	101.93 83.16 : 107.81	98.07 83.16 : 107.81	96.62 83.16 : 107.81
Molybdenum	TM181	104.94 87.11 : 106.87	101.65 87.11 : 106.87	98.35 87.11 : 106.87
Nickel	TM181	97.8 80.26 : 102.28	96.33 80.26 : 102.28	91.93 80.26 : 102.28
Phosphorus	TM181	117.58 94.56 : 124.28	111.11 94.56 : 124.28	110.51 94.56 : 124.28
Selenium	TM181	105.49 82.28 : 110.48	101.96 82.28 : 110.48	96.47 82.28 : 110.48
Strontium	TM181	101.34 79.13 : 102.79	92.2 79.13 : 102.79	89.76 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86	97.79 82.94 : 111.86	95.58 82.94 : 111.86
Tin	TM181	107.98 86.72 : 110.03	103.04 86.72 : 110.03	96.58 86.72 : 110.03
Titanium	TM181	93.89 66.23 : 102.06	57.71 66.23 : 102.06	79.39 66.23 : 102.06

Metals in solid samples by OES

		QC 2343	QC 2300	QC 2304
Vanadium	TM181	108.06	98.9	95.24
		75.51 : 108.87	75.51 : 108.87	75.51 : 108.87
Zinc	TM181	103.49	96.51	97.95
		84.68 : 113.99	84.68 : 113.99	84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2310
Acenaphthene	TM218	95.0 80.97 : 105.99
Acenaphthylene	TM218	91.5 74.76 : 107.36
Anthracene	TM218	90.0 73.04 : 106.97
Benz(a)anthracene	TM218	85.5 68.79 : 119.64
Benzo(a)pyrene	TM218	83.5 66.17 : 117.52
Benzo(b)fluoranthene	TM218	82.5 66.40 : 118.34
Benzo(ghi)perylene	TM218	82.5 67.68 : 112.07
Benzo(k)fluoranthene	TM218	86.0 72.84 : 114.66
Chrysene	TM218	84.0 68.39 : 115.56
Dibenzo(ah)anthracene	TM218	80.0 69.03 : 110.45
Fluoranthene	TM218	89.0 69.37 : 117.19
Fluorene	TM218	93.5 75.38 : 105.98
Indeno(123cd)pyrene	TM218	76.5 65.91 : 113.61
Naphthalene	TM218	96.5 71.40 : 105.87
Phenanthrene	TM218	91.5 74.04 : 109.30
Pyrene	TM218	90.5 69.68 : 115.27

pH

Component	Method Code	QC 2333
pH	TM133	99.74 97.97 : 101.10

pH Value of Filtered Water

pH Value of Filtered Water

Component	Method Code	QC 2365
pH	TM256	100.4 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2392	QC 2356
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	105.84 53.34 : 140.63	106.49 53.34 : 140.63
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	94.15 82.04 : 114.37	97.08 82.04 : 114.37
Catechol by HPLC (S)	TM062 (S)	93.33 22.43 : 157.02	84.76 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	95.82 76.45 : 108.78	97.49 76.45 : 108.78
Napthol by HPLC (S)	TM062 (S)	108.57 75.62 : 124.38	112.14 75.62 : 124.38
Phenol by HPLC (S)	TM062 (S)	105.3 77.49 : 117.37	109.27 77.49 : 117.37
Resorcinol HPLC (S)	TM062 (S)	101.89 71.43 : 129.59	105.66 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	96.88 83.23 : 105.39	99.79 83.23 : 105.39

Phenols by HPLC (W)

Component	Method Code	QC 2350
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	53.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	53.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	52.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	54.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	53.33 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2361
Total Organic Carbon	TM132	99.22 87.02 : 113.45

Total Sulphur

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210215-10	Client Reference:	B025563	Report Number:	588983	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843	
Total Sulphur						
Component	Method Code	QC 2319	QC 2334			
Total Sulphur %	TM132	88.08 61.64 : 114.47	103.63 61.64 : 114.47			

VOC MS (S)		
Component	Method Code	QC 2338
1,1,1,2-tetrachloroethane	TM116	110.2 86.59 : 118.97
1,1,1-Trichloroethane	TM116	108.8 86.26 : 117.53
1,1,2-Trichloroethane	TM116	95.8 75.16 : 112.70
1,1-Dichloroethane	TM116	116.6 83.27 : 122.16
1,2-Dichloroethane	TM116	117.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	114.8 82.59 : 123.23
2-Chlorotoluene	TM116	102.2 66.81 : 118.43
4-Chlorotoluene	TM116	95.6 65.88 : 114.76
Benzene	TM116	103.4 93.16 : 123.63
Carbon Disulphide	TM116	106.4 75.11 : 124.81
Carbontetrachloride	TM116	104.4 82.35 : 126.46
Chlorobenzene	TM116	105.8 85.07 : 118.13
Chloroform	TM116	116.4 88.13 : 122.71
Chloromethane	TM116	121.2 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	111.8 78.27 : 128.90
Dibromomethane	TM116	94.8 77.47 : 121.29
Dichloromethane	TM116	117.2 87.89 : 134.72
Ethylbenzene	TM116	95.8 79.92 : 110.05
Hexachlorobutadiene	TM116	58.0 16.78 : 153.29
Isopropylbenzene	TM116	85.6 64.20 : 119.59
Naphthalene	TM116	116.6 79.29 : 125.59
o-Xylene	TM116	90.0 72.86 : 102.10

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210215-10	Client Reference:	B025563	Report Number:	588983	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843	
VOC MS (S)						
		QC 2338				
p/m-Xylene	TM116	88.7 76.47 : 108.99				
Sec-Butylbenzene	TM116	70.2 44.71 : 117.87				
Tetrachloroethene	TM116	100.0 85.86 : 122.95				
Toluene	TM116	94.4 87.82 : 116.21				
Trichloroethene	TM116	103.2 79.80 : 112.33				
Trichlorofluoromethane	TM116	119.4 80.52 : 132.12				
Vinyl Chloride	TM116	114.4 74.57 : 146.88				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

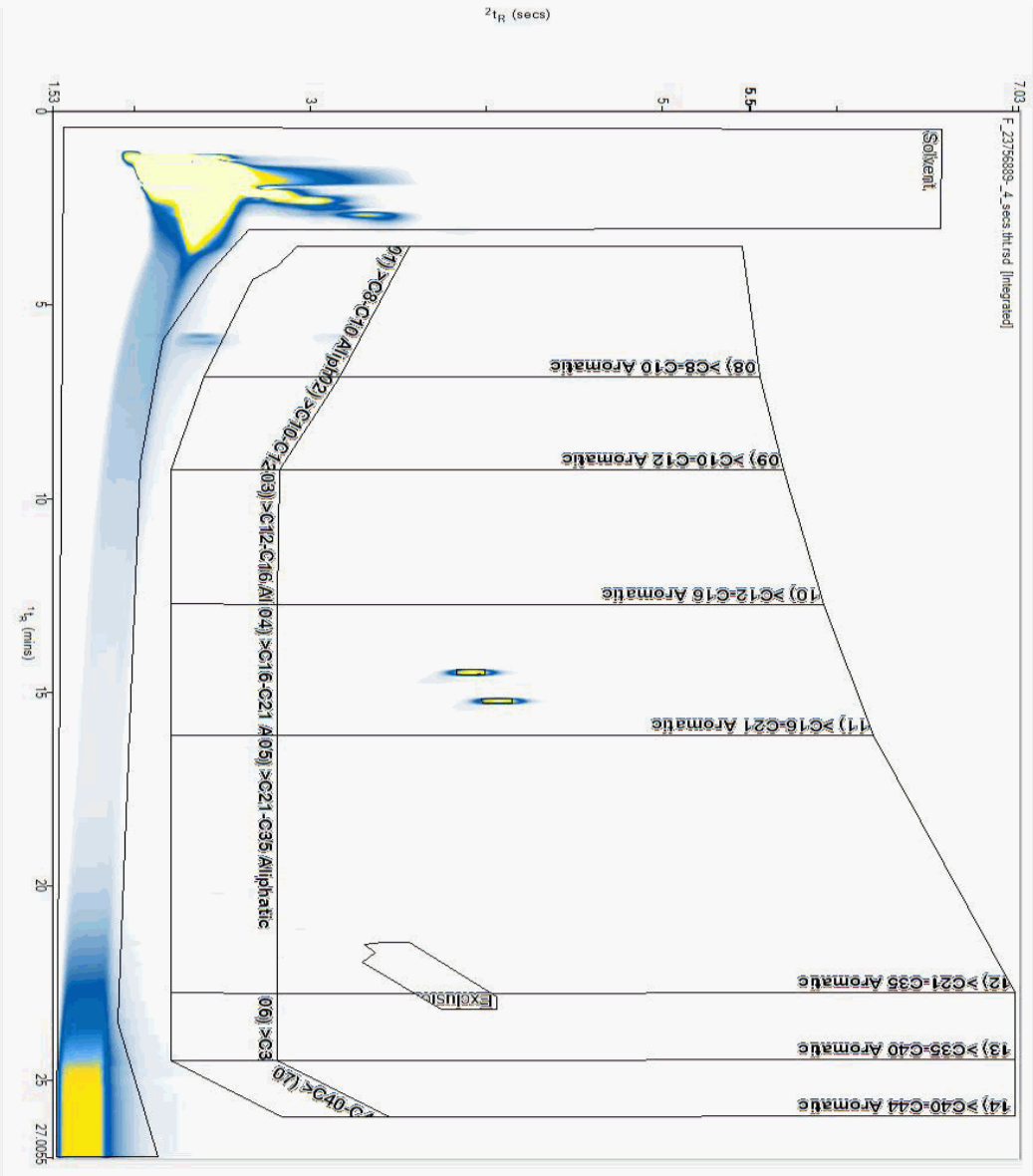
Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23756889 Depth : 1.00
Sample ID : BH-PTR-24A

ChromSpace LIMS export
Current batch
Sample Identity: F_23756889-4_secs.tht
Date Acquired : 21/02/21 01:33:25
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

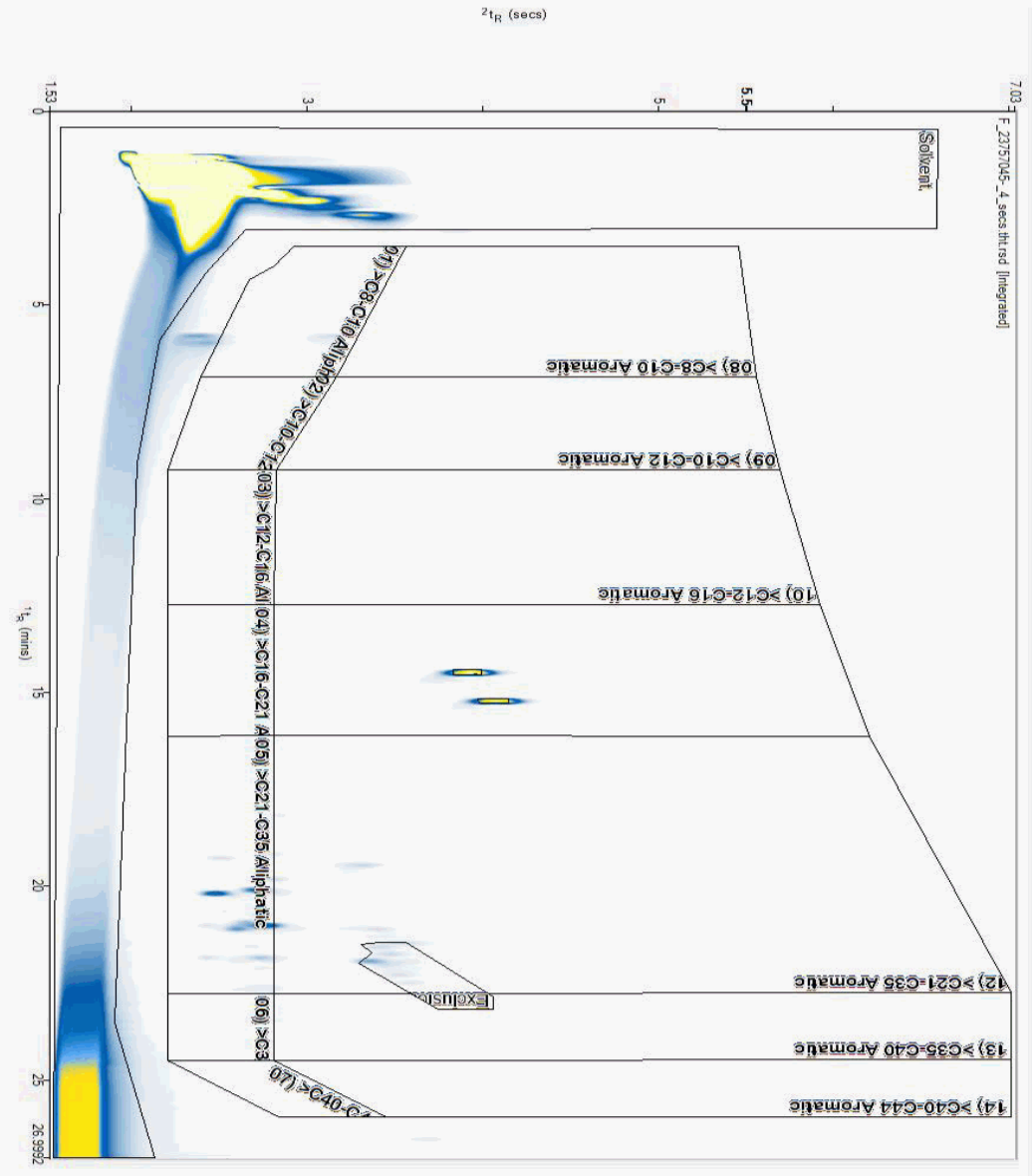
Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23757045 Depth : 0.30
Sample ID : BH-PTR-24A

ChromSpace LIMS export
Current batch
Sample Identity: F_23757045-4_secs.tht
Date Acquired : 21/02/21 03:07:48
Units : ppm
Dilution : 0
CF :
Multiplier :





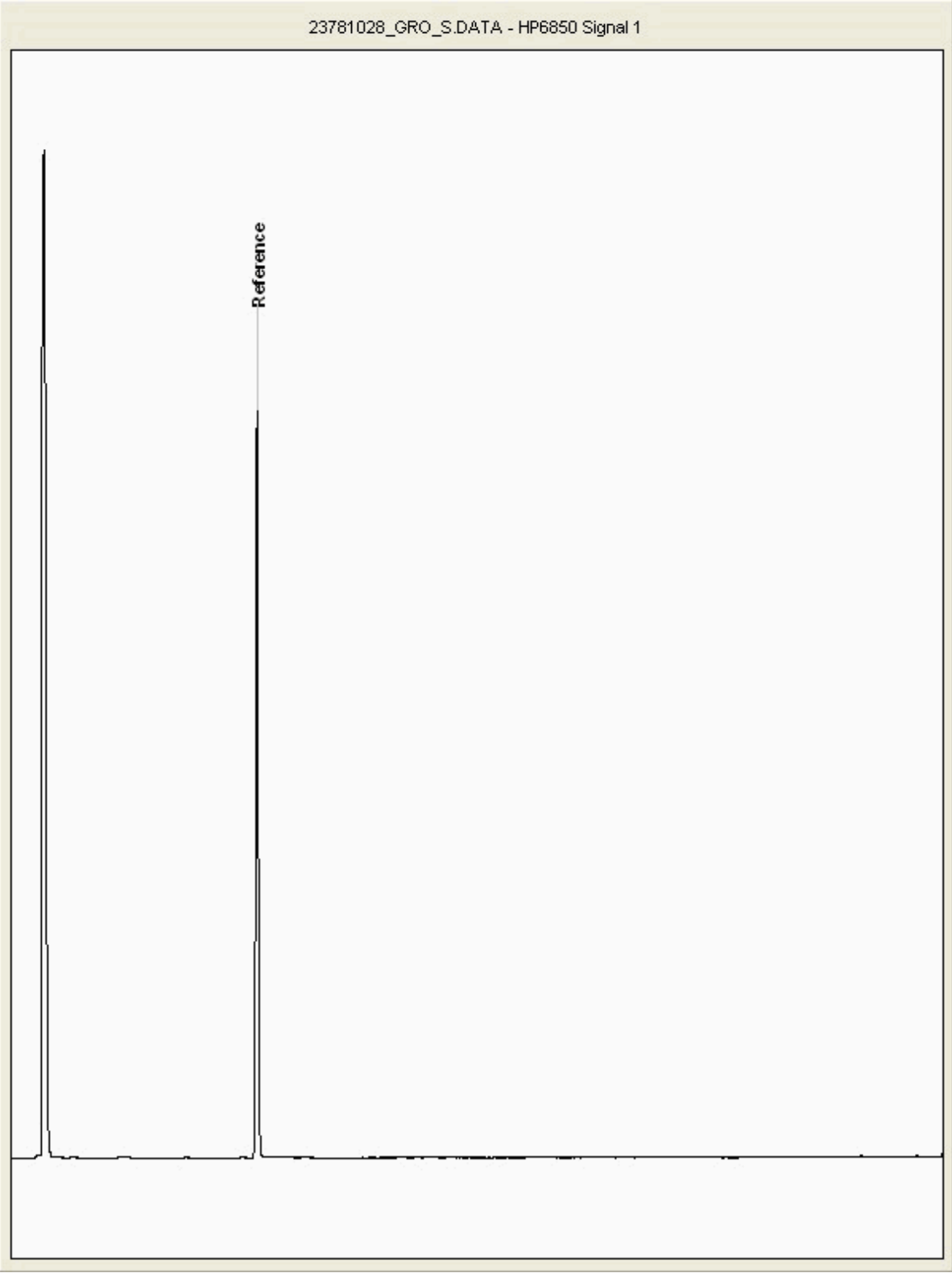
CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23781028 Depth : 0.30
Sample ID : BH-PTR-24A



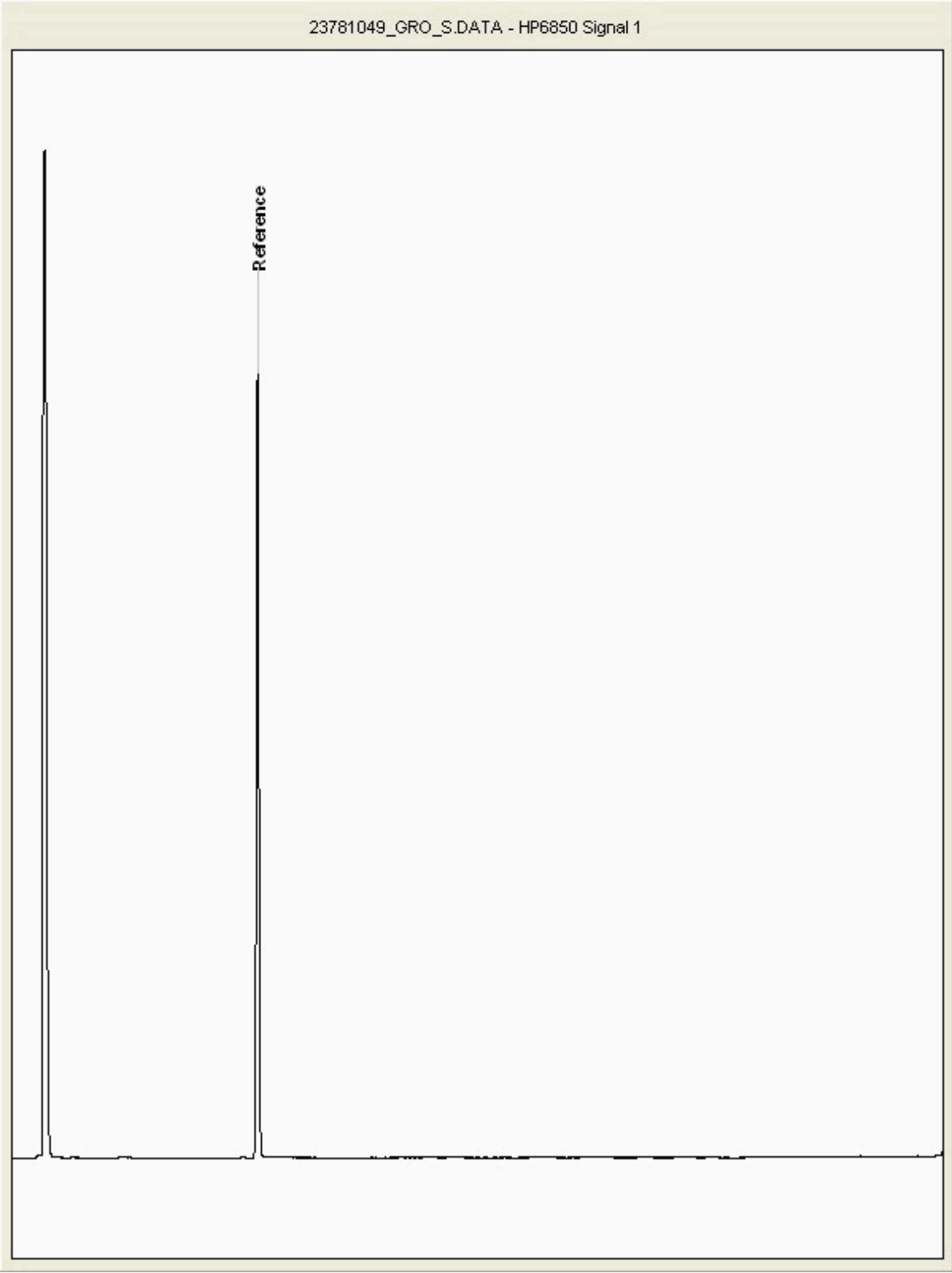
CERTIFICATE OF ANALYSIS

Validated

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	588843

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23781049 Depth : 1.00
Sample ID : BH-PTR-24A





CERTIFICATE OF ANALYSIS

SDG:	210215-10	Client Reference:	B025563	Report Number:	588983
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	588843

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Hawarden

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CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

26 February 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210217-2

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

588432

We received 10 samples on Tuesday February 16, 2021 and 7 of these samples were scheduled for analysis which was completed on Friday February 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23737345	BH-PTR-23	ES1	0.10	16/02/2021
23737346	BH-PTR-23	ES2	0.20	16/02/2021
23737347	BH-PTR-23	ES3	0.50	16/02/2021
23737348	BH-PTR-23	ES4	1.00	16/02/2021
23737350	BH-PTR-25	ES1	0.10	16/02/2021
23737351	BH-PTR-25	ES2	0.20	16/02/2021
23737352	BH-PTR-25	ES3	0.50	16/02/2021
23737354	BH-PTR-25	ES4	1.00	16/02/2021
23737355	BH-PTR-23 WS5		0.90	15/02/2021
23737356	BH-PTR-25 WS5		0.70	15/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend

- X

Test
- N

No Determination Possible

Sample Types -

- S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23737345	23737346	23737347	23737351	23737352	23737354	23737356
						1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	0.5 glass bottle (ALE227)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1			S							X
Ammonium Low	All	NDPs: 0 Tests: 2			S		X			X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 4			S	X		X		X		
Anions by Kone (w)	All	NDPs: 0 Tests: 3			S		X			X		X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4			S	X		X		X		
Boron Water Soluble	All	NDPs: 0 Tests: 4			S	X		X		X		
CEN Readings	All	NDPs: 0 Tests: 2			S		X			X		
Chromium III	All	NDPs: 0 Tests: 6			S	X	X	X	X	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4			S	X		X		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3			S		X			X		X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2			S		X			X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 4			S	X		X		X		X
Fluoride	All	NDPs: 0 Tests: 2			S		X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4			S		X		X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4			S	X		X		X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	23737356		BH-PTR-25 WS5		0.70		0.5 glass bottle (ALE227)		UNL			
	23737354		BH-PTR-25		1.00		60g VOC (ALE215) 250g Amber Jar (ALE210)		S			
	23737352		BH-PTR-25		0.50		1kg TUB with Handle (ALE260)		S			
	23737351		BH-PTR-25		0.20		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		S			
	23737347		BH-PTR-23		0.50		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		S			
	23737346		BH-PTR-23		0.20		1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)		S			
23737345		BH-PTR-23		0.10		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		S				



CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend						
<div><div>X</div>Test</div>						
<div><div>N</div>No Determination Possible</div>						
Sample Types -						
S - Soil/Solid						
UNS - Unspecified Solid						
GW - Ground Water						
SW - Surface Water						
LE - Land Leachate						
PL - Prepared Leachate						
PR - Process Water						
SA - Saline Water						
TE - Trade Effluent						
TS - Treated Sewage						
US - Untreated Sewage						
RE - Recreational Water						
DW - Drinking Water Non-regulatory						
UNL - Unspecified Liquid						
SL - Sludge						
G - Gas						
OTH - Other						
Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	VOC MS (S)
23737356	BH-PTR-25 WS5		0.70	0.5 glass bottle (ALE227)	UNL	
23737354	BH-PTR-25	ES4	1.00	60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
23737352	BH-PTR-25	ES3	0.50	1kg TUB with Handle (ALE260)	S	
23737351	BH-PTR-25	ES2	0.20	60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
23737347	BH-PTR-23	ES3	0.50	1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
23737346	BH-PTR-23	ES2	0.20	250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
23737345	BH-PTR-23	ES1	0.10	1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
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				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)	S	
				60g VOC (ALE215)	S	
				250g Amber Jar (ALE210)	S	
				1kg TUB with Handle (ALE260)		

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23737345	BH-PTR-23	0.10	Dark Brown	Sandy Clay Loam	Stones	Vegetation
23737346	BH-PTR-23	0.20	Light Brown	Sandy Clay Loam	Stones	Vegetation
23737347	BH-PTR-23	0.50	Dark Brown	Sandy Clay Loam	Stones	Vegetation
23737351	BH-PTR-25	0.20	Light Brown	Clay Loam	Stones	Vegetation
23737352	BH-PTR-25	0.50	Light Brown	Sand	Stones	None
23737354	BH-PTR-25	1.00	Light Brown	Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PTR-23	BH-PTR-23	BH-PTR-23	BH-PTR-25	BH-PTR-25	BH-PTR-25
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-PTR-23	BH-PTR-23	BH-PTR-23	BH-PTR-25	BH-PTR-25	BH-PTR-25
M	mCERTS accredited.		0.10	0.20	0.50	0.20	0.50	1.00
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
dis.filt	Dissolved / filtered sample.		16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021
tot.unfilt	Total / unfiltered sample.		16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021	16/02/2021
*	Subcontracted - refer to subcontractor report for accreditation status.		210217-2	210217-2	210217-2	210217-2	210217-2	210217-2
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23737345	23737346	23737347	23737351	23737352	23737354
(F)	Trigger breach confirmed		ES1	ES2	ES3	ES2	ES3	ES4
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	14	13	17	15	12	9.2
Catechol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01	<0.01		<0.01
Phenol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01	<0.01		<0.01
Cresols	<0.01 mg/kg	TM062 (S)	<0.01		<0.01	<0.01		<0.01
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05		<0.05	<0.05		<0.05
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015		<0.015	<0.015		<0.015
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01	<0.01		<0.01
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01		<0.01	<0.01		<0.01
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015		<0.015	<0.015		<0.015
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06		<0.06	<0.06		<0.06
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13		<0.13	<0.13		<0.13
Sulphur, Total	<0.02 %	TM132	<0.02		0.0212	0.0257		<0.02
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00723		0.00733	0.0113		0.00262
pH	1 pH Units	TM133	8.64		8.72	8.35		8.36
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6		<0.6	<0.6		<0.6
Cyanide, Free	<1 mg/kg	TM153	<1		<1	<1		<1
Chromium, Trivalent	<0.9 mg/kg	TM181	12.1		9.44	7.37		<0.9
Antimony	<0.6 mg/kg	TM181	0.726		0.694	1.17		<0.6
Arsenic	<0.6 mg/kg	TM181	10.7		13.2	14.8		57.1
Barium	<0.6 mg/kg	TM181	52.7		58.4	70.6		41.3
Beryllium	<0.01 mg/kg	TM181	0.497		0.45	0.701		0.318
Cadmium	<0.02 mg/kg	TM181	0.0316		<0.02	<0.02		<0.02
Chromium	<0.9 mg/kg	TM181	12.1		9.44	7.37		<0.9
Copper	<1.4 mg/kg	TM181	11.2		9	7.69		4.28
Iron	<1000 mg/kg	TM181	18500		18900	30000		78600
Lead	<0.7 mg/kg	TM181	8.57		5.3	9.98		1.38
Manganese	<0.13 mg/kg	TM181	329		311	345		326
Mercury	<0.1 mg/kg	TM181	<0.1		<0.1	<0.1		<0.1
Molybdenum	<0.1 mg/kg	TM181	0.443		0.339	0.604		2.53
Nickel	<0.2 mg/kg	TM181	13.8		13.7	17.3		12.6
Selenium	<1 mg/kg	TM181	<1		<1	<1		<1
Vanadium	<0.2 mg/kg	TM181	28.5		27.8	34.7		23.2

CERTIFICATE OF ANALYSIS

Validated

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2
Location: Cambridge South East Tra

Client Reference: B025563
Order Number: 7000964

Report Number: 588432
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-23	BH-PTR-23	BH-PTR-25	BH-PTR-25		
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	108	107	105	103		
Toluene-d8**	%	TM116	100	99.5	95.7	98.2		
4-Bromofluorobenzene**	%	TM116	86.4	85.3	68.6	95.1		
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M		
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #	<7 #	<7 #		
Vinyl Chloride	<6 µg/kg	TM116	<6 ♦ M	<6 ♦ M	<6 ♦ M	<6 ♦ M		
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M		
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #		
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M		
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M	<8 M	<8 3 M		
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M		
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10	<10	<10		
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Chloroform	<8 µg/kg	TM116	<8 M	<8 M	<8 M	<8 M		
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M		
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M		
Benzene	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M		
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #		
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M		
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M		
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Toluene	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M		
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10	<10	<10		
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		

SDG: 210217-2
Location: Cambridge South East Tra

Client Reference: B025563
Order Number: 7000964

Report Number: 588432
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-23	BH-PTR-23	BH-PTR-25	BH-PTR-25		
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M		
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M		
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M		
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M	<4 M		
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #		
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Styrene	<10 µg/kg	TM116	<10 ♦ #	<10 ♦ #	<10 ♦ #	<10 ♦ #		
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #	<5 #	<5 #		
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #		
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M	<16 M	<16 M		
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M	<8 M		
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M	<14 M	<14 M		
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #		
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10	<10	<10		
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M	<8 M		
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M		
n-Butylbenzene	<11 µg/kg	TM116	<11	<11	<11	<11		
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M		
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M	<14 M		
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #		
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20	<20	<20		
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20	<20	<20		
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M	<13 M	<13 M		

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ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2
Location: Cambridge South East Tra

Client Reference: B025563
Order Number: 7000964

Report Number: 588432
Superseded Report:

VOC MS (S)

Results Legend

ISO17025 accredited.
M mCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-44@ Sample deviation (see appendix)

Customer Sample Ref.

Depth (m)
Sample Type
Date Sampled
Sampled Time
Date Received
SDG Ref
Lab Sample No.(s)
AGS Reference

BH-PTR-23
0.10
Soil/Solid (S)
16/02/2021
16/02/2021
210217-2
23737345
ES1

BH-PTR-23
0.50
Soil/Solid (S)
16/02/2021
16/02/2021
210217-2
23737347
ES3

BH-PTR-25
0.20
Soil/Solid (S)
16/02/2021
16/02/2021
210217-2
23737351
ES2

BH-PTR-25
1.00
Soil/Solid (S)
16/02/2021
16/02/2021
210217-2
23737354
ES4

Component

LOD/Units

Method

1,3-Dichloropropane

<7
µg/kg

TM116

<7

M

<7

M

<7

M

<7

M

Tetrachloroethene

<5
µg/kg

TM116

<5

M

<5

M

<5

M

<5

M

Dibromochloromethane

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

1,2-Dibromoethane

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

Chlorobenzene

<5
µg/kg

TM116

<5

M

<5

M

<5

M

<5

M

1,1,1,2-Tetrachloroethane

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

Ethylbenzene

<4
µg/kg

TM116

<4

M

<4

M

<4

M

<4

M

p/m-Xylene

<10
µg/kg

TM116

<10

#

<10

#

<10

#

<10

#

o-Xylene

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

Styrene

<10
µg/kg

TM116

<10

♦ #

<10

♦ #

<10

♦ #

<10

♦ #

Bromoform

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

Isopropylbenzene

<5
µg/kg

TM116

<5

#

<5

#

<5

#

<5

#

1,1,2,2-Tetrachloroethane

<10
µg/kg

TM116

<10

#

<10

#

<10

#

<10

#

1,2,3-Trichloropropane

<16
µg/kg

TM116

<16

M

<16

M

<16

M

<16

M

Bromobenzene

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

Propylbenzene

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

2-Chlorotoluene

<9
µg/kg

TM116

<9

M

<9

M

<9

M

<9

M

1,3,5-Trimethylbenzene

<8
µg/kg

TM116

<8

M

<8

M

<8

M

<8

M

4-Chlorotoluene

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

tert-Butylbenzene

<14
µg/kg

TM116

<14

M

<14

M

<14

M

<14

M

1,2,4-Trimethylbenzene

<9
µg/kg

TM116

<9

#

<9

#

<9

#

<9

#

sec-Butylbenzene

<10
µg/kg

TM116

<10

<10

<10

<10

4-Isopropyltoluene

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

1,3-Dichlorobenzene

<8
µg/kg

TM116

<8

M

<8

M

<8

M

<8

M

1,4-Dichlorobenzene

<5
µg/kg

TM116

<5

M

<5

M

<5

M

<5

M

n-Butylbenzene

<11
µg/kg

TM116

<11

<11

<11

<11

1,2-Dichlorobenzene

<10
µg/kg

TM116

<10

M

<10

M

<10

M

<10

M

1,2-Dibromo-3-chloropropane

<14
µg/kg

TM116

<14

M

<14

M

<14

M

<14

M

Tert-amyl methyl ether

<10
µg/kg

TM116

<10

#

<10

#

<10

#

<10

#

1,2,4-Trichlorobenzene

<20
µg/kg

TM116

<20

<20

<20

<20

Hexachlorobutadiene

<20
µg/kg

TM116

<20

<20

<20

<20

Naphthalene

<13
µg/kg

TM116

<13

M

<13

M

<13

M

<13

M

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SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-58*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-PTR-23ES1	24/02/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.10										
Sample Type	SOLID										
Date Sampled	16/02/2021 00:00:00										
Date Received	16/02/2021 13:30:00										
SDG	210217-2										
Original Sample	23737345										
Method Number	TM048										
Cust. Sample Ref.	BH-PTR-23ES3	24/02/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	SOLID										
Date Sampled	16/02/2021 00:00:00										
Date Received	16/02/2021 13:30:00										
SDG	210217-2										
Original Sample	23737347										
Method Number	TM048										
Cust. Sample Ref.	BH-PTR-25ES2	24/02/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20										
Sample Type	SOLID										
Date Sampled	16/02/2021 00:00:00										
Date Received	16/02/2021 13:30:00										
SDG	210217-2										
Original Sample	23737351										
Method Number	TM048										
Cust. Sample Ref.	BH-PTR-25ES4	24/02/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	1.00										
Sample Type	SOLID										
Date Sampled	16/02/2021 00:00:00										
Date Received	16/02/2021 13:30:00										
SDG	210217-2										
Original Sample	23737354										
Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23737345	23737346	23737347	23737351	23737352	23737354	23737356
Customer Sample Ref.	BH-PTR-23	BH-PTR-23	BH-PTR-23	BH-PTR-25	BH-PTR-25	BH-PTR-25	BH-PTR-25 W55
AGS Ref.	ES1	ES2	ES3	ES2	ES3	ES4	
Depth	0.10	0.20	0.50	0.20	0.50	1.00	0.70
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Unspecified Liq
Ammoniacal Nitrogen							23-Feb-2021
Ammonium Low		24-Feb-2021			24-Feb-2021		
Anions by Kone (soil)	23-Feb-2021		23-Feb-2021	23-Feb-2021		23-Feb-2021	
Anions by Kone (w)		24-Feb-2021			24-Feb-2021		24-Feb-2021
Asbestos ID in Solid Samples	24-Feb-2021		24-Feb-2021	24-Feb-2021		24-Feb-2021	
Boron Water Soluble	26-Feb-2021		26-Feb-2021	26-Feb-2021		26-Feb-2021	
CEN 10:1 Leachate (1 Stage)		20-Feb-2021			20-Feb-2021		
CEN Readings		23-Feb-2021			23-Feb-2021		
Chromium III	26-Feb-2021	25-Feb-2021	26-Feb-2021	26-Feb-2021	25-Feb-2021	26-Feb-2021	
Cyanide Comp/Free/Total/Thiocyanate	24-Feb-2021		24-Feb-2021	24-Feb-2021		24-Feb-2021	
Dissolved Metals by ICP-MS		24-Feb-2021			24-Feb-2021		23-Feb-2021
Dissolved Organic/Inorganic Carbon		25-Feb-2021			25-Feb-2021		
EPH CWG GC (S)	22-Feb-2021		22-Feb-2021	22-Feb-2021		22-Feb-2021	
Fluoride		24-Feb-2021			24-Feb-2021		
GRO by GC-FID (S)	24-Feb-2021		24-Feb-2021	24-Feb-2021		24-Feb-2021	
Hexavalent Chromium (s)	24-Feb-2021		24-Feb-2021	24-Feb-2021		24-Feb-2021	
Low Level Cyanide (W)		25-Feb-2021			25-Feb-2021		
Low Level Hexavalent Chromium (w)		25-Feb-2021			25-Feb-2021		
Mercury Dissolved		25-Feb-2021			25-Feb-2021		
Metals in solid samples by OES	26-Feb-2021		26-Feb-2021	26-Feb-2021		26-Feb-2021	
Moisture at 105C		20-Feb-2021			20-Feb-2021		
Nitrite by Kone (w)							22-Feb-2021
PAH by GCMS	23-Feb-2021		23-Feb-2021	23-Feb-2021		23-Feb-2021	
pH	22-Feb-2021		22-Feb-2021	22-Feb-2021		22-Feb-2021	
pH Value							22-Feb-2021
pH Value of Filtered Water		24-Feb-2021			24-Feb-2021		
Phenols by HPLC (S)	24-Feb-2021		24-Feb-2021	24-Feb-2021		23-Feb-2021	
Phenols by HPLC (W)		25-Feb-2021			25-Feb-2021		
Sample description	19-Feb-2021	19-Feb-2021	19-Feb-2021	19-Feb-2021	19-Feb-2021	19-Feb-2021	
Sulphur Dissolved by ICP-OES							24-Feb-2021
Total Organic Carbon	25-Feb-2021		25-Feb-2021	25-Feb-2021		25-Feb-2021	
Total Sulphur	25-Feb-2021		25-Feb-2021	25-Feb-2021		25-Feb-2021	
TPH CWG GC (S)	24-Feb-2021		24-Feb-2021	24-Feb-2021		24-Feb-2021	
VOC MS (S)	24-Feb-2021		24-Feb-2021	24-Feb-2021		24-Feb-2021	

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2352
Ammoniacal Nitrogen as N	TM099	100.8 91.28 : 106.64

Ammonium Low

Component	Method Code	QC 2371	QC 2396
Ammoniacal Nitrogen as N	TM099	100.8 96.04 : 106.80	104.0 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2321	QC 2397
Chloride (soluble)	TM243	148.7 86.68 : 115.67	151.3 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00	158.88 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2312	QC 2379
Chloride	TM184	104.0 92.93 : 115.43	96.8 91.40 : 109.10
Sulphate (soluble)	TM184	101.2 90.53 : 113.03	98.0 91.99 : 109.30
TON as NO3	TM184	103.5 99.60 : 111.90	

Boron Water Soluble

Component	Method Code	QC 2399
Water Soluble Boron	TM222	91.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2330	QC 2398
Free Cyanide	TM153	96.04 79.00 : 115.00	94.36 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89	97.44 94.09 : 113.89
Total Cyanide	TM153	96.5 73.07 : 107.47	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2340	QC 2348
Aluminium	TM152	107.0 90.98 : 111.82	96.33 90.78 : 110.89
Antimony	TM152	100.5 90.44 : 113.04	96.67 77.22 : 119.42
Arsenic	TM152	101.67 88.00 : 112.00	98.17 86.77 : 107.67
Barium	TM152	100.0 90.20 : 111.19	96.67 87.86 : 110.23
Beryllium	TM152	108.67 87.77 : 113.97	99.0 86.19 : 112.98
Bismuth	TM152	104.5 91.90 : 112.20	97.0 84.06 : 106.46
Borate	TM152	109.88 88.00 : 112.00	97.53 88.00 : 112.00
Boron	TM152	110.0 96.48 : 114.93	97.67 83.92 : 114.90
Cadmium	TM152	105.0 96.43 : 110.53	99.67 88.89 : 106.69
Calcium	TM152	102.67 81.38 : 119.09	97.33 80.24 : 117.95
Chromium	TM152	102.5 91.84 : 108.67	97.67 83.22 : 110.16
Cobalt	TM152	101.83 88.00 : 112.00	97.0 82.49 : 112.36
Copper	TM152	102.67 92.47 : 118.11	98.83 83.14 : 113.00
Iron	TM152	104.0 92.00 : 113.00	98.67 88.40 : 109.24
Lead	TM152	100.67 88.00 : 112.00	98.0 83.71 : 109.58
Lithium	TM152	108.83 91.62 : 113.12	97.0 84.50 : 114.28
Magnesium	TM152	101.33 93.14 : 107.91	94.0 87.56 : 114.57
Manganese	TM152	105.17 95.03 : 110.58	98.33 90.01 : 108.72
Molybdenum	TM152	100.17 88.00 : 112.00	95.33 85.53 : 107.42
Nickel	TM152	102.17 88.00 : 112.00	99.17 88.05 : 106.42
Phosphorus	TM152	104.17 88.00 : 112.00	97.83 82.76 : 107.72
Potassium	TM152	102.0 93.90 : 112.36	94.0 88.45 : 106.42
Selenium	TM152	103.5 91.58 : 115.98	98.17 85.61 : 111.03
Silver	TM152	102.5 88.80 : 122.30	95.0 88.48 : 110.48
Sodium	TM152	102.67 94.28 : 110.71	93.33 88.32 : 106.30
Strontium	TM152	103.67 88.00 : 112.00	96.67 83.77 : 107.87
Tellurium	TM152	101.0 93.32 : 114.66	94.33 82.83 : 104.73

Dissolved Metals by ICP-MS

		QC 2340	QC 2348
Thallium	TM152	98.0 88.00 : 112.00	95.83 77.47 : 113.87
Tin	TM152	102.83 92.63 : 109.70	96.5 87.36 : 109.55
Titanium	TM152	108.17 95.58 : 111.68	100.83 87.29 : 108.31
Tungsten	TM152	99.17 81.32 : 124.72	96.0 68.27 : 122.97
Uranium	TM152	102.67 88.00 : 112.00	97.0 82.46 : 105.16
Vanadium	TM152	105.67 88.00 : 112.00	96.17 88.43 : 114.30
Zinc	TM152	104.67 92.98 : 118.95	98.67 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2331
Dissolved Inorganic Carbon	TM090	120.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2359	QC 2367
Fluoride	TM104	102.0 96.67 : 108.67	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2329
QC	TM089	85.19 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2399
Hexavalent Chromium	TM151	96.0 92.00 : 111.20

Low Level Cyanide (W)

Low Level Cyanide (W)

Component	Method Code	QC 2365
Free Cyanide - Low Level	TM279	77.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2334
Mercury Dissolved (CVAf)	TM183	97.5 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2377	QC 2371	QC 2300
Aluminium	TM181	83.45 77.46 : 123.98	109.73 73.56 : 108.85	100.0 73.56 : 108.85
Antimony	TM181	93.9 87.04 : 111.16	95.53 76.89 : 111.24	95.12 76.89 : 111.24
Arsenic	TM181	96.51 87.34 : 110.87	100.0 88.53 : 111.01	99.13 88.53 : 111.01
Barium	TM181	86.15 80.73 : 115.16	103.67 77.67 : 105.35	94.5 77.67 : 105.35
Beryllium	TM181	95.15 89.47 : 112.97	102.99 85.44 : 109.61	104.1 85.44 : 109.61
Boron	TM181	80.23 76.57 : 104.15	99.43 73.51 : 104.66	87.97 73.51 : 104.66
Cadmium	TM181	87.24 78.94 : 102.43	89.71 77.67 : 104.12	91.77 77.67 : 104.12
Chromium	TM181	81.34 77.55 : 104.47	94.12 77.55 : 104.47	90.87 77.55 : 104.47
Cobalt	TM181	88.99 82.95 : 107.41	94.03 84.60 : 104.13	91.51 84.60 : 104.13
Copper	TM181	110.56 84.36 : 106.14	92.43 82.40 : 105.45	95.6 82.40 : 105.45
Iron	TM181	88.1 81.43 : 115.79	103.17 82.95 : 110.58	98.41 82.95 : 110.58
Lead	TM181	88.29 81.95 : 107.63	92.79 78.24 : 104.05	92.34 78.24 : 104.05
Manganese	TM181	102.5 94.29 : 119.51	114.44 94.29 : 119.51	113.89 94.29 : 119.51
Mercury	TM181	92.51 82.73 : 106.36	95.89 83.16 : 107.81	98.07 83.16 : 107.81
Molybdenum	TM181	92.59 86.61 : 111.07	102.47 87.11 : 106.87	101.65 87.11 : 106.87
Nickel	TM181	89.73 79.72 : 103.80	95.35 80.26 : 102.28	96.33 80.26 : 102.28
Phosphorus	TM181	105.66 92.65 : 125.47	114.75 94.56 : 124.28	111.11 94.56 : 124.28

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210217-2	Client Reference:	B025563	Report Number:	588432	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2377	QC 2371	QC 2300
Selenium	TM181	97.65 88.36 : 111.25	98.43 82.28 : 110.48	101.96 82.28 : 110.48
Strontium	TM181	84.41 78.06 : 99.91	95.32 79.13 : 102.79	92.2 79.13 : 102.79
Thallium	TM181	95.58 88.60 : 116.73	95.58 82.94 : 111.86	97.79 82.94 : 111.86
Tin	TM181	93.54 89.77 : 112.62	101.9 86.72 : 110.03	103.04 86.72 : 110.03
Titanium	TM181	66.41 66.29 : 105.96	102.29 66.23 : 102.06	57.71 66.23 : 102.06
Vanadium	TM181	89.74 75.51 : 108.87	103.3 75.51 : 108.87	98.9 75.51 : 108.87
Zinc	TM181	95.07 84.02 : 111.24	96.92 84.68 : 113.99	96.51 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2310
Acenaphthene	TM218	95.0 80.97 : 105.99
Acenaphthylene	TM218	91.5 74.76 : 107.36
Anthracene	TM218	90.0 73.04 : 106.97
Benz(a)anthracene	TM218	85.5 68.79 : 119.64
Benzo(a)pyrene	TM218	83.5 66.17 : 117.52
Benzo(b)fluoranthene	TM218	82.5 66.40 : 118.34
Benzo(ghi)perylene	TM218	82.5 67.68 : 112.07
Benzo(k)fluoranthene	TM218	86.0 72.84 : 114.66
Chrysene	TM218	84.0 68.39 : 115.56
Dibenzo(ah)anthracene	TM218	80.0 69.03 : 110.45
Fluoranthene	TM218	89.0 69.37 : 117.19
Fluorene	TM218	93.5 75.38 : 105.98
Indeno(123cd)pyrene	TM218	76.5 65.91 : 113.61
Naphthalene	TM218	96.5 71.40 : 105.87
Phenanthrene	TM218	91.5 74.04 : 109.30
Pyrene	TM218	90.5 69.68 : 115.27

pH

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210217-2	Client Reference:	B025563	Report Number:	588432	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		

pH

Component	Method Code	QC 2333	QC 2364
pH	TM133	99.74 97.97 : 101.10	100.92 98.71 : 102.32

pH Value

Component	Method Code	QC 2365
pH	TM256	100.94 99.33 : 102.54

pH Value of Filtered Water

Component	Method Code	QC 2365	QC 2368
pH	TM256	100.4 99.33 : 102.54	99.87 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2392	QC 2356
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	105.84 53.34 : 140.63	106.49 53.34 : 140.63
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	94.15 82.04 : 114.37	97.08 82.04 : 114.37
Catechol by HPLC (S)	TM062 (S)	93.33 22.43 : 157.02	84.76 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	95.82 76.45 : 108.78	97.49 76.45 : 108.78
Naphthol by HPLC (S)	TM062 (S)	108.57 75.62 : 124.38	112.14 75.62 : 124.38
Phenol by HPLC (S)	TM062 (S)	105.3 77.49 : 117.37	109.27 77.49 : 117.37
Resorcinol HPLC (S)	TM062 (S)	101.89 71.43 : 129.59	105.66 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	96.88 83.23 : 105.39	99.79 83.23 : 105.39

Phenols by HPLC (W)

Component	Method Code	QC 2350
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	53.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	53.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	52.67 76.60 : 126.28

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210217-2	Client Reference:	B025563	Report Number:	588432	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Phenols by HPLC (W)						

		QC 2350
Napthol by HPLC (W)	TM259	54.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	53.33 79.09 : 131.82

Sulphur Dissolved by ICP-OES		
Component	Method Code	QC 2320
Sulphur Dissolved	TM228	89.9 83.39 : 110.45

Total Organic Carbon		
Component	Method Code	QC 2361
Total Organic Carbon	TM132	99.22 87.02 : 113.45

Total Sulphur			
Component	Method Code	QC 2319	QC 2334
Total Sulphur %	TM132	88.08 61.64 : 114.47	103.63 61.64 : 114.47

VOC MS (S)			
Component	Method Code	QC 2397	QC 2338
1,1,1,2-tetrachloroethane	TM116	93.0 84.84 : 116.25	110.2 86.59 : 118.97
1,1,1-Trichloroethane	TM116	94.0 73.73 : 118.05	108.8 86.26 : 117.53
1,1,2-Trichloroethane	TM116	91.4 77.12 : 116.04	95.8 75.16 : 112.70
1,1-Dichloroethane	TM116	108.4 74.46 : 129.15	116.6 83.27 : 122.16
1,2-Dichloroethane	TM116	107.6 92.38 : 131.65	117.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	101.6 83.64 : 126.18	114.8 82.59 : 123.23
2-Chlorotoluene	TM116	87.6 76.03 : 113.25	102.2 66.81 : 118.43
4-Chlorotoluene	TM116	87.0 66.90 : 112.46	95.6 65.88 : 114.76

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210217-2	Client Reference:	B025563	Report Number:	588432	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						

		QC 2397	QC 2338
Benzene	TM116	98.6 88.60 : 113.80	103.4 93.16 : 123.63
Carbon Disulphide	TM116	102.2 74.91 : 122.14	106.4 75.11 : 124.81
Carbontetrachloride	TM116	94.6 80.31 : 124.50	104.4 82.35 : 126.46
Chlorobenzene	TM116	97.0 83.81 : 114.18	105.8 85.07 : 118.13
Chloroform	TM116	107.0 87.40 : 122.49	116.4 88.13 : 122.71
Chloromethane	TM116	109.0 65.89 : 136.93	121.2 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	102.4 80.67 : 126.72	111.8 78.27 : 128.90
Dibromomethane	TM116	89.8 73.23 : 118.35	94.8 77.47 : 121.29
Dichloromethane	TM116	113.0 81.11 : 133.25	117.2 87.89 : 134.72
Ethylbenzene	TM116	82.8 75.92 : 110.41	95.8 79.92 : 110.05
Hexachlorobutadiene	TM116	62.8 12.82 : 152.73	58.0 16.78 : 153.29
Isopropylbenzene	TM116	68.8 55.79 : 97.59	85.6 64.20 : 119.59
Naphthalene	TM116	101.6 80.86 : 128.81	116.6 79.29 : 125.59
o-Xylene	TM116	78.8 69.99 : 108.74	90.0 72.86 : 102.10
p/m-Xylene	TM116	77.9 68.32 : 108.91	88.7 76.47 : 108.99
Sec-Butylbenzene	TM116	65.2 38.50 : 101.50	70.2 44.71 : 117.87
Tetrachloroethene	TM116	88.6 76.95 : 121.02	100.0 85.86 : 122.95
Toluene	TM116	87.4 74.24 : 107.42	94.4 87.82 : 116.21
Trichloroethene	TM116	92.6 85.28 : 109.36	103.2 79.80 : 112.33
Trichlorofluoromethane	TM116	103.2 84.55 : 133.27	119.4 80.52 : 132.12
Vinyl Chloride	TM116	107.0 68.02 : 143.37	114.4 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

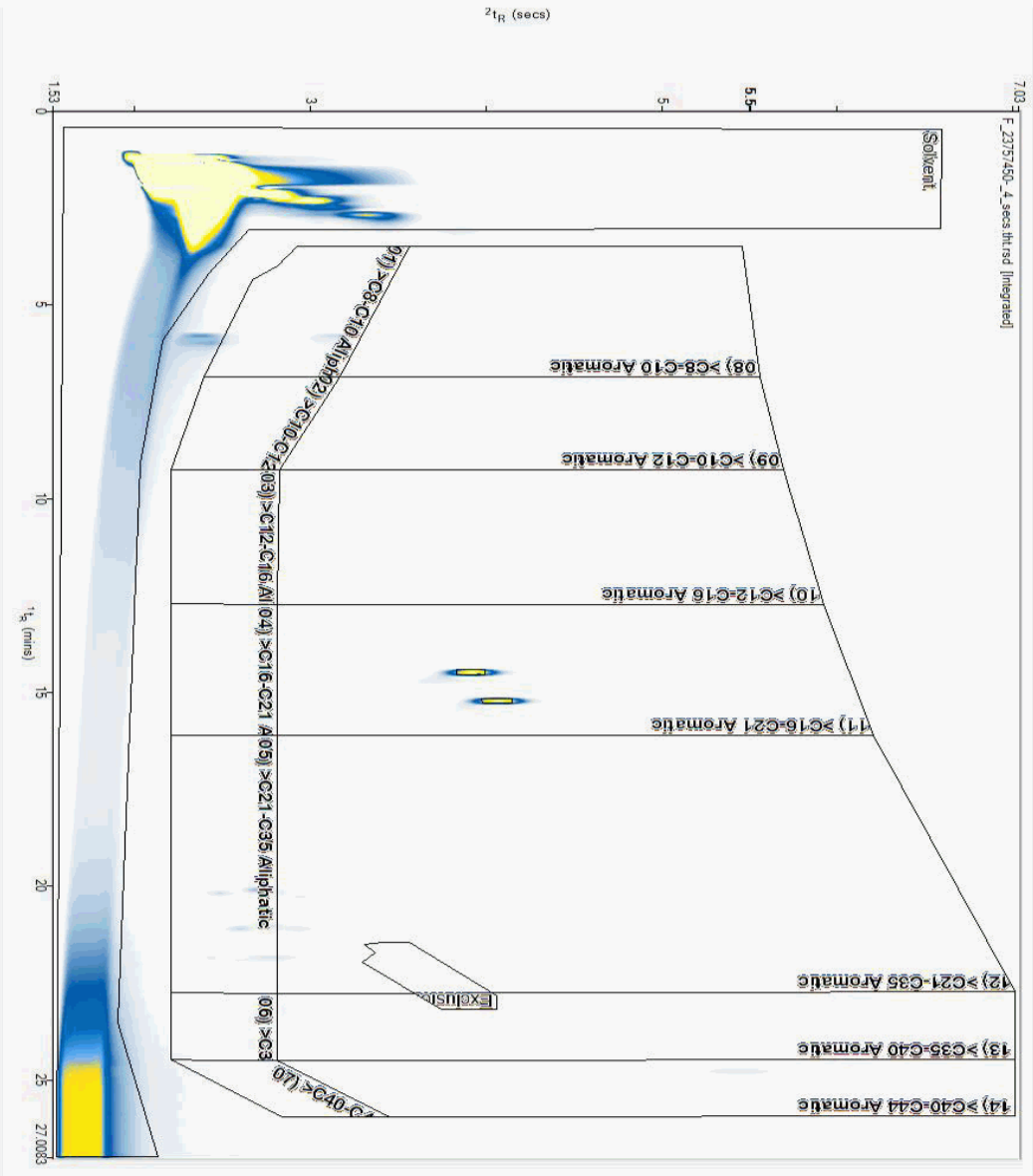
Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23757450 Depth : 0.50
Sample ID : BH-PTR-23

ChromSpace LIMS export
Current batch
Sample Identity: F_23757450-4_secs.tht
Date Acquired : 21/02/21 01:01:57
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

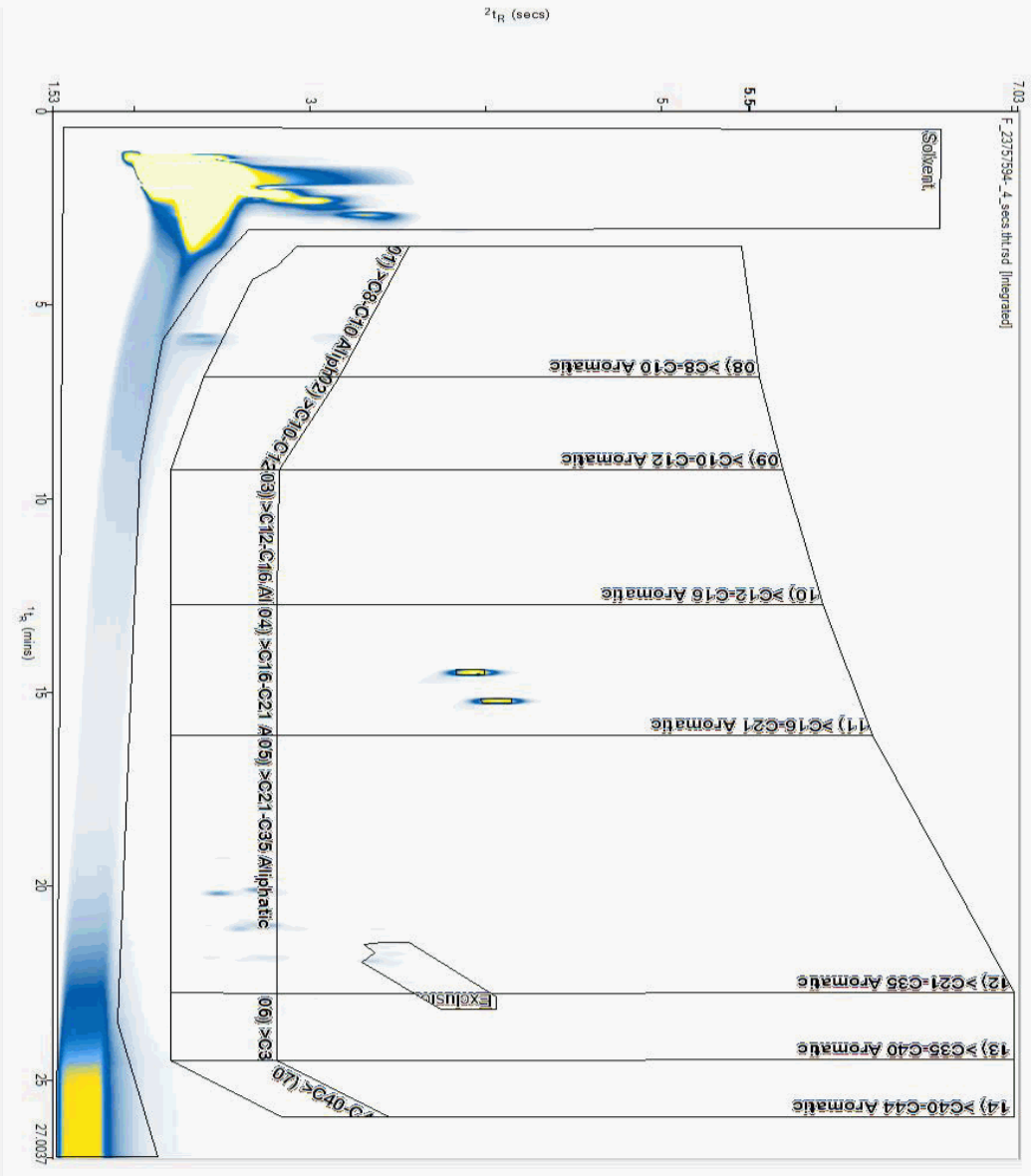
Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23757594 Depth : 0.10
Sample ID : BH-PTR-23

ChromSpace LIMS export
Current batch
Sample Identity: F_23757594-4_secs.tht
Date Acquired : 21/02/21 02:36:21
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

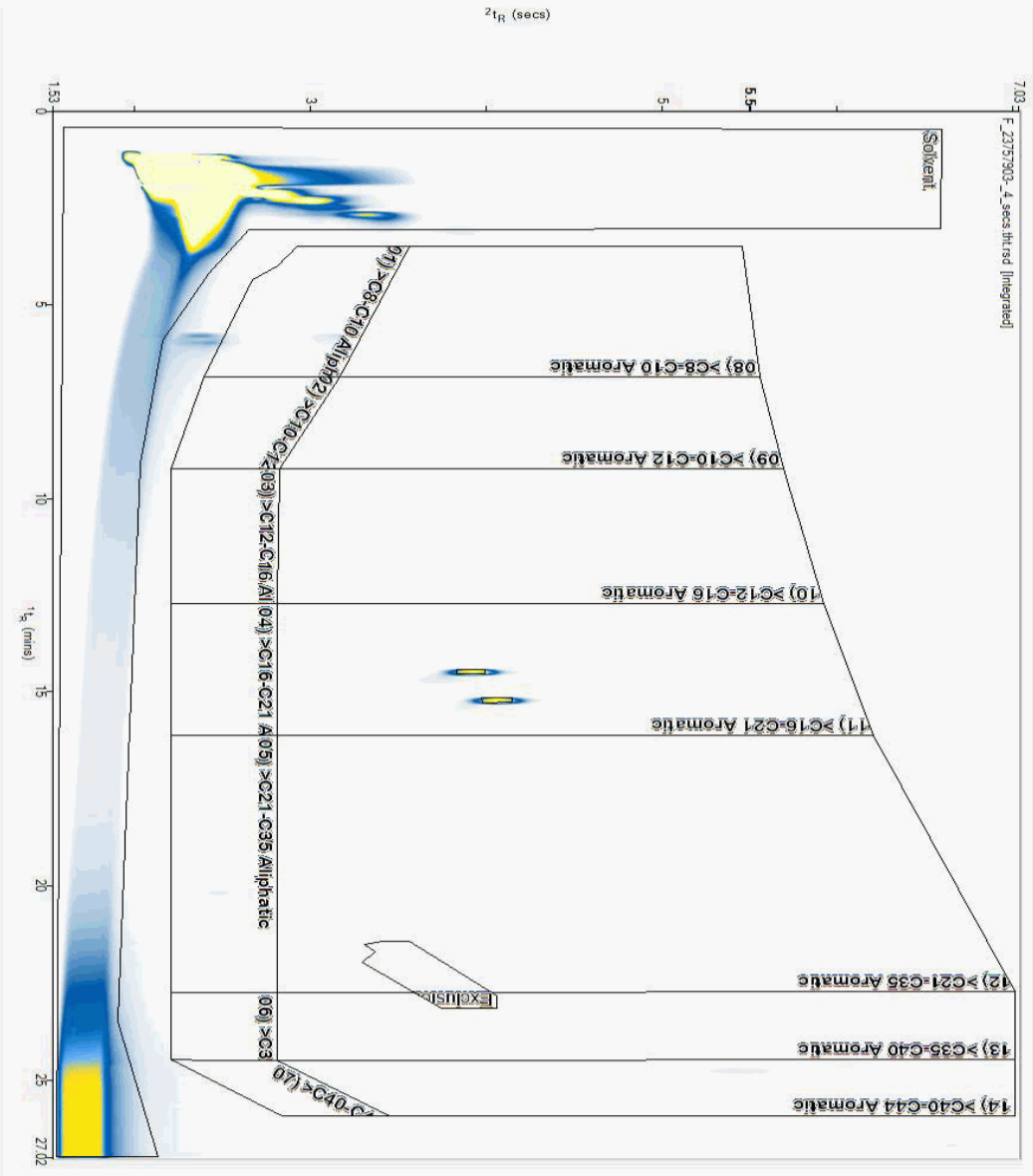
Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23757903 Depth : 1.00
Sample ID : BH-PTR-25

ChromSpace LIMS export
Current batch
Sample Identity: F_23757903-4_secs.tht
Date Acquired : 20/02/21 11:59:00
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

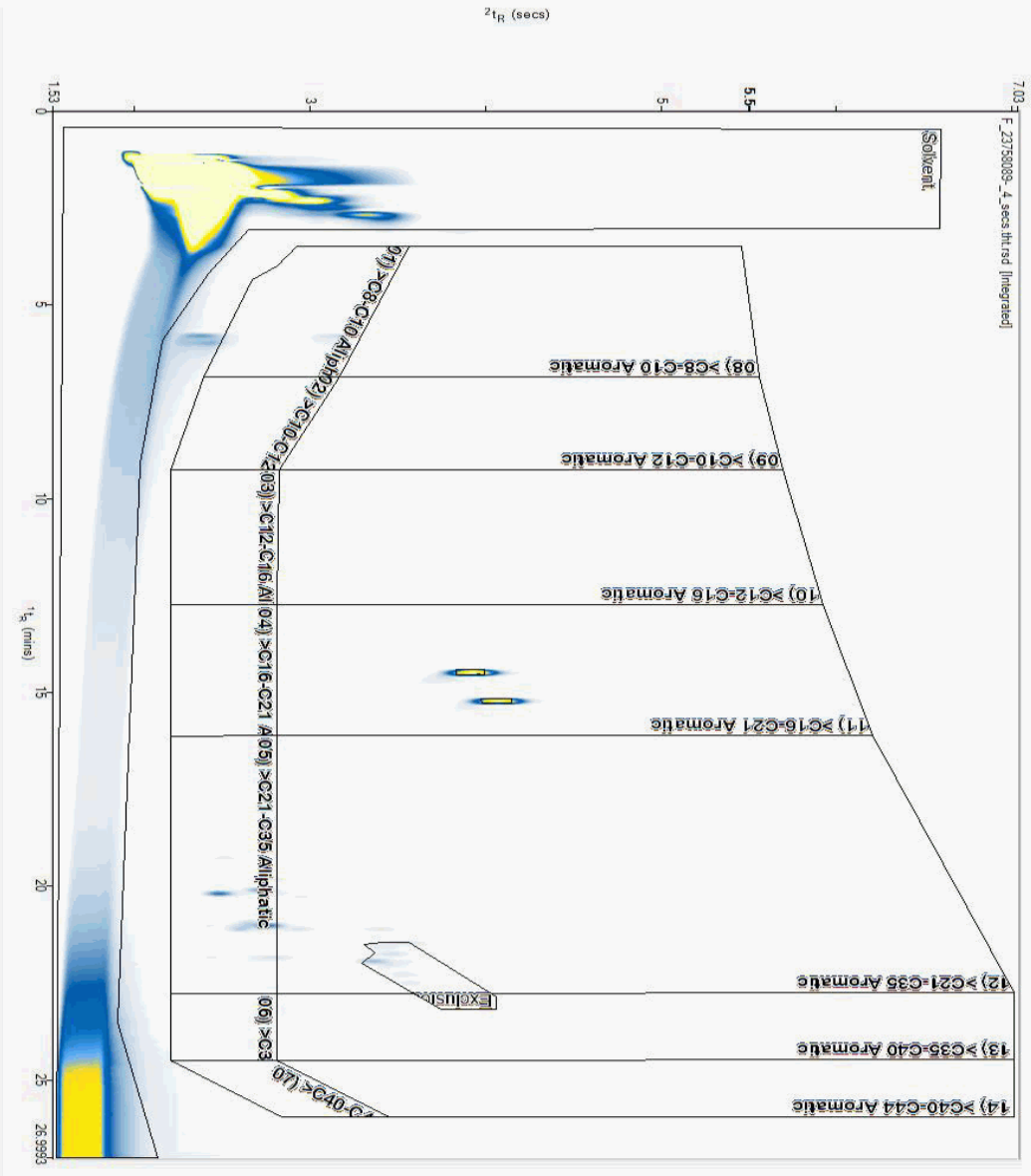
Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23758089 Depth : 0.20
Sample ID : BH-PTR-25

ChromSpace LIMS export
Current batch
Sample Identity: F_23758089-4_secs.tht
Date Acquired : 21/02/21 02:04:54
Units : ppm
Dilution : 0
CF :
Multiplier :





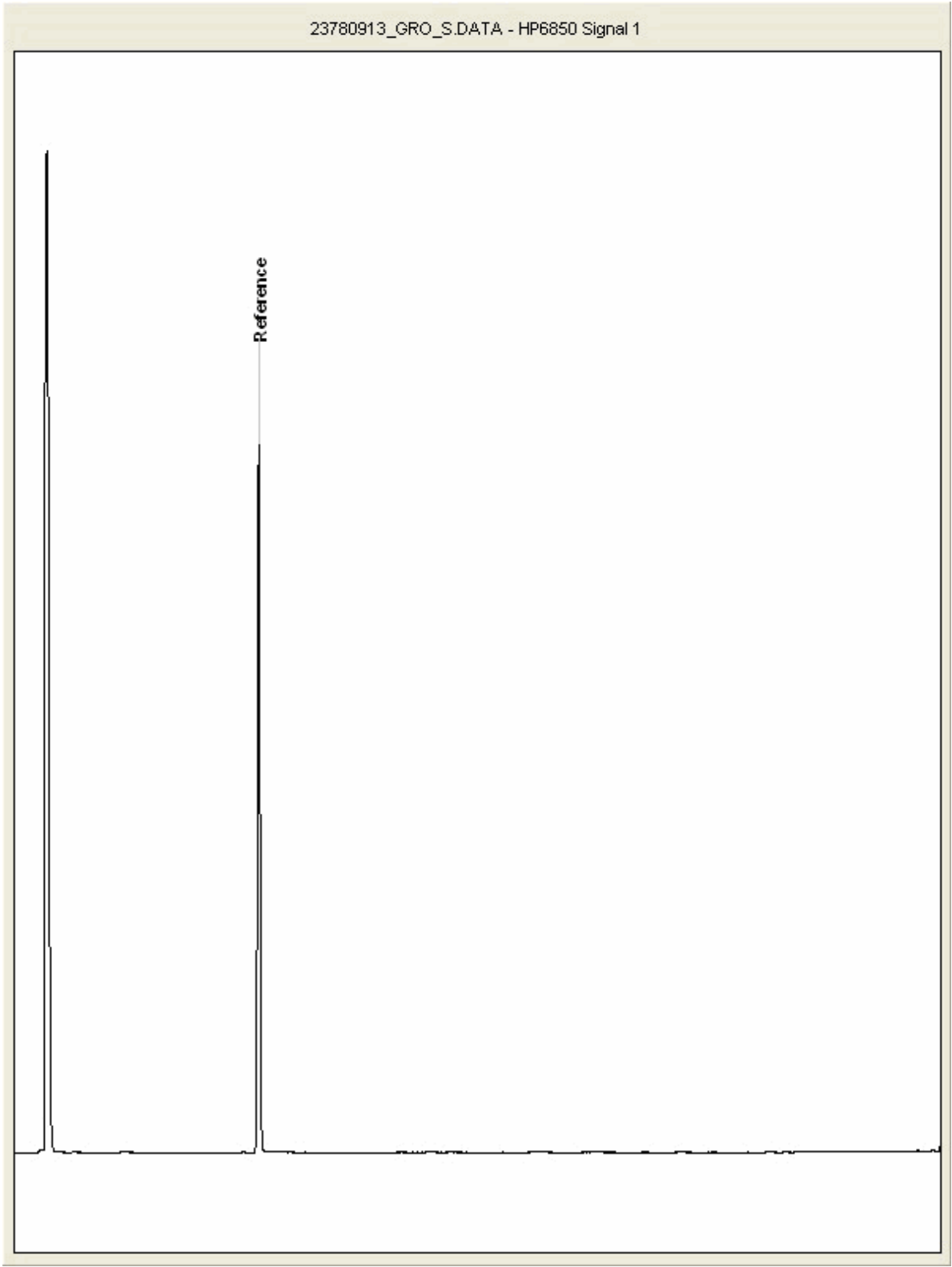
CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23780913 Depth : 0.10
Sample ID : BH-PTR-23



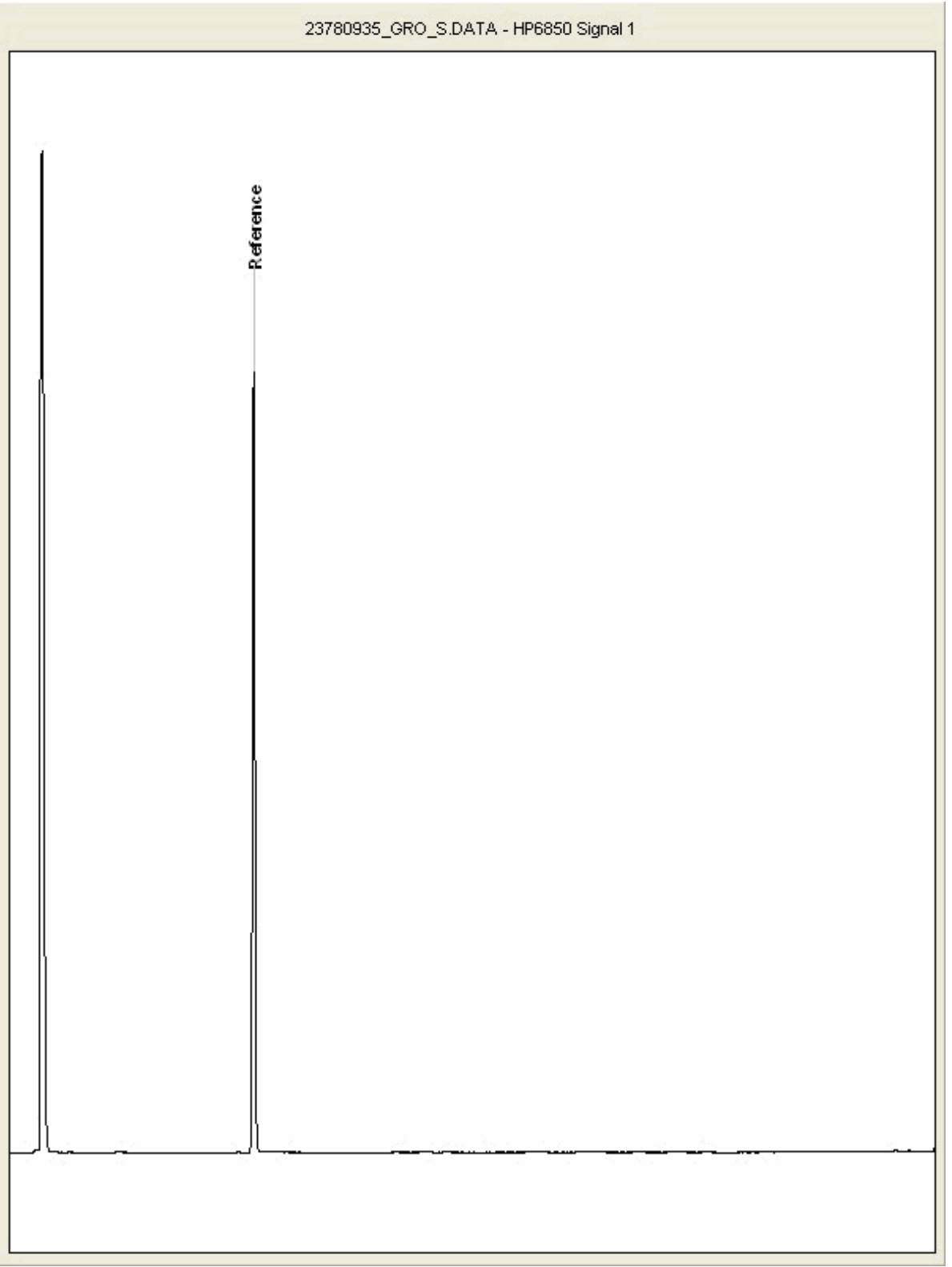
CERTIFICATE OF ANALYSIS

Validated

SDG: 210217-2 Client Reference: B025563 Report Number: 588432
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23780935 Depth : 0.50
Sample ID : BH-PTR-23





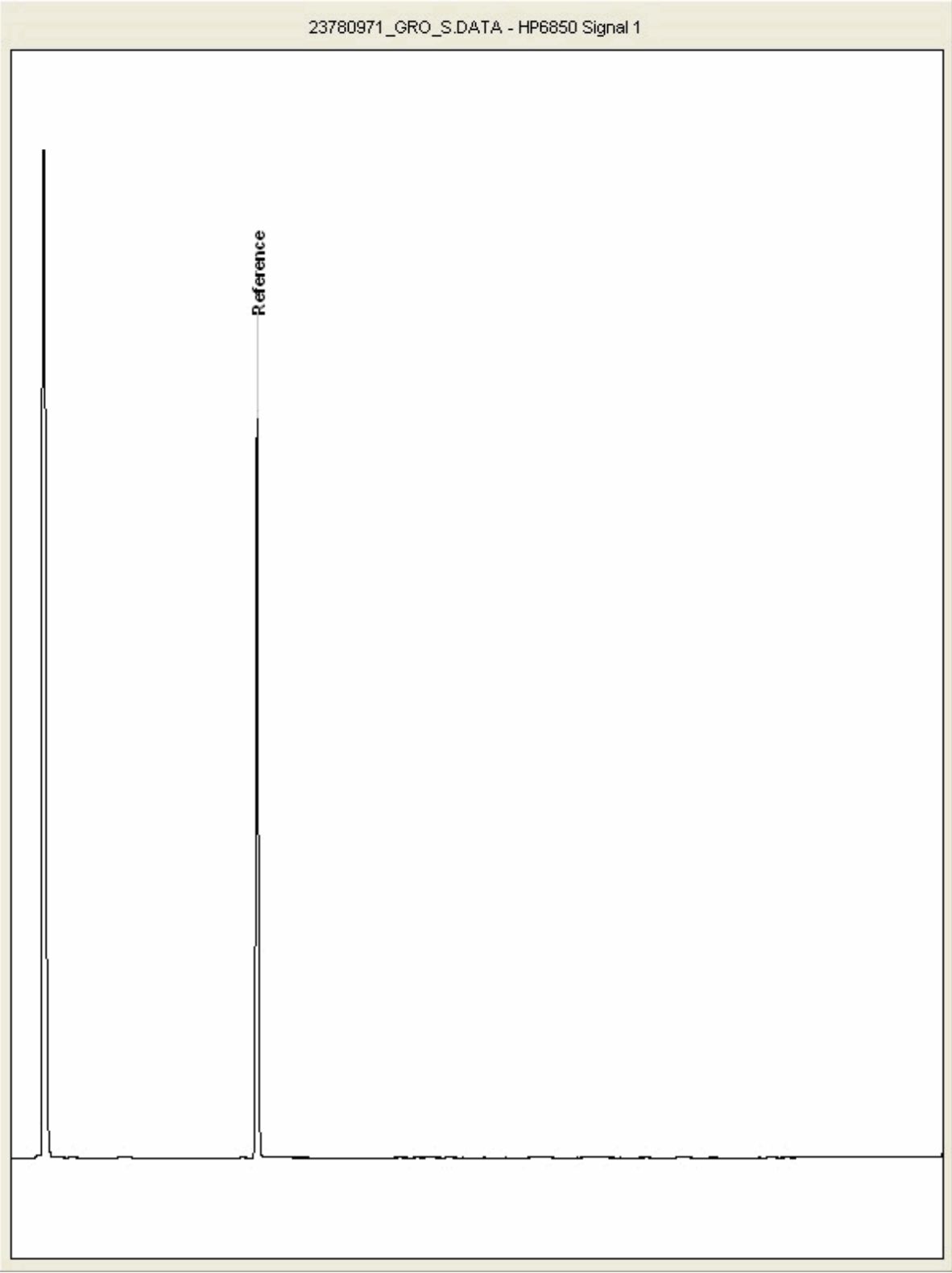
CERTIFICATE OF ANALYSIS

Validated

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23780971 Depth : 0.20
Sample ID : BH-PTR-25



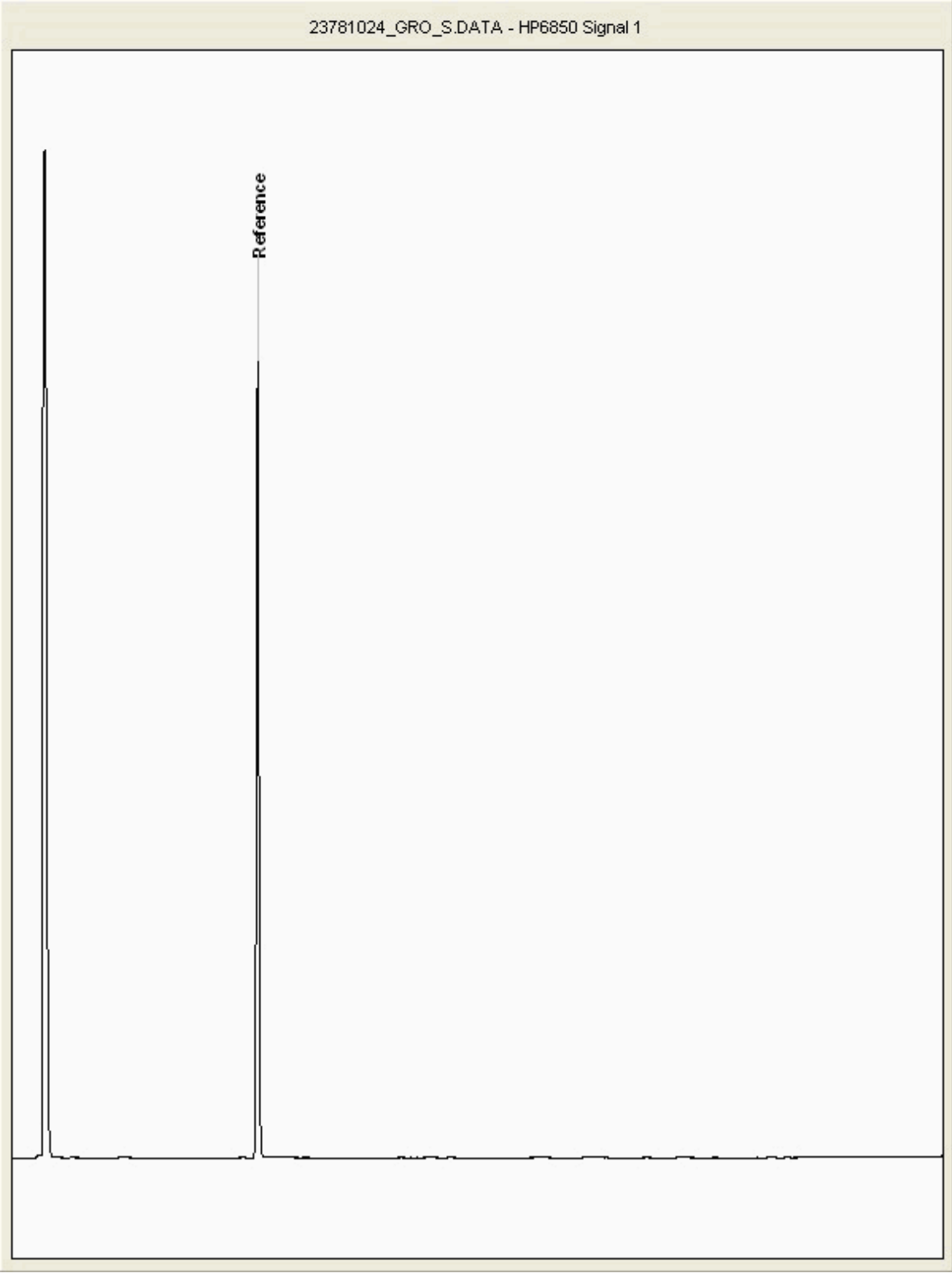
CERTIFICATE OF ANALYSIS

Validated

SDG:	210217-2	Client Reference:	B025563	Report Number:	588432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23781024 Depth : 1.00
Sample ID : BH-PTR-25





CERTIFICATE OF ANALYSIS

SDG: 210217-2 **Client Reference:** B025563 **Report Number:** 588432
Location: idge South East Transport - Ph: **Order Number:** 7000964 **Superseded Report:**

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

08 March 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210219-163

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

589693

We received 5 samples on Friday February 19, 2021 and 1 of these samples were scheduled for analysis which was completed on Monday March 08, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7

Version Issued: 08/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210219-163 Client Reference: B025563 Report Number: 589693
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23762688	BH-PTR-28	ES1	0.10	
23762689	BH-PTR-28	ES2	0.20	
23762690	BH-PTR-28	ES3	0.50	
23762692	BH-PTR-28	EW5	0.85	18/02/2021
23762691	BH-PTR-28	ES4	1.00	

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210219-163 Client Reference: B025563 Report Number: 589693
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23762689			
	Customer Sample Reference		BH-PTR-28			
	AGS Reference		ES2			
	Depth (m)		0.20			
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	Kone Cup
	Sample Type		S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X			
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X			
Boron Water Soluble	All	NDPs: 0 Tests: 1		X		
CEN Readings	All	NDPs: 0 Tests: 2	X			X
Chromium III	All	NDPs: 0 Tests: 2	X	X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X			
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X		
Fluoride	All	NDPs: 0 Tests: 1	X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X			

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23762689			
	Customer Sample Reference		BH-PTR-28			
	AGS Reference		ES2			
	Depth (m)		0.20			
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	Kone Cup
	Sample Type		S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X		
PAH by GCMS	All	NDPs: 0 Tests: 1		X		
pH	All	NDPs: 0 Tests: 1		X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1				X
Sample description	All	NDPs: 0 Tests: 1		X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X		
Total Sulphur	All	NDPs: 0 Tests: 1		X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X		
VOC MS (S)	All	NDPs: 0 Tests: 1			X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23762689	BH-PTR-28	0.20	Light Brown	Loamy Sand	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unfit + " (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-PTR-28</div> <div>0.20 Soil/Solid (S) - 19/02/2021 210219-163 23762689 ES2</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	21	\$					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	\$					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	\$ M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	\$ M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	\$					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	\$ M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	\$					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	\$ M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	\$ M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	\$ M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	\$					
Sulphur, Total	<0.02 %	TM132	0.0314	\$					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0108	\$ #					
pH	1 pH Units	TM133	8.67	\$ M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	\$ #					
Cyanide, Free	<1 mg/kg	TM153	<1	\$ M					
Chromium, Trivalent	<0.9 mg/kg	TM181	17.5	\$					
Antimony	<0.6 mg/kg	TM181	<0.6	\$ #					
Arsenic	<0.6 mg/kg	TM181	11.2	\$ M					
Barium	<0.6 mg/kg	TM181	88.1	\$ #					
Beryllium	<0.01 mg/kg	TM181	0.715	\$ M					
Cadmium	<0.02 mg/kg	TM181	<0.02	\$ M					
Chromium	<0.9 mg/kg	TM181	17.5	\$ M					
Copper	<1.4 mg/kg	TM181	9.46	\$ M					
Iron	<1000 mg/kg	TM181	27300	\$ #					
Lead	<0.7 mg/kg	TM181	6.08	\$ M					
Manganese	<0.13 mg/kg	TM181	190	\$ M					
Mercury	<0.1 mg/kg	TM181	<0.1	\$ M					
Molybdenum	<0.1 mg/kg	TM181	0.268	\$ #					
Nickel	<0.2 mg/kg	TM181	17.5	\$ M					
Selenium	<1 mg/kg	TM181	<1	\$ #					
Vanadium	<0.2 mg/kg	TM181	32.1	\$ #					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:

Location:

210219-163
Cambridge South East Tra

Client Reference:

Order Number:

B025563
7000964

Report Number:

Superseded Report:

589693

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-28					
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	105	\$				
Toluene-d8**	%	TM116	99.1	\$				
4-Bromofluorobenzene**	%	TM116	92.6	\$				
Dichlorodifluoromethane	<6 µg/kg	TM116	<120	\$ M				
Chloromethane	<7 µg/kg	TM116	<140	\$ #				
Vinyl Chloride	<6 µg/kg	TM116	<120	\$ M				
Bromomethane	<10 µg/kg	TM116	<200	\$ M				
Chloroethane	<10 µg/kg	TM116	<200	\$ M				
Trichlorofluorormethane	<6 µg/kg	TM116	<120	\$ M				
1,1-Dichloroethene	<10 µg/kg	TM116	<200	\$ #				
Carbon Disulphide	<7 µg/kg	TM116	<140	\$ M				
Dichloromethane	<10 µg/kg	TM116	<200	\$ #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200	\$ M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200	\$ M				
1,1-Dichloroethane	<8 µg/kg	TM116	<160	\$ M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120	\$ M				
2,2-Dichloropropane	<10 µg/kg	TM116	<200	\$				
Bromochloromethane	<10 µg/kg	TM116	<200	\$ M				
Chloroform	<8 µg/kg	TM116	<160	\$ M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140	\$ M				
1,1-Dichloropropene	<10 µg/kg	TM116	<200	\$ M				
Carbontetrachloride	<10 µg/kg	TM116	<200	\$ M				
1,2-Dichloroethane	<5 µg/kg	TM116	<100	\$ M				
Benzene	<9 µg/kg	TM116	<180	\$ M				
Trichloroethene	<9 µg/kg	TM116	<180	\$ #				
1,2-Dichloropropane	<10 µg/kg	TM116	<200	\$ M				
Dibromomethane	<9 µg/kg	TM116	<180	\$ M				
Bromodichloromethane	<7 µg/kg	TM116	<140	\$ M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200	\$ M				
Toluene	<7 µg/kg	TM116	<140	\$ M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200	\$				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200	\$ M				

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210219-163

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 589693

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-28				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		-				
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		19/02/2021				
			210219-163				
(F)	Trigger breach confirmed		23762689				
1-44@	Sample deviation (see appendix)		ES2				
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<140 \$ M				
Tetrachloroethene	<5 µg/kg	TM116	<100 \$ M				
Dibromochloromethane	<10 µg/kg	TM116	<200 \$ M				
1,2-Dibromoethane	<10 µg/kg	TM116	<200 \$ M				
Chlorobenzene	<5 µg/kg	TM116	<100 \$ M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<200 \$ M				
Ethylbenzene	<4 µg/kg	TM116	<80 \$ M				
p/m-Xylene	<10 µg/kg	TM116	<200 \$ #				
o-Xylene	<10 µg/kg	TM116	<200 \$ M				
Styrene	<10 µg/kg	TM116	<200 \$ #				
Bromoform	<10 µg/kg	TM116	<200 \$ M				
Isopropylbenzene	<5 µg/kg	TM116	<100 \$ #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<200 \$ #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<320 \$ M				
Bromobenzene	<10 µg/kg	TM116	<200 \$ M				
Propylbenzene	<10 µg/kg	TM116	<200 \$ M				
2-Chlorotoluene	<9 µg/kg	TM116	<180 \$ M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<160 \$ M				
4-Chlorotoluene	<10 µg/kg	TM116	<200 \$ M				
tert-Butylbenzene	<14 µg/kg	TM116	<280 \$ M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<180 \$ #				
sec-Butylbenzene	<10 µg/kg	TM116	<200 \$				
4-Isopropyltoluene	<10 µg/kg	TM116	<200 \$ M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<160 \$ M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<100 \$ M				
n-Butylbenzene	<11 µg/kg	TM116	<220 \$				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<200 \$ M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<280 \$ M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<200 \$ #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<400 \$				
Hexachlorobutadiene	<20 µg/kg	TM116	<400 \$				
Naphthalene	<13 µg/kg	TM116	<260 \$ M				

15:12:42 08/03/2021

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CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - f
Mass Sample taken (kg)	0.122	Natural Moisture Content (%)	34.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	74.5
Particle Size <4mm	>95%		

Case	
SDG	210219-163
Lab Sample Number(s)	23762689
Sampled Date	
Customer Sample Ref.	BH-PTR-28 ES2
Depth (m)	0.20

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.01	<0.01	0.1	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	8.51	<3	85.1	<30	-	-	-
Fluoride	1.18	<0.5	11.8	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00105	<0.0005	0.0105	<0.005	-	-	-
Barium	0.00685	<0.0002	0.0685	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0229	<0.01	0.229	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	30.6	<0.2	306	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00284	<0.0003	0.0284	<0.003	-	-	-
Hardness dissolved	78.4	<0.65	784	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.306	<0.019	3.06	<0.19	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.488	<0.036	4.88	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00174	<0.0004	0.0174	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.0197	<0.001	0.197	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	6.8	<2	68	<20	-	-	-

Leach Test Information

Date Prepared	26-Feb-2021
pH (pH Units)	8.93
Conductivity (µS/cm)	136.00
Temperature (°C)	15.70
Volume Leachant (Litres)	0.868

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23762689
Customer Sample Ref.	BH-PTR-28
AGS Ref.	ES2
Depth	0.20
Type	Soil/Solid (S)
Ammonium Low	02-Mar-2021
Anions by Kone (soil)	02-Mar-2021
Anions by Kone (w)	01-Mar-2021
Asbestos ID in Solid Samples	02-Mar-2021
Boron Water Soluble	03-Mar-2021
CEN 10:1 Leachate (1 Stage)	03-Mar-2021
CEN Readings	03-Mar-2021
Chromium III	03-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	01-Mar-2021
Dissolved Metals by ICP-MS	03-Mar-2021
Dissolved Organic/Inorganic Carbon	04-Mar-2021
EPH CWG GC (S)	01-Mar-2021
Fluoride	03-Mar-2021
GRO by GC-FID (S)	02-Mar-2021
Hexavalent Chromium (s)	26-Feb-2021
Low Level Cyanide (W)	03-Mar-2021
Low Level Hexavalent Chromium (w)	03-Mar-2021
Mercury Dissolved	01-Mar-2021
Metals in solid samples by OES	08-Mar-2021
Moisture at 105C	26-Feb-2021
PAH by GCMS	03-Mar-2021
pH	26-Feb-2021
pH Value of Filtered Water	01-Mar-2021
Phenols by HPLC (S)	26-Feb-2021
Phenols by HPLC (W)	03-Mar-2021
Sample description	25-Feb-2021
Total Organic Carbon	01-Mar-2021
Total Sulphur	02-Mar-2021
TPH CWG GC (S)	02-Mar-2021
VOC MS (S)	03-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2370
Ammoniacal Nitrogen as N	TM099	99.4 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2372
Chloride (soluble)	TM243	140.93 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	168.22 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2363
Chloride	TM184	108.0 92.93 : 115.43
Sulphate (soluble)	TM184	109.6 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2320
Water Soluble Boron	TM222	97.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2302
Free Cyanide	TM153	90.3 79.00 : 115.00
Thiocyanate	TM153	94.87 94.09 : 113.89
Total Cyanide	TM153	91.61 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2398
Aluminium	TM152	100.67 90.78 : 110.89
Antimony	TM152	105.17 77.22 : 119.42
Arsenic	TM152	103.5 86.77 : 107.67



CERTIFICATE OF ANALYSIS

Validated

SDG: 210219-163 Client Reference: B025563 Report Number: 589693
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2398
Barium	TM152	101.67 87.86 : 110.23
Beryllium	TM152	106.0 86.19 : 112.98
Bismuth	TM152	107.0 84.06 : 106.46
Borate	TM152	101.23 88.00 : 112.00
Boron	TM152	101.33 83.92 : 114.90
Cadmium	TM152	106.0 88.89 : 106.69
Calcium	TM152	104.67 80.24 : 117.95
Chromium	TM152	101.17 83.22 : 110.16
Cobalt	TM152	100.83 82.49 : 112.36
Copper	TM152	102.5 83.14 : 113.00
Iron	TM152	98.0 88.40 : 109.24
Lead	TM152	103.83 83.71 : 109.58
Lithium	TM152	107.5 84.50 : 114.28
Magnesium	TM152	96.67 87.56 : 114.57
Manganese	TM152	97.83 90.01 : 108.72
Molybdenum	TM152	103.83 85.53 : 107.42
Nickel	TM152	101.83 88.05 : 106.42
Phosphorus	TM152	103.17 82.76 : 107.72
Potassium	TM152	98.0 88.45 : 106.42
Selenium	TM152	102.5 85.61 : 111.03
Silver	TM152	103.5 88.48 : 110.48
Sodium	TM152	97.33 88.32 : 106.30
Strontium	TM152	100.67 83.77 : 107.87
Tellurium	TM152	102.0 82.83 : 104.73
Thallium	TM152	92.0 77.47 : 113.87
Tin	TM152	105.67 87.36 : 109.55
Titanium	TM152	105.67 87.29 : 108.31



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Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2398
Tungsten	TM152	103.33 68.27 : 122.97
Uranium	TM152	106.5 82.46 : 105.16
Vanadium	TM152	103.0 88.43 : 114.30
Zinc	TM152	103.67 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2350
Dissolved Inorganic Carbon	TM090	103.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.0 96.13 : 109.53

Fluoride

Component	Method Code	QC 2394
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2398
QC	TM089	81.21 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2359
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2371
Free Cyanide - Low Level	TM279	79.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.0 81.83 : 110.45



CERTIFICATE OF ANALYSIS

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SDG: 210219-163 Client Reference: B025563 Report Number: 589693
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Metals in solid samples by OES

Component	Method Code	QC 2342	QC 2395
Aluminium	TM181	92.04 77.46 : 123.98	82.48 77.46 : 123.98
Antimony	TM181	97.15 87.04 : 111.16	101.22 87.04 : 111.16
Arsenic	TM181	95.93 87.34 : 110.87	99.71 87.34 : 110.87
Barium	TM181	91.74 80.73 : 115.16	92.66 80.73 : 115.16
Beryllium	TM181	100.75 89.47 : 112.97	100.75 89.47 : 112.97
Boron	TM181	87.39 76.57 : 104.15	76.5 76.57 : 104.15
Cadmium	TM181	90.95 78.94 : 102.43	90.12 78.94 : 102.43
Chromium	TM181	84.79 77.55 : 104.47	87.63 77.55 : 104.47
Cobalt	TM181	87.11 82.95 : 107.41	89.94 82.95 : 107.41
Copper	TM181	91.37 84.36 : 106.14	93.31 84.36 : 106.14
Iron	TM181	94.44 81.43 : 115.79	88.89 81.43 : 115.79
Lead	TM181	89.19 81.95 : 107.63	91.44 81.95 : 107.63
Manganese	TM181	125.0 94.29 : 119.51	113.61 94.29 : 119.51
Mercury	TM181	93.24 82.73 : 106.36	95.89 82.73 : 106.36
Molybdenum	TM181	96.3 86.61 : 111.07	98.35 86.61 : 111.07
Nickel	TM181	87.78 79.72 : 103.80	87.78 79.72 : 103.80
Phosphorus	TM181	115.96 92.65 : 125.47	104.44 92.65 : 125.47
Selenium	TM181	98.43 88.36 : 111.25	99.22 88.36 : 111.25
Strontium	TM181	92.65 78.06 : 99.91	91.31 78.06 : 99.91
Thallium	TM181	98.67 88.60 : 116.73	98.23 88.60 : 116.73
Tin	TM181	95.44 89.77 : 112.62	100.38 89.77 : 112.62
Titanium	TM181	77.1 66.29 : 105.96	62.98 66.29 : 105.96
Vanadium	TM181	96.34 75.51 : 108.87	93.04 75.51 : 108.87
Zinc	TM181	98.36 84.02 : 111.24	93.63 84.02 : 111.24

PAH by GCMS



CERTIFICATE OF ANALYSIS

Validated

SDG: 210219-163 Client Reference: B025563 Report Number: 589693
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

PAH by GCMS

Component	Method Code	QC 2357
Acenaphthene	TM218	99.0 76.79 : 103.90
Acenaphthylene	TM218	96.0 78.40 : 108.66
Anthracene	TM218	98.0 70.90 : 109.22
Benz(a)anthracene	TM218	92.0 73.77 : 119.26
Benzo(a)pyrene	TM218	92.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	93.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	87.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	92.5 75.98 : 116.59
Chrysene	TM218	93.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	84.5 69.17 : 115.30
Fluoranthene	TM218	104.0 75.88 : 112.84
Fluorene	TM218	98.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	86.0 70.26 : 117.95
Naphthalene	TM218	97.0 74.70 : 101.83
Phenanthrene	TM218	102.0 73.62 : 109.34
Pyrene	TM218	101.0 71.46 : 117.00

pH

Component	Method Code	QC 2378
pH	TM133	100.0 97.97 : 101.10

pH Value of Filtered Water

Component	Method Code	QC 2334
pH	TM256	100.53 99.33 : 102.54

Phenols by HPLC (S)

Phenols by HPLC (S)

Component	Method Code	QC 2347
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.95 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	13.33 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	49.06 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	30.71 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	54.3 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	60.38 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	48.85 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2395
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	54.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	54.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	54.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	54.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	54.17 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2371
Total Organic Carbon	TM132	97.66 87.02 : 113.45

VOC MS (S)

Component	Method Code	QC 2341
1,1,1,2-tetrachloroethane	TM116	93.2 84.84 : 116.25
1,1,1-Trichloroethane	TM116	98.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	91.2 77.12 : 116.04
1,1-Dichloroethane	TM116	110.0 74.46 : 129.15
1,2-Dichloroethane	TM116	102.2 92.38 : 131.65

VOC MS (S)

		QC 2341
1,4-Dichlorobenzene	TM116	101.4 83.64 : 126.18
2-Chlorotoluene	TM116	100.0 76.03 : 113.25
4-Chlorotoluene	TM116	101.2 66.90 : 112.46
Benzene	TM116	102.0 88.60 : 113.80
Carbon Disulphide	TM116	106.4 74.91 : 122.14
Carbontetrachloride	TM116	96.8 80.31 : 124.50
Chlorobenzene	TM116	99.4 83.81 : 114.18
Chloroform	TM116	109.0 87.40 : 122.49
Chloromethane	TM116	110.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.6 80.67 : 126.72
Dibromomethane	TM116	90.0 73.23 : 118.35
Dichloromethane	TM116	114.2 81.11 : 133.25
Ethylbenzene	TM116	89.0 75.92 : 110.41
Hexachlorobutadiene	TM116	66.0 12.82 : 152.73
Isopropylbenzene	TM116	80.8 55.79 : 97.59
Naphthalene	TM116	105.4 80.86 : 128.81
o-Xylene	TM116	85.4 69.99 : 108.74
p/m-Xylene	TM116	86.6 68.32 : 108.91
Sec-Butylbenzene	TM116	74.2 38.50 : 101.50
Tetrachloroethene	TM116	97.2 76.95 : 121.02
Toluene	TM116	91.2 74.24 : 107.42
Trichloroethene	TM116	95.8 85.28 : 109.36
Trichlorofluoromethane	TM116	100.0 84.55 : 133.27
Vinyl Chloride	TM116	108.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23791161 Depth : 0.20
Sample ID : BH-PTR-28



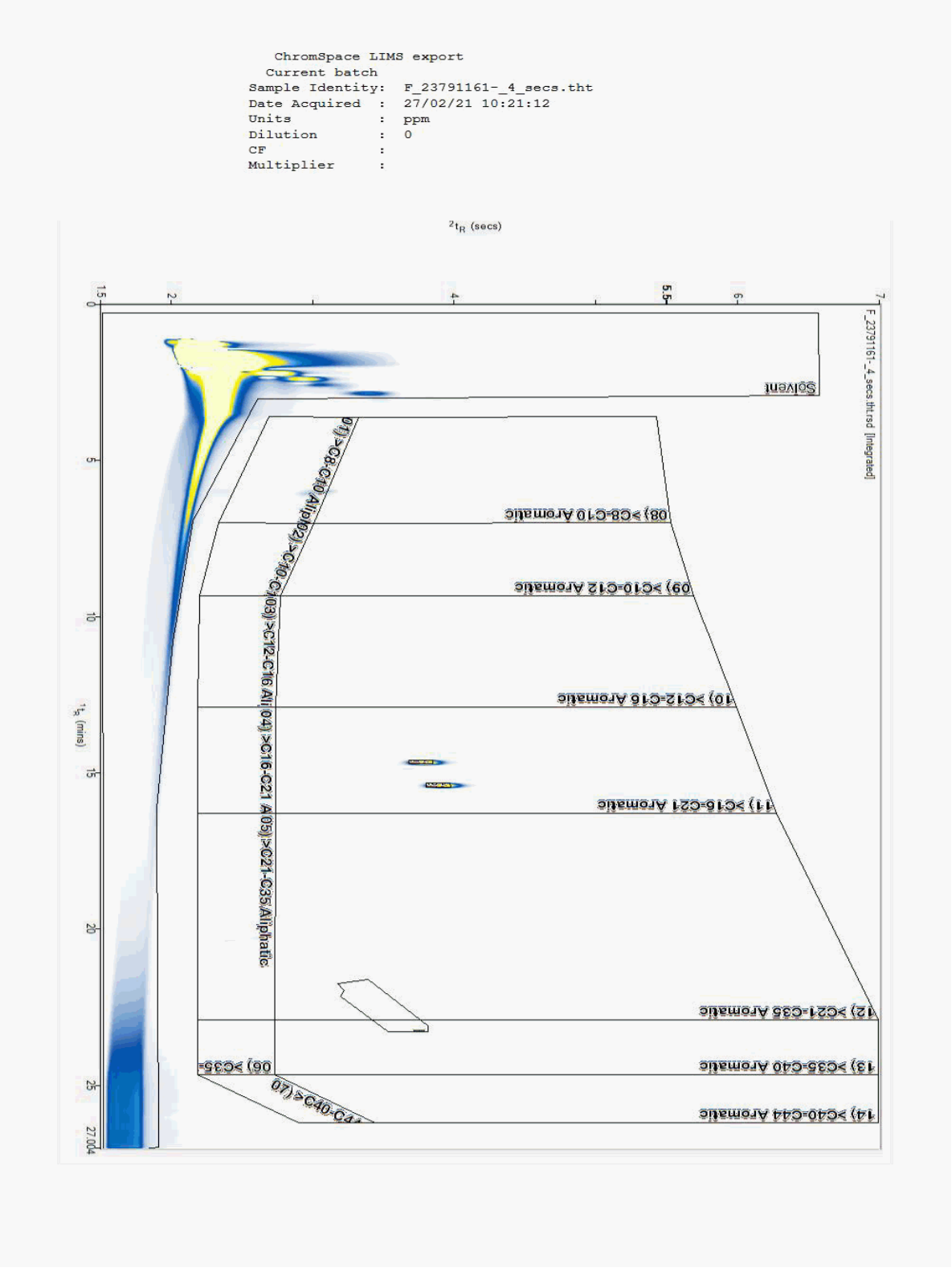
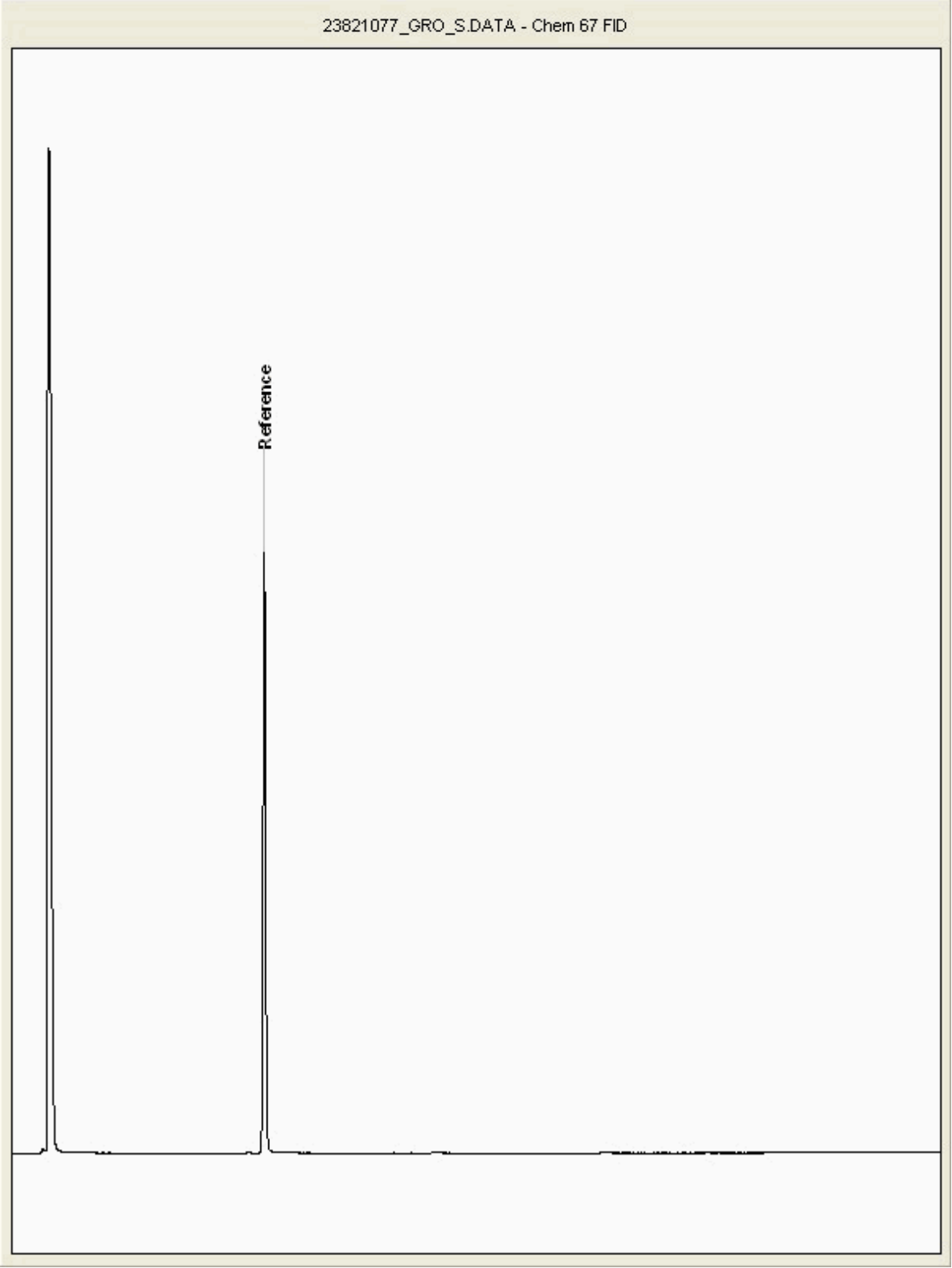
CERTIFICATE OF ANALYSIS

Validated

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23821077 Depth : 0.20
Sample ID : BH-PTR-28





CERTIFICATE OF ANALYSIS

SDG:	210219-163	Client Reference:	B025563	Report Number:	589693
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Attention: Richard Tonge

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Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	11 March 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210224-71
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	590142

We received 5 samples on Wednesday February 24, 2021 and 2 of these samples were scheduled for analysis which was completed on Tuesday March 09, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23784763	BH-PTR-20 ES1		0.10	23/02/2021
23784764	BH-PTR-20 ES2		0.20	23/02/2021
23784765	BH-PTR-20 ES3		0.50	23/02/2021
23784769	BH-PTR-20 ES4		1.00	23/02/2021
23784768	BH-PTR-20 WS5		0.80	23/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23784765		23784769	
	Customer Sample Reference		BH-PTR-20 ES3		BH-PTR-20 ES4	
	AGS Reference					
	Depth (m)		0.50		1.00	
	Container		Handle (ALE260)	1kg TUB with Handle (ALE210)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1			X	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X		X
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2		X		X
CEN Readings	All	NDPs: 0 Tests: 2	X		X	
Chromium III	All	NDPs: 0 Tests: 3		X	X	X
Coronene	All	NDPs: 0 Tests: 1		X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X		X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X		X	
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
Fluoride	All	NDPs: 0 Tests: 2	X		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23784765		23784769	
	Customer Sample Reference		BH-PTIR-20 ES3		BH-PTIR-20 ES4	
	AGS Reference					
	Depth (m)		0.50		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X			X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	X			
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1			X	
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1			X	
Mercury Dissolved	All	NDPs: 0 Tests: 2	X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X			X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1	X			
PAH by GCMS	All	NDPs: 0 Tests: 2	X			X
PCBs by GCMS	All	NDPs: 0 Tests: 1	X			
pH	All	NDPs: 0 Tests: 2	X			X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1			X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X			X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X		X	
Sample description	All	NDPs: 0 Tests: 2	X			X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23784765		23784769	
	Customer Sample Reference		BH-PTIR-20 ES3		BH-PTIR-20 ES4	
	AGS Reference					
	Depth (m)		0.50		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X			
Total Organic Carbon	All	NDPs: 0 Tests: 2	X			X
Total Sulphur	All	NDPs: 0 Tests: 2	X			X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X			X
VOC MS (S)	All	NDPs: 0 Tests: 2		X		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23784765	BH-PTR-20 ES3	0.50	Dark Brown	Sandy Loam	Stones	Vegetation
23784769	BH-PTR-20 ES4	1.00	Dark Brown	Silt Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PTR-20 ES3	BH-PTR-20 ES4				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.		0.50	1.00				
dis.filt	Dissolved / filtered sample.		Unspecified Solid (UNS)	Unspecified Solid (UNS)				
tot.unfilt	Total / unfiltered sample.		23/02/2021	23/02/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24/02/2021	24/02/2021				
(F)	Trigger breach confirmed		210224-71	210224-71				
1-445@	Sample deviation (see appendix)		23784765	23784769				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	18	34				
Loss on ignition	<0.7 %	TM018	40.1					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	0.184				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	0.184				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Organic Carbon, Total	<0.2 %	TM132	1.97					
Sulphur, Total	<0.02 %	TM132	0.0307	0.0639				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0197	0.0779				
pH	1 pH Units	TM133	8.32	8.23				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
PCB congener 28	<3 µg/kg	TM168	<3					
PCB congener 52	<3 µg/kg	TM168	<3					
PCB congener 101	<3 µg/kg	TM168	<3					
PCB congener 118	<3 µg/kg	TM168	<3					
PCB congener 138	<3 µg/kg	TM168	<3					
PCB congener 153	<3 µg/kg	TM168	<3					
PCB congener 180	<3 µg/kg	TM168	<3					
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21					
Chromium, Trivalent	<0.9 mg/kg	TM181	17.6	17.6				
Antimony	<0.6 mg/kg	TM181	1.47	0.981				
Arsenic	<0.6 mg/kg	TM181	17.3	12.6				
Barium	<0.6 mg/kg	TM181	98.7	78.4				
Beryllium	<0.01 mg/kg	TM181	1.03	0.958				
Cadmium	<0.02 mg/kg	TM181	<0.02	0.223				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-PTR-20 ES3		BH-PTR-20 ES4				
#	ISO17025 accredited.			Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 Unspecified Solid (UNS) 23/02/2021 . 24/02/2021 210224-71 23784765	1.00 Unspecified Solid (UNS) 23/02/2021 . 24/02/2021 210224-71 23784769				
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted - refer to subcontractor report for accreditation status.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-4+5@ Sample deviation (see appendix)										
Component		LOD/Units	Method							
Dibromofluoromethane**		%	TM116	106	110					
Toluene-d8**		%	TM116	94.1	97					
4-Bromofluorobenzene**		%	TM116	71.1	83.9					
Dichlorodifluoromethane		<6 µg/kg	TM116	<6	<60					
Chloromethane		<7 µg/kg	TM116	<7	<70					
Vinyl Chloride		<6 µg/kg	TM116	<6	<60	@	@			
Bromomethane		<10 µg/kg	TM116	<10	<100					
Chloroethane		<10 µg/kg	TM116	<10	<100					
Trichlorofluorormethane		<6 µg/kg	TM116	<6	<60					
1,1-Dichloroethene		<10 µg/kg	TM116	<10	<100					
Carbon Disulphide		<7 µg/kg	TM116	<7	<70					
Dichloromethane		<10 µg/kg	TM116	<10	<100					
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10	<100					
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10	<100					
1,1-Dichloroethane		<8 µg/kg	TM116	<8	<80					
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6	<60					
2,2-Dichloropropane		<10 µg/kg	TM116	<10	<100					
Bromochloromethane		<10 µg/kg	TM116	<10	<100					
Chloroform		<8 µg/kg	TM116	<8	<80					
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7	<70					
1,1-Dichloropropene		<10 µg/kg	TM116	<10	<100					
Carbontetrachloride		<10 µg/kg	TM116	<10	<100					
1,2-Dichloroethane		<5 µg/kg	TM116	<5	<50					
Benzene		<9 µg/kg	TM116	<9	<90					
Trichloroethene		<9 µg/kg	TM116	<9	<90					
1,2-Dichloropropane		<10 µg/kg	TM116	<10	<100					
Dibromomethane		<9 µg/kg	TM116	<9	<90					
Bromodichloromethane		<7 µg/kg	TM116	<7	<70					
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10	<100					
Toluene		<7 µg/kg	TM116	<7	<70					
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10	<100					
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10	<100					

VOC MS (S)

Results Legend			Customer Sample Ref.		BH-PTR-20 ES3		BH-PTR-20 ES4					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference			0.50	1.00						
M	mCERTS accredited.				Unspecified Solid (UNS)	Unspecified Solid (UNS)						
aq	Aqueous / settled sample.											
dis.filt	Dissolved / filtered sample.											
tot.unfilt	Total / unfiltered sample.											
*	Subcontracted - refer to subcontractor report for accreditation status.											
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery											
(F)	Trigger breach confirmed											
1-4-6@	Sample deviation (see appendix)											
Component	LOD/Units		Method									
1,3-Dichloropropane	<7 µg/kg	TM116			<7	<70						
Tetrachloroethene	<5 µg/kg	TM116			<5	<50						
Dibromochloromethane	<10 µg/kg	TM116			<10	<100						
1,2-Dibromoethane	<10 µg/kg	TM116			<10	<100						
Chlorobenzene	<5 µg/kg	TM116			<5	<50						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116			<10	<100						
Ethylbenzene	<4 µg/kg	TM116			<4	<40						
p/m-Xylene	<10 µg/kg	TM116			<10	<100						
o-Xylene	<10 µg/kg	TM116			<10	<100						
Styrene	<10 µg/kg	TM116			<10	<100						
Bromoform	<10 µg/kg	TM116			<10	<100						
Isopropylbenzene	<5 µg/kg	TM116			<5	<50						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116			<10	<100						
1,2,3-Trichloropropane	<16 µg/kg	TM116			<16	<160						
Bromobenzene	<10 µg/kg	TM116			<10	<100						
Propylbenzene	<10 µg/kg	TM116			<10	<100						
2-Chlorotoluene	<9 µg/kg	TM116			<9	<90						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116			<8	<80						
4-Chlorotoluene	<10 µg/kg	TM116			<10	<100						
tert-Butylbenzene	<14 µg/kg	TM116			<14	<140						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116			<9	<90						
sec-Butylbenzene	<10 µg/kg	TM116			<10	<100						
4-Isopropyltoluene	<10 µg/kg	TM116			<10	<100						
1,3-Dichlorobenzene	<8 µg/kg	TM116			<8	<80						
1,4-Dichlorobenzene	<5 µg/kg	TM116			<5	<50						
n-Butylbenzene	<11 µg/kg	TM116			<11	<110						
1,2-Dichlorobenzene	<10 µg/kg	TM116			<10	<100						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116			<14	<140						
Tert-amyl methyl ether	<10 µg/kg	TM116			<10	<100						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116			<20	<200						
Hexachlorobutadiene	<20 µg/kg	TM116			<20	<200						
Naphthalene	<13 µg/kg	TM116			<13	<130						

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-20 ES3		BH-PTR-20 ES4					
#	ISO17025 accredited.									
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted - refer to subcontractor report for accreditation status.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-4-6@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20		<200					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20		<200					
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02		<0.2					
Sum of BTEX	<40 µg/kg	TM116	<40		<400					

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.	1-5&*\$@	Sample deviation (see appendix)	Trigger breach confirmed							
*	Subcontracted test.										
Cust. Sample Ref.	BH-PTR-20 ES3	04/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	MISC_SOLID										
Date Sampled	23/02/2021 00:00:00										
Date Received	24/02/2021 08:15:00										
SDG	210224-71										
Original Sample	23784765										
Method Number	TM048										
Cust. Sample Ref.	BH-PTR-20 ES4	03/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	1.00										
Sample Type	MISC_SOLID										
Date Sampled	23/02/2021 00:00:00										
Date Received	24/02/2021 08:15:00										
SDG	210224-71										
Original Sample	23784769										
Method Number	TM048										

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.129	Natural Moisture Content (%)	42.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	70.4
Particle Size <4mm	>95%		

Case		Landfill Waste Acceptance Criteria Limits
SDG	210224-71	
Lab Sample Number(s)	23784765	
Sampled Date	23-Feb-2021	
Customer Sample Ref.	BH-PTR-20 ES3	
Depth (m)	0.50	

Solid Waste Analysis		Result		
Total Organic Carbon (%)		1.97		
Loss on Ignition (%)		40.1		
Sum of BTEX (mg/kg)		<0.04		
Sum of 7 PCBs (mg/kg)		<0.021		
Mineral Oil (mg/kg)		<5		
PAH Sum of 17 (mg/kg)		<10		
pH (pH Units)		8.32		
ANC to pH 6 (mol/kg)		<0.03		
ANC to pH 4 (mol/kg)		1.77		
Inert Waste Landfill		3	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	5
		-		6
		6		10
		1		-
		500		-
		100		-
		-	>6	-
		-		-
		-		-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00068	<0.0005	0.0068	<0.005	0.5	2	25
Barium	0.01	<0.0002	0.1	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00285	<0.0003	0.0285	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000104	<0.00001	0.000104	<0.0001	0.01	0.2	2
Molybdenum	0.00509	<0.003	0.0509	<0.03	0.5	10	30
Nickel	0.0038	<0.0004	0.038	<0.004	0.4	10	40
Lead	0.000938	<0.0002	0.00938	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00493	<0.001	0.0493	<0.01	4	50	200
Chloride	3.2	<2	32	<20	800	15000	25000
Fluoride	0.693	<0.5	6.93	<5	10	150	500
Sulphate (soluble)	4.7	<2	47	<20	1000	20000	50000
Total Dissolved Solids	170	<5	1700	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	11.4	<3	114	<30	500	800	1000

Leach Test Information

Date Prepared	01-Mar-2021
pH (pH Units)	8.37
Conductivity (µS/cm)	129.00
Temperature (°C)	11.20
Volume Leachant (Litres)	0.861

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

11/03/2021 08:42:06

SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.148	Natural Moisture Content (%)	65
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	60.6
Particle Size <4mm	>95%		

Case

SDG	210224-71			
Lab Sample Number(s)	23784769			
Sampled Date	23-Feb-2021			
Customer Sample Ref.	BH-PTR-20 ES4			
Depth (m)	1.00			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.023	<0.01	0.23	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	0.00276	<0.0025	0.0276	<0.025	-	-	-
Dissolved Organic Carbon	6.61	<3	66.1	<30	-	-	-
Fluoride	0.974	<0.5	9.74	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.00881	<0.0002	0.0881	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0193	<0.01	0.193	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	34.9	<0.2	349	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00186	<0.0003	0.0186	<0.003	-	-	-
Lead	0.000674	<0.0002	0.00674	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.215	<0.036	2.15	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00137	<0.0004	0.0137	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00551	<0.001	0.0551	<0.01	-	-	-
Chloride	4	<2	40	<20	-	-	-
Sulphate (soluble)	18.7	<2	187	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	01-Mar-2021
pH (pH Units)	8.56
Conductivity (µS/cm)	158.00
Temperature (°C)	17.50
Volume Leachant (Litres)	0.842

11/03/2021 08:42:08



SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.148	Natural Moisture Content (%)		65
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		60.6
Particle Size <4mm	>95%			

Case

SDG	210224-71			
Lab Sample Number(s)	23784769			
Sampled Date	23-Feb-2021			
Customer Sample Ref.	BH-PTR-20 ES4			
Depth (m)	1.00			

[illegible]

Leach Test Information

Date Prepared	01-Mar-2021
pH (pH Units)	8.56
Conductivity (µS/cm)	158.00
Temperature (°C)	17.50
Volume Leachant (Litres)	0.842

11/03/2021 08:42:08

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325 2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23784765	23784769
Customer Sample Ref.	BH-PTR-20 ES3	BH-PTR-20 ES4
AGS Ref.		
Depth	0.50	1.00
Type	Unspecified So	Unspecified So
Ammonium Low		04-Mar-2021
ANC at pH4 and ANC at pH 6	04-Mar-2021	
Anions by Kone (soil)	04-Mar-2021	04-Mar-2021
Anions by Kone (w)	04-Mar-2021	04-Mar-2021
Asbestos ID in Solid Samples	04-Mar-2021	03-Mar-2021
Boron Water Soluble	06-Mar-2021	06-Mar-2021
CEN 10:1 Leachate (1 Stage)	01-Mar-2021	01-Mar-2021
CEN Readings	03-Mar-2021	03-Mar-2021
Chromium III	03-Mar-2021	04-Mar-2021
Coronene	01-Mar-2021	
Cyanide Comp/Free/Total/Thiocyanate	04-Mar-2021	04-Mar-2021
Dissolved Metals by ICP-MS	04-Mar-2021	04-Mar-2021
Dissolved Organic/Inorganic Carbon	05-Mar-2021	05-Mar-2021
EPH by GCxGC-FID	03-Mar-2021	
EPH CWG GC (S)	03-Mar-2021	02-Mar-2021
Fluoride	04-Mar-2021	04-Mar-2021
GRO by GC-FID (S)	04-Mar-2021	04-Mar-2021
Hexavalent Chromium (s)	03-Mar-2021	03-Mar-2021
Loss on Ignition in soils	04-Mar-2021	
Low Level Cyanide (W)		04-Mar-2021
Low Level Hexavalent Chromium (w)		04-Mar-2021
Mercury Dissolved	04-Mar-2021	04-Mar-2021
Metals in solid samples by OES	09-Mar-2021	04-Mar-2021
Moisture at 105C	01-Mar-2021	01-Mar-2021
PAH 16 & 17 Calc	02-Mar-2021	
PAH by GCMS	02-Mar-2021	03-Mar-2021
PCBs by GCMS	02-Mar-2021	
pH	02-Mar-2021	02-Mar-2021
pH Value of Filtered Water		04-Mar-2021
Phenols by HPLC (S)	02-Mar-2021	02-Mar-2021
Phenols by HPLC (W)	04-Mar-2021	04-Mar-2021
Sample description	28-Feb-2021	28-Feb-2021
Total Dissolved Solids	03-Mar-2021	
Total Organic Carbon	04-Mar-2021	04-Mar-2021
Total Sulphur	04-Mar-2021	04-Mar-2021
TPH CWG GC (S)	04-Mar-2021	04-Mar-2021
VOC MS (S)	04-Mar-2021	04-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2395
Ammoniacal Nitrogen as N	TM099	102.0 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2331
ANC pH_4 dry soil	TM182	106.16 82.79 : 130.38

Anions by Kone (w)

Component	Method Code	QC 2390
Chloride	TM184	101.0 92.93 : 115.43
Sulphate (soluble)	TM184	98.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2399	QC 2394
Water Soluble Boron	TM222	121.5 84.00 : 111.00	99.5 84.00 : 111.00

Coronene

Component	Method Code	QC 2347
Coronene RAW	TM410	105.0 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2358
Free Cyanide	TM153	100.99 79.00 : 115.00
Thiocyanate	TM153	103.85 94.09 : 113.89
Total Cyanide	TM153	105.59 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2328
Aluminium	TM152	102.67 90.98 : 111.82
Antimony	TM152	101.33 90.44 : 113.04
Arsenic	TM152	101.33 88.00 : 112.00
Barium	TM152	102.83 90.20 : 111.19
Beryllium	TM152	104.83 87.77 : 113.97
Bismuth	TM152	99.5 91.90 : 112.20
Borate	TM152	103.7 88.00 : 112.00
Boron	TM152	103.33 96.48 : 114.93
Cadmium	TM152	102.67 96.43 : 110.53
Calcium	TM152	101.33 81.38 : 119.09
Chromium	TM152	101.17 91.84 : 108.67
Cobalt	TM152	102.67 88.00 : 112.00
Copper	TM152	103.0 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00
Lead	TM152	96.83 88.00 : 112.00
Lithium	TM152	104.0 91.62 : 113.12
Magnesium	TM152	98.0 93.14 : 107.91
Manganese	TM152	101.67 95.03 : 110.58
Molybdenum	TM152	99.0 88.00 : 112.00
Nickel	TM152	103.17 88.00 : 112.00
Phosphorus	TM152	101.0 88.00 : 112.00
Potassium	TM152	100.0 93.90 : 112.36
Selenium	TM152	100.67 91.58 : 115.98
Silver	TM152	95.33 88.80 : 122.30
Sodium	TM152	99.33 94.28 : 110.71
Strontium	TM152	102.67 88.00 : 112.00
Tellurium	TM152	100.5 93.32 : 114.66



CERTIFICATE OF ANALYSIS

Validated

SDG:210224-71

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

590142

Dissolved Metals by ICP-MS

		QC 2328
Thallium	TM152	83.0 88.00 : 112.00
Tin	TM152	102.0 92.63 : 109.70
Titanium	TM152	104.5 95.58 : 111.68
Tungsten	TM152	99.0 81.32 : 124.72
Uranium	TM152	98.67 88.00 : 112.00
Vanadium	TM152	101.0 88.00 : 112.00
Zinc	TM152	102.0 92.98 : 118.95

Component	Method Code	QC 2327
Dissolved Inorganic Carbon	TM090	104.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.5 96.13 : 109.53

Component	Method Code	QC 2333
EPH >C10-C40 Raw	TM415	96.93 56.36 : 129.92

Component	Method Code	QC 2358
EPH >C8-C40 Raw	TM414	98.47 58.74 : 124.10
Total Aliphatics Raw	TM414	107.29 64.15 : 136.53
Total Aromatics Raw	TM414	90.08 57.33 : 145.15

Component	Method Code	QC 2362	QC 2322
Fluoride	TM104	102.0 96.67 : 108.67	102.0 96.67 : 108.67

GRO by GC-FID (S)



CERTIFICATE OF ANALYSIS

Validated

SDG:210224-71

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

590142

GRO by GC-FID (S)

Component	Method Code	QC 2366
QC	TM089	78.23 70.34 : 111.95

Component	Method Code	QC 2306
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Component	Method Code	QC 2318
Loss on Ignition	TM018	97.63 87.10 : 102.39

Component	Method Code	QC 2372
Free Cyanide - Low Level	TM279	75.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	93.0 81.83 : 110.45

Component	Method Code	QC 2340
Mercury Dissolved (CVAf)	TM183	88.9 69.30 : 128.70

Component	Method Code	QC 2334
Aluminium	TM181	82.12 73.56 : 108.85
Antimony	TM181	91.46 76.89 : 111.24
Arsenic	TM181	100.87 88.53 : 111.01
Barium	TM181	84.22 77.67 : 105.35



CERTIFICATE OF ANALYSIS

Validated

SDG:

Location:

210224-71
Cambridge South East Tra

Client Reference:

Order Number:

B025563
7000964

Report Number:

Superseded Report:

590142

Metals in solid samples by OES

		QC 2334
Beryllium	TM181	88.81 85.44 : 109.61
Boron	TM181	85.1 73.51 : 104.66
Cadmium	TM181	84.77 77.67 : 104.12
Chromium	TM181	81.95 77.55 : 104.47
Cobalt	TM181	86.79 84.60 : 104.13
Copper	TM181	83.45 82.40 : 105.45
Iron	TM181	88.89 82.95 : 110.58
Lead	TM181	93.02 78.24 : 104.05
Manganese	TM181	101.11 94.29 : 119.51
Mercury	TM181	90.1 83.16 : 107.81
Molybdenum	TM181	94.65 87.11 : 106.87
Nickel	TM181	86.55 80.26 : 102.28
Phosphorus	TM181	105.66 94.56 : 124.28
Selenium	TM181	90.98 82.28 : 110.48
Strontium	TM181	83.74 79.13 : 102.79
Thallium	TM181	87.61 82.94 : 111.86
Tin	TM181	90.87 86.72 : 110.03
Titanium	TM181	80.92 66.23 : 102.06
Vanadium	TM181	90.11 75.51 : 108.87
Zinc	TM181	90.55 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2340	QC 2329
Acenaphthene	TM218	96.0 78.59 : 112.16	101.0 76.79 : 103.90
Acenaphthylene	TM218	96.0 75.11 : 109.01	96.5 78.40 : 108.66
Anthracene	TM218	95.0 73.99 : 113.85	97.5 70.90 : 109.22
Benz(a)anthracene	TM218	90.5 69.31 : 119.18	86.0 73.77 : 119.26
Benzo(a)pyrene	TM218	86.0 66.97 : 114.92	86.0 73.20 : 114.18



CERTIFICATE OF ANALYSIS

Validated

SDG:

Location:

210224-71
Cambridge South East Tra

Client Reference:

Order Number:

B025563
7000964

Report Number:

Superseded Report:

590142

PAH by GCMS

		QC 2340	QC 2329
Benzo(b)fluoranthene	TM218	84.0 67.41 : 114.46	83.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 62.92 : 114.36	84.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	87.0 69.98 : 116.49	94.0 75.98 : 116.59
Chrysene	TM218	88.0 69.86 : 114.50	89.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	83.5 64.54 : 115.22	82.0 69.17 : 115.30
Fluoranthene	TM218	104.0 72.56 : 111.70	88.0 75.88 : 112.84
Fluorene	TM218	95.5 79.13 : 111.49	99.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	82.5 61.22 : 113.25	71.5 70.26 : 117.95
Naphthalene	TM218	90.5 77.96 : 110.91	98.0 74.70 : 101.83
Phenanthrene	TM218	100.5 76.83 : 113.25	97.5 73.62 : 109.34
Pyrene	TM218	101.5 72.45 : 110.77	89.0 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2367
PCB congener 101	TM168	82.1 65.66 : 110.06
PCB congener 105	TM168	81.0 58.10 : 106.34
PCB congener 114	TM168	82.2 59.38 : 106.48
PCB congener 118	TM168	81.5 60.02 : 106.23
PCB congener 123	TM168	88.1 65.01 : 99.81
PCB congener 126	TM168	83.2 59.31 : 109.23
PCB congener 138	TM168	86.6 63.95 : 107.63
PCB congener 153	TM168	86.6 62.65 : 108.85
PCB congener 156	TM168	85.3 61.69 : 112.27
PCB congener 157	TM168	80.7 55.37 : 104.81
PCB congener 167	TM168	82.8 65.58 : 109.14
PCB congener 169	TM168	84.3 56.84 : 112.10
PCB congener 180	TM168	86.4 66.99 : 111.63
PCB congener 189	TM168	83.0 57.75 : 112.59

PCBs by GCMS

		QC 2367
PCB congener 28	TM168	84.7 73.68 : 105.96
PCB congener 52	TM168	83.7 67.24 : 107.62
PCB congener 77	TM168	85.1 64.87 : 108.49
PCB congener 81	TM168	83.1 70.78 : 110.80

pH

Component	Method Code	QC 2362
pH	TM133	100.53 98.71 : 102.32

pH Value of Filtered Water

Component	Method Code	QC 2360
pH	TM256	100.13 99.06 : 101.47

Phenols by HPLC (S)

Component	Method Code	QC 2383
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	49.35 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	11.43 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	47.18 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	30.71 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	50.99 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	51.57 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	46.87 76.56 : 106.38

Phenols by HPLC (W)

Phenols by HPLC (W)

Component	Method Code	QC 2395
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	54.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	54.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	54.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	54.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	54.17 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2331
Total Dissolved Solids	TM123	100.0 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2373	QC 2364
Total Organic Carbon	TM132	99.61 87.02 : 113.45	100.39 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2344
Total Sulphur %	TM132	98.45 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2388
1,1,1,2-tetrachloroethane	TM116	96.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	102.4 73.73 : 118.05
1,1,2-Trichloroethane	TM116	94.2 77.12 : 116.04
1,1-Dichloroethane	TM116	117.6 74.46 : 129.15
1,2-Dichloroethane	TM116	106.4 92.38 : 131.65



CERTIFICATE OF ANALYSIS

Validated

SDG:210224-71Client Reference: B025563Report Number: 590142

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

VOC MS (S)

		QC 2388
1,4-Dichlorobenzene	TM116	113.6 83.64 : 126.18
2-Chlorotoluene	TM116	106.2 76.03 : 113.25
4-Chlorotoluene	TM116	100.8 66.90 : 112.46
Benzene	TM116	107.0 88.60 : 113.80
Carbon Disulphide	TM116	109.4 74.91 : 122.14
Carbontetrachloride	TM116	97.0 80.31 : 124.50
Chlorobenzene	TM116	102.8 83.81 : 114.18
Chloroform	TM116	111.6 87.40 : 122.49
Chloromethane	TM116	115.8 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	111.4 80.67 : 126.72
Dibromomethane	TM116	92.2 73.23 : 118.35
Dichloromethane	TM116	122.2 81.11 : 133.25
Ethylbenzene	TM116	91.4 75.92 : 110.41
Hexachlorobutadiene	TM116	46.8 12.82 : 152.73
Isopropylbenzene	TM116	83.2 55.79 : 97.59
Naphthalene	TM116	120.4 80.86 : 128.81
o-Xylene	TM116	84.8 69.99 : 108.74
p/m-Xylene	TM116	87.1 68.32 : 108.91
Sec-Butylbenzene	TM116	68.4 38.50 : 101.50
Tetrachloroethene	TM116	96.8 76.95 : 121.02
Toluene	TM116	93.2 74.24 : 107.42
Trichloroethene	TM116	97.2 85.28 : 109.36
Trichlorofluoromethane	TM116	109.2 84.55 : 133.27
Vinyl Chloride	TM116	117.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:210224-71Client Reference: B025563Report Number: 590142

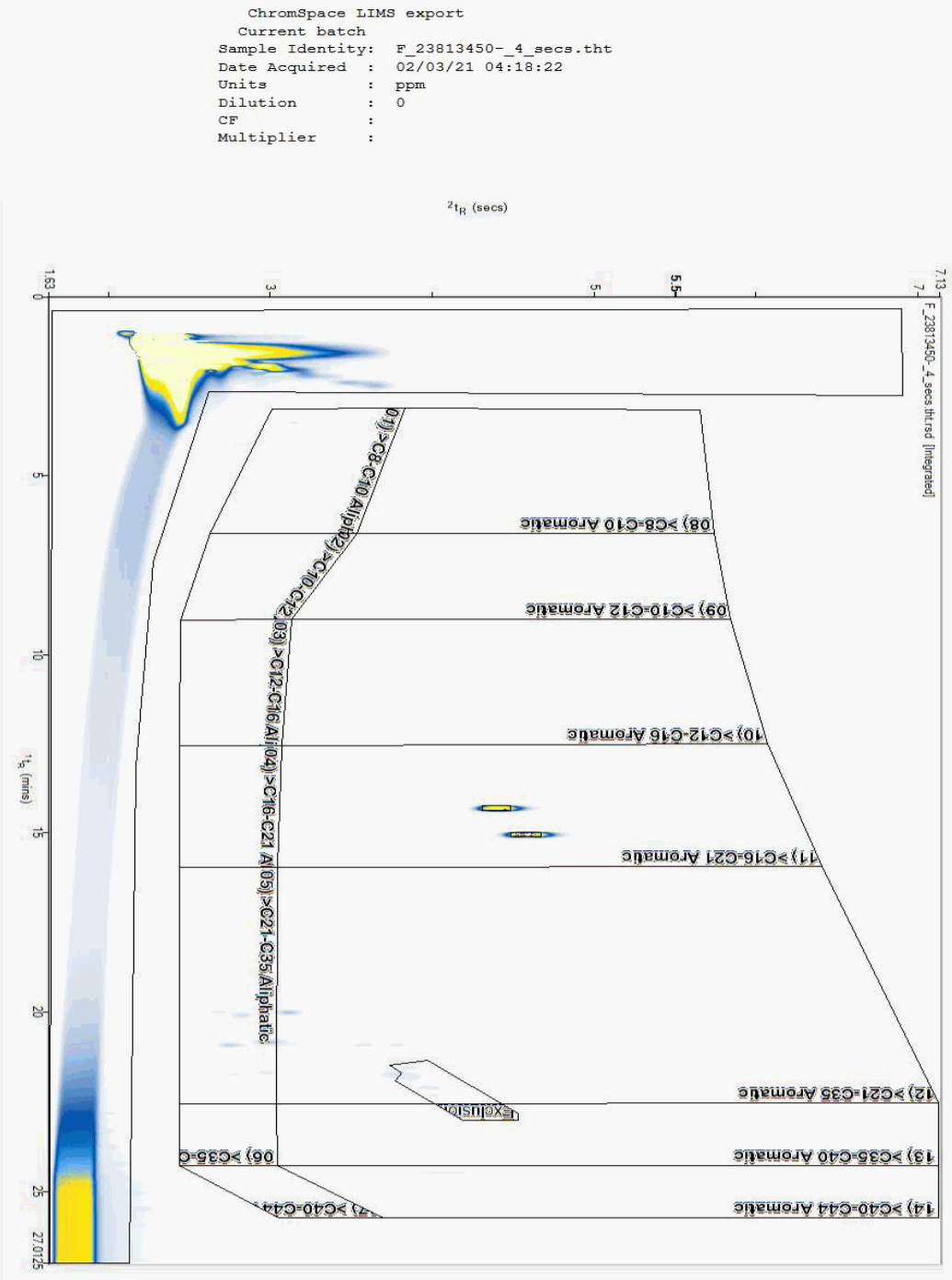
Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Chromatogram

Analysis:EPH CWG GC (S)

Sample No :23813450Depth :0.50

Sample ID :BH-PTR-20 ES3





CERTIFICATE OF ANALYSIS

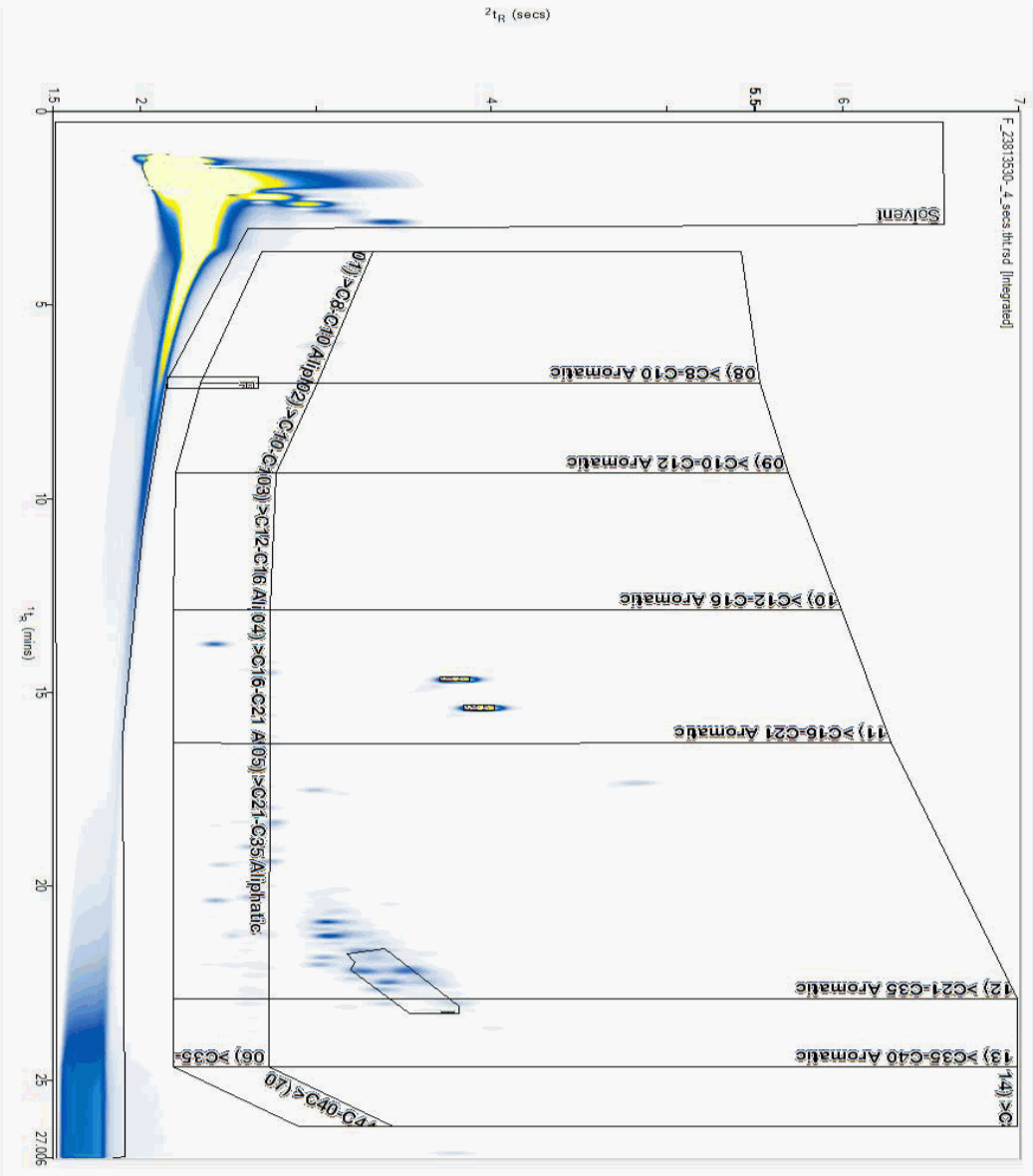
Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23813530 Depth : 1.00
Sample ID : BH-PTR-20 ES4

ChromSpace LIMS export
Current batch
Sample Identity: F_23813530-4_secs.tht
Date Acquired : 01/03/21 10:58:46
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

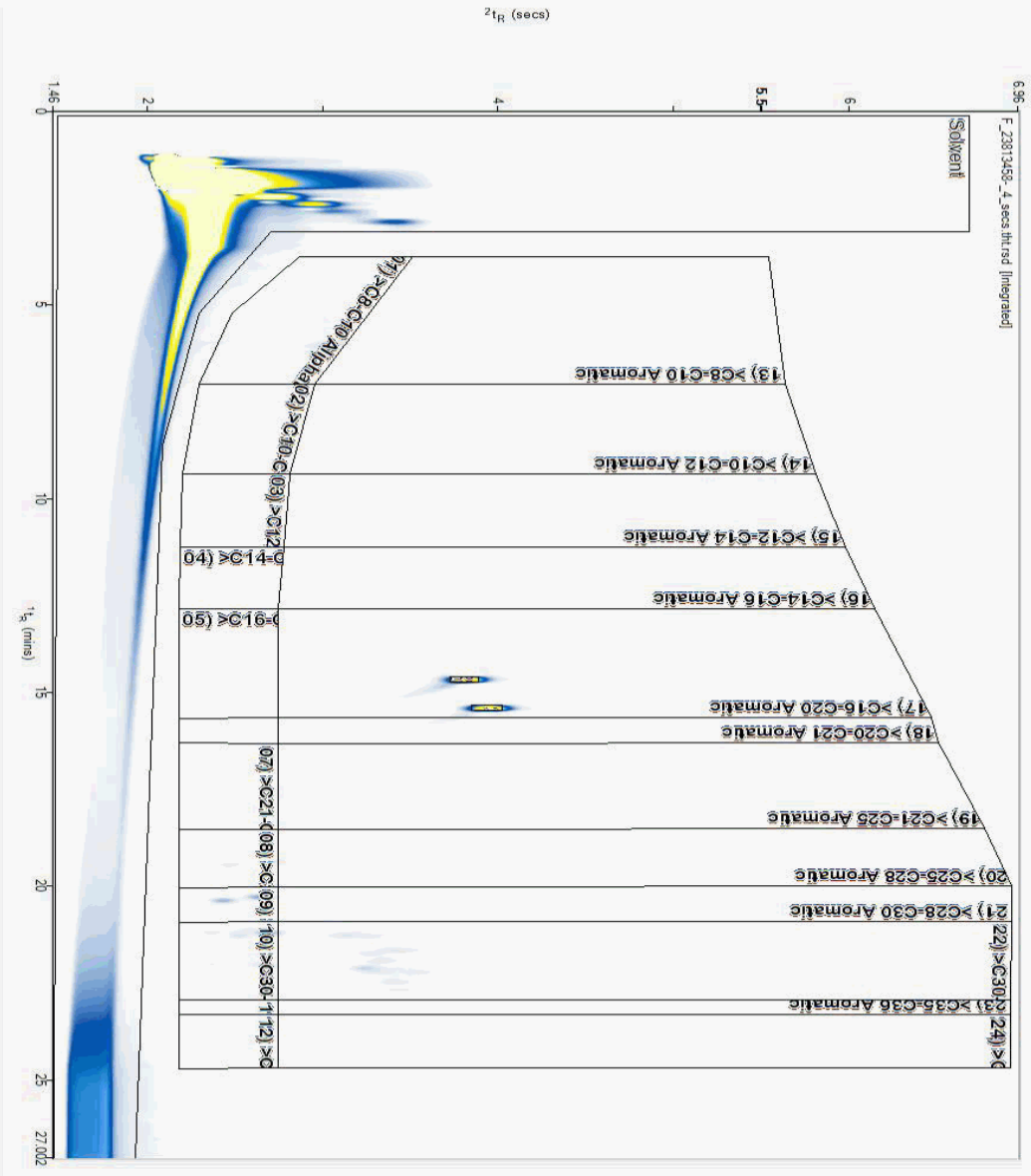
Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23813458 Depth : 0.50
Sample ID : BH-PTR-20 ES3

ChromSpace LIMS export
Current batch
Sample Identity: F_23813458-4_secs.tht
Date Acquired : 02/03/21 07:32:14
Units : ppm
Dilution : 0
CF :
Multiplier :





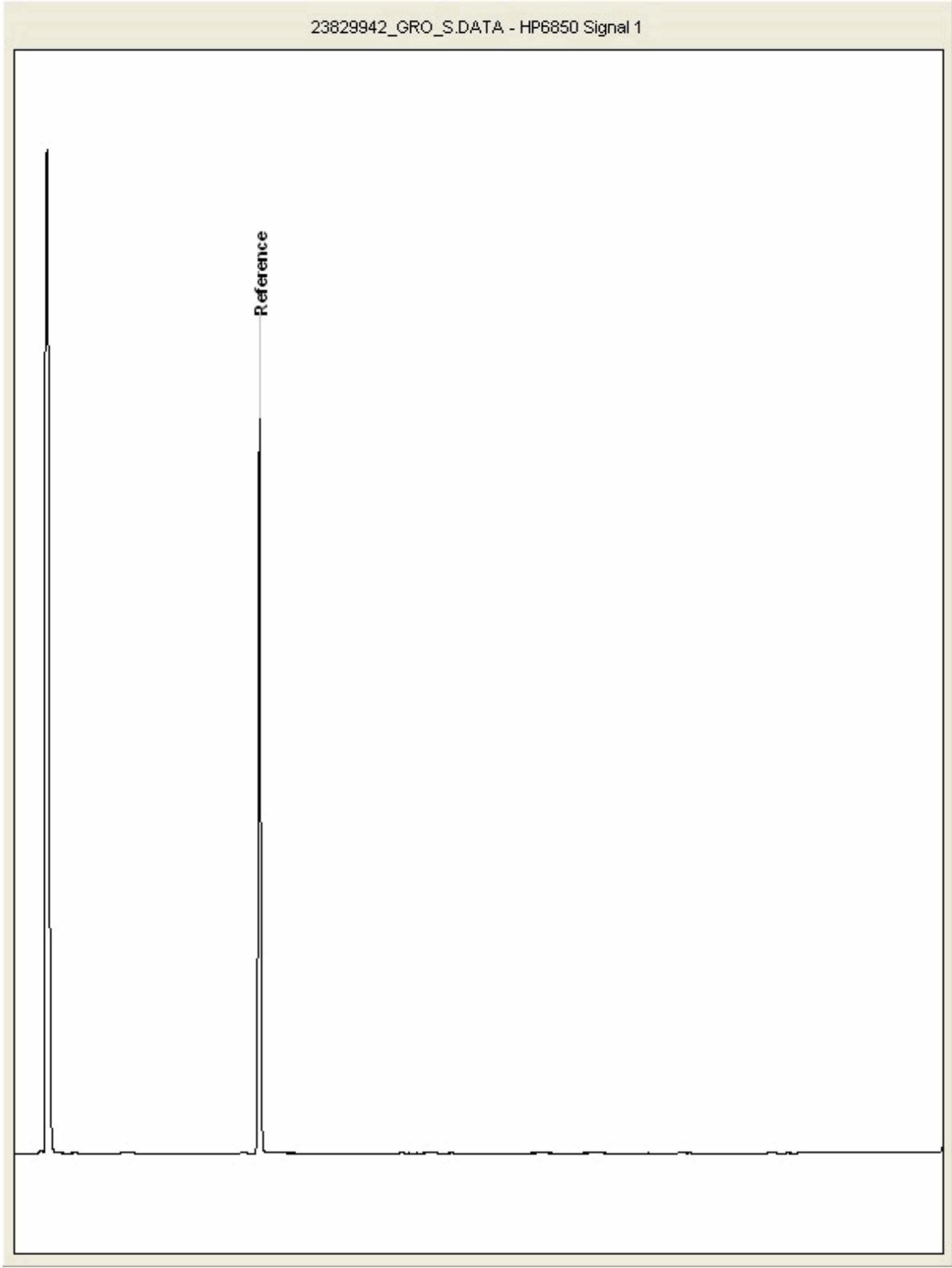
CERTIFICATE OF ANALYSIS

Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23829942 Depth : 0.50
Sample ID : BH-PTR-20 ES3



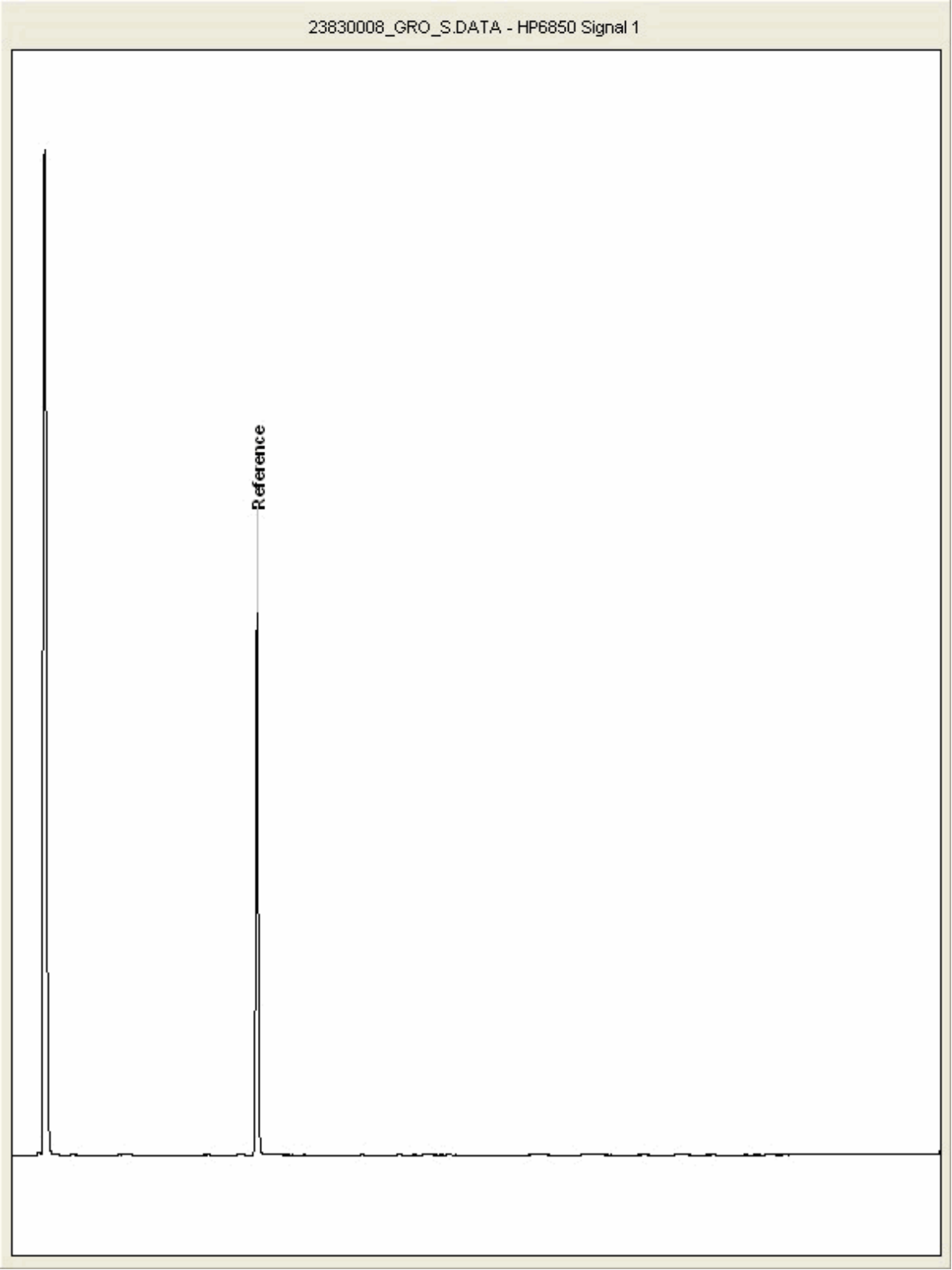
CERTIFICATE OF ANALYSIS

Validated

SDG: 210224-71 Client Reference: B025563 Report Number: 590142
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23830008 Depth : 1.00
Sample ID : BH-PTR-20 ES4





CERTIFICATE OF ANALYSIS

SDG:	210224-71	Client Reference:	B025563	Report Number:	590142
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	10 March 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210226-130
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	589933

We received 8 samples on Friday February 26, 2021 and 3 of these samples were scheduled for analysis which was completed on Wednesday March 10, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:

210226-130

Client Reference:

B025563

Report Number:

589933

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23804627	BH - PTR - 22	ES1	0.00 - 0.10	24/02/2021
23804628	BH - PTR - 22	ES2	0.15 - 0.20	24/02/2021
23804630	BH - PTR - 22	ES3	0.25 - 0.50	24/02/2021
23804631	BH - PTR - 22	ES4	0.55 - 1.00	24/02/2021
23804623	PTR - TP - 030	ES1	0.00 - 0.20	24/02/2021
23804624	PTR - TP - 030	ES2	0.40	24/02/2021
23804625	PTR - TP - 030	ES3	1.00	24/02/2021
23804626	PTR - TP - 030	ES4	2.50	24/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:

210226-130

Client Reference:

B025563

Report Number:

589933

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23804627	23804623	23804625
						BH - PTR - 22	PTR - TP - 030	PTR - TP - 030
						ES1	ES1	ES3
						0.00 - 0.10	0.00 - 0.20	1.00
						60g VOC (ALE215)	60g VOC (ALE210)	60g VOC (ALE215)
						250g Amber Jar (ALE210)	250g Amber Jar (ALE215)	250g Amber Jar (ALE210)
						1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)
						S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1					X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 3				X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1					X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3				X	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 3				X	X	X
CEN Readings	All	NDPs: 0 Tests: 1					X	
Chromium III	All	NDPs: 0 Tests: 3				X	X	X
Coronene	All	NDPs: 0 Tests: 1					X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3				X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1					X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1					X	
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1					X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 3				X	X	X
Fluoride	All	NDPs: 0 Tests: 1					X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3				X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130Client Reference: B025563Report Number: 589933

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Results Legend	Lab Sample No(s)		23804627	23804623	23804625
	Customer Sample Reference		BH - PTR - 22	PTR - TP - 030	PTR - TP - 030
	AGS Reference		ES1	ES1	ES3
	Depth (m)		0.00 - 0.10	0.00 - 0.20	1.00
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
			S	S	S
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X	
Mercury Dissolved	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 3	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 3	X	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 3	X	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 3	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 3	X	X	X
Total Sulphur	All	NDPs: 0 Tests: 3	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 3	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130Client Reference: B025563Report Number: 589933

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Results Legend	Lab Sample No(s)		23804627	23804623	23804625
	Customer Sample Reference		BH - PTR - 22	PTR - TP - 030	PTR - TP - 030
	AGS Reference		ES1	ES1	ES3
	Depth (m)		0.00 - 0.10	0.00 - 0.20	1.00
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
			S	S	S
VOC MS (S)	All	NDPs: 0 Tests: 3	X	X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23804627	BH - PTR - 22	0.00 - 0.10	Dark Brown	Loamy Sand	Vegetation	Stones
23804623	PTR - TP - 030	0.00 - 0.20	Dark Brown	Silt Loam	Vegetation	Stones
23804625	PTR - TP - 030	1.00	Light Brown	Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH - PTR - 22	PTR - TP - 030	PTR - TP - 030			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.		0.00 - 0.10	0.00 - 0.20	1.00			
tot.unfilt	Total / unfiltered sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
*	Subcontracted - refer to subcontractor report for accreditation status.		24/02/2021	24/02/2021	24/02/2021			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		12:00:00	12:00:00	12:00:00			
(F)	Trigger breach confirmed		26/02/2021	26/02/2021	26/02/2021			
1-445@	Sample deviation (see appendix)		210226-130	210226-130	210226-130			
			23804627	23804623	23804625			
			ES1	ES1	ES3			
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	9	13	9			
Loss on ignition	<0.7 %	TM018		4.81				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Cresols	<0.01 mg/kg	TM062 (S)	0.011	0.0115	<0.01			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06	<0.06			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13			
Organic Carbon, Total	<0.2 %	TM132		1.1				
Sulphur, Total	<0.02 %	TM132	0.0214	0.0226	0.0609			
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00781	0.011	<0.002			
pH	1 pH Units	TM133	8.25	8.42	8.72			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6			
Cyanide, Free	<1 mg/kg	TM153	<1	<1	<1			
PCB congener 28	<3 µg/kg	TM168		<3				
PCB congener 52	<3 µg/kg	TM168		<3				
PCB congener 101	<3 µg/kg	TM168		<3				
PCB congener 118	<3 µg/kg	TM168		<3				
PCB congener 138	<3 µg/kg	TM168		<3				
PCB congener 153	<3 µg/kg	TM168		<3				
PCB congener 180	<3 µg/kg	TM168		<3				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21				
Chromium, Trivalent	<0.9 mg/kg	TM181	9.41	12.7	7.93			
Antimony	<0.6 mg/kg	TM181	<0.6	0.798	10.5			
Arsenic	<0.6 mg/kg	TM181	11.4	10	7.43			
Barium	<0.6 mg/kg	TM181	40.3	50.6	29			
Beryllium	<0.01 mg/kg	TM181	0.396	0.261	0.106			
Cadmium	<0.02 mg/kg	TM181	0.136	0.109	3.03			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH - PTR - 22 0.00 - 0.10 Soil/Solid (S) 24/02/2021 12:00:00 26/02/2021 210226-130 23804627 ES1	PTR - TP - 030 0.00 - 0.20 Soil/Solid (S) 24/02/2021 12:00:00 26/02/2021 210226-130 23804623 ES1	PTR - TP - 030 1.00 Soil/Solid (S) 24/02/2021 12:00:00 26/02/2021 210226-130 23804625 ES3			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference							
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-456	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	103	103	101				
Toluene-d8**	%	TM116	96.1	96.3	101				
4-Bromofluorobenzene**	%	TM116	80.4	79.8	102				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M	<8 M	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M	<5 M				
Benzene	<9 µg/kg	TM116	<9 M	<9 M	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Toluene	<7 µg/kg	TM116	<7 M	<7 M	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)		16.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		85.5
Particle Size <4mm	>95%			

Case

SDG	210226-130
Lab Sample Number(s)	23804623
Sampled Date	24-Feb-2021
Customer Sample Ref.	PTR - TP - 030 ES1
Depth (m)	0.00 - 0.20

Landfill Waste Acceptance Criteria Limits

Solid Waste Analysis		Result
Total Organic Carbon (%)	1.1	
Loss on Ignition (%)	4.81	
Sum of BTEX (mg/kg)	<0.04	
Sum of 7 PCBs (mg/kg)	<0.021	
Mineral Oil (mg/kg)	5.66	
PAH Sum of 17 (mg/kg)	<10	
pH (pH Units)	8.42	
ANC to pH 6 (mol/kg)	0.0444	
ANC to pH 4 (mol/kg)	0.599	

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00148	<0.0005	0.0148	<0.005	0.5	2	25
Barium	0.0147	<0.0002	0.147	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.0033	<0.0003	0.033	<0.003	2	50	100
Mercury Dissolved (CVAf)	0.0000241	<0.00001	0.000241	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.0015	<0.0004	0.015	<0.004	0.4	10	40
Lead	0.0004	<0.0002	0.004	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0643	<0.001	0.643	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.544	<0.5	5.44	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	103	<5	1030	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	12.4	<3	124	<30	500	800	1000

Leach Test Information

Date Prepared	03-Mar-2021
pH (pH Units)	10.06
Conductivity (µS/cm)	128.00
Temperature (°C)	11.00
Volume Leachant (Litres)	0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

10/03/2021 09:41:37

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23804627	23804623	23804625
Customer Sample Ref.	BH - PTR - 22	PTR - TP - 030	PTR - TP - 030
AGS Ref.	ES1	ES1	ES3
Depth	0.00 - 0.10	0.00 - 0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6		08-Mar-2021	
Anions by Kone (soil)	08-Mar-2021	05-Mar-2021	08-Mar-2021
Anions by Kone (w)		04-Mar-2021	
Asbestos ID in Solid Samples	05-Mar-2021	08-Mar-2021	08-Mar-2021
Boron Water Soluble	06-Mar-2021	06-Mar-2021	06-Mar-2021
CEN 10:1 Leachate (1 Stage)		03-Mar-2021	
CEN Readings		04-Mar-2021	
Chromium III	08-Mar-2021	05-Mar-2021	05-Mar-2021
Coronene		05-Mar-2021	
Cyanide Comp/Free/Total/Thiocyanate	10-Mar-2021	10-Mar-2021	10-Mar-2021
Dissolved Metals by ICP-MS		08-Mar-2021	
Dissolved Organic/Inorganic Carbon		08-Mar-2021	
EPH by GCxGC-FID		05-Mar-2021	
EPH CWG GC (S)	05-Mar-2021	05-Mar-2021	05-Mar-2021
Fluoride		05-Mar-2021	
GRO by GC-FID (S)	08-Mar-2021	08-Mar-2021	08-Mar-2021
Hexavalent Chromium (s)	05-Mar-2021	05-Mar-2021	05-Mar-2021
Loss on Ignition in soils		09-Mar-2021	
Mercury Dissolved		08-Mar-2021	
Metals in solid samples by OES	09-Mar-2021	05-Mar-2021	05-Mar-2021
Moisture at 105C		03-Mar-2021	
PAH 16 & 17 Calc		05-Mar-2021	
PAH by GCMS	05-Mar-2021	04-Mar-2021	05-Mar-2021
PCBs by GCMS		05-Mar-2021	
pH	03-Mar-2021	03-Mar-2021	03-Mar-2021
Phenols by HPLC (S)	05-Mar-2021	05-Mar-2021	05-Mar-2021
Phenols by HPLC (W)		05-Mar-2021	
Sample description	03-Mar-2021	03-Mar-2021	03-Mar-2021
Total Dissolved Solids		08-Mar-2021	
Total Organic Carbon	08-Mar-2021	08-Mar-2021	08-Mar-2021
Total Sulphur	08-Mar-2021	08-Mar-2021	08-Mar-2021
TPH CWG GC (S)	08-Mar-2021	08-Mar-2021	08-Mar-2021
VOC MS (S)	05-Mar-2021	05-Mar-2021	05-Mar-2021

ASSOCIATED AQC DATA

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2384
ANC pH_4 dry soil	TM182	107.92 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2334
Chloride (soluble)	TM243	149.74 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	162.15 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2396
Chloride	TM184	101.0 92.93 : 115.43
Sulphate (soluble)	TM184	100.8 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2391	QC 2318
Water Soluble Boron	TM222	102.0 84.00 : 111.00	98.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2390
Coronene RAW	TM410	113.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2336
Free Cyanide	TM153	101.98 79.00 : 115.00
Thiocyanate	TM153	97.44 94.09 : 113.89
Total Cyanide	TM153	101.4 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2321	QC 2375
Aluminium	TM152	102.0 90.98 : 111.82	106.0 90.78 : 110.89
Antimony	TM152	104.5 90.44 : 113.04	104.0 77.22 : 119.42
Arsenic	TM152	102.33 88.00 : 112.00	103.67 86.77 : 107.67
Barium	TM152	101.67 90.20 : 111.19	102.5 87.86 : 110.23
Beryllium	TM152	103.17 87.77 : 113.97	107.83 86.19 : 112.98
Bismuth	TM152	98.67 91.90 : 112.20	102.5 84.06 : 106.46
Borate	TM152	104.32 88.00 : 112.00	108.02 88.00 : 112.00
Boron	TM152	104.0 96.48 : 114.93	108.0 83.92 : 114.90
Cadmium	TM152	94.83 96.43 : 110.53	105.17 88.89 : 106.69
Calcium	TM152	101.33 81.38 : 119.09	108.67 80.24 : 117.95
Chromium	TM152	101.33 91.84 : 108.67	103.83 83.22 : 110.16
Cobalt	TM152	102.33 88.00 : 112.00	104.5 82.49 : 112.36
Copper	TM152	102.83 92.47 : 118.11	104.5 83.14 : 113.00
Iron	TM152	102.0 92.00 : 113.00	104.67 88.40 : 109.24
Lead	TM152	97.83 88.00 : 112.00	102.0 83.71 : 109.58
Lithium	TM152	101.5 91.62 : 113.12	107.83 84.50 : 114.28
Magnesium	TM152	98.67 93.14 : 107.91	102.0 87.56 : 114.57
Manganese	TM152	102.0 95.03 : 110.58	104.83 90.01 : 108.72
Molybdenum	TM152	100.0 88.00 : 112.00	102.17 85.53 : 107.42
Nickel	TM152	103.0 88.00 : 112.00	104.0 88.05 : 106.42
Phosphorus	TM152	100.67 88.00 : 112.00	103.17 82.76 : 107.72
Potassium	TM152	100.67 93.90 : 112.36	102.67 88.45 : 106.42
Selenium	TM152	104.0 91.58 : 115.98	105.67 85.61 : 111.03
Silver	TM152	98.0 88.80 : 122.30	102.17 88.48 : 110.48
Sodium	TM152	98.67 94.28 : 110.71	102.67 88.32 : 106.30
Strontium	TM152	104.0 88.00 : 112.00	102.67 83.77 : 107.87
Tellurium	TM152	103.83 93.32 : 114.66	101.17 82.83 : 104.73

Dissolved Metals by ICP-MS

		QC 2321	QC 2375
Thallium	TM152	81.5 88.00 : 112.00	104.5 77.47 : 113.87
Tin	TM152	98.33 92.63 : 109.70	102.83 87.36 : 109.55
Titanium	TM152	99.67 95.58 : 111.68	106.5 87.29 : 108.31
Tungsten	TM152	99.67 81.32 : 124.72	102.5 68.27 : 122.97
Uranium	TM152	101.0 88.00 : 112.00	103.0 82.46 : 105.16
Vanadium	TM152	105.67 88.00 : 112.00	104.5 88.43 : 114.30
Zinc	TM152	104.0 92.98 : 118.95	105.0 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2330
Dissolved Inorganic Carbon	TM090	123.0 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.83 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2395
EPH >C10-C40 Raw	TM415	82.7 56.36 : 129.92

EPH CWG GC (S)

Component	Method Code	QC 2307
EPH >C8-C40 Raw	TM414	90.11 56.39 : 129.94
Total Aliphatics Raw	TM414	94.27 62.55 : 133.12
Total Aromatics Raw	TM414	111.44 57.00 : 150.27

Fluoride

Component	Method Code	QC 2385
Fluoride	TM104	104.0 96.67 : 108.67

GRO by GC-FID (S)

GRO by GC-FID (S)

Component	Method Code	QC 2301
QC	TM089	90.79 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2374
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2315
Loss on Ignition	TM018	93.6 87.10 : 102.39

Mercury Dissolved

Component	Method Code	QC 2308
Mercury Dissolved (CVAf)	TM183	94.2 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2392	QC 2395	QC 2355	QC 2366
Aluminium	TM181	99.12 77.46 : 123.98	82.48 77.46 : 123.98	108.85 73.56 : 108.85	93.81 73.56 : 108.85
Antimony	TM181	97.56 87.04 : 111.16	101.22 87.04 : 111.16	97.56 76.89 : 111.24	97.97 76.89 : 111.24
Arsenic	TM181	104.65 87.34 : 110.87	99.71 87.34 : 110.87	106.98 88.53 : 111.01	100.87 88.53 : 111.01
Barium	TM181	99.08 80.73 : 115.16	92.66 80.73 : 115.16	104.59 77.67 : 105.35	91.74 77.67 : 105.35
Beryllium	TM181	101.49 89.47 : 112.97	100.75 89.47 : 112.97	106.34 85.44 : 109.61	98.88 85.44 : 109.61
Boron	TM181	94.56 76.57 : 104.15	76.5 76.57 : 104.15	100.29 73.51 : 104.66	91.4 73.51 : 104.66
Cadmium	TM181	93.83 78.94 : 102.43	90.12 78.94 : 102.43	97.12 77.67 : 104.12	89.3 77.67 : 104.12
Chromium	TM181	89.86 77.55 : 104.47	87.63 77.55 : 104.47	97.36 79.64 : 105.83	84.99 79.64 : 105.83



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 589933

Superseded Report:

Metals in solid samples by OES

		QC 2392	QC 2395	QC 2355	QC 2366
Cobalt	TM181	94.65 82.95 : 107.41	89.94 82.95 : 107.41	98.74 84.60 : 104.13	90.25 84.60 : 104.13
Copper	TM181	97.01 84.36 : 106.14	93.31 84.36 : 106.14	103.35 82.40 : 105.45	91.9 82.40 : 105.45
Iron	TM181	95.24 81.43 : 115.79	88.89 81.43 : 115.79	108.73 82.95 : 110.58	96.03 82.95 : 110.58
Lead	TM181	95.72 81.95 : 107.63	91.44 81.95 : 107.63	101.58 78.24 : 104.05	91.44 78.24 : 104.05
Manganese	TM181	113.61 94.29 : 119.51	113.61 94.29 : 119.51	119.44 94.29 : 119.51	103.61 94.29 : 119.51
Mercury	TM181	100.72 82.73 : 106.36	95.89 82.73 : 106.36	102.9 83.16 : 107.81	98.07 83.16 : 107.81
Molybdenum	TM181	102.47 86.61 : 111.07	98.35 86.61 : 111.07	100.82 87.11 : 106.87	98.35 87.11 : 106.87
Nickel	TM181	92.91 79.72 : 103.80	87.78 79.72 : 103.80	99.76 80.26 : 102.28	89.49 80.26 : 102.28
Phosphorus	TM181	113.74 92.65 : 125.47	104.44 92.65 : 125.47	118.38 94.56 : 124.28	107.88 94.56 : 124.28
Selenium	TM181	104.31 88.36 : 111.25	99.22 88.36 : 111.25	110.2 82.28 : 110.48	101.57 82.28 : 110.48
Strontium	TM181	95.55 78.06 : 99.91	91.31 78.06 : 99.91	104.45 79.13 : 102.79	93.1 79.13 : 102.79
Thallium	TM181	104.42 88.60 : 116.73	98.23 88.60 : 116.73	107.96 82.94 : 111.86	97.79 82.94 : 111.86
Tin	TM181	103.04 89.77 : 112.62	100.38 89.77 : 112.62	109.51 86.72 : 110.03	99.62 86.72 : 110.03
Titanium	TM181	88.55 66.29 : 105.96	62.98 66.29 : 105.96	86.26 66.23 : 102.06	84.73 66.23 : 102.06
Vanadium	TM181	95.97 75.51 : 108.87	93.04 75.51 : 108.87	105.13 86.19 : 109.45	96.7 86.19 : 109.45
Zinc	TM181	101.44 84.02 : 111.24	93.63 84.02 : 111.24	110.68 84.68 : 113.99	98.36 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2376	QC 2339
Acenaphthene	TM218	86.0 78.59 : 112.16	90.5 76.79 : 103.90
Acenaphthylene	TM218	84.0 75.11 : 109.01	89.0 78.40 : 108.66
Anthracene	TM218	82.5 73.99 : 113.85	90.0 70.90 : 109.22
Benz(a)anthracene	TM218	85.5 69.31 : 119.18	98.5 73.77 : 119.26
Benzo(a)pyrene	TM218	75.5 66.97 : 114.92	92.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	77.0 67.41 : 114.46	99.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	83.0 62.92 : 114.36	92.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	86.0 69.98 : 116.49	98.5 75.98 : 116.59
Chrysene	TM218	84.0 69.86 : 114.50	96.0 74.82 : 114.18



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 589933

Superseded Report:

PAH by GCMS

		QC 2376	QC 2339
Dibenzo(ah)anthracene	TM218	87.0 64.54 : 115.22	89.5 69.17 : 115.30
Fluoranthene	TM218	74.0 72.56 : 111.70	96.0 75.88 : 112.84
Fluorene	TM218	84.0 79.13 : 111.49	88.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	87.5 61.22 : 113.25	88.5 70.26 : 117.95
Naphthalene	TM218	86.0 77.96 : 110.91	91.5 74.70 : 101.83
Phenanthrene	TM218	77.5 76.83 : 113.25	92.5 73.62 : 109.34
Pyrene	TM218	77.5 72.45 : 110.77	95.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2300
PCB congener 101	TM168	79.3 65.66 : 110.06
PCB congener 105	TM168	75.5 58.10 : 106.34
PCB congener 114	TM168	76.2 59.38 : 106.48
PCB congener 118	TM168	77.3 60.02 : 106.23
PCB congener 123	TM168	81.4 65.01 : 99.81
PCB congener 126	TM168	74.5 59.31 : 109.23
PCB congener 138	TM168	78.5 63.95 : 107.63
PCB congener 153	TM168	81.1 62.65 : 108.85
PCB congener 156	TM168	76.5 61.69 : 112.27
PCB congener 157	TM168	73.0 55.37 : 104.81
PCB congener 167	TM168	75.7 65.58 : 109.14
PCB congener 169	TM168	75.4 56.84 : 112.10
PCB congener 180	TM168	80.9 66.99 : 111.63
PCB congener 189	TM168	73.8 57.75 : 112.59
PCB congener 28	TM168	82.5 73.68 : 105.96
PCB congener 52	TM168	81.5 67.24 : 107.62
PCB congener 77	TM168	80.0 64.87 : 108.49
PCB congener 81	TM168	81.2 70.78 : 110.80

		CERTIFICATE OF ANALYSIS				Validated
SDG:		210226-130	Client Reference:	B025563	Report Number:	589933
Location:		Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH						
Component	Method Code	QC 2372				
pH	TM133	100.66 98.71 : 102.32				

Phenols by HPLC (S)		
Component	Method Code	QC 2328
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.0 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	11.43 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	30.0 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	50.31 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	47.5 76.56 : 106.38

Phenols by HPLC (W)		
Component	Method Code	QC 2310
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	51.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	51.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	59.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	52.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.33 79.09 : 131.82

Total Dissolved Solids		
Component	Method Code	QC 2310
Total Dissolved Solids	TM123	99.9 97.30 : 100.92

Total Organic Carbon

		CERTIFICATE OF ANALYSIS				Validated
SDG:		210226-130	Client Reference:	B025563	Report Number:	589933
Location:		Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Total Organic Carbon						
Component	Method Code	QC 2385	QC 2392			
Total Organic Carbon	TM132	95.31 87.02 : 113.45	98.05 87.02 : 113.45			

Total Sulphur		
Component	Method Code	QC 2368
Total Sulphur %	TM132	92.75 61.64 : 114.47

VOC MS (S)		
Component	Method Code	QC 2376
1,1,1,2-tetrachloroethane	TM116	107.0 84.84 : 116.25
1,1,1-Trichloroethane	TM116	102.2 73.73 : 118.05
1,1,2-Trichloroethane	TM116	94.6 77.12 : 116.04
1,1-Dichloroethane	TM116	103.6 74.46 : 129.15
1,2-Dichloroethane	TM116	110.6 92.38 : 131.65
1,4-Dichlorobenzene	TM116	120.8 83.64 : 126.18
2-Chlorotoluene	TM116	99.4 76.03 : 113.25
4-Chlorotoluene	TM116	96.0 66.90 : 112.46
Benzene	TM116	97.2 88.60 : 113.80
Carbon Disulphide	TM116	94.8 74.91 : 122.14
Carbontetrachloride	TM116	110.0 80.31 : 124.50
Chlorobenzene	TM116	106.6 83.81 : 114.18
Chloroform	TM116	105.0 87.40 : 122.49
Chloromethane	TM116	100.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	106.0 80.67 : 126.72
Dibromomethane	TM116	100.8 73.23 : 118.35
Dichloromethane	TM116	104.2 81.11 : 133.25

CERTIFICATE OF ANALYSIS

Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2376
Ethylbenzene	TM116	93.8 75.92 : 110.41
Hexachlorobutadiene	TM116	109.2 12.82 : 152.73
Isopropylbenzene	TM116	83.8 55.79 : 97.59
Naphthalene	TM116	111.8 80.86 : 128.81
o-Xylene	TM116	87.8 69.99 : 108.74
p/m-Xylene	TM116	89.6 68.32 : 108.91
Sec-Butylbenzene	TM116	103.0 38.50 : 101.50
Tetrachloroethene	TM116	106.4 76.95 : 121.02
Toluene	TM116	92.6 74.24 : 107.42
Trichloroethene	TM116	98.0 85.28 : 109.36
Trichlorofluoromethane	TM116	114.0 84.55 : 133.27
Vinyl Chloride	TM116	98.2 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



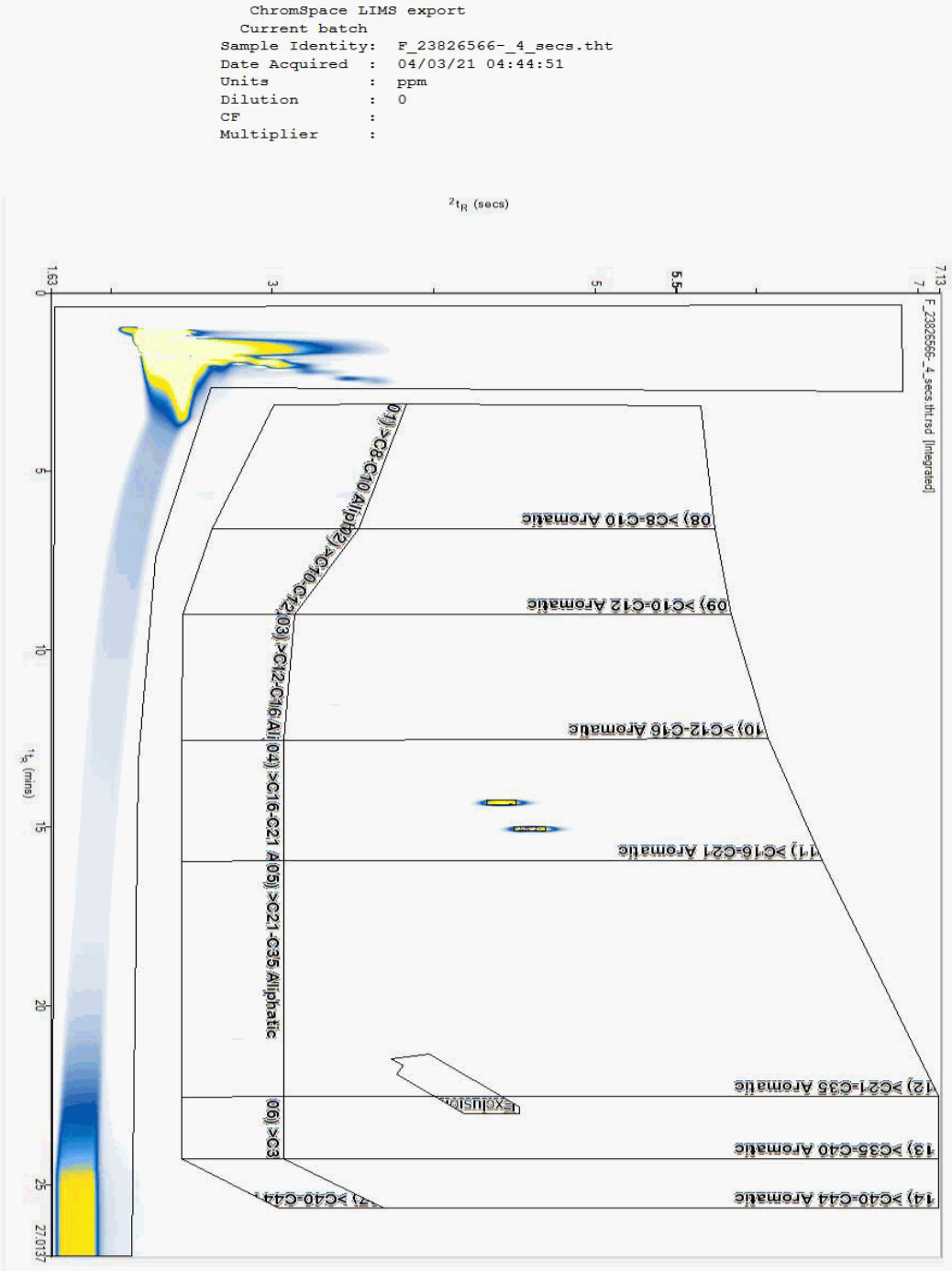
CERTIFICATE OF ANALYSIS

Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S)	Sample No : 23826566	Depth : 1.00
	Sample ID : PTR - TP - 030	





CERTIFICATE OF ANALYSIS

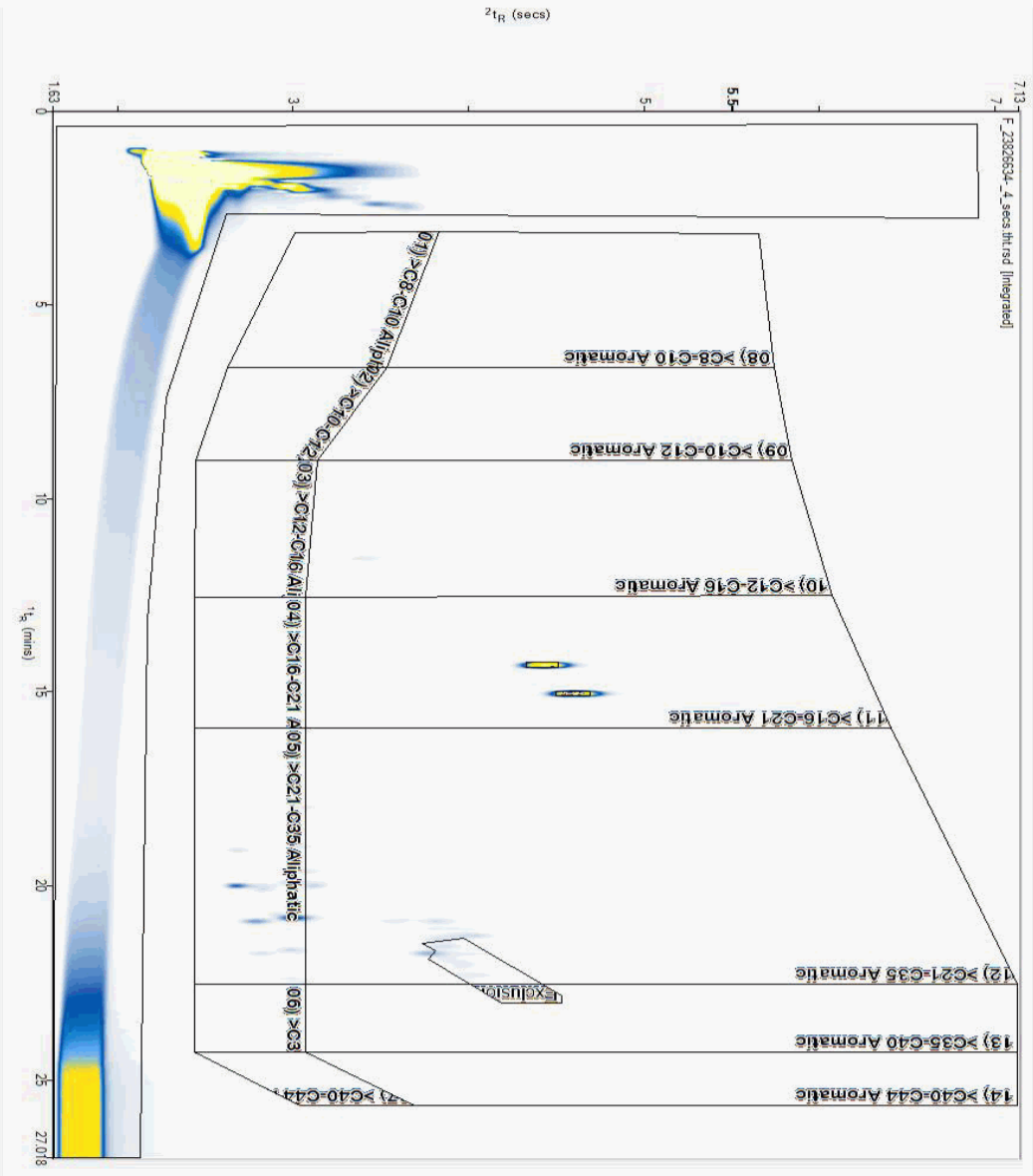
Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23826634 Depth : 0.00 - 0.10
Sample ID : BH - PTR - 22

ChromSpace LIMS export
Current batch
Sample Identity: F_23826634-4_secs.tht
Date Acquired : 04/03/21 06:16:36
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

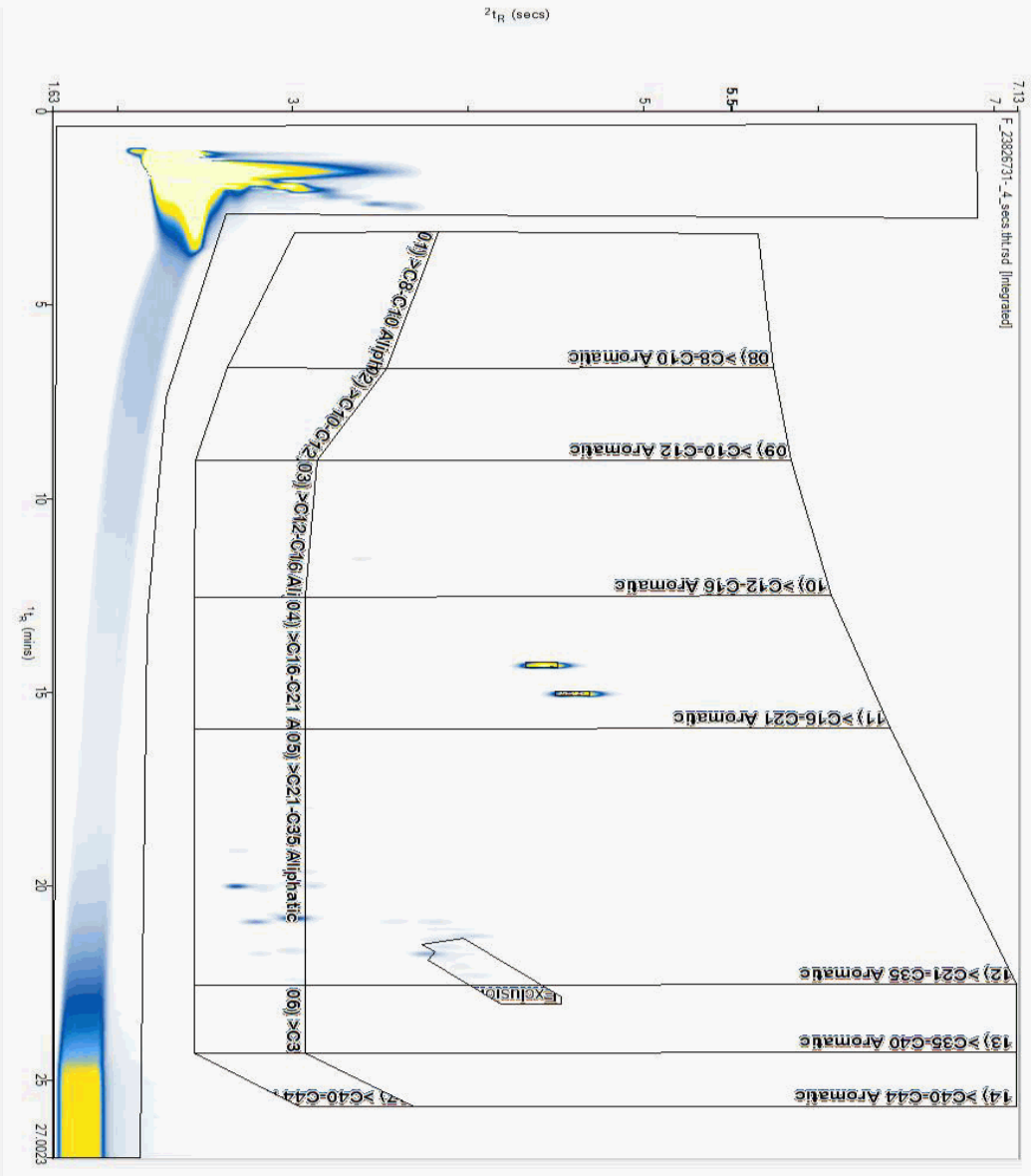
Validated

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23826731 Depth : 0.00 - 0.20
Sample ID : PTR - TP - 030

ChromSpace LIMS export
Current batch
Sample Identity: F_23826731-4_secs.tht
Date Acquired : 04/03/21 06:47:09
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130 Client Reference: B025563 Report Number: 589933
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23826761 Depth : 0.00 - 0.20
Sample ID : PTR - TP - 030



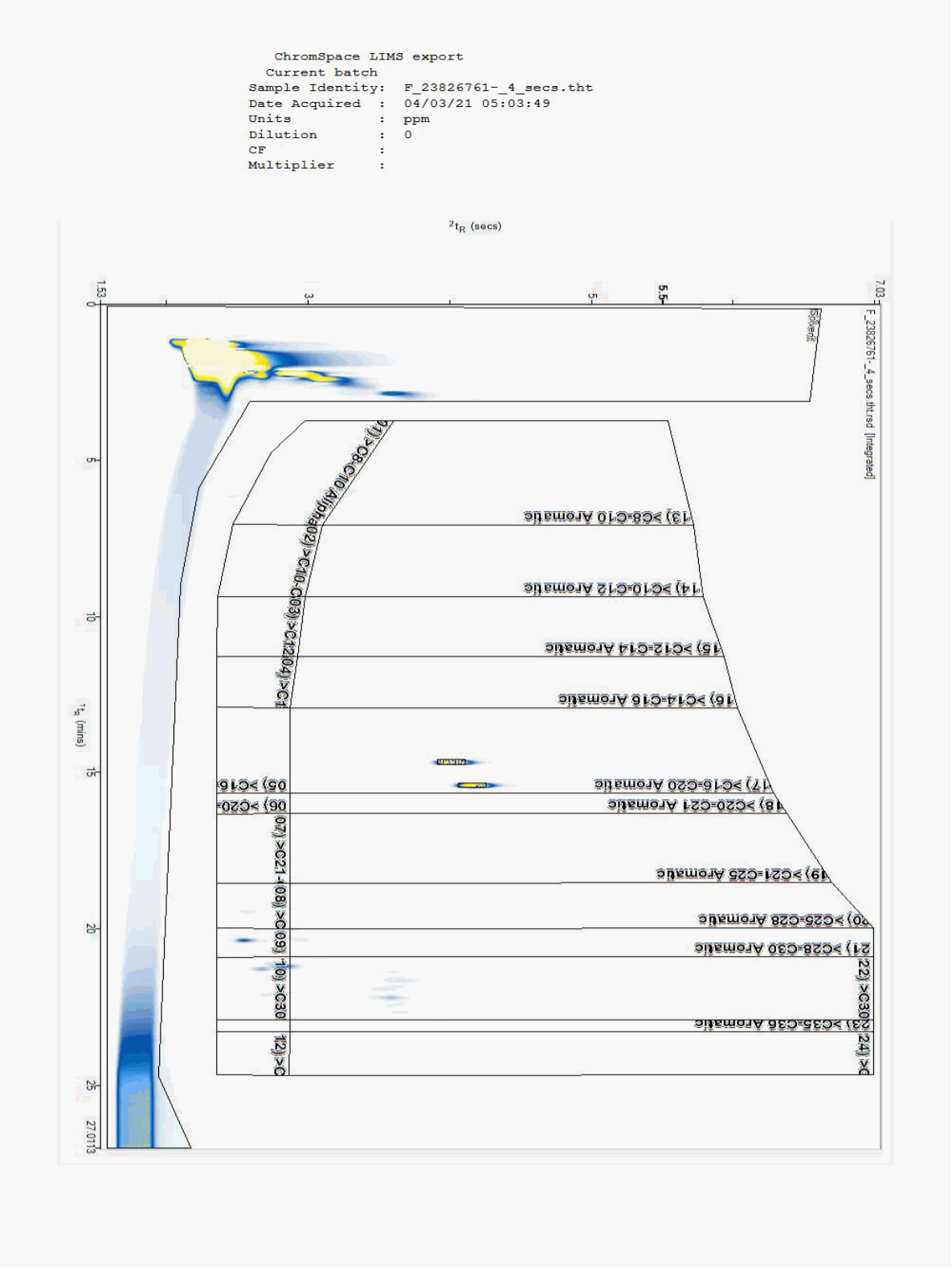
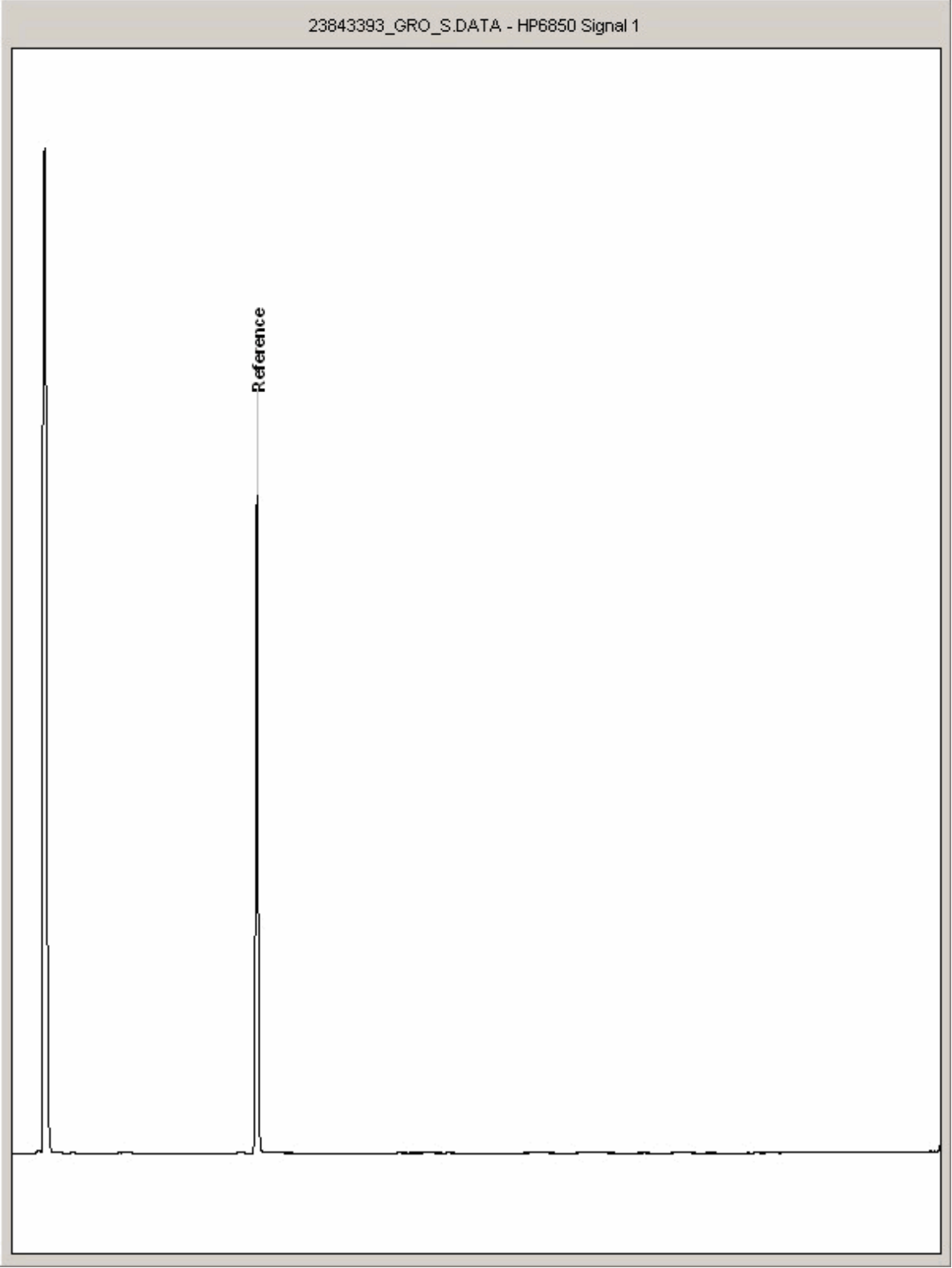
CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130 Client Reference: B025563 Report Number: 589933
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23843393 Depth : 0.00 - 0.10
Sample ID : BH - PTR - 22





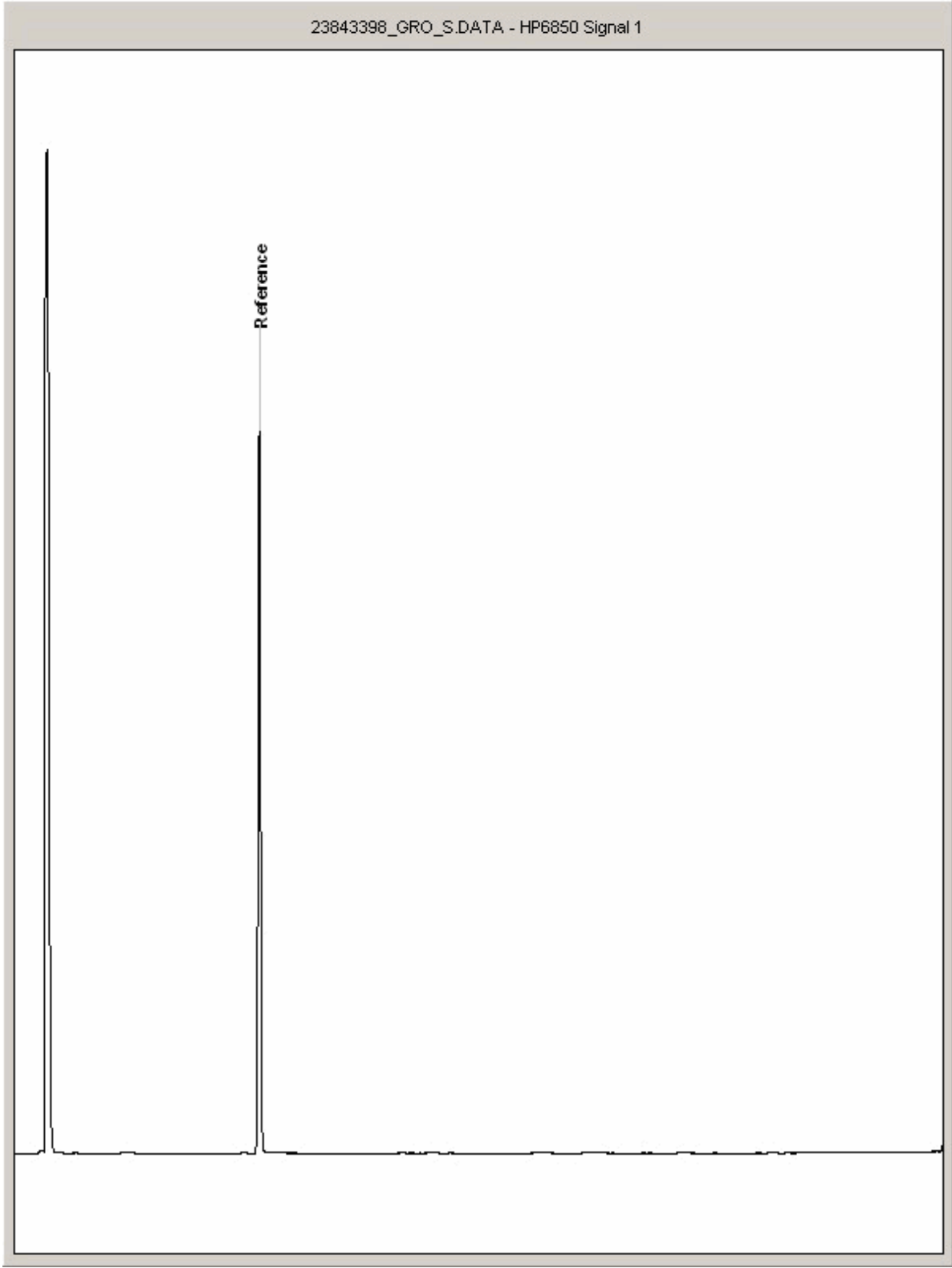
CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130 Client Reference: B025563 Report Number: 589933
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23843398 Depth : 1.00
Sample ID : PTR - TP - 030



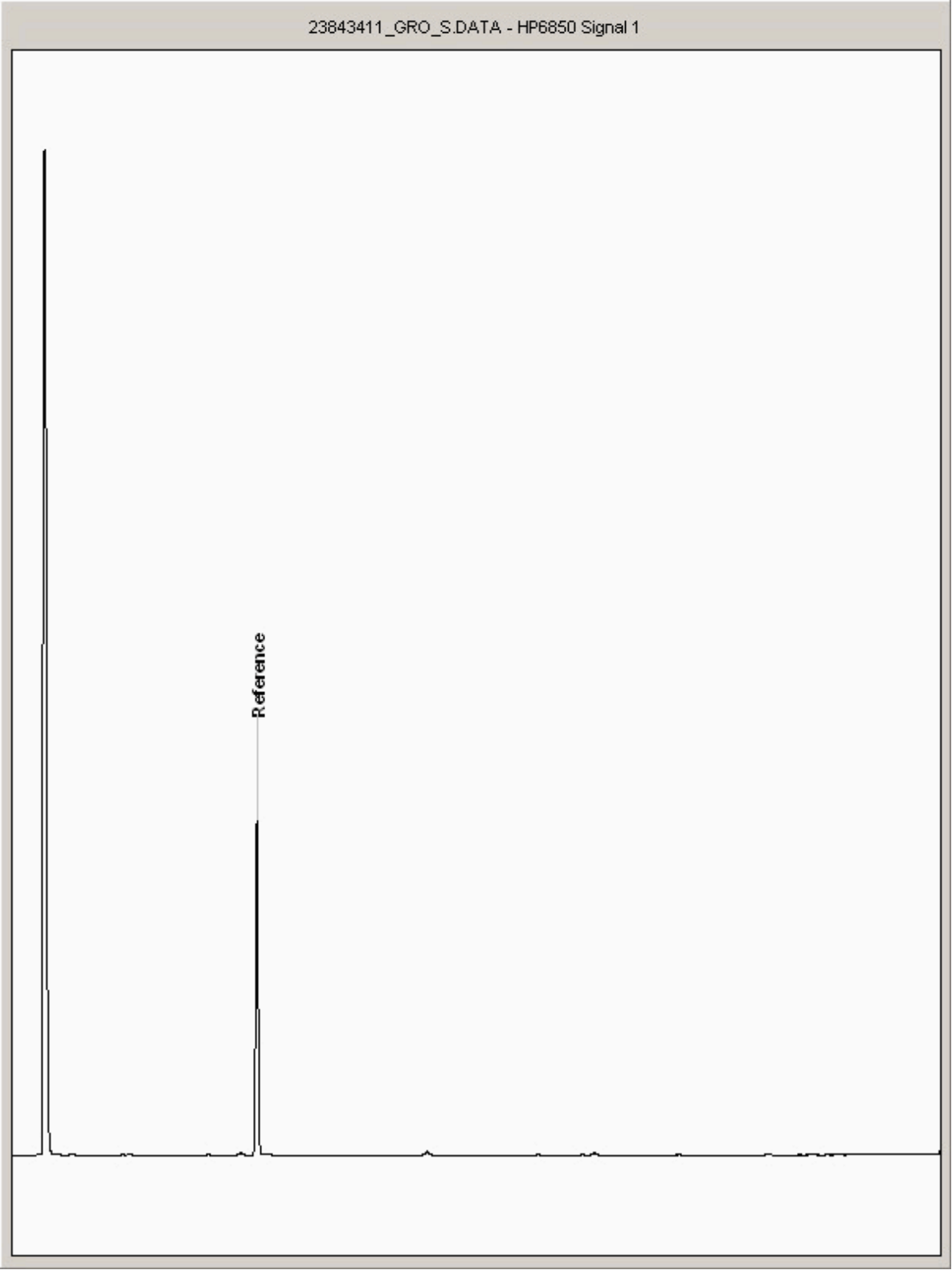
CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-130 Client Reference: B025563 Report Number: 589933
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23843411 Depth : 0.00 - 0.20
Sample ID : PTR - TP - 030





CERTIFICATE OF ANALYSIS

SDG:	210226-130	Client Reference:	B025563	Report Number:	589933
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Attention: Richard Tonge

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Hawarden

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CH5 3US

Tel: (01244) 528700

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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

09 March 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210226-137

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

589889

We received 9 samples on Friday February 26, 2021 and 3 of these samples were scheduled for analysis which was completed on Tuesday March 09, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 09/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23804878	PTR - TP - 026	ES1	0.00 - 0.00	24/02/2021
23804879	PTR - TP - 026	ES2	0.00 - 0.50	24/02/2021
23804880	PTR - TP - 026	ES3	0.00 - 1.00	24/02/2021
23804881	PTR - TP - 026	ES4	0.00 - 2.00	24/02/2021
23804882	PTR - TP - 026	ES5	0.00 - 3.00	24/02/2021
23804883	PTR - TP - 027	ES1	0.00 - 0.20	24/02/2021
23804884	PTR - TP - 027	ES2	0.00 - 0.50	24/02/2021
23804885	PTR - TP - 027	ES3	0.00 - 1.00	24/02/2021
23804886	PTR - TP - 027	ES4	0.00 - 2.50	24/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23804879	23804881	23804884
						PTR - TP - 026	PTR - TP - 026	PTR - TP - 027
						ES2	ES4	ES2
						0.00 - 0.50	0.00 - 2.00	0.00 - 0.50
						1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
						S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1				X		
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1						X
Anions by Kone (soil)	All	NDPs: 0 Tests: 3				X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 2				X		X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3				X	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 3				X	X	X
CEN Readings	All	NDPs: 0 Tests: 2				X		X
Chromium III	All	NDPs: 0 Tests: 4				X	X	X
Coronene	All	NDPs: 0 Tests: 1						X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3				X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2				X		X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2				X		X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1						X
EPH CWG GC (S)	All	NDPs: 0 Tests: 3				X	X	X
Fluoride	All	NDPs: 0 Tests: 2				X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23804879	23804881	23804884								
	Customer Sample Reference		PTR - TP - 026	PTR - TP - 026	PTR - TP - 027								
	AGS Reference		ES2	ES4	ES2								
	Depth (m)		0.00 - 0.50	0.00 - 2.00	0.00 - 0.50								
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	250g Amber Jar (ALE215)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S	S	S	S	S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X		X					X		
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3		X		X				X			
Loss on Ignition in soils	All	NDPs: 0 Tests: 1								X			
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X										
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X										
Mercury Dissolved	All	NDPs: 0 Tests: 2	X				X						
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X		X				X			
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1								X			
PAH by GCMS	All	NDPs: 0 Tests: 3		X		X				X			
PCBs by GCMS	All	NDPs: 0 Tests: 1								X			
pH	All	NDPs: 0 Tests: 3		X		X				X			
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X										
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X		X				X			
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X				X						
Sample description	All	NDPs: 0 Tests: 3		X		X				X			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23804879	23804881	23804884								
	Customer Sample Reference		PTR - TP - 026	PTR - TP - 026	PTR - TP - 027								
	AGS Reference		ES2	ES4	ES2								
	Depth (m)		0.00 - 0.50	0.00 - 2.00	0.00 - 0.50								
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	250g Amber Jar (ALE215)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S	S	S	S	S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 1								X			
Total Organic Carbon	All	NDPs: 0 Tests: 3		X		X				X			
Total Sulphur	All	NDPs: 0 Tests: 3		X		X				X			
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X				X			
VOC MS (S)	All	NDPs: 0 Tests: 3			X		X					X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23804879	PTR - TP - 026	0.00 - 0.50	Dark Brown	Sandy Loam	Stones	Vegetation
23804881	PTR - TP - 026	0.00 - 2.00	Light Brown	Chalk	Stones	Vegetation
23804884	PTR - TP - 027	0.00 - 0.50	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	PTR - TP - 026	PTR - TP - 026	PTR - TP - 027			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.		0.00 - 0.50 Soil/Solid (S)	0.00 - 2.00 Soil/Solid (S)	0.00 - 0.50 Soil/Solid (S)			
tot.unfilt	Total / unfiltered sample.		24/02/2021	24/02/2021	24/02/2021			
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		26/02/2021 210226-137 23804879 ES2	26/02/2021 210226-137 23804881 ES4	26/02/2021 210226-137 23804884 ES2			
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	11	9.9	8.9			
Loss on ignition	<0.7 %	TM018			<0.7 M			
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 #	<0.01 M			
Cresols	<0.01 mg/kg	TM062 (S)	0.0112 M	<0.01 #	<0.01 M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 #	<0.015 M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	0.0448 M	<0.01 #	<0.01 M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 #	<0.015 M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 #	<0.06 M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13			
Organic Carbon, Total	<0.2 %	TM132			0.55 M			
Sulphur, Total	<0.02 %	TM132	0.0221	<0.02	0.0228			
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00557 #	<0.002 #	0.0055 #			
pH	1 pH Units	TM133	8.75 M	8.92 #	8.75 M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #			
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 #	<1 M			
PCB congener 28	<3 µg/kg	TM168			<3 M			
PCB congener 52	<3 µg/kg	TM168			<3 M			
PCB congener 101	<3 µg/kg	TM168			<3 M			
PCB congener 118	<3 µg/kg	TM168			<3 M			
PCB congener 138	<3 µg/kg	TM168			<3 M			
PCB congener 153	<3 µg/kg	TM168			<3 M			
PCB congener 180	<3 µg/kg	TM168			<3 M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168			<21			
Chromium, Trivalent	<0.9 mg/kg	TM181	8.79	2.24	10.7			
Antimony	<0.6 mg/kg	TM181	0.63 #	<0.6 #	1.02 #			
Arsenic	<0.6 mg/kg	TM181	5.7 M	2.57 #	7.55 M			
Barium	<0.6 mg/kg	TM181	37.6 #	12 #	44.9 #			
Beryllium	<0.01 mg/kg	TM181	0.192 M	0.0627 #	0.223 M			
Cadmium	<0.02 mg/kg	TM181	0.0675 M	0.0347 #	0.046 M			

SDG:	210226-137	Client Reference:	B025563	Report Number:	589889
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210226-137	Client Reference:	B025563	Report Number:	589889
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	PTR - TP - 026	PTR - TP - 026	PTR - TP - 027			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference							
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
+	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4+5/6	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	108	105	108				
Toluene-d8**	%	TM116	99.4	99.7	98.5				
4-Bromofluorobenzene**	%	TM116	92.7	95.3	93.6				
Dichlorodifluoromethane	<6 µg/kg	TM116	<120 M	<120 #	<120 M				
Chloromethane	<7 µg/kg	TM116	<140 #	<140 #	<140 #				
Vinyl Chloride	<6 µg/kg	TM116	<120 ◆ M	<120 ◆ #	<120 ◆ M				
Bromomethane	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
Chloroethane	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<120 M	<120 #	<120 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<200 #	<200 #	<200 #				
Carbon Disulphide	<7 µg/kg	TM116	<140 M	<140 #	<140 M				
Dichloromethane	<10 µg/kg	TM116	<200 #	<200 #	<200 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<160 M	<160 #	<160 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120 M	<120 #	<120 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<200	<200	<200				
Bromochloromethane	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
Chloroform	<8 µg/kg	TM116	<160 M	<160 #	<160 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140 M	<140 #	<140 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
Carbontetrachloride	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<100 M	<100 #	<100 M				
Benzene	<9 µg/kg	TM116	<180 M	<180 #	<180 M				
Trichloroethene	<9 µg/kg	TM116	<180 #	<180 #	<180 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
Dibromomethane	<9 µg/kg	TM116	<180 M	<180 #	<180 M				
Bromodichloromethane	<7 µg/kg	TM116	<140 M	<140 #	<140 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200 M	<200 #	<200 M				
Toluene	<7 µg/kg	TM116	<140 M	<140 #	<140 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200	<200	<200				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200 M	<200 #	<200 M				

ALS

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	PTR - TP - 026ES2	04/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.00 - 0.50										
Sample Type	SOLID										
Date Sampled	24/02/2021 00:00:00										
Date Received	26/02/2021 08:00:00										
SDG	210226-137										
Original Sample	23804879										
Method Number	TM048										
Cust. Sample Ref.	PTR - TP - 026ES4	05/03/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.00 - 2.00										
Sample Type	SOLID										
Date Sampled	24/02/2021 00:00:00										
Date Received	26/02/2021 08:00:00										
SDG	210226-137										
Original Sample	23804881										
Method Number	TM048										
Cust. Sample Ref.	PTR - TP - 027ES2	04/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.00 - 0.50										
Sample Type	SOLID										
Date Sampled	24/02/2021 00:00:00										
Date Received	26/02/2021 08:00:00										
SDG	210226-137										
Original Sample	23804884										
Method Number	TM048										

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

Client Reference	Site Location
Mass Sample taken (kg)	Cambridge South East Transport - F
Mass of dry sample (kg)	18.9
Particle Size <4mm	Dry Matter Content (%)
	84.1

Case	Landfill Waste Acceptance Criteria Limits
SDG	
Lab Sample Number(s)	
Sampled Date	
Customer Sample Ref.	
Depth (m)	
Solid Waste Analysis	
Total Organic Carbon (%)	
Loss on Ignition (%)	
Sum of BTEX (mg/kg)	
Sum of 7 PCBs (mg/kg)	
Mineral Oil (mg/kg)	
PAH Sum of 17 (mg/kg)	
pH (pH Units)	
ANC to pH 6 (mol/kg)	
ANC to pH 4 (mol/kg)	
Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill
3	5
-	-
6	-
1	-
500	-
100	-
-	>6
-	-
-	-

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00195	<0.0002	0.0195	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00289	<0.0003	0.0289	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00121	<0.001	0.0121	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.85	<0.5	8.5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	93.6	<5	936	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.57	<3	55.7	<30	500	800	1000

Leach Test Information

Date Prepared	01-Mar-2021
pH (pH Units)	9.06
Conductivity (µS/cm)	72.40
Temperature (°C)	12.50
Volume Leachant (Litres)	0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

SDG:	210226-137	Client Reference:	B025563	Report Number:	589889
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - I
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)		22.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		81.6
Particle Size <4mm	>95%			

Case

SDG	210226-137			
Lab Sample Number(s)	23804879			
Sampled Date	24-Feb-2021			
Customer Sample Ref.	PTR - TP - 026 ES2			
Depth (m)	0.00 - 0.50			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.044	<0.01	0.44	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	3.11	<3	31.1	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.00194	<0.0002	0.0194	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.011	<0.01	0.11	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	18.6	<0.2	186	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00112	<0.0003	0.0112	<0.003	-	-	-
Lead	0.000534	<0.0002	0.00534	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.3	<0.036	3	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00328	<0.001	0.0328	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	3.7	<2	37	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	01-Mar-2021
pH (pH Units)	8.74
Conductivity (µS/cm)	83.40
Temperature (°C)	17.90
Volume Leachant (Litres)	0.880

09/03/2021 16:28:47



SDG:	210226-137	Client Reference:	B025563	Report Number:	589889
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)		22.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		81.6
Particle Size <4mm	>95%			

Case

SDG	210226-137			
Lab Sample Number(s)	23804879			
Sampled Date	24-Feb-2021			
Customer Sample Ref.	PTR - TP - 026 ES2			
Depth (m)	0.00 - 0.50			

[illegible]

Leach Test Information

Date Prepared	01-Mar-2021
pH (pH Units)	8.74
Conductivity (µS/cm)	83.40
Temperature (°C)	17.90
Volume Leachant (Litres)	0.880

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23804879	23804881	23804884
Customer Sample Ref.	PTR - TP - 026	PTR - TP - 026	PTR - TP - 027
AGS Ref.	ES2	ES4	ES2
Depth	0.00 - 0.50	0.00 - 2.00	0.00 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	04-Mar-2021		
ANC at pH4 and ANC at pH 6			04-Mar-2021
Anions by Kone (soil)	04-Mar-2021	04-Mar-2021	04-Mar-2021
Anions by Kone (w)	04-Mar-2021		04-Mar-2021
Asbestos ID in Solid Samples	04-Mar-2021	05-Mar-2021	04-Mar-2021
Boron Water Soluble	04-Mar-2021	04-Mar-2021	04-Mar-2021
CEN 10:1 Leachate (1 Stage)	01-Mar-2021		01-Mar-2021
CEN Readings	02-Mar-2021		02-Mar-2021
Chromium III	05-Mar-2021	05-Mar-2021	04-Mar-2021
Coronene			03-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	04-Mar-2021	04-Mar-2021	04-Mar-2021
Dissolved Metals by ICP-MS	04-Mar-2021		04-Mar-2021
Dissolved Organic/Inorganic Carbon	05-Mar-2021		05-Mar-2021
EPH by GCxGC-FID			03-Mar-2021
EPH CWG GC (S)	03-Mar-2021	03-Mar-2021	03-Mar-2021
Fluoride	03-Mar-2021		03-Mar-2021
GRO by GC-FID (S)	04-Mar-2021	04-Mar-2021	04-Mar-2021
Hexavalent Chromium (s)	03-Mar-2021	03-Mar-2021	03-Mar-2021
Loss on Ignition in soils			04-Mar-2021
Low Level Cyanide (W)	04-Mar-2021		
Low Level Hexavalent Chromium (w)	03-Mar-2021		
Mercury Dissolved	03-Mar-2021		03-Mar-2021
Metals in solid samples by OES	06-Mar-2021	09-Mar-2021	06-Mar-2021
Moisture at 105C	01-Mar-2021		01-Mar-2021
PAH 16 & 17 Calc			03-Mar-2021
PAH by GCMS	03-Mar-2021	04-Mar-2021	03-Mar-2021
PCBs by GCMS			03-Mar-2021
pH	02-Mar-2021	02-Mar-2021	02-Mar-2021
pH Value of Filtered Water	03-Mar-2021		
Phenols by HPLC (S)	03-Mar-2021	02-Mar-2021	02-Mar-2021
Phenols by HPLC (W)	03-Mar-2021		03-Mar-2021
Sample description	28-Feb-2021	28-Feb-2021	28-Feb-2021
Total Dissolved Solids			03-Mar-2021
Total Organic Carbon	04-Mar-2021	04-Mar-2021	04-Mar-2021
Total Sulphur	04-Mar-2021	04-Mar-2021	04-Mar-2021
TPH CWG GC (S)	04-Mar-2021	04-Mar-2021	04-Mar-2021
VOC MS (S)	04-Mar-2021	04-Mar-2021	04-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2395
Ammoniacal Nitrogen as N	TM099	102.0 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2331
ANC pH_4 dry soil	TM182	106.16 82.79 : 130.38

Anions by Kone (w)

Component	Method Code	QC 2390
Chloride	TM184	101.0 92.93 : 115.43
Sulphate (soluble)	TM184	98.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2388
Water Soluble Boron	TM222	97.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2347
Coronene RAW	TM410	96.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2316	QC 2381
Free Cyanide	TM153	97.33 79.00 : 115.00	100.99 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89	100.64 94.09 : 113.89
Total Cyanide	TM153	100.7 73.07 : 107.47	104.2 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2397
Aluminium	TM152	103.33 90.98 : 111.82
Antimony	TM152	105.0 90.44 : 113.04
Arsenic	TM152	103.5 88.00 : 112.00
Barium	TM152	97.67 90.20 : 111.19
Beryllium	TM152	103.67 87.77 : 113.97
Bismuth	TM152	103.0 91.90 : 112.20
Borate	TM152	103.7 88.00 : 112.00
Boron	TM152	103.67 96.48 : 114.93
Cadmium	TM152	103.33 96.43 : 110.53
Calcium	TM152	102.0 81.38 : 119.09
Chromium	TM152	102.33 91.84 : 108.67
Cobalt	TM152	103.0 88.00 : 112.00
Copper	TM152	104.0 92.47 : 118.11
Iron	TM152	102.0 92.00 : 113.00
Lead	TM152	99.17 88.00 : 112.00
Lithium	TM152	102.67 91.62 : 113.12
Magnesium	TM152	98.0 93.14 : 107.91
Manganese	TM152	103.17 95.03 : 110.58
Molybdenum	TM152	101.5 88.00 : 112.00
Nickel	TM152	104.83 88.00 : 112.00
Phosphorus	TM152	100.5 88.00 : 112.00
Potassium	TM152	101.33 93.90 : 112.36
Selenium	TM152	105.67 91.58 : 115.98
Silver	TM152	102.83 88.80 : 122.30
Sodium	TM152	98.67 94.28 : 110.71
Strontium	TM152	104.67 88.00 : 112.00
Tellurium	TM152	101.17 93.32 : 114.66

Dissolved Metals by ICP-MS

		QC 2397
Thallium	TM152	88.0 88.00 : 112.00
Tin	TM152	104.33 92.63 : 109.70
Titanium	TM152	102.0 95.58 : 111.68
Tungsten	TM152	101.83 81.32 : 124.72
Uranium	TM152	103.17 88.00 : 112.00
Vanadium	TM152	101.67 88.00 : 112.00
Zinc	TM152	103.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2327
Dissolved Inorganic Carbon	TM090	104.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.5 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2333
EPH >C10-C40 Raw	TM415	96.93 56.36 : 129.92

Fluoride

Component	Method Code	QC 2306	QC 2312
Fluoride	TM104	102.67 96.67 : 108.67	101.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2366	QC 2327
QC	TM089	78.23 70.34 : 111.95	82.67 70.75 : 114.19

Hexavalent Chromium (s)

Hexavalent Chromium (s)

Component	Method Code	QC 2306	QC 2337
Hexavalent Chromium	TM151	102.0 92.00 : 111.20	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2372
Loss on Ignition	TM018	100.95 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2360
Free Cyanide - Low Level	TM279	76.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	92.0 81.83 : 110.45

Metals in solid samples by OES

Component	Method Code	QC 2377	QC 2393	QC 2371	QC 2307	QC 2366
Aluminium	TM181	107.96 77.46 : 123.98	95.58 77.46 : 123.98	82.57 77.46 : 123.98	94.69 73.56 : 108.85	93.81 73.56 : 108.85
Antimony	TM181	115.85 87.04 : 111.16	100.0 87.04 : 111.16	100.41 87.04 : 111.16	67.48 76.89 : 111.24	97.97 76.89 : 111.24
Arsenic	TM181	113.08 87.34 : 110.87	105.52 87.34 : 110.87	102.91 87.34 : 110.87	99.13 88.53 : 111.01	100.87 88.53 : 111.01
Barium	TM181	111.01 80.73 : 115.16	92.66 80.73 : 115.16	94.5 80.73 : 115.16	96.33 77.67 : 105.35	91.74 77.67 : 105.35
Beryllium	TM181	111.57 89.47 : 112.97	101.87 89.47 : 112.97	104.48 89.47 : 112.97	100.0 85.44 : 109.61	98.88 85.44 : 109.61
Boron	TM181	96.28 76.57 : 104.15	90.83 76.57 : 104.15	79.66 76.57 : 104.15	90.83 73.51 : 104.66	91.4 73.51 : 104.66
Cadmium	TM181	101.65 78.94 : 102.43	91.77 78.94 : 102.43	89.3 78.94 : 102.43	90.53 77.67 : 104.12	89.3 77.67 : 104.12
Chromium	TM181	99.19 77.55 : 104.47	87.63 77.55 : 104.47	86.21 77.55 : 104.47	84.58 79.64 : 105.83	84.99 79.64 : 105.83
Cobalt	TM181	101.57 82.95 : 107.41	97.17 82.95 : 107.41	92.77 82.95 : 107.41	90.25 84.60 : 104.13	90.25 84.60 : 104.13
Copper	TM181	107.04 84.36 : 106.14	97.36 84.36 : 106.14	92.08 84.36 : 106.14	91.9 82.40 : 105.45	91.9 82.40 : 105.45
Iron	TM181	109.52 81.43 : 115.79	95.24 81.43 : 115.79	95.24 81.43 : 115.79	97.62 82.95 : 110.58	96.03 82.95 : 110.58
Lead	TM181	100.9 81.95 : 107.63	96.4 81.95 : 107.63	92.79 81.95 : 107.63	91.67 78.24 : 104.05	91.44 78.24 : 104.05
Manganese	TM181	121.39 94.29 : 119.51	106.94 94.29 : 119.51	114.17 94.29 : 119.51	106.94 94.29 : 119.51	103.61 94.29 : 119.51

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SDG:	210226-137	Client Reference:	B025563	Report Number:	589889	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2377	QC 2393	QC 2371	QC 2307	QC 2366
Mercury	TM181	108.21 82.73 : 106.36	103.38 82.73 : 106.36	98.31 82.73 : 106.36	97.58 83.16 : 107.81	98.07 83.16 : 107.81
Molybdenum	TM181	110.7 86.61 : 111.07	105.76 86.61 : 111.07	101.23 86.61 : 111.07	94.24 87.11 : 106.87	98.35 87.11 : 106.87
Nickel	TM181	100.0 79.72 : 103.80	96.33 79.72 : 103.80	91.93 79.72 : 103.80	89.73 80.26 : 102.28	89.49 80.26 : 102.28
Phosphorus	TM181	115.76 92.65 : 125.47	115.76 92.65 : 125.47	111.52 92.65 : 125.47	105.86 94.56 : 124.28	107.88 94.56 : 124.28
Selenium	TM181	112.16 88.36 : 111.25	105.49 88.36 : 111.25	102.35 88.36 : 111.25	100.39 82.28 : 110.48	101.57 82.28 : 110.48
Strontium	TM181	105.79 78.06 : 99.91	91.31 78.06 : 99.91	91.31 78.06 : 99.91	93.99 79.13 : 102.79	93.1 79.13 : 102.79
Thallium	TM181	111.5 88.60 : 116.73	107.08 88.60 : 116.73	101.33 88.60 : 116.73	96.46 82.94 : 111.86	97.79 82.94 : 111.86
Tin	TM181	112.17 89.77 : 112.62	103.04 89.77 : 112.62	98.86 89.77 : 112.62	98.48 86.72 : 110.03	99.62 86.72 : 110.03
Titanium	TM181	80.92 66.29 : 105.96	74.05 66.29 : 105.96	68.4 66.29 : 105.96	84.73 66.23 : 102.06	84.73 66.23 : 102.06
Vanadium	TM181	108.42 75.51 : 108.87	91.58 75.51 : 108.87	94.51 75.51 : 108.87	97.44 86.19 : 109.45	96.7 86.19 : 109.45
Zinc	TM181	109.45 84.02 : 111.24	103.9 84.02 : 111.24	98.97 84.02 : 111.24	98.56 84.68 : 113.99	98.36 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2312	QC 2336	QC 2328
Acenaphthene	TM218	101.5 80.97 : 105.99	99.0 78.59 : 112.16	90.0 78.59 : 112.16
Acenaphthylene	TM218	99.5 74.76 : 107.36	98.5 75.11 : 109.01	88.5 75.11 : 109.01
Anthracene	TM218	98.5 73.04 : 106.97	95.0 73.99 : 113.85	90.5 73.99 : 113.85
Benz(a)anthracene	TM218	94.0 68.79 : 119.64	88.0 69.31 : 119.18	86.5 69.31 : 119.18
Benzo(a)pyrene	TM218	92.0 66.17 : 117.52	82.5 66.97 : 114.92	75.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	92.0 66.40 : 118.34	81.0 67.41 : 114.46	77.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	88.5 67.68 : 112.07	79.5 62.92 : 114.36	72.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	92.0 72.84 : 114.66	84.0 69.98 : 116.49	83.5 69.98 : 116.49
Chrysene	TM218	93.0 68.39 : 115.56	82.5 69.86 : 114.50	83.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	86.0 69.03 : 110.45	76.5 64.54 : 115.22	80.0 64.54 : 115.22
Fluoranthene	TM218	99.5 69.37 : 117.19	100.0 72.56 : 111.70	98.0 72.56 : 111.70
Fluorene	TM218	100.0 75.38 : 105.98	98.5 79.13 : 111.49	88.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	84.0 65.91 : 113.61	80.5 61.22 : 113.25	76.5 61.22 : 113.25
Naphthalene	TM218	97.0 71.40 : 105.87	95.0 77.96 : 110.91	92.0 77.96 : 110.91

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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
PAH by GCMS						

		QC 2312	QC 2336	QC 2328
Phenanthrene	TM218	101.5 74.04 : 109.30	100.5 76.83 : 113.25	92.0 76.83 : 113.25
Pyrene	TM218	101.0 69.68 : 115.27	98.5 72.45 : 110.77	96.5 72.45 : 110.77

PCBs by GCMS

Component	Method Code	QC 2354
PCB congener 101	TM168	85.5 65.66 : 110.06
PCB congener 105	TM168	83.9 58.10 : 106.34
PCB congener 114	TM168	85.9 59.38 : 106.48
PCB congener 118	TM168	84.7 60.02 : 106.23
PCB congener 123	TM168	91.0 65.01 : 99.81
PCB congener 126	TM168	85.7 59.31 : 109.23
PCB congener 138	TM168	87.9 63.95 : 107.63
PCB congener 153	TM168	90.2 62.65 : 108.85
PCB congener 156	TM168	86.6 61.69 : 112.27
PCB congener 157	TM168	84.0 55.37 : 104.81
PCB congener 167	TM168	85.1 65.58 : 109.14
PCB congener 169	TM168	87.8 56.84 : 112.10
PCB congener 180	TM168	89.2 66.99 : 111.63
PCB congener 189	TM168	85.5 57.75 : 112.59
PCB congener 28	TM168	87.5 73.68 : 105.96
PCB congener 52	TM168	87.0 67.24 : 107.62
PCB congener 77	TM168	87.7 64.87 : 108.49
PCB congener 81	TM168	88.8 70.78 : 110.80

pH

Component	Method Code	QC 2370	QC 2375
pH	TM133	99.21 97.97 : 101.10	100.13 97.97 : 101.10



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Client Reference: B025563

Order Number: 7000964

Report Number: 589889

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pH Value of Filtered Water

Component	Method Code	QC 2349
pH	TM256	100.94 99.33 : 102.54

Phenols by HPLC (S)				
Component	Method Code	QC 2372	QC 2374	QC 2376
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	48.7 70.71 : 116.42	52.6 68.54 : 123.77	52.6 68.54 : 123.77
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	43.27 64.54 : 117.79	45.61 68.54 : 123.77	47.37 68.54 : 123.77
Catechol by HPLC (S)	TM062 (S)	12.38 22.43 : 157.02	16.19 19.39 : 135.70	12.38 19.39 : 135.70
Cresols by HPLC (S)	TM062 (S)	45.93 74.40 : 108.98	44.68 77.98 : 111.41	45.72 77.98 : 111.41
Napthol by HPLC (S)	TM062 (S)	26.43 47.22 : 132.72	31.43 57.50 : 102.50	35.71 57.50 : 102.50
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18	49.01 68.24 : 117.99	50.33 68.24 : 117.99
Resorcinol HPLC (S)	TM062 (S)	50.31 71.43 : 129.59	47.17 69.99 : 127.22	49.06 69.99 : 127.22
Xylenols by HPLC (S)	TM062 (S)	45.94 76.56 : 106.38	48.33 88.23 : 104.42	49.17 88.23 : 104.42

Phenols by HPLC (W)		
Component	Method Code	QC 2368
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	54.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	54.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	53.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	55.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	54.0 79.09 : 131.82

Total Dissolved Solids		
Component	Method Code	QC 2368
Total Dissolved Solids	TM123	100.0 97.30 : 100.92

Total Organic Carbon



CERTIFICATE OF ANALYSIS

Validated

SDG:

210226-137

Location:

Cambridge South East Tra

Client Reference:

B025563

Order Number:

7000964

Report Number:

589889

Superseded Report:

Total Organic Carbon

Component	Method Code	QC 2364
Total Organic Carbon	TM132	100.39 87.02 : 113.45

Total Sulphur			
Component	Method Code	QC 2313	QC 2344
Total Sulphur %	TM132	73.58 61.64 : 114.47	98.45 61.64 : 114.47

VOC MS (S)		
Component	Method Code	QC 2302
1,1,1,2-tetrachloroethane	TM116	93.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	98.0 73.73 : 118.05
1,1,2-Trichloroethane	TM116	90.4 77.12 : 116.04
1,1-Dichloroethane	TM116	114.8 74.46 : 129.15
1,2-Dichloroethane	TM116	102.2 92.38 : 131.65
1,4-Dichlorobenzene	TM116	111.4 83.64 : 126.18
2-Chlorotoluene	TM116	102.0 76.03 : 113.25
4-Chlorotoluene	TM116	99.2 66.90 : 112.46
Benzene	TM116	102.0 88.60 : 113.80
Carbon Disulphide	TM116	108.8 74.91 : 122.14
Carbontetrachloride	TM116	96.0 80.31 : 124.50
Chlorobenzene	TM116	100.0 83.81 : 114.18
Chloroform	TM116	110.4 87.40 : 122.49
Chloromethane	TM116	113.8 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	108.4 80.67 : 126.72
Dibromomethane	TM116	90.8 73.23 : 118.35
Dichloromethane	TM116	120.2 81.11 : 133.25



CERTIFICATE OF ANALYSIS

Validated

SDG:210226-137Client Reference: B025563Report Number: 589889

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

VOC MS (S)

		QC 2302
Ethylbenzene	TM116	89.8 75.92 : 110.41
Hexachlorobutadiene	TM116	65.4 12.82 : 152.73
Isopropylbenzene	TM116	80.6 55.79 : 97.59
Naphthalene	TM116	105.6 80.86 : 128.81
o-Xylene	TM116	82.4 69.99 : 108.74
p/m-Xylene	TM116	83.4 68.32 : 108.91
Sec-Butylbenzene	TM116	74.6 38.50 : 101.50
Tetrachloroethene	TM116	95.6 76.95 : 121.02
Toluene	TM116	90.6 74.24 : 107.42
Trichloroethene	TM116	94.4 85.28 : 109.36
Trichlorofluoromethane	TM116	110.0 84.55 : 133.27
Vinyl Chloride	TM116	115.4 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:210226-137Client Reference: B025563Report Number: 589889

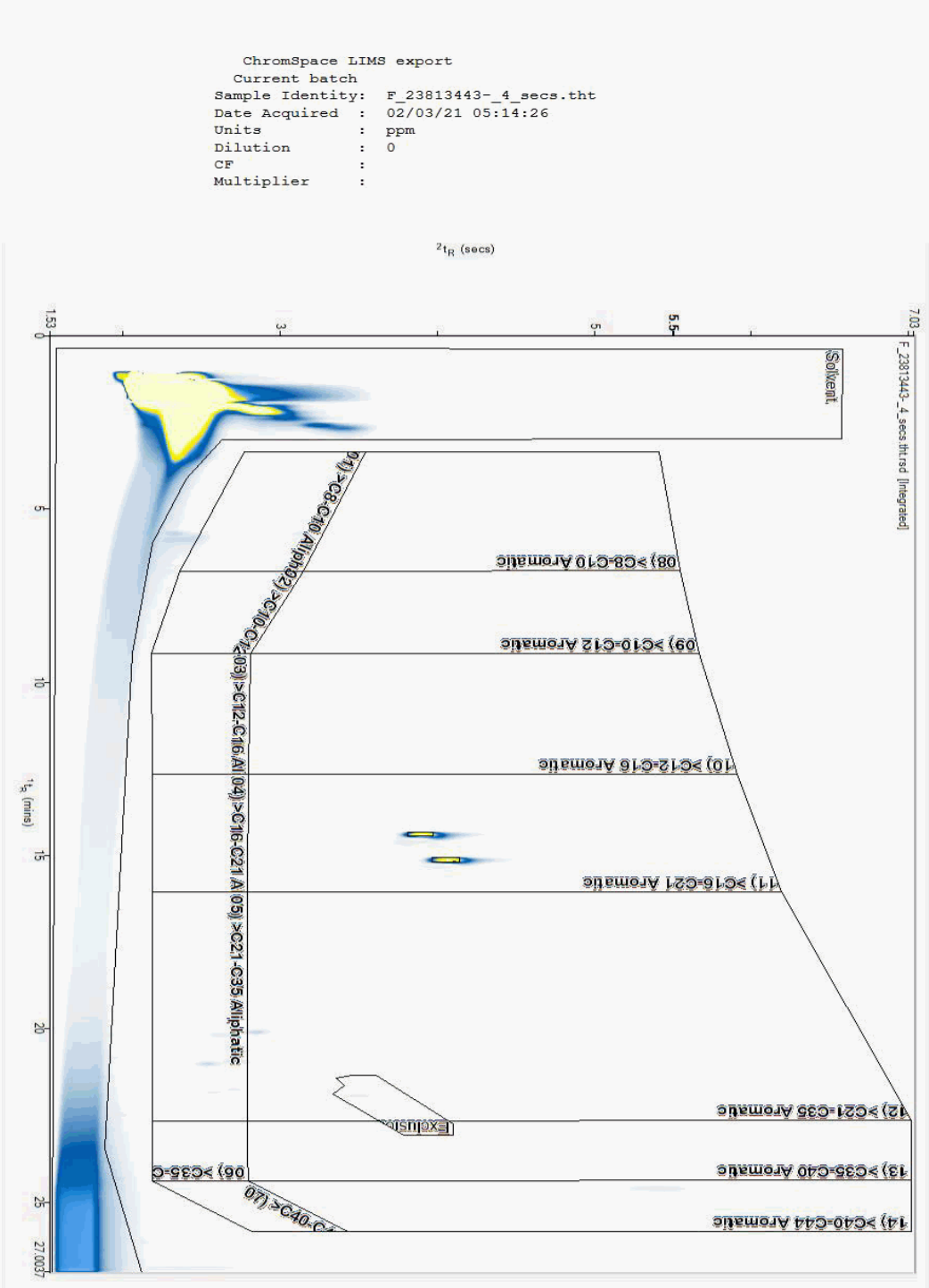
Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Chromatogram

Analysis:EPH CWG GC (S)

Sample No : 23813443Sample ID : PTR - TP - 027

Depth : 0.00 - 0.50





CERTIFICATE OF ANALYSIS

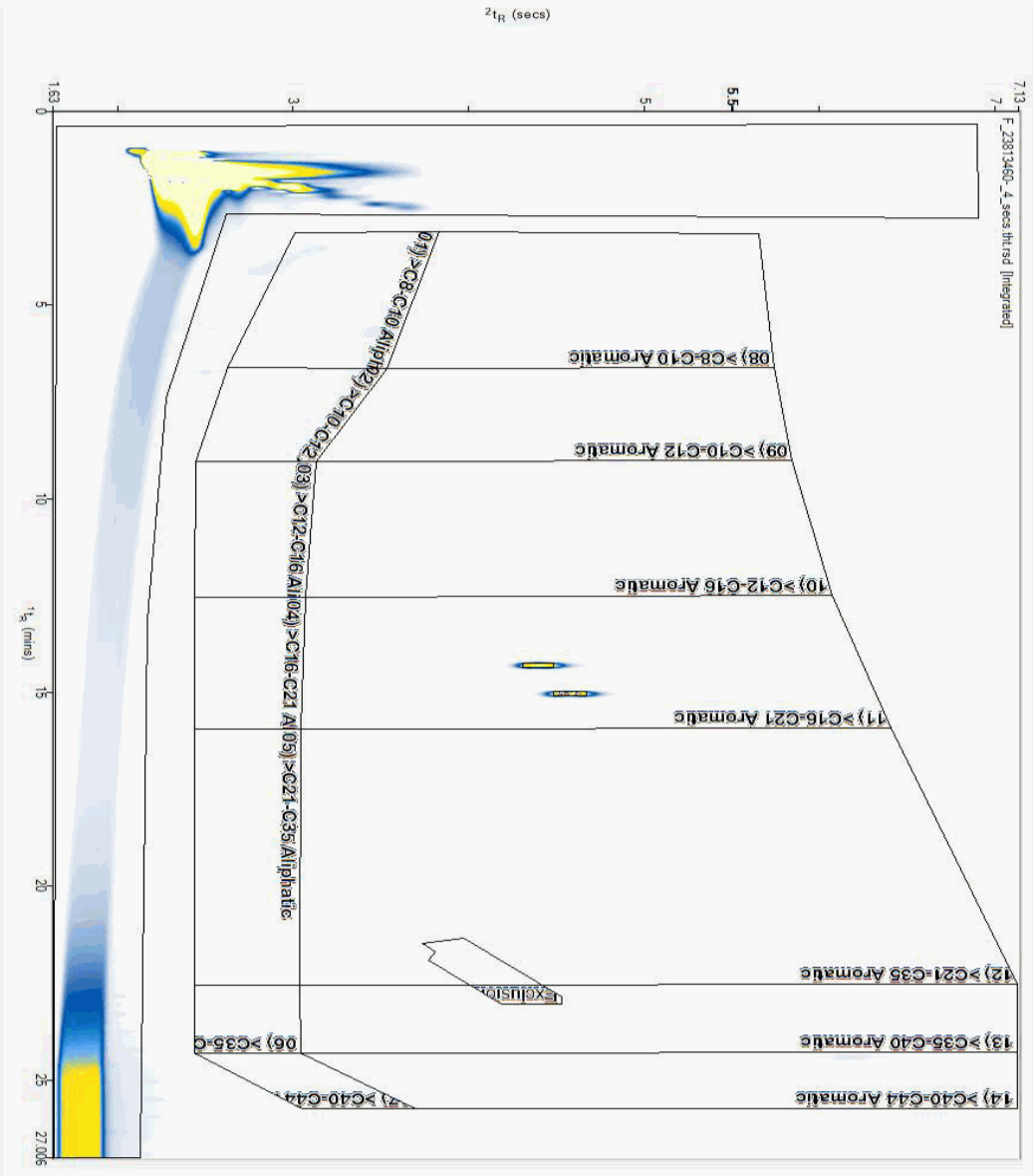
Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23813460 Depth : 0.00 - 2.00
Sample ID : PTR - TP - 026

ChromSpace LIMS export
Current batch
Sample Identity: F_23813460-4_secs.tht
Date Acquired : 02/03/21 02:46:38
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

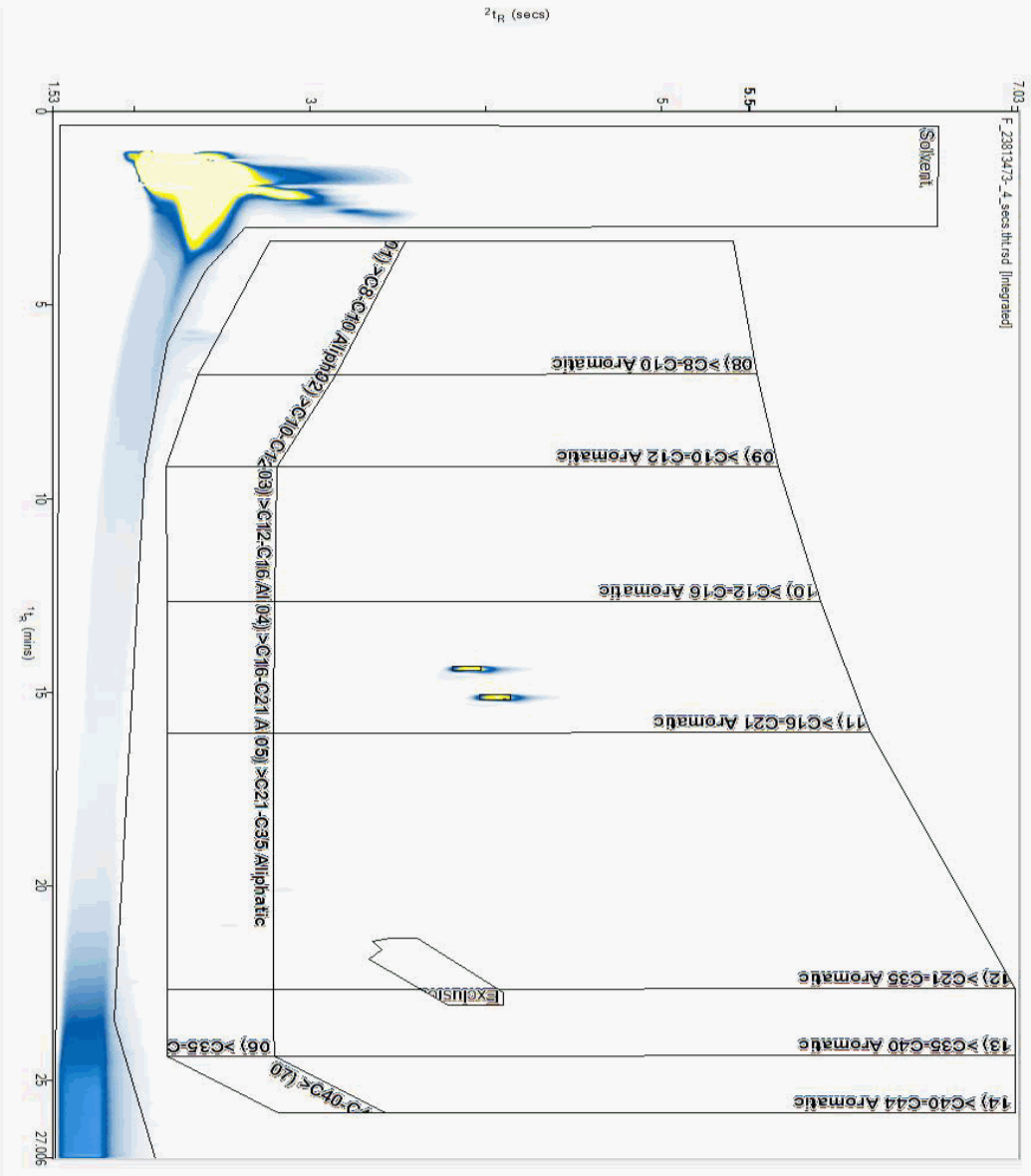
Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23813473 Depth : 0.00 - 0.50
Sample ID : PTR - TP - 026

ChromSpace LIMS export
Current batch
Sample Identity: F_23813473-4_secs.tht
Date Acquired : 02/03/21 07:51:44
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23813451 Depth : 0.00 - 0.50
Sample ID : PTR - TP - 027



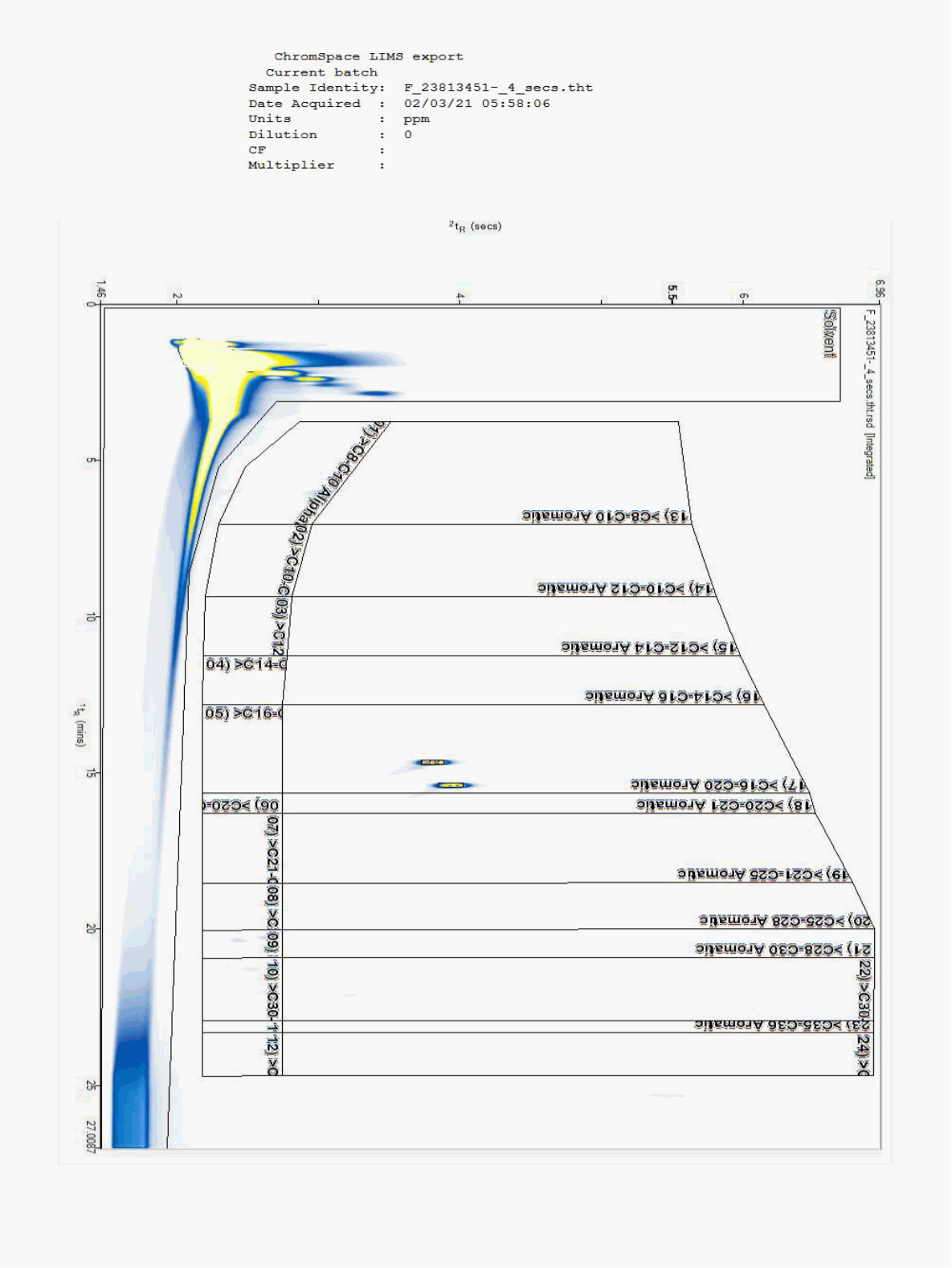
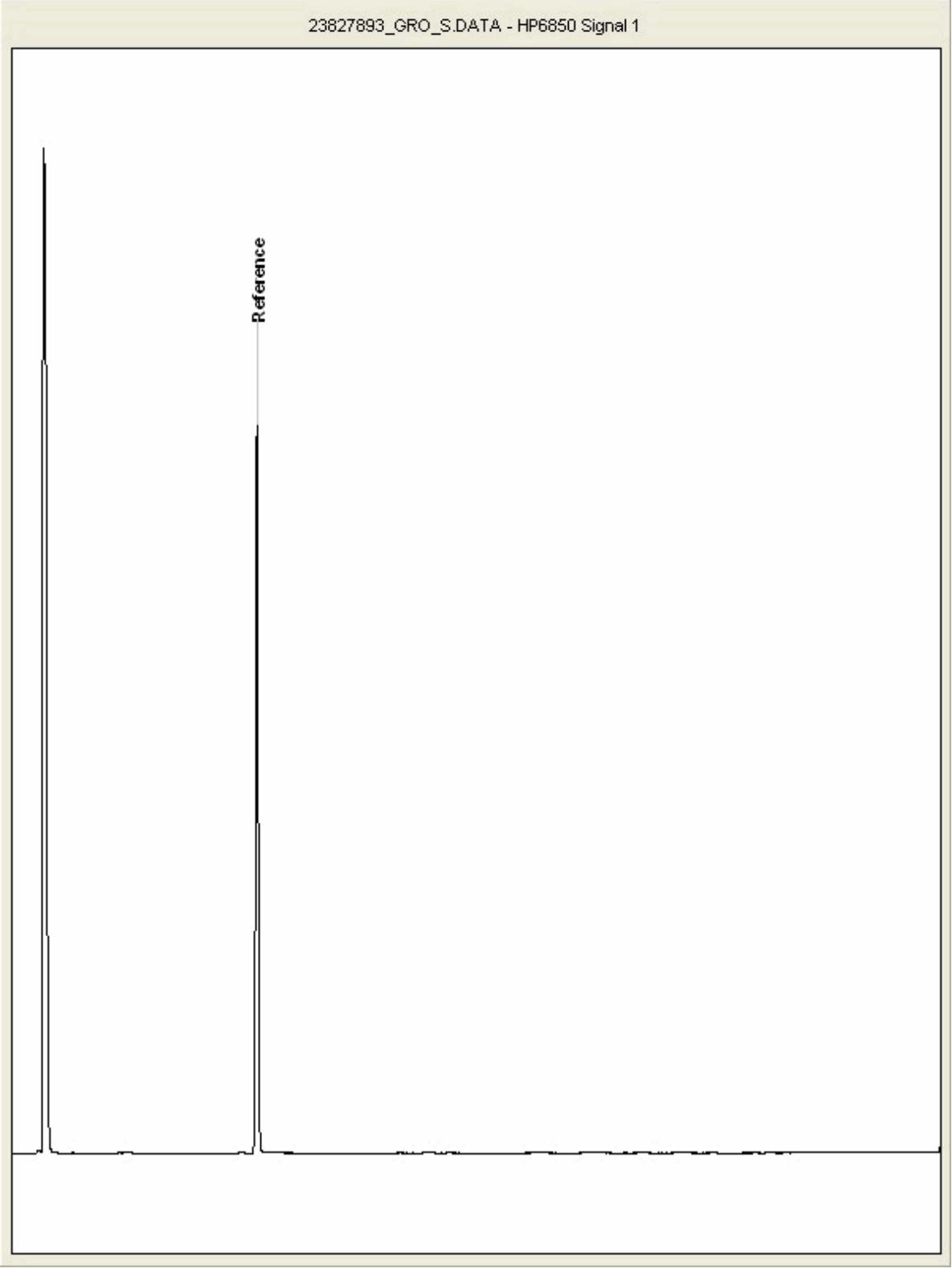
CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23827893 Depth : 0.00 - 2.00
Sample ID : PTR - TP - 026





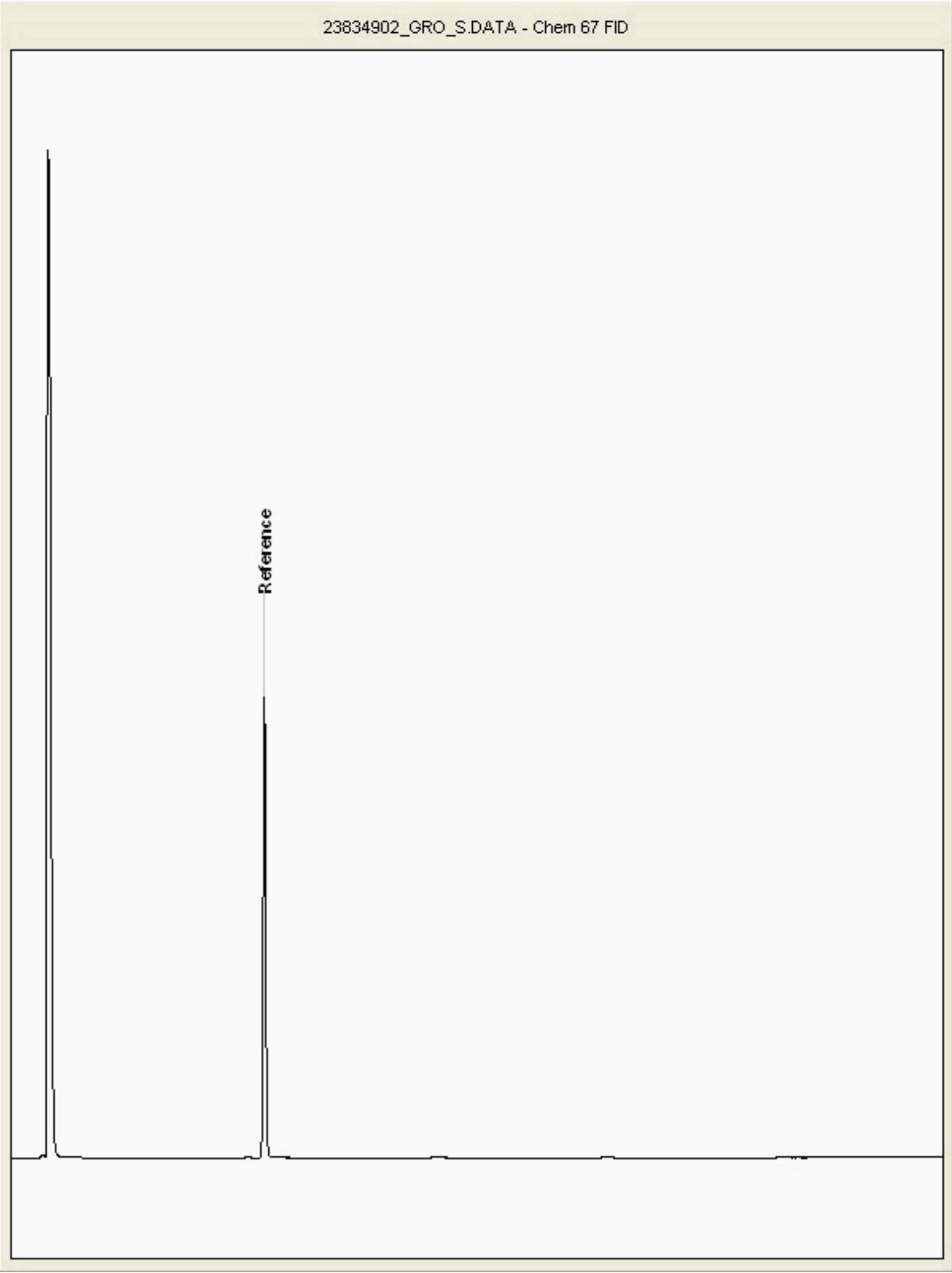
CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23834902 Depth : 0.00 - 0.50
Sample ID : PTR - TP - 027



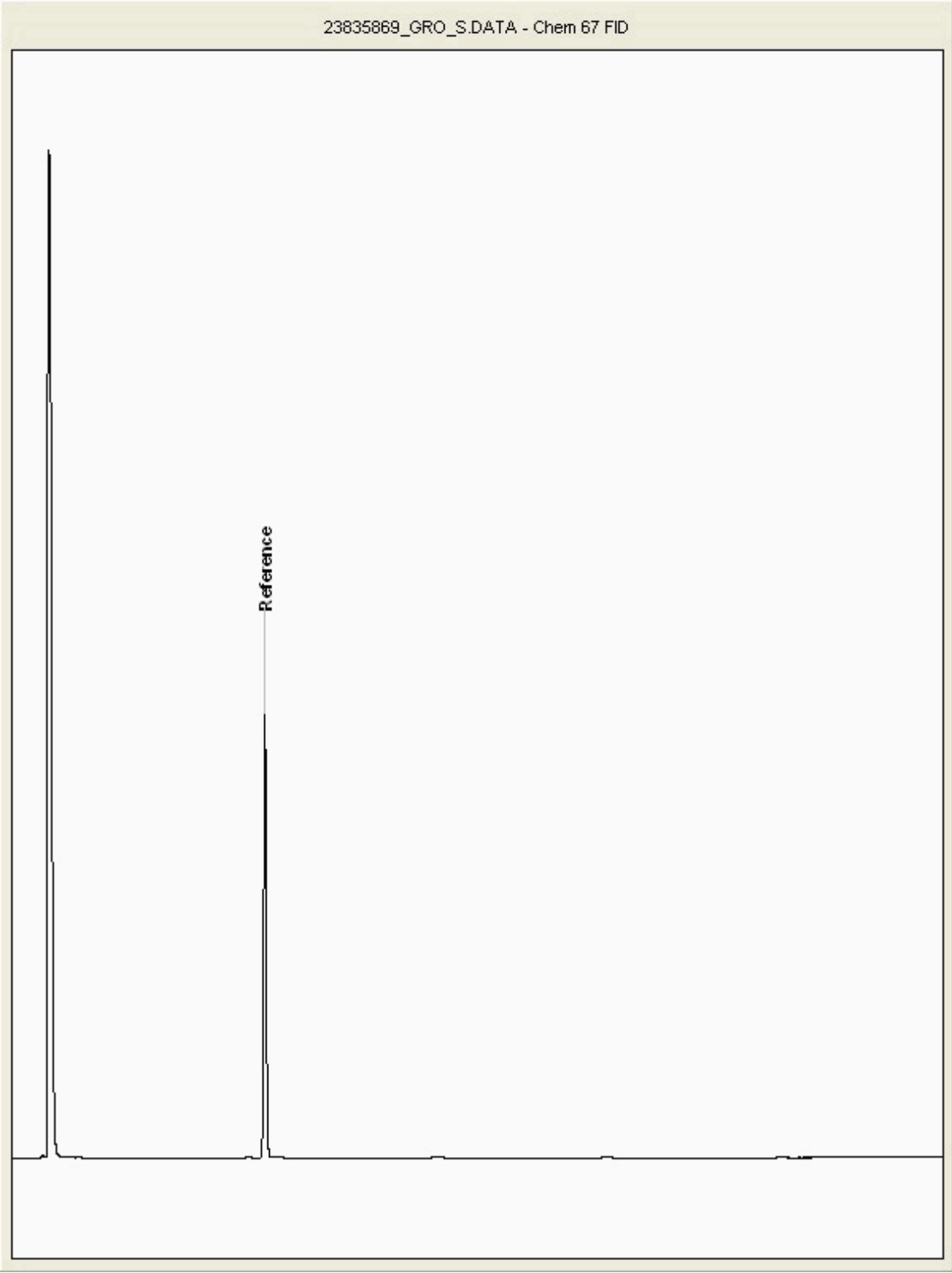
CERTIFICATE OF ANALYSIS

Validated

SDG: 210226-137 Client Reference: B025563 Report Number: 589889
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23835869 Depth : 0.00 - 0.50
Sample ID : PTR - TP - 026





CERTIFICATE OF ANALYSIS

SDG:	210226-137	Client Reference:	B025563	Report Number:	589889
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Attention: Richard Tonge

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Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	11 March 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210301-62
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	590144

We received 4 samples on Monday March 01, 2021 and 2 of these samples were scheduled for analysis which was completed on Wednesday March 10, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 11/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-62 Client Reference: B025563 Report Number: 590144
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23816566	BH-OBL-014		0.10	25/02/2021
23816568	BH-OBL-014		0.20	25/02/2021
23816569	BH-OBL-014		0.50	25/02/2021
23816571	BH-OBL-014		1.00	25/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-62 Client Reference: B025563 Report Number: 590144
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23816568					23816571				
						BH-OBL-014					BH-OBL-014				
						0.20					1.00				
						60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
Ammonium Low	All	NDPs: 0 Tests: 1													
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1													
Anions by Kone (soil)	All	NDPs: 0 Tests: 2													
Anions by Kone (w)	All	NDPs: 0 Tests: 1													
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2													
Boron Water Soluble	All	NDPs: 0 Tests: 2													
CEN Readings	All	NDPs: 0 Tests: 1													
Chromium III	All	NDPs: 0 Tests: 3													
Coronene	All	NDPs: 0 Tests: 1													
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2													
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1													
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1													
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1													
EPH CWG GC (S)	All	NDPs: 0 Tests: 2													
Fluoride	All	NDPs: 0 Tests: 1													



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-62 Client Reference: B025563 Report Number: 590144
Location: Cambridge South East TraOrder Number: 7000964

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23816568		23816571	
	Customer Sample Reference		BH-OBL-014		BH-OBL-014	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X		X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X			
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X		
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
PCBs by GCMS	All	NDPs: 0 Tests: 1		X		
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-62 Client Reference: B025563 Report Number: 590144
Location: Cambridge South East TraOrder Number: 7000964

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23816568		23816571	
	Customer Sample Reference		BH-OBL-014		BH-OBL-014	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23816568	BH-OBL-014	0.20	Dark Brown	Loamy Sand	Vegetation	Stones
23816571	BH-OBL-014	1.00	Cream	Sandy Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-OBL-014	BH-OBL-014				
#	ISO17025 accredited.		0.20	1.00				
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		25/02/2021	25/02/2021				
dis.filt	Dissolved / filtered sample.		-	-				
tot.unfilt	Total / unfiltered sample.		01/03/2021	01/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210301-62	210301-62				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23816568	23816571				
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	12	12				
Loss on ignition	<0.7 %	TM018	6.35					
			M					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
			M	M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
			M	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
			M	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
			M	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
			M	M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
			M	M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Organic Carbon, Total	<0.2 %	TM132	1.4					
			M					
Sulphur, Total	<0.02 %	TM132	0.0392	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.014	<0.002				
			#	#				
pH	1 pH Units	TM133	8.27	8.87				
			M	M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
			#	#				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
			M	M				
PCB congener 28	<3 µg/kg	TM168	<3					
			M					
PCB congener 52	<3 µg/kg	TM168	<3					
			M					
PCB congener 101	<3 µg/kg	TM168	<3					
			M					
PCB congener 118	<3 µg/kg	TM168	<3					
			M					
PCB congener 138	<3 µg/kg	TM168	<3					
			M					
PCB congener 153	<3 µg/kg	TM168	<3					
			M					
PCB congener 180	<3 µg/kg	TM168	<3					
			M					
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21					
Chromium, Trivalent	<0.9 mg/kg	TM181	14	3.77				
Antimony	<0.6 mg/kg	TM181	2.27	<0.6				
			#	#				
Arsenic	<0.6 mg/kg	TM181	12.8	4.96				
			M	M				
Barium	<0.6 mg/kg	TM181	40.7	23.7				
			#	#				
Beryllium	<0.01 mg/kg	TM181	0.209	0.0685				
			M	M				
Cadmium	<0.02 mg/kg	TM181	0.634	0.0994				
			M	M				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBL-014	BH-OBL-014				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 25/02/2021 . 01/03/2021 210301-62 23816568	1.00 Soil/Solid (S) 25/02/2021 . 01/03/2021 210301-62 23816571				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4&6	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	100	99.3					
Toluene-d8**	%	TM116	94.6	100					
4-Bromofluorobenzene**	%	TM116	75.3	96.5					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M					
Benzene	<9 µg/kg	TM116	<9 M	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M					
Toluene	<7 µg/kg	TM116	<7 M	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M					

CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBL-014	BH-OBL-014				
# M aq diss.flit tot.unfit + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 25/02/2021 . 01/03/2021 210301-62 23816568	1.00 Soil/Solid (S) 25/02/2021 . 01/03/2021 210301-62 23816571					
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M					
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M					
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M					
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M					
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M					
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #					
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M					
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 M	<10 M					
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M					
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M					
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #					
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M					
n-Butylbenzene	<11 µg/kg	TM116	<11	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20					
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-OBL-014	08/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20										
Sample Type	SOLID										
Date Sampled	25/02/2021 00:00:00										
Date Received	01/03/2021 05:00:00										
SDG	210301-62										
Original Sample	23816568										
Method Number	TM048										
Cust. Sample Ref.	BH-OBL-014	08/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	1.00										
Sample Type	SOLID										
Date Sampled	25/02/2021 00:00:00										
Date Received	01/03/2021 05:00:00										
SDG	210301-62										
Original Sample	23816571										
Method Number	TM048										

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84
Particle Size <4mm	>95%		

Case		Landfill Waste Acceptance
SDG	210301-62	Criteria Limits
Lab Sample Number(s)	23816568	
Sampled Date	25-Feb-2021	
Customer Sample Ref.	BH-OBL-014	
Depth (m)	0.20	

Solid Waste Analysis		Result		
Total Organic Carbon (%)		1.4		
Loss on Ignition (%)		6.35		
Sum of BTEX (mg/kg)		<0.04		
Sum of 7 PCBs (mg/kg)		<0.021		
Mineral Oil (mg/kg)		10		
PAH Sum of 17 (mg/kg)		<10		
pH (pH Units)		8.27		
ANC to pH 6 (mol/kg)		0.0378		
ANC to pH 4 (mol/kg)		0.234		

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	-	-	-	-	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	-	-	-	-	0.5	10	70
Copper	-	-	-	-	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	-	-	-	-	0.4	10	40
Lead	-	-	-	-	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	-	-	-	-	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	107	<5	1070	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	7.12	<3	71.2	<30	500	800	1000

Leach Test Information

Date Prepared	04-Mar-2021
pH (pH Units)	8.62
Conductivity (µS/cm)	124.00
Temperature (°C)	16.20
Volume Leachant (Litres)	0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - f
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84
Particle Size <4mm	>95%		

Case			
SDG	210301-62		
Lab Sample Number(s)	23816568		
Sampled Date	25-Feb-2021		
Customer Sample Ref.	BH-OBL-014		
Depth (m)	0.20		

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.017	<0.01	0.17	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	0.00163	<0.0005	0.0163	<0.005	-	-	-
Barium	0.00581	<0.0002	0.0581	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0295	<0.01	0.295	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.5	<0.2	235	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00328	<0.0003	0.0328	<0.003	-	-	-
Hardness dissolved	61.4	<0.65	614	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.639	<0.019	6.39	<0.19	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.67	<0.036	6.7	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00164	<0.0004	0.0164	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00186	<0.001	0.0186	<0.01	-	-	-
Zinc	0.00189	<0.001	0.0189	<0.01	-	-	-
2.3.5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	04-Mar-2021
pH (pH Units)	8.62
Conductivity (µS/cm)	124.00
Temperature (°C)	16.20
Volume Leachant (Litres)	0.883

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23816568	23816571
Customer Sample Ref.	BH-OBL-014	BH-OBL-014
AGS Ref.		
Depth	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	09-Mar-2021	
ANC at pH4 and ANC at pH 6	08-Mar-2021	
Anions by Kone (soil)	05-Mar-2021	05-Mar-2021
Anions by Kone (w)	08-Mar-2021	
Asbestos ID in Solid Samples	08-Mar-2021	08-Mar-2021
Boron Water Soluble	06-Mar-2021	06-Mar-2021
CEN 10:1 Leachate (1 Stage)	04-Mar-2021	
CEN Readings	05-Mar-2021	
Chromium III	08-Mar-2021	06-Mar-2021
Coronene	05-Mar-2021	
Cyanide Comp/Free/Total/Thiocyanate	10-Mar-2021	10-Mar-2021
Dissolved Metals by ICP-MS	08-Mar-2021	
Dissolved Organic/Inorganic Carbon	09-Mar-2021	
EPH by GCxGC-FID	05-Mar-2021	
EPH CWG GC (S)	05-Mar-2021	08-Mar-2021
Fluoride	08-Mar-2021	
GRO by GC-FID (S)	08-Mar-2021	08-Mar-2021
Hexavalent Chromium (s)	05-Mar-2021	05-Mar-2021
Loss on Ignition in soils	09-Mar-2021	
Low Level Cyanide (W)	09-Mar-2021	
Low Level Hexavalent Chromium (w)	08-Mar-2021	
Mercury Dissolved	08-Mar-2021	
Metals in solid samples by OES	09-Mar-2021	06-Mar-2021
Moisture at 105C	04-Mar-2021	
PAH 16 & 17 Calc	05-Mar-2021	
PAH by GCMS	04-Mar-2021	05-Mar-2021
PCBs by GCMS	05-Mar-2021	
pH	03-Mar-2021	03-Mar-2021
pH Value of Filtered Water	08-Mar-2021	
Phenols by HPLC (S)	05-Mar-2021	05-Mar-2021
Phenols by HPLC (W)	09-Mar-2021	
Sample description	03-Mar-2021	03-Mar-2021
Total Dissolved Solids	08-Mar-2021	
Total Organic Carbon	09-Mar-2021	09-Mar-2021
Total Sulphur	08-Mar-2021	08-Mar-2021
TPH CWG GC (S)	08-Mar-2021	08-Mar-2021
VOC MS (S)	08-Mar-2021	08-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low		
Component	Method Code	QC 2394
Ammoniacal Nitrogen as N	TM099	101.6 96.04 : 106.80

ANC at pH4 and ANC at pH 6		
Component	Method Code	QC 2384
ANC pH_4 dry soil	TM182	107.92 82.79 : 130.38

Anions by Kone (w)		
Component	Method Code	QC 2324
Chloride	TM184	101.0 91.40 : 109.10
Sulphate (soluble)	TM184	101.6 91.99 : 109.30
TON as NO3	TM184	100.0 92.98 : 109.90

Boron Water Soluble		
Component	Method Code	QC 2391
Water Soluble Boron	TM222	102.0 84.00 : 111.00

Coronene		
Component	Method Code	QC 2390
Coronene RAW	TM410	113.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate		
Component	Method Code	QC 2348
Free Cyanide	TM153	101.98 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	103.5 73.07 : 107.47

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

Component	Method Code	QC 2395	QC 2302
Aluminium	TM152	100.0 90.98 : 111.82	102.0 90.78 : 110.89
Antimony	TM152	99.67 90.44 : 113.04	101.5 77.22 : 119.42
Arsenic	TM152	98.67 88.00 : 112.00	99.5 86.77 : 107.67
Barium	TM152	92.83 90.20 : 111.19	99.17 87.86 : 110.23
Beryllium	TM152	101.67 87.77 : 113.97	111.5 86.19 : 112.98
Bismuth	TM152	97.33 91.90 : 112.20	104.83 84.06 : 106.46
Borate	TM152	101.85 88.00 : 112.00	108.02 88.00 : 112.00
Boron	TM152	102.0 96.48 : 114.93	108.0 83.92 : 114.90
Cadmium	TM152	98.33 96.43 : 110.53	101.17 88.89 : 106.69
Calcium	TM152	98.0 81.38 : 119.09	99.33 80.24 : 117.95
Chromium	TM152	97.0 91.84 : 108.67	102.83 83.22 : 110.16
Cobalt	TM152	97.5 88.00 : 112.00	99.17 82.49 : 112.36
Copper	TM152	97.83 92.47 : 118.11	98.17 83.14 : 113.00
Iron	TM152	97.33 92.00 : 113.00	97.33 88.40 : 109.24
Lead	TM152	95.5 88.00 : 112.00	102.0 83.71 : 109.58
Lithium	TM152	101.17 91.62 : 113.12	113.17 84.50 : 114.28
Magnesium	TM152	96.67 93.14 : 107.91	100.67 87.56 : 114.57
Manganese	TM152	97.5 95.03 : 110.58	98.17 90.01 : 108.72
Molybdenum	TM152	96.0 88.00 : 112.00	98.0 85.53 : 107.42
Nickel	TM152	98.33 88.00 : 112.00	98.33 88.05 : 106.42
Phosphorus	TM152	97.67 88.00 : 112.00	102.0 82.76 : 107.72
Potassium	TM152	97.33 93.90 : 112.36	98.67 88.45 : 106.42
Selenium	TM152	98.33 91.58 : 115.98	100.33 85.61 : 111.03
Silver	TM152	93.0 88.80 : 122.30	99.17 88.48 : 110.48
Sodium	TM152	97.33 94.28 : 110.71	101.33 88.32 : 106.30
Strontium	TM152	98.33 88.00 : 112.00	99.33 83.77 : 107.87
Tellurium	TM152	100.5 93.32 : 114.66	97.5 82.83 : 104.73

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2395	QC 2302
Thallium	TM152	97.33 88.00 : 112.00	102.83 77.47 : 113.87
Tin	TM152	96.0 92.63 : 109.70	100.17 87.36 : 109.55
Titanium	TM152	100.17 95.58 : 111.68	104.17 87.29 : 108.31
Tungsten	TM152	98.0 81.32 : 124.72	102.0 68.27 : 122.97
Uranium	TM152	98.33 88.00 : 112.00	103.33 82.46 : 105.16
Vanadium	TM152	98.0 88.00 : 112.00	96.5 88.43 : 114.30
Zinc	TM152	99.67 92.98 : 118.95	107.33 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2371
Dissolved Inorganic Carbon	TM090	102.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.17 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2395
EPH >C10-C40 Raw	TM415	82.7 56.36 : 129.92

EPH CWG GC (S)

Component	Method Code	QC 2307	QC 2378
EPH >C8-C40 Raw	TM414	90.11 56.39 : 129.94	96.0 57.98 : 125.66
Total Aliphatics Raw	TM414	94.27 62.55 : 133.12	102.85 64.55 : 136.91
Total Aromatics Raw	TM414	111.44 57.00 : 150.27	100.8 55.89 : 144.43

Fluoride

Component	Method Code	QC 2311
Fluoride	TM104	104.0 96.67 : 108.67

GRO by GC-FID (S)

GRO by GC-FID (S)

Component	Method Code	QC 2372
QC	TM089	90.39 72.28 : 114.54

Hexavalent Chromium (s)

Component	Method Code	QC 2374
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2370
Loss on Ignition	TM018	95.73 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2346
Free Cyanide - Low Level	TM279	78.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.25 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2308
Mercury Dissolved (CVAf)	TM183	94.2 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2363
Aluminium	TM181	86.11 77.46 : 123.98
Antimony	TM181	97.15 87.04 : 111.16
Arsenic	TM181	101.16 87.34 : 110.87
Barium	TM181	93.58 80.73 : 115.16

Metals in solid samples by OES

		QC 2363
Beryllium	TM181	101.49 89.47 : 112.97
Boron	TM181	78.22 76.57 : 104.15
Cadmium	TM181	89.71 78.94 : 102.43
Chromium	TM181	86.21 77.55 : 104.47
Cobalt	TM181	92.45 82.95 : 107.41
Copper	TM181	94.01 84.36 : 106.14
Iron	TM181	95.24 81.43 : 115.79
Lead	TM181	91.22 81.95 : 107.63
Manganese	TM181	110.28 94.29 : 119.51
Mercury	TM181	98.79 82.73 : 106.36
Molybdenum	TM181	100.82 86.61 : 111.07
Nickel	TM181	91.93 79.72 : 103.80
Phosphorus	TM181	111.72 92.65 : 125.47
Selenium	TM181	102.35 88.36 : 111.25
Strontium	TM181	90.65 78.06 : 99.91
Thallium	TM181	100.88 88.60 : 116.73
Tin	TM181	100.0 89.77 : 112.62
Titanium	TM181	64.66 66.29 : 105.96
Vanadium	TM181	91.58 75.51 : 108.87
Zinc	TM181	100.21 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2376	QC 2339
Acenaphthene	TM218	86.0 78.59 : 112.16	90.5 76.79 : 103.90
Acenaphthylene	TM218	84.0 75.11 : 109.01	89.0 78.40 : 108.66
Anthracene	TM218	82.5 73.99 : 113.85	90.0 70.90 : 109.22
Benz(a)anthracene	TM218	85.5 69.31 : 119.18	98.5 73.77 : 119.26
Benzo(a)pyrene	TM218	75.5 66.97 : 114.92	92.5 73.20 : 114.18



CERTIFICATE OF ANALYSIS

Validated

SDG:210301-62

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

590144

PAH by GCMS

		QC 2376	QC 2339
		77.0 67.41 : 114.46	99.5 75.36 : 117.58
Benzo(b)fluoranthene	TM218		
Benzo(ghi)perylene	TM218	83.0 62.92 : 114.36	92.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	86.0 69.98 : 116.49	98.5 75.98 : 116.59
Chrysene	TM218	84.0 69.86 : 114.50	96.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 64.54 : 115.22	89.5 69.17 : 115.30
Fluoranthene	TM218	74.0 72.56 : 111.70	96.0 75.88 : 112.84
Fluorene	TM218	84.0 79.13 : 111.49	88.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	87.5 61.22 : 113.25	88.5 70.26 : 117.95
Naphthalene	TM218	86.0 77.96 : 110.91	91.5 74.70 : 101.83
Phenanthrene	TM218	77.5 76.83 : 113.25	92.5 73.62 : 109.34
Pyrene	TM218	77.5 72.45 : 110.77	95.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2300
PCB congener 101	TM168	79.3 65.66 : 110.06
PCB congener 105	TM168	75.5 58.10 : 106.34
PCB congener 114	TM168	76.2 59.38 : 106.48
PCB congener 118	TM168	77.3 60.02 : 106.23
PCB congener 123	TM168	81.4 65.01 : 99.81
PCB congener 126	TM168	74.5 59.31 : 109.23
PCB congener 138	TM168	78.5 63.95 : 107.63
PCB congener 153	TM168	81.1 62.65 : 108.85
PCB congener 156	TM168	76.5 61.69 : 112.27
PCB congener 157	TM168	73.0 55.37 : 104.81
PCB congener 167	TM168	75.7 65.58 : 109.14
PCB congener 169	TM168	75.4 56.84 : 112.10
PCB congener 180	TM168	80.9 66.99 : 111.63
PCB congener 189	TM168	73.8 57.75 : 112.59



CERTIFICATE OF ANALYSIS

Validated

SDG:210301-62

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

590144

PCBs by GCMS

		QC 2300
		82.5 73.68 : 105.96
PCB congener 28	TM168	
PCB congener 52	TM168	81.5 67.24 : 107.62
PCB congener 77	TM168	80.0 64.87 : 108.49
PCB congener 81	TM168	81.2 70.78 : 110.80

pH

Component	Method Code	QC 2372
pH	TM133	100.66 98.71 : 102.32

pH Value of Filtered Water

Component	Method Code	QC 2361
pH	TM256	100.27 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2328
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.0 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	11.43 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	30.0 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	50.31 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	47.5 76.56 : 106.38

Phenols by HPLC (W)

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Phenols by HPLC (W)						

Component	Method Code	QC 2339
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	51.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	50.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	58.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	51.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.67 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2394
Total Dissolved Solids	TM123	99.4 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2354
Total Organic Carbon	TM132	99.22 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2378
Total Sulphur %	TM132	98.96 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2356
1,1,1,2-tetrachloroethane	TM116	108.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	107.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	97.4 77.12 : 116.04
1,1-Dichloroethane	TM116	107.8 74.46 : 129.15
1,2-Dichloroethane	TM116	112.8 92.38 : 131.65

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
VOC MS (S)						

		QC 2356
1,4-Dichlorobenzene	TM116	110.0 83.64 : 126.18
2-Chlorotoluene	TM116	93.8 76.03 : 113.25
4-Chlorotoluene	TM116	86.8 66.90 : 112.46
Benzene	TM116	100.2 88.60 : 113.80
Carbon Disulphide	TM116	81.8 74.91 : 122.14
Carbontetrachloride	TM116	112.0 80.31 : 124.50
Chlorobenzene	TM116	107.4 83.81 : 114.18
Chloroform	TM116	109.4 87.40 : 122.49
Chloromethane	TM116	103.2 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.4 80.67 : 126.72
Dibromomethane	TM116	107.0 73.23 : 118.35
Dichloromethane	TM116	111.6 81.11 : 133.25
Ethylbenzene	TM116	88.2 75.92 : 110.41
Hexachlorobutadiene	TM116	30.2 12.82 : 152.73
Isopropylbenzene	TM116	68.0 55.79 : 97.59
Naphthalene	TM116	112.8 80.86 : 128.81
o-Xylene	TM116	82.8 69.99 : 108.74
p/m-Xylene	TM116	83.1 68.32 : 108.91
Sec-Butylbenzene	TM116	55.8 38.50 : 101.50
Tetrachloroethene	TM116	102.0 76.95 : 121.02
Toluene	TM116	91.2 74.24 : 107.42
Trichloroethene	TM116	98.8 85.28 : 109.36
Trichlorofluoromethane	TM116	117.0 84.55 : 133.27
Vinyl Chloride	TM116	100.0 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

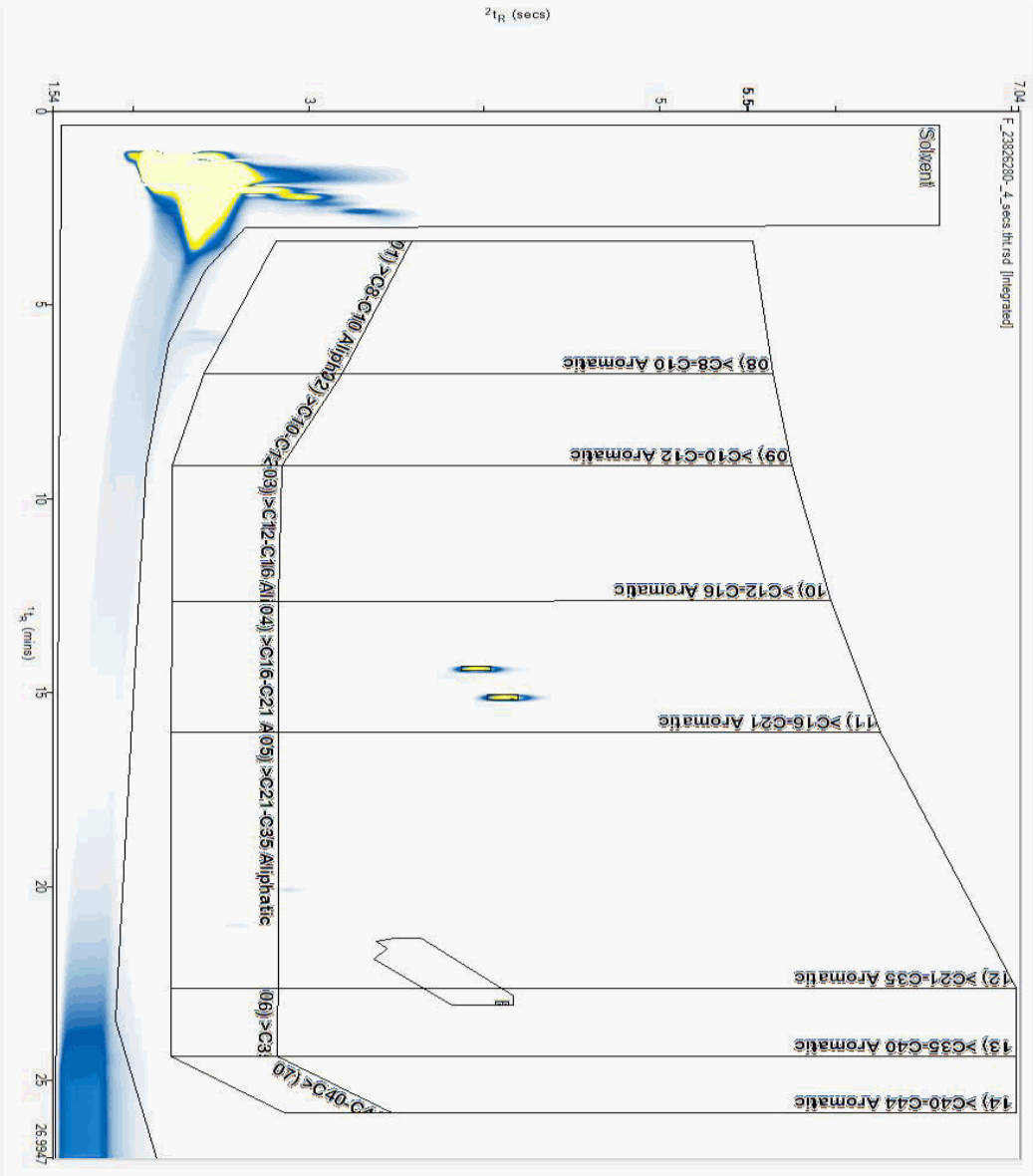
Validated

SDG: 210301-62 Client Reference: B025563 Report Number: 590144
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23826280 Depth : 1.00
Sample ID : BH-OBL-014

ChromSpace LIMS export
Current batch
Sample Identity: F_23826280-4_secs.tht
Date Acquired : 06/03/21 05:24:18
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

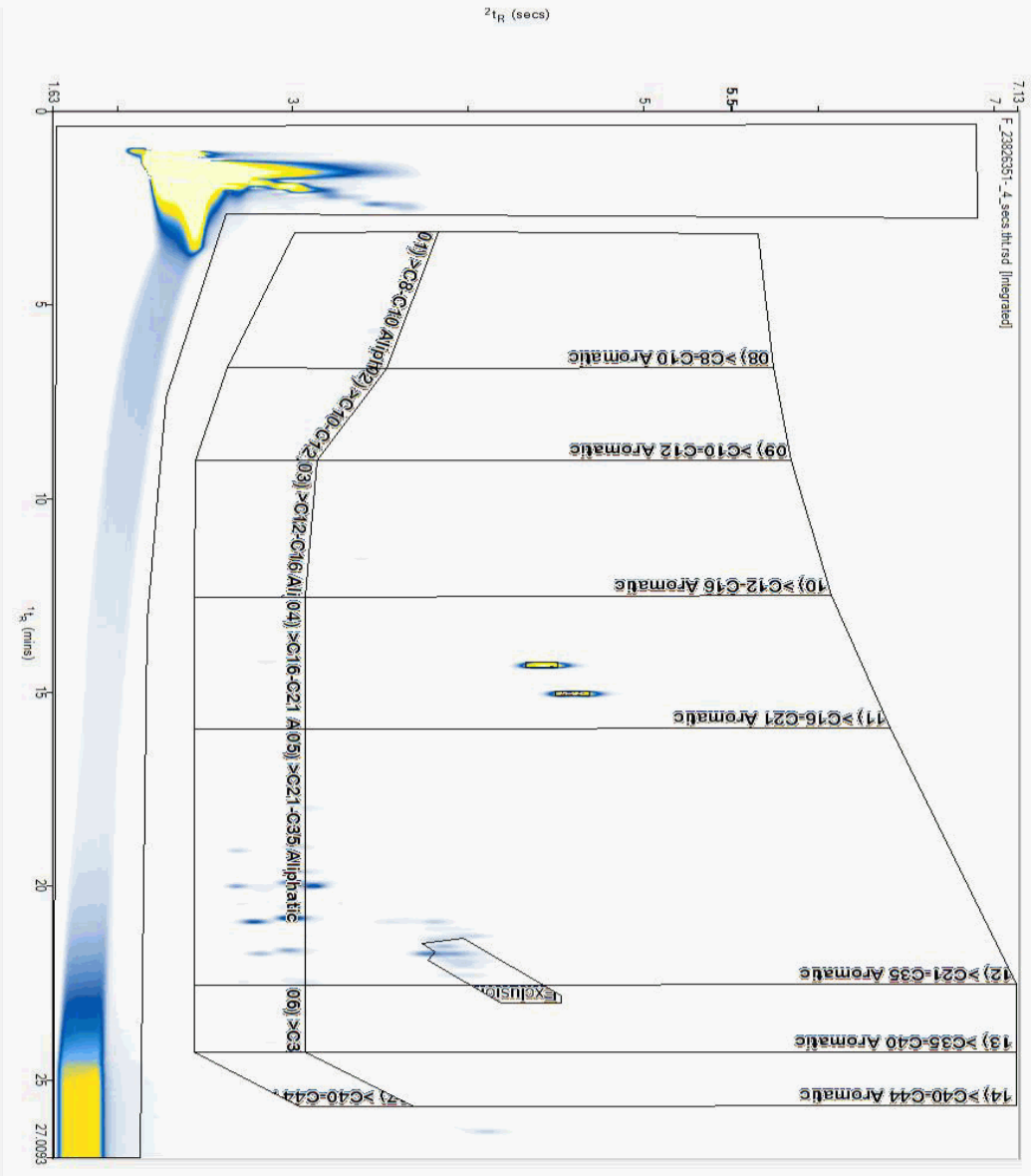
Validated

SDG: 210301-62 Client Reference: B025563 Report Number: 590144
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23826351 Depth : 0.20
Sample ID : BH-OBL-014

ChromSpace LIMS export
Current batch
Sample Identity: F_23826351-4_secs.tht
Date Acquired : 04/03/21 09:50:34
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH by GCxGC-FID
Sample No : 23826407
Sample ID : BH-OBL-014
Depth : 0.20



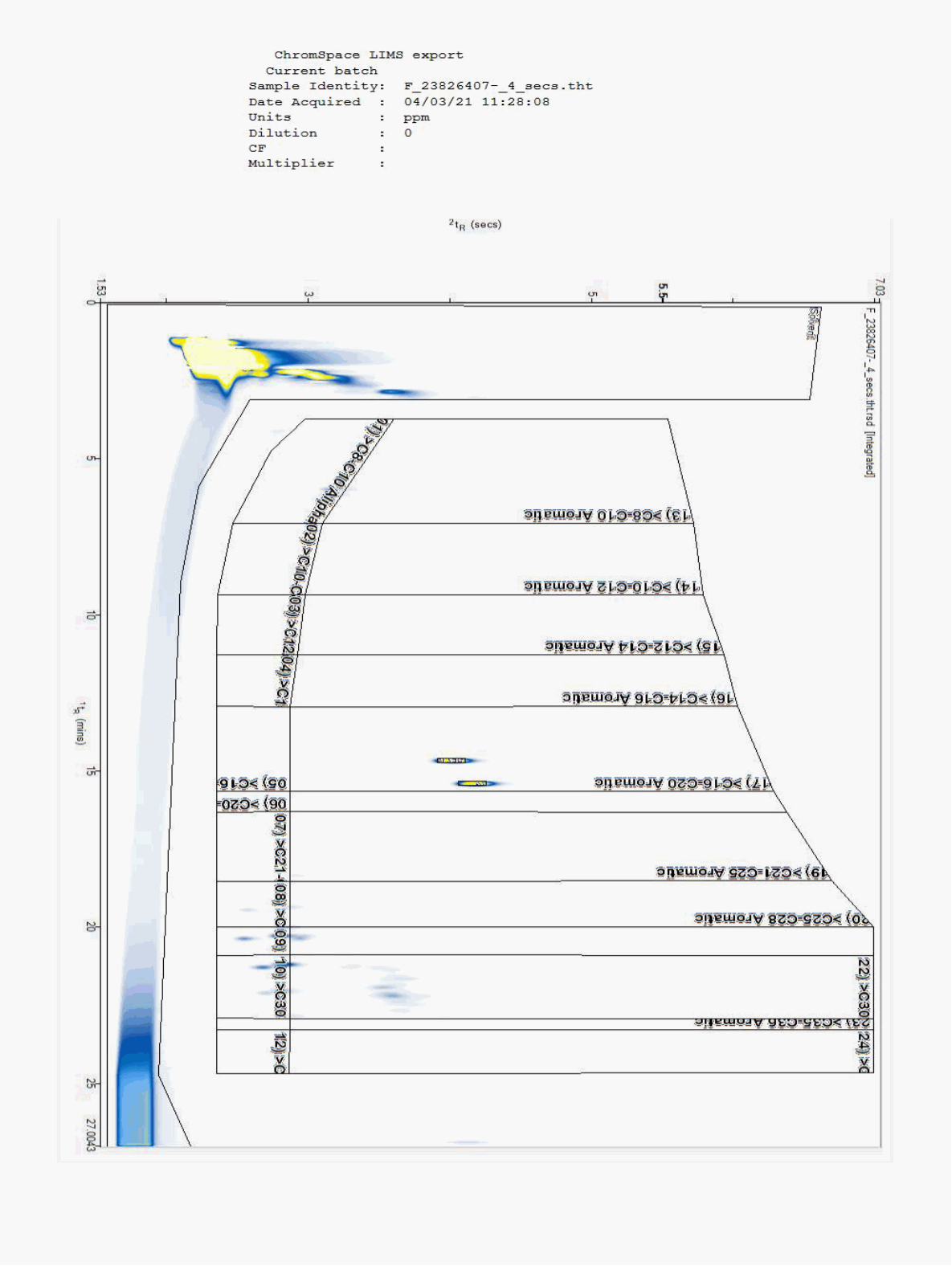
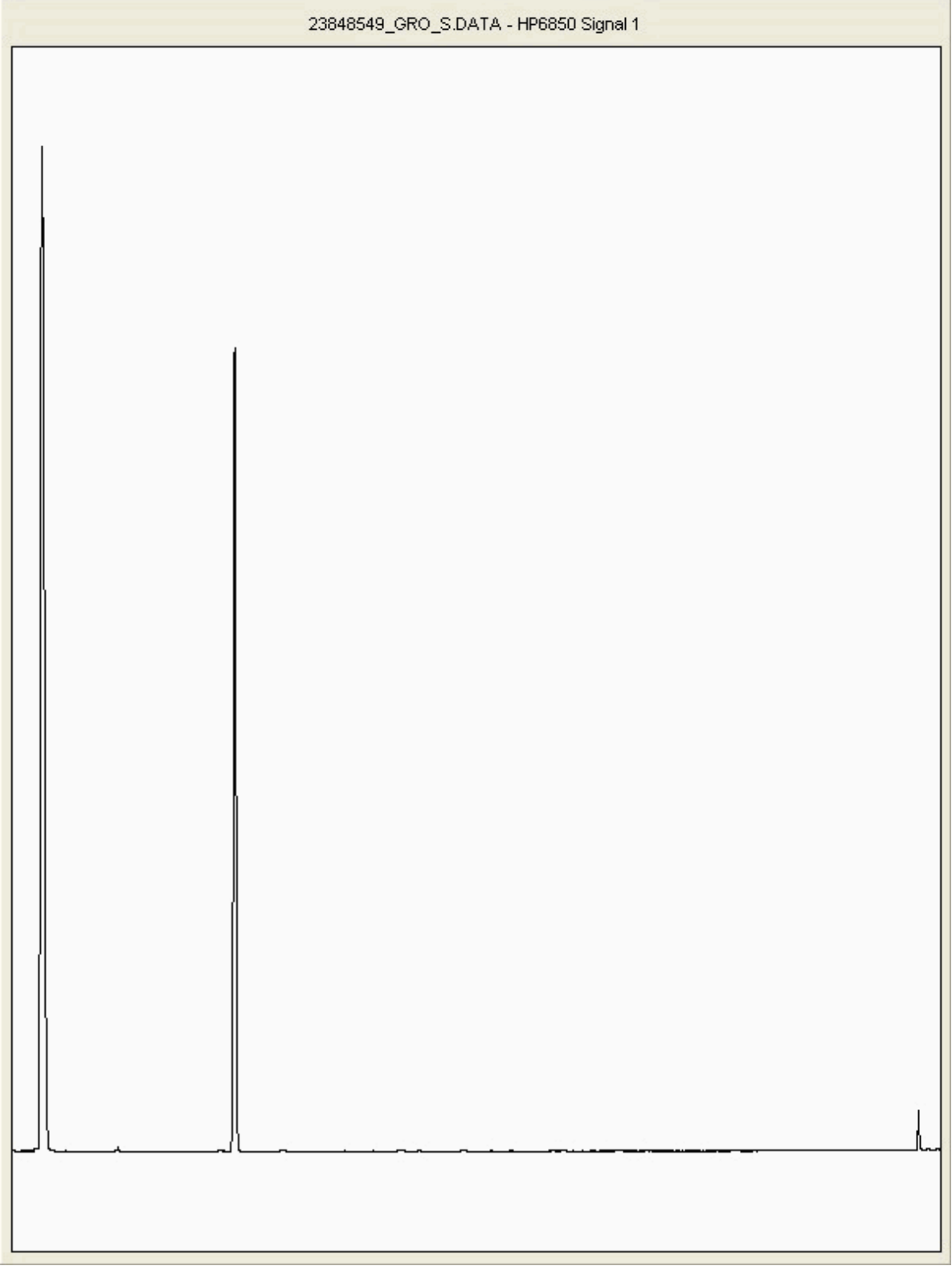
CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-62	Client Reference:	B025563	Report Number:	590144
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)
Sample No : 23848549
Sample ID : BH-OBL-014
Depth : 1.00



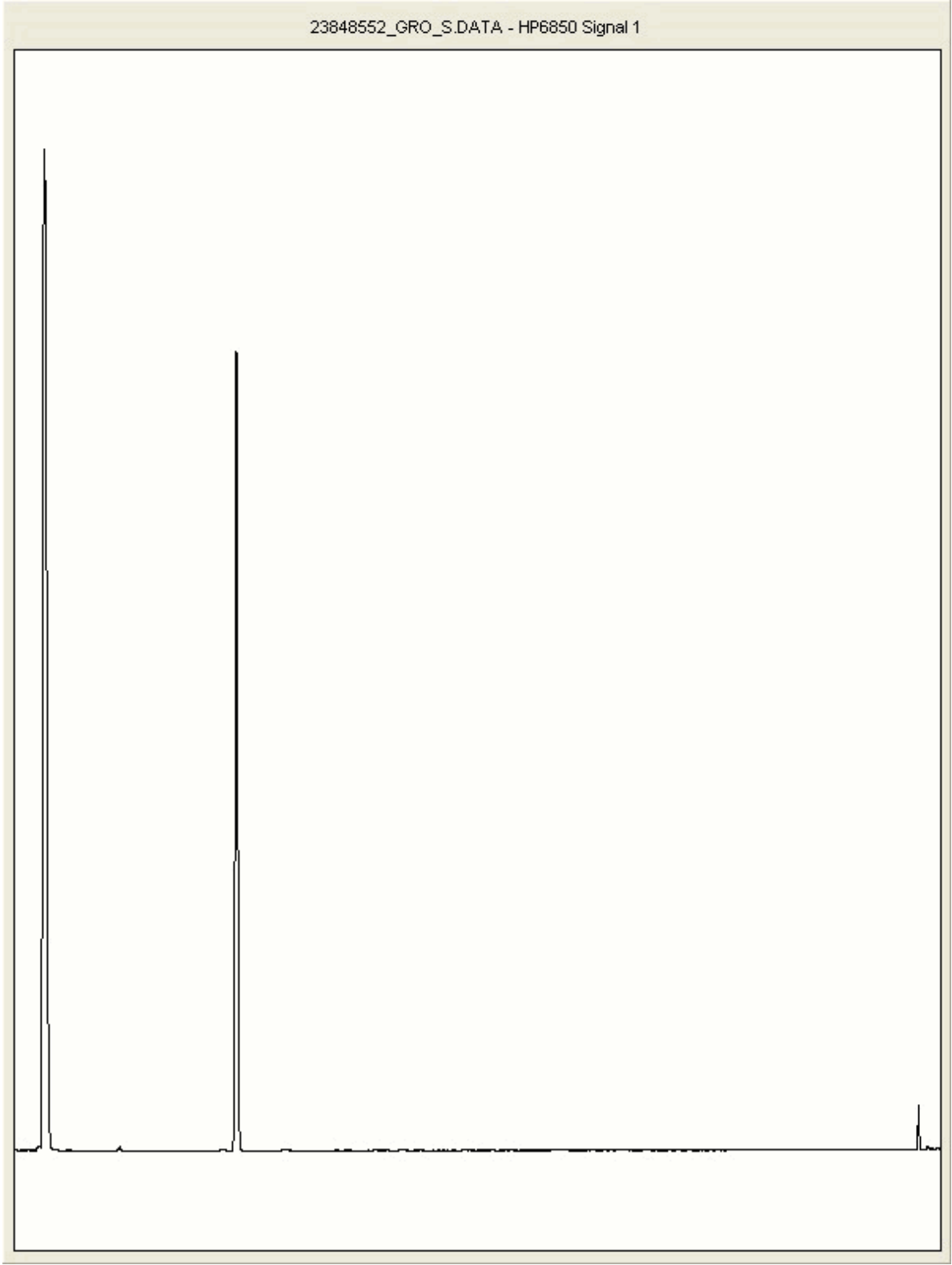
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23848552

Sample ID : BH-OBL-014

Depth : 0.20



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
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LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 10 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210301-64
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 589949

We received 4 samples on Monday March 01, 2021 and 2 of these samples were scheduled for analysis which was completed on Wednesday March 10, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-64 Client Reference: B025563 Report Number: 589949
Location: Cambridge South East Transport Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23816636	BH-PTR-19 ES1		0.10	26/02/2021
23816637	BH-PTR-19 ES2		0.20	26/02/2021
23816638	BH-PTR-19 ES2		1.00	26/02/2021
23816639	BH-PTR-19 ES3		0.50	26/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-64 Client Reference: B025563 Report Number: 589949
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23816637	23816638						
	Customer Sample Reference		BH-PTR-19 ES2	BH-PTR-19 ES2						
	AGS Reference									
	Depth (m)		0.20	1.00						
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Hande (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1				X				
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X						
Anions by Kone (soil)	All	NDPs: 0 Tests: 1					X			
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X		X				
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1				X				
Boron Water Soluble	All	NDPs: 0 Tests: 1						X		
CEN Readings	All	NDPs: 0 Tests: 2		X		X				
Chromium III	All	NDPs: 0 Tests: 2				X	X			
Coronene	All	NDPs: 0 Tests: 1		X						
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1					X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2		X		X				
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2		X		X				
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		X						
EPH CWG GC (S)	All	NDPs: 0 Tests: 1						X		
Fluoride	All	NDPs: 0 Tests: 2		X		X				



CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-64 Client Reference: B025563 Report Number: 589949
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23816637	23816638						
	Customer Sample Reference		BH-PTR-19 ES2	BH-PTR-19 ES2						
	AGS Reference									
	Depth (m)		0.20	1.00						
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Hande (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1							X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1						X		
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X						
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1				X				
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1					X			
Mercury Dissolved	All	NDPs: 0 Tests: 2		X		X				
Metals in solid samples by OES	All	NDPs: 0 Tests: 1						X		
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X						
PAH by GCMS	All	NDPs: 0 Tests: 2		X			X			
PCBs by GCMS	All	NDPs: 0 Tests: 1		X						
pH	All	NDPs: 0 Tests: 2		X				X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1				X				
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1						X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2		X		X				
Sample description	All	NDPs: 0 Tests: 2		X		X				

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23816637		23816638	
	Customer Sample Reference		BH-PTR-19 ES2		BH-PTR-19 ES2	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X			
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 1				X
TPH CWG GC (S)	All	NDPs: 0 Tests: 1				X
VOC MS (S)	All	NDPs: 0 Tests: 2		X		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23816637	BH-PTR-19 ES2	0.20	Dark Brown	Sandy Loam	Stones	Vegetation
23816638	BH-PTR-19 ES2	1.00	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref.	BH-PTR-19 ES2		BH-PTR-19 ES2					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5/6 Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 26/02/2021 . 01/03/2021 210301-64 23816637	1.00 Soil/Solid (S) 26/02/2021 . 01/03/2021 210301-64 23816638					
Component	LOD/Units	Method								
Moisture Content Ratio (% of as received sample)	%	PM024	11	11						
Loss on ignition	<0.7 %	TM018	3.02							
Catechol	<0.01 mg/kg	TM062 (S)		<0.01						
Phenol	<0.01 mg/kg	TM062 (S)		<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)		<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)		<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)		<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)		<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)		<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)		<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)		<0.13						
Organic Carbon, Total	<0.2 %	TM132	0.474							
Sulphur, Total	<0.02 %	TM132		<0.02						
Fraction Organic Carbon (FOC)	<0.002	TM132		0.00525	#					
pH	1 pH Units	TM133	8.64	8.57	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6	#					
Cyanide, Free	<1 mg/kg	TM153		<1	M					
PCB congener 28	<3 µg/kg	TM168	<3							
PCB congener 52	<3 µg/kg	TM168	<3							
PCB congener 101	<3 µg/kg	TM168	<3							
PCB congener 118	<3 µg/kg	TM168	<3							
PCB congener 138	<3 µg/kg	TM168	<3							
PCB congener 153	<3 µg/kg	TM168	<3							
PCB congener 180	<3 µg/kg	TM168	<3							
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21							
Chromium, Trivalent	<0.9 mg/kg	TM181		10.7						
Antimony	<0.6 mg/kg	TM181		<0.6	#					
Arsenic	<0.6 mg/kg	TM181		9.64	M					
Barium	<0.6 mg/kg	TM181		47	#					
Beryllium	<0.01 mg/kg	TM181		0.171	M					
Cadmium	<0.02 mg/kg	TM181		<0.02	M					



CERTIFICATE OF ANALYSIS

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-64

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 589949

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-19 ES2	BH-PTR-19 ES2				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	100	100				
Toluene-d8**	%	TM116	99.7	101				
4-Bromofluorobenzene**	%	TM116	93.1	94.5				
Dichlorodifluoromethane	<6 µg/kg	TM116		<6				
Chloromethane	<7 µg/kg	TM116		<7				
Vinyl Chloride	<6 µg/kg	TM116		<6				
Bromomethane	<10 µg/kg	TM116		<10				
Chloroethane	<10 µg/kg	TM116		<10				
Trichlorofluoromethane	<6 µg/kg	TM116		<6				
1,1-Dichloroethene	<10 µg/kg	TM116		<10				
Carbon Disulphide	<7 µg/kg	TM116		<7				
Dichloromethane	<10 µg/kg	TM116		<10				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10				
trans-1,2-Dichloroethene	<10 µg/kg	TM116		<10				
1,1-Dichloroethane	<8 µg/kg	TM116		<8				
cis-1,2-Dichloroethene	<6 µg/kg	TM116		<6				
2,2-Dichloropropane	<10 µg/kg	TM116		<10				
Bromochloromethane	<10 µg/kg	TM116		<10				
Chloroform	<8 µg/kg	TM116		<8				
1,1,1-Trichloroethane	<7 µg/kg	TM116		<7				
1,1-Dichloropropene	<10 µg/kg	TM116		<10				
Carbontetrachloride	<10 µg/kg	TM116		<10				
1,2-Dichloroethane	<5 µg/kg	TM116		<5				
Benzene	<9 µg/kg	TM116	<9	<9				
Trichloroethene	<9 µg/kg	TM116		<9				
1,2-Dichloropropane	<10 µg/kg	TM116		<10				
Dibromomethane	<9 µg/kg	TM116		<9				
Bromodichloromethane	<7 µg/kg	TM116		<7				
cis-1,3-Dichloropropene	<10 µg/kg	TM116		<10				
Toluene	<7 µg/kg	TM116	<7	<7				
trans-1,3-Dichloropropene	<10 µg/kg	TM116		<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116		<10				

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-64

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 589949

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-19 ES2	BH-PTR-19 ES2				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116		<7				
Tetrachloroethene	<5 µg/kg	TM116		<5				
Dibromochloromethane	<10 µg/kg	TM116		<10				
1,2-Dibromoethane	<10 µg/kg	TM116		<10				
Chlorobenzene	<5 µg/kg	TM116		<5				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116		<10				
Ethylbenzene	<4 µg/kg	TM116	<4	<4				
p/m-Xylene	<10 µg/kg	TM116	<10	<10				
o-Xylene	<10 µg/kg	TM116	<10	<10				
Styrene	<10 µg/kg	TM116		<10				
Bromoform	<10 µg/kg	TM116		<10				
Isopropylbenzene	<5 µg/kg	TM116		<5				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116		<10				
1,2,3-Trichloropropane	<16 µg/kg	TM116		<16				
Bromobenzene	<10 µg/kg	TM116		<10				
Propylbenzene	<10 µg/kg	TM116		<10				
2-Chlorotoluene	<9 µg/kg	TM116		<9				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8				
4-Chlorotoluene	<10 µg/kg	TM116		<10				
tert-Butylbenzene	<14 µg/kg	TM116		<14				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116		<9				
sec-Butylbenzene	<10 µg/kg	TM116		<10				
4-Isopropyltoluene	<10 µg/kg	TM116		<10				
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8				
1,4-Dichlorobenzene	<5 µg/kg	TM116		<5				
n-Butylbenzene	<11 µg/kg	TM116		<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116		<10				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14				
Tert-amyl methyl ether	<10 µg/kg	TM116		<10				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20				
Hexachlorobutadiene	<20 µg/kg	TM116		<20				
Naphthalene	<13 µg/kg	TM116		<13				

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210301-64

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 589949

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-19 ES2	BH-PTR-19 ES2				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 26/02/2021 . 01/03/2021 210301-64 23816637	1.00 Soil/Solid (S) 26/02/2021 . 01/03/2021 210301-64 23816638				
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116		<7 M				
Tetrachloroethene	<5 µg/kg	TM116		<5 M				
Dibromochloromethane	<10 µg/kg	TM116		<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116		<10 M				
Chlorobenzene	<5 µg/kg	TM116		<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116		<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M				
Styrene	<10 µg/kg	TM116		<10 @ #				
Bromoform	<10 µg/kg	TM116		<10 M				
Isopropylbenzene	<5 µg/kg	TM116		<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116		<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116		<16 M				
Bromobenzene	<10 µg/kg	TM116		<10 M				
Propylbenzene	<10 µg/kg	TM116		<10 M				
2-Chlorotoluene	<9 µg/kg	TM116		<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8 M				
4-Chlorotoluene	<10 µg/kg	TM116		<10 M				
tert-Butylbenzene	<14 µg/kg	TM116		<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116		<9 #				
sec-Butylbenzene	<10 µg/kg	TM116		<10				
4-Isopropyltoluene	<10 µg/kg	TM116		<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116		<5 M				
n-Butylbenzene	<11 µg/kg	TM116		<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116		<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20				
Hexachlorobutadiene	<20 µg/kg	TM116		<20				
Naphthalene	<13 µg/kg	TM116		<13 M				

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SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport -
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)	12.2
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	89.1
Particle Size <4mm	>95%		

Case		<div>Landfill Waste Acceptance Criteria Limits</div> <table><tr><td>Inert Waste Landfill</td><td>Stable Non-reactive Hazardous Waste in Non- Hazardous</td><td>Hazardous Waste Landfill</td></tr></table>			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous Waste Landfill
Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous				Hazardous Waste Landfill		
SDG	210301-64						
Lab Sample Number(s)	23816637						
Sampled Date	26-Feb-2021						
Customer Sample Ref.	BH-PTR-19 ES2						
Depth (m)	0.20						

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.474
Loss on Ignition (%)	3.02
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.64
ANC to pH 6 (mol/kg)	0.0376
ANC to pH 4 (mol/kg)	0.22

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00287	<0.0002	0.0287	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00104	<0.001	0.0104	<0.01	0.5	10	70
Copper	0.00139	<0.0003	0.0139	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	0.00126	<0.0002	0.0126	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00136	<0.001	0.0136	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.708	<0.5	7.08	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	75.7	<5	757	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.42	<3	34.2	<30	500	800	1000

Leach Test Information

Date Prepared	04-Mar-2021
pH (pH Units)	8.76
Conductivity (µS/cm)	78.40
Temperature (°C)	19.10
Volume Leachant (Litres)	0.889

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

10/03/2021 09:56:45



SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.2
Particle Size <4mm	>95%		

Case				
SDG	210301-64			
Lab Sample Number(s)	23816638			
Sampled Date	26-Feb-2021			
Customer Sample Ref.	BH-PTR-19 ES2			
Depth (m)	1.00			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.056	<0.01	0.56	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.22	<3	42.2	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.00328	<0.0002	0.0328	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0107	<0.01	0.107	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	17.5	<0.2	175	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00139	<0.0003	0.0139	<0.003	-	-	-
Lead	0.00152	<0.0002	0.0152	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.326	<0.036	3.26	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	04-Mar-2021
pH (pH Units)	8.75
Conductivity (µS/cm)	87.50
Temperature (°C)	18.80
Volume Leachant (Litres)	0.888

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CERTIFICATE OF ANALYSIS

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SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	
Mass Sample taken (kg)	0.102	Cambridge South East Transport - F	
Mass of dry sample (kg)	0.090	Natural Moisture Content (%)	13.4
Particle Size <4mm	>95%	Dry Matter Content (%)	88.2

Case

SDG	210301-64
Lab Sample Number(s)	23816638
Sampled Date	26-Feb-2021
Customer Sample Ref.	BH-PTR-19 ES2
Depth (m)	1.00

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Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		
	Result	Limit of Detection	Result	Limit of Detection	
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	- - -

Leach Test Information

Date Prepared	04-Mar-2021
pH (pH Units)	8.75
Conductivity (µS/cm)	87.50
Temperature (°C)	18.80
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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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Test Completion Dates

Lab Sample No(s)	23816637	23816638
Customer Sample Ref.	BH-PTR-19 ES2	BH-PTR-19 ES2
AGS Ref.		
Depth	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low		09-Mar-2021
ANC at pH4 and ANC at pH 6	08-Mar-2021	
Anions by Kone (soil)		08-Mar-2021
Anions by Kone (w)	05-Mar-2021	05-Mar-2021
Asbestos ID in Solid Samples		08-Mar-2021
Boron Water Soluble		08-Mar-2021
CEN 10:1 Leachate (1 Stage)	04-Mar-2021	04-Mar-2021
CEN Readings	05-Mar-2021	05-Mar-2021
Chromium III		08-Mar-2021
Coronene	05-Mar-2021	
Cyanide Comp/Free/Total/Thiocyanate		10-Mar-2021
Dissolved Metals by ICP-MS	09-Mar-2021	09-Mar-2021
Dissolved Organic/Inorganic Carbon	09-Mar-2021	09-Mar-2021
EPH by GCxGC-FID	05-Mar-2021	
EPH CWG GC (S)		05-Mar-2021
Fluoride	08-Mar-2021	08-Mar-2021
GRO by GC-FID (S)		08-Mar-2021
Hexavalent Chromium (s)		05-Mar-2021
Loss on Ignition in soils	09-Mar-2021	
Low Level Cyanide (W)		09-Mar-2021
Low Level Hexavalent Chromium (w)		08-Mar-2021
Mercury Dissolved	08-Mar-2021	08-Mar-2021
Metals in solid samples by OES		06-Mar-2021
Moisture at 105C	04-Mar-2021	04-Mar-2021
PAH 16 & 17 Calc	05-Mar-2021	
PAH by GCMS	04-Mar-2021	05-Mar-2021
PCBs by GCMS	05-Mar-2021	
pH	03-Mar-2021	08-Mar-2021
pH Value of Filtered Water		08-Mar-2021
Phenols by HPLC (S)		05-Mar-2021
Phenols by HPLC (W)	08-Mar-2021	08-Mar-2021
Sample description	03-Mar-2021	03-Mar-2021
Total Dissolved Solids	08-Mar-2021	
Total Organic Carbon	09-Mar-2021	09-Mar-2021
Total Sulphur		08-Mar-2021
TPH CWG GC (S)		08-Mar-2021
VOC MS (S)	08-Mar-2021	08-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low		
Component	Method Code	QC 2394
Ammoniacal Nitrogen as N	TM099	101.6 96.04 : 106.80
ANC at pH4 and ANC at pH 6		
Component	Method Code	QC 2374
ANC pH_4 dry soil	TM182	109.09 82.79 : 130.38
Anions by Kone (soil)		
Component	Method Code	QC 2334
Chloride (soluble)	TM243	149.74 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	162.15 70.00 : 130.00
Anions by Kone (w)		
Component	Method Code	QC 2300
Chloride	TM184	105.0 92.93 : 115.43
Sulphate (soluble)	TM184	101.2 90.53 : 113.03
Boron Water Soluble		
Component	Method Code	QC 2312
Water Soluble Boron	TM222	94.5 84.00 : 111.00
Coronene		
Component	Method Code	QC 2390
Coronene RAW	TM410	113.5 79.43 : 137.78

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Cyanide Comp/Free/Total/Thiocyanate						

Component	Method Code	QC 2348
Free Cyanide	TM153	101.98 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	103.5 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2384	QC 2392
Aluminium	TM152	99.67 90.98 : 111.82	97.33 90.98 : 111.82
Antimony	TM152	100.67 90.44 : 113.04	97.0 90.44 : 113.04
Arsenic	TM152	98.5 88.00 : 112.00	96.67 88.00 : 112.00
Barium	TM152	101.17 90.20 : 111.19	93.83 90.20 : 111.19
Beryllium	TM152	100.67 87.77 : 113.97	98.17 87.77 : 113.97
Bismuth	TM152	98.5 91.90 : 112.20	95.5 91.90 : 112.20
Borate	TM152	99.38 88.00 : 112.00	98.77 88.00 : 112.00
Boron	TM152	99.33 96.48 : 114.93	98.67 96.48 : 114.93
Cadmium	TM152	93.67 96.43 : 110.53	97.17 96.43 : 110.53
Calcium	TM152	98.67 81.38 : 119.09	99.33 81.38 : 119.09
Chromium	TM152	96.33 91.84 : 108.67	97.83 91.84 : 108.67
Cobalt	TM152	97.17 88.00 : 112.00	95.17 88.00 : 112.00
Copper	TM152	98.33 92.47 : 118.11	97.17 92.47 : 118.11
Iron	TM152	97.33 92.00 : 113.00	97.33 92.00 : 113.00
Lead	TM152	95.67 88.00 : 112.00	98.33 88.00 : 112.00
Lithium	TM152	98.33 91.62 : 113.12	98.83 91.62 : 113.12
Magnesium	TM152	92.0 93.14 : 107.91	96.67 93.14 : 107.91
Manganese	TM152	97.17 95.03 : 110.58	98.33 95.03 : 110.58
Molybdenum	TM152	96.33 88.00 : 112.00	94.0 88.00 : 112.00
Nickel	TM152	97.83 88.00 : 112.00	97.5 88.00 : 112.00
Phosphorus	TM152	98.0 88.00 : 112.00	98.83 88.00 : 112.00
Potassium	TM152	98.67 93.90 : 112.36	98.0 93.90 : 112.36

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	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2384	QC 2392
Selenium	TM152	99.5 91.58 : 115.98	98.17 91.58 : 115.98
Silver	TM152	97.17 88.80 : 122.30	89.83 88.80 : 122.30
Sodium	TM152	93.33 94.28 : 110.71	96.67 94.28 : 110.71
Strontium	TM152	99.33 88.00 : 112.00	99.0 88.00 : 112.00
Tellurium	TM152	101.33 93.32 : 114.66	97.5 93.32 : 114.66
Thallium	TM152	93.83 88.00 : 112.00	87.67 88.00 : 112.00
Tin	TM152	95.17 92.63 : 109.70	96.83 92.63 : 109.70
Titanium	TM152	101.0 95.58 : 111.68	100.17 95.58 : 111.68
Tungsten	TM152	98.67 81.32 : 124.72	96.0 81.32 : 124.72
Uranium	TM152	98.0 88.00 : 112.00	96.5 88.00 : 112.00
Vanadium	TM152	106.17 88.00 : 112.00	98.67 88.00 : 112.00
Zinc	TM152	100.33 92.98 : 118.95	97.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2371
Dissolved Inorganic Carbon	TM090	102.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.17 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2395
EPH >C10-C40 Raw	TM415	82.7 56.36 : 129.92

EPH CWG GC (S)

Component	Method Code	QC 2307
EPH >C8-C40 Raw	TM414	90.11 56.39 : 129.94
Total Aliphatics Raw	TM414	94.27 62.55 : 133.12
Total Aromatics Raw	TM414	111.44 57.00 : 150.27

Fluoride

Fluoride

Component	Method Code	QC 2344
Fluoride	TM104	104.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2372
QC	TM089	90.39 72.28 : 114.54

Hexavalent Chromium (s)

Component	Method Code	QC 2374
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2370
Loss on Ignition	TM018	95.73 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2346
Free Cyanide - Low Level	TM279	78.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.25 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2308
Mercury Dissolved (CVAf)	TM183	94.2 69.30 : 128.70

Metals in solid samples by OES

Metals in solid samples by OES

Component	Method Code	QC 2363
Aluminium	TM181	86.11 77.46 : 123.98
Antimony	TM181	97.15 87.04 : 111.16
Arsenic	TM181	101.16 87.34 : 110.87
Barium	TM181	93.58 80.73 : 115.16
Beryllium	TM181	101.49 89.47 : 112.97
Boron	TM181	78.22 76.57 : 104.15
Cadmium	TM181	89.71 78.94 : 102.43
Chromium	TM181	86.21 77.55 : 104.47
Cobalt	TM181	92.45 82.95 : 107.41
Copper	TM181	94.01 84.36 : 106.14
Iron	TM181	95.24 81.43 : 115.79
Lead	TM181	91.22 81.95 : 107.63
Manganese	TM181	110.28 94.29 : 119.51
Mercury	TM181	98.79 82.73 : 106.36
Molybdenum	TM181	100.82 86.61 : 111.07
Nickel	TM181	91.93 79.72 : 103.80
Phosphorus	TM181	111.72 92.65 : 125.47
Selenium	TM181	102.35 88.36 : 111.25
Strontium	TM181	90.65 78.06 : 99.91
Thallium	TM181	100.88 88.60 : 116.73
Tin	TM181	100.0 89.77 : 112.62
Titanium	TM181	64.66 66.29 : 105.96
Vanadium	TM181	91.58 75.51 : 108.87
Zinc	TM181	100.21 84.02 : 111.24

PAH by GCMS



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Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

PAH by GCMS

Component	Method Code	QC 2376	QC 2382
Acenaphthene	TM218	86.0 78.59 : 112.16	91.5 76.79 : 103.90
Acenaphthylene	TM218	84.0 75.11 : 109.01	89.5 78.40 : 108.66
Anthracene	TM218	82.5 73.99 : 113.85	90.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.5 69.31 : 119.18	91.0 73.77 : 119.26
Benzo(a)pyrene	TM218	75.5 66.97 : 114.92	84.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	77.0 67.41 : 114.46	90.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	83.0 62.92 : 114.36	87.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	86.0 69.98 : 116.49	93.0 75.98 : 116.59
Chrysene	TM218	84.0 69.86 : 114.50	89.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 64.54 : 115.22	84.5 69.17 : 115.30
Fluoranthene	TM218	74.0 72.56 : 111.70	91.0 75.88 : 112.84
Fluorene	TM218	84.0 79.13 : 111.49	90.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	87.5 61.22 : 113.25	78.5 70.26 : 117.95
Naphthalene	TM218	86.0 77.96 : 110.91	91.0 74.70 : 101.83
Phenanthrene	TM218	77.5 76.83 : 113.25	92.0 73.62 : 109.34
Pyrene	TM218	77.5 72.45 : 110.77	90.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2300
PCB congener 101	TM168	79.3 65.66 : 110.06
PCB congener 105	TM168	75.5 58.10 : 106.34
PCB congener 114	TM168	76.2 59.38 : 106.48
PCB congener 118	TM168	77.3 60.02 : 106.23
PCB congener 123	TM168	81.4 65.01 : 99.81
PCB congener 126	TM168	74.5 59.31 : 109.23
PCB congener 138	TM168	78.5 63.95 : 107.63
PCB congener 153	TM168	81.1 62.65 : 108.85
PCB congener 156	TM168	76.5 61.69 : 112.27



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PCBs by GCMS

		QC 2300
PCB congener 157	TM168	73.0 55.37 : 104.81
PCB congener 167	TM168	75.7 65.58 : 109.14
PCB congener 169	TM168	75.4 56.84 : 112.10
PCB congener 180	TM168	80.9 66.99 : 111.63
PCB congener 189	TM168	73.8 57.75 : 112.59
PCB congener 28	TM168	82.5 73.68 : 105.96
PCB congener 52	TM168	81.5 67.24 : 107.62
PCB congener 77	TM168	80.0 64.87 : 108.49
PCB congener 81	TM168	81.2 70.78 : 110.80

pH

Component	Method Code	QC 2361	QC 2386
pH	TM133	100.26 97.97 : 101.10	100.53 97.97 : 101.10

pH Value of Filtered Water

Component	Method Code	QC 2363
pH	TM256	100.4 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2328
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.0 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	11.43 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	30.0 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	50.31 71.43 : 129.59

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Phenols by HPLC (S)						

		QC 2328
Xylenols by HPLC (S)	TM062 (S)	47.5 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2323
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	49.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	49.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	57.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	51.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.67 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2351
Total Dissolved Solids	TM123	98.7 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2354	QC 2361
Total Organic Carbon	TM132	99.22 87.02 : 113.45	98.44 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2378
Total Sulphur %	TM132	98.96 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2356
1,1,1,2-tetrachloroethane	TM116	108.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	107.6 73.73 : 118.05

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VOC MS (S)						

		QC 2356
1,1,2-Trichloroethane	TM116	97.4 77.12 : 116.04
1,1-Dichloroethane	TM116	107.8 74.46 : 129.15
1,2-Dichloroethane	TM116	112.8 92.38 : 131.65
1,4-Dichlorobenzene	TM116	110.0 83.64 : 126.18
2-Chlorotoluene	TM116	93.8 76.03 : 113.25
4-Chlorotoluene	TM116	86.8 66.90 : 112.46
Benzene	TM116	100.2 88.60 : 113.80
Carbon Disulphide	TM116	81.8 74.91 : 122.14
Carbontetrachloride	TM116	112.0 80.31 : 124.50
Chlorobenzene	TM116	107.4 83.81 : 114.18
Chloroform	TM116	109.4 87.40 : 122.49
Chloromethane	TM116	103.2 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.4 80.67 : 126.72
Dibromomethane	TM116	107.0 73.23 : 118.35
Dichloromethane	TM116	111.6 81.11 : 133.25
Ethylbenzene	TM116	88.2 75.92 : 110.41
Hexachlorobutadiene	TM116	30.2 12.82 : 152.73
Isopropylbenzene	TM116	68.0 55.79 : 97.59
Naphthalene	TM116	112.8 80.86 : 128.81
o-Xylene	TM116	82.8 69.99 : 108.74
p/m-Xylene	TM116	83.1 68.32 : 108.91
Sec-Butylbenzene	TM116	55.8 38.50 : 101.50
Tetrachloroethene	TM116	102.0 76.95 : 121.02
Toluene	TM116	91.2 74.24 : 107.42
Trichloroethene	TM116	98.8 85.28 : 109.36
Trichlorofluoromethane	TM116	117.0 84.55 : 133.27
Vinyl Chloride	TM116	100.0 68.02 : 143.37



CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



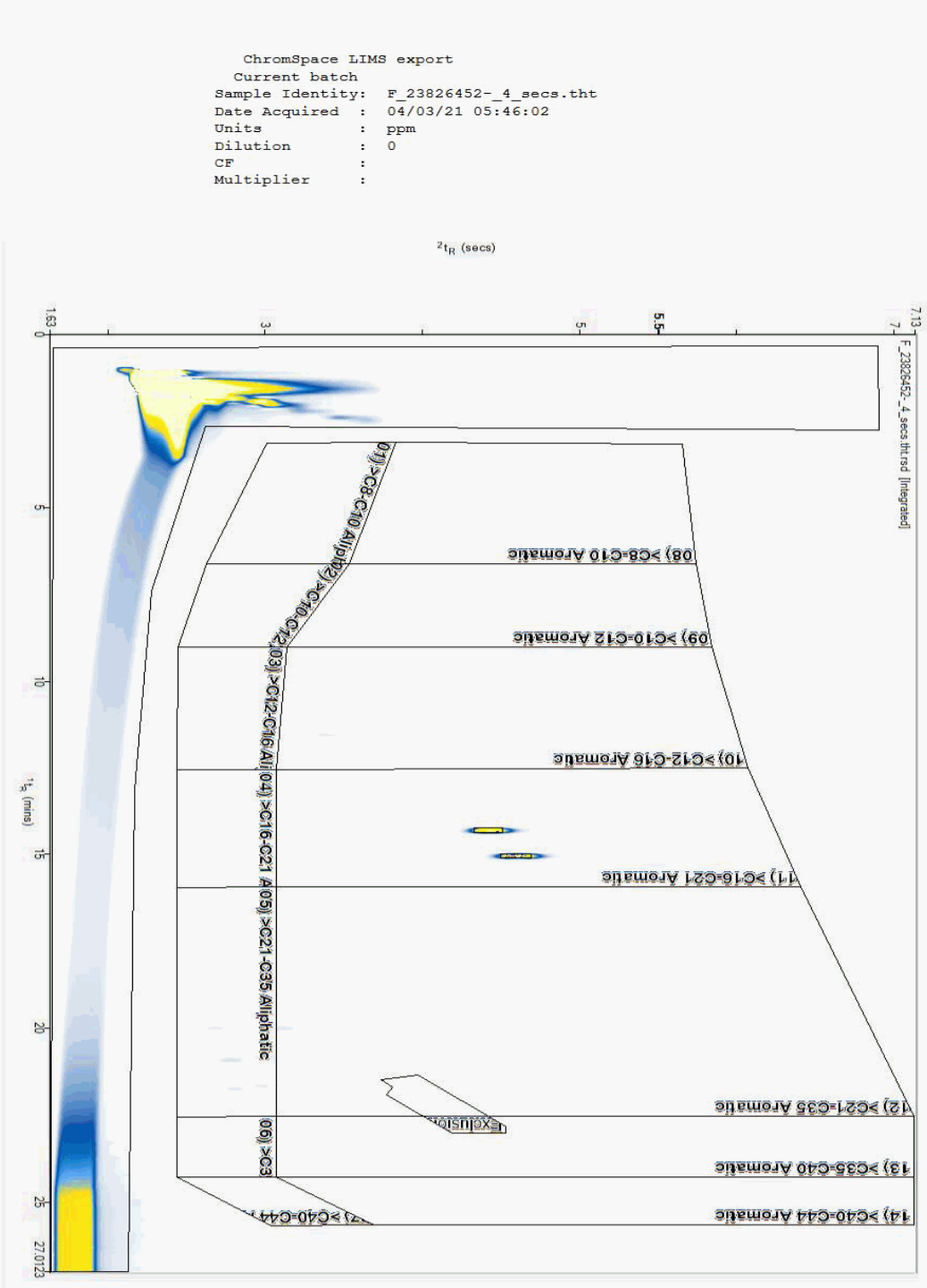
CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23826452	Depth :	1.00
		Sample ID :	BH-PTR-19 ES2		





CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH by GCxGC-FID	Sample No :	23826563	Depth :	0.20
		Sample ID :	BH-PTR-19 ES2		



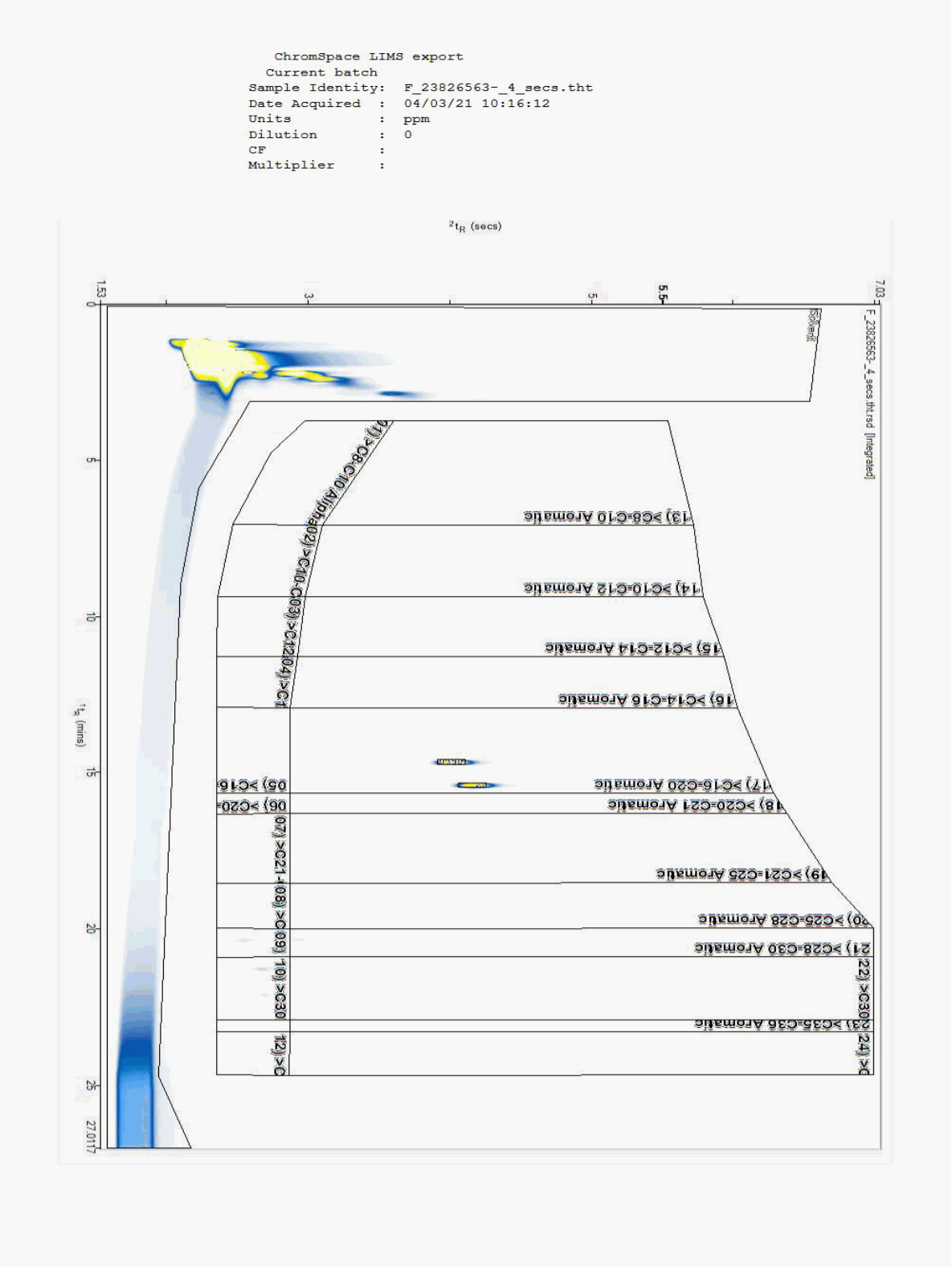
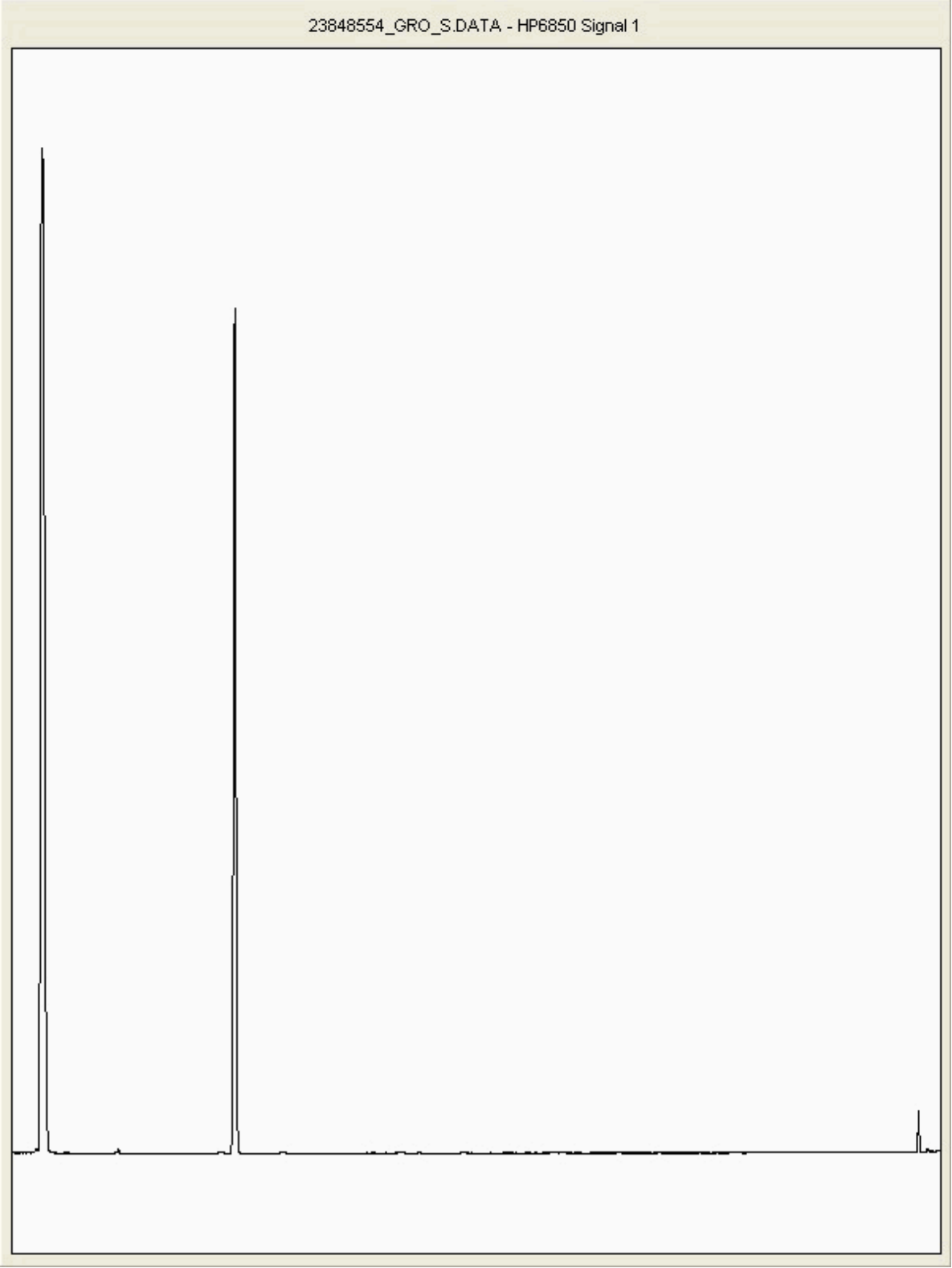
CERTIFICATE OF ANALYSIS

Validated

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	GRO by GC-FID (S)	Sample No :	23848554	Depth :	1.00
		Sample ID :	BH-PTR-19 ES2		





CERTIFICATE OF ANALYSIS

SDG:	210301-64	Client Reference:	B025563	Report Number:	589949
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	12 March 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210302-77
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	590317

We received 4 samples on Friday February 26, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday March 12, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210302-77 Client Reference: B025563 Report Number: 590317
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23819778	BH-PTR-21	ES1	0.10	23/02/2021
23819779	BH-PTR-21	ES2	0.20	23/02/2021
23819780	BH-PTR-21	ES3	0.50	23/02/2021
23819781	BH-PTR-21	ES4	1.00	23/02/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210302-77 Client Reference: B025563 Report Number: 590317
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23819778		
	Customer Sample Reference		BH-PTR-21		
	AGS Reference		ES1		
	Depth (m)		0.10		
	Container		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	60g VOC (ALE215)	
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23819778		
	Customer Sample Reference		BH-PTR-21		
	AGS Reference		ES1		
	Depth (m)		0.10		
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23819778	BH-PTR-21	0.10	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unflit + "" (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-PTR-21</div> <div>0.10 Soil/Solid (S) 23/02/2021 . 26/02/2021 210302-77 23819778 ES1</div>				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	14					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M				
Cresols	<0.01 mg/kg	TM062 (S)	0.0117	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05					
Xylenols	<0.015 mg/kg	TM062 (S)	0.0468	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13					
Sulphur, Total	<0.02 %	TM132	0.0313					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00944	#				
pH	1 pH Units	TM133	8.27	M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#				
Cyanide, Free	<1 mg/kg	TM153	<1	@ M				
Chromium, Trivalent	<0.9 mg/kg	TM181	12.8					
Antimony	<0.6 mg/kg	TM181	<0.6	#				
Arsenic	<0.6 mg/kg	TM181	16.4	M				
Barium	<0.6 mg/kg	TM181	50.3	#				
Beryllium	<0.01 mg/kg	TM181	0.62	M				
Cadmium	<0.02 mg/kg	TM181	0.123	M				
Chromium	<0.9 mg/kg	TM181	12.8	M				
Copper	<1.4 mg/kg	TM181	8.43	M				
Iron	<1000 mg/kg	TM181	22500	#				
Lead	<0.7 mg/kg	TM181	13.6	M				
Manganese	<0.13 mg/kg	TM181	278	M				
Mercury	<0.1 mg/kg	TM181	<0.1	M				
Molybdenum	<0.1 mg/kg	TM181	0.363	#				
Nickel	<0.2 mg/kg	TM181	16.2	M				
Selenium	<1 mg/kg	TM181	<1	#				
Vanadium	<0.2 mg/kg	TM181	34.5	#				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-21				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)						
		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 23/02/2021 . 26/02/2021 210302-77 23819778 ES1				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	116	@			
Toluene-d8**	%	TM116	95.5	@			
4-Bromofluorobenzene**	%	TM116	81.7	@			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 @ M				
Chloromethane	<7 µg/kg	TM116	<7 @ #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 @ M				
Chloroethane	<10 µg/kg	TM116	<10 @ M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 @ M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 @ #				
Carbon Disulphide	<7 µg/kg	TM116	<7 @ M				
Dichloromethane	<10 µg/kg	TM116	74.9 @ #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 @ M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 @ M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 @ M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 @ M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10 @				
Bromochloromethane	<10 µg/kg	TM116	<10 @ M				
Chloroform	<8 µg/kg	TM116	<8 @ M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 @ M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 @ M				
Carbontetrachloride	<10 µg/kg	TM116	<10 @ M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 @ M				
Benzene	<9 µg/kg	TM116	<9 @ M				
Trichloroethene	<9 µg/kg	TM116	<9 @ #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 @ M				
Dibromomethane	<9 µg/kg	TM116	<9 @ M				
Bromodichloromethane	<7 µg/kg	TM116	<7 @ M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 @ M				
Toluene	<7 µg/kg	TM116	<7 @ M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10 @				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 @ M				

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-PTR-21 0.10 Soil/Solid (S) 23/02/2021 . 26/02/2021 210302-77 23819778 ES1				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-44@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 @ M				
Tetrachloroethene	<5 µg/kg	TM116	<5 @ M				
Dibromochloromethane	<10 µg/kg	TM116	<10 @ M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 @ M				
Chlorobenzene	<5 µg/kg	TM116	<5 @ M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 @ M				
Ethylbenzene	<4 µg/kg	TM116	<4 @ M				
p/m-Xylene	<10 µg/kg	TM116	<10 @ #				
o-Xylene	<10 µg/kg	TM116	<10 @ M				
Styrene	<10 µg/kg	TM116	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 @ M				
Isopropylbenzene	<5 µg/kg	TM116	<5 @ #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 @ #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 @ M				
Bromobenzene	<10 µg/kg	TM116	<10 @ M				
Propylbenzene	<10 µg/kg	TM116	<10 @ M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 @ M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 @ M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 @ M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 @ M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 @ #				
sec-Butylbenzene	<10 µg/kg	TM116	<10 @				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 @ M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 @ M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 @ M				
n-Butylbenzene	<11 µg/kg	TM116	<11 @				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 @ M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 @ M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 @ #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20 @				
Hexachlorobutadiene	<20 µg/kg	TM116	<20 @				
Naphthalene	<13 µg/kg	TM116	<13 @ M				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.5
Particle Size <4mm	>95%		

Case

SDG	210302-77			
Lab Sample Number(s)	23819778			
Sampled Date	23-Feb-2021			
Customer Sample Ref.	BH-PTR-21 ES1			
Depth (m)	0.10			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.025	<0.01	0.25	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	7.9	<3	79	<30	-	-	-
Fluoride	0.93	<0.5	9.3	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00274	<0.0005	0.0274	<0.005	-	-	-
Barium	0.00596	<0.0002	0.0596	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0176	<0.01	0.176	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	29	<0.2	290	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000598	<0.0003	0.00598	<0.003	-	-	-
Lead	0.000248	<0.0002	0.00248	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.389	<0.036	3.89	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00143	<0.0004	0.0143	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.0841	<0.001	0.841	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	05-Mar-2021
pH (pH Units)	9.06
Conductivity (µS/cm)	87.80
Temperature (°C)	13.30
Volume Leachant (Litres)	0.884

12/03/2021 08:53:11

08:52:33 12/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)		17
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		85.5
Particle Size <4mm	>95%			

Case

SDG	210302-77			
Lab Sample Number(s)	23819778			
Sampled Date	23-Feb-2021			
Customer Sample Ref.	BH-PTR-21 ES1			
Depth (m)	0.10			

[illegible]

Leach Test Information

Date Prepared	05-Mar-2021
pH (pH Units)	9.06
Conductivity (µS/cm)	87.80
Temperature (°C)	13.30
Volume Leachant (Litres)	0.884

12/03/2021 08:53:11

08:52:33 12/03/2021

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23819778
Customer Sample Ref.	BH-PTR-21
AGS Ref.	ES1
Depth	0.10
Type	Soil/Solid (S)
Ammonium Low	10-Mar-2021
Anions by Kone (soil)	10-Mar-2021
Anions by Kone (w)	09-Mar-2021
Asbestos ID in Solid Samples	10-Mar-2021
Boron Water Soluble	09-Mar-2021
CEN 10:1 Leachate (1 Stage)	06-Mar-2021
CEN Readings	08-Mar-2021
Chromium III	10-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	11-Mar-2021
Dissolved Metals by ICP-MS	10-Mar-2021
Dissolved Organic/Inorganic Carbon	12-Mar-2021
EPH CWG GC (S)	08-Mar-2021
Fluoride	09-Mar-2021
GRO by GC-FID (S)	10-Mar-2021
Hexavalent Chromium (s)	08-Mar-2021
Low Level Cyanide (W)	10-Mar-2021
Low Level Hexavalent Chromium (w)	09-Mar-2021
Mercury Dissolved	11-Mar-2021
Metals in solid samples by OES	09-Mar-2021
Moisture at 105C	05-Mar-2021
PAH by GCMS	08-Mar-2021
pH	09-Mar-2021
pH Value of Filtered Water	10-Mar-2021
Phenols by HPLC (S)	10-Mar-2021
Phenols by HPLC (W)	10-Mar-2021
Sample description	04-Mar-2021
Total Organic Carbon	11-Mar-2021
Total Sulphur	09-Mar-2021
TPH CWG GC (S)	10-Mar-2021
VOC MS (S)	10-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2391
Ammoniacal Nitrogen as N	TM099	100.8 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2332
Chloride (soluble)	TM243	135.75 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	158.88 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2343
Chloride	TM184	107.0 92.93 : 115.43
Sulphate (soluble)	TM184	96.8 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2334
Water Soluble Boron	TM222	93.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2331
Free Cyanide	TM153	105.94 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	107.69 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2392	QC 2337
Aluminium	TM152	97.33 90.98 : 111.82	103.67 90.98 : 111.82
Antimony	TM152	97.0 90.44 : 113.04	102.83 90.44 : 113.04
Arsenic	TM152	96.67 88.00 : 112.00	102.5 88.00 : 112.00

Dissolved Metals by ICP-MS

		QC 2392	QC 2337
Barium	TM152	93.83 90.20 : 111.19	97.67 90.20 : 111.19
Beryllium	TM152	98.17 87.77 : 113.97	104.67 87.77 : 113.97
Bismuth	TM152	95.5 91.90 : 112.20	102.17 91.90 : 112.20
Borate	TM152	98.77 88.00 : 112.00	104.32 88.00 : 112.00
Boron	TM152	98.67 96.48 : 114.93	104.33 96.48 : 114.93
Cadmium	TM152	97.17 96.43 : 110.53	102.5 96.43 : 110.53
Calcium	TM152	99.33 81.38 : 119.09	104.0 81.38 : 119.09
Chromium	TM152	97.83 91.84 : 108.67	101.83 91.84 : 108.67
Cobalt	TM152	95.17 88.00 : 112.00	101.0 88.00 : 112.00
Copper	TM152	97.17 92.47 : 118.11	102.83 92.47 : 118.11
Iron	TM152	97.33 92.00 : 113.00	102.0 92.00 : 113.00
Lead	TM152	98.33 88.00 : 112.00	103.0 88.00 : 112.00
Lithium	TM152	98.83 91.62 : 113.12	104.67 91.62 : 113.12
Magnesium	TM152	96.67 93.14 : 107.91	101.33 93.14 : 107.91
Manganese	TM152	98.33 95.03 : 110.58	102.17 95.03 : 110.58
Molybdenum	TM152	94.0 88.00 : 112.00	99.67 88.00 : 112.00
Nickel	TM152	97.5 88.00 : 112.00	102.17 88.00 : 112.00
Phosphorus	TM152	98.83 88.00 : 112.00	104.0 88.00 : 112.00
Potassium	TM152	98.0 93.90 : 112.36	103.33 93.90 : 112.36
Selenium	TM152	98.17 91.58 : 115.98	103.33 91.58 : 115.98
Silver	TM152	89.83 88.80 : 122.30	101.33 88.80 : 122.30
Sodium	TM152	96.67 94.28 : 110.71	101.33 94.28 : 110.71
Strontium	TM152	99.0 88.00 : 112.00	102.0 88.00 : 112.00
Tellurium	TM152	97.5 93.32 : 114.66	103.17 93.32 : 114.66
Thallium	TM152	87.67 88.00 : 112.00	101.17 88.00 : 112.00
Tin	TM152	96.83 92.63 : 109.70	102.17 92.63 : 109.70
Titanium	TM152	100.17 95.58 : 111.68	104.83 95.58 : 111.68

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2392	QC 2337
Tungsten	TM152	96.0 81.32 : 124.72	100.33 81.32 : 124.72
Uranium	TM152	96.5 88.00 : 112.00	101.17 88.00 : 112.00
Vanadium	TM152	98.67 88.00 : 112.00	100.5 88.00 : 112.00
Zinc	TM152	97.33 92.98 : 118.95	103.0 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2355
Dissolved Inorganic Carbon	TM090	116.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	101.17 96.13 : 109.53

Fluoride

Component	Method Code	QC 2358
Fluoride	TM104	100.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2348
QC	TM089	88.32 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2338
Hexavalent Chromium	TM151	98.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2317
Free Cyanide - Low Level	TM279	80.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	98.25 81.83 : 110.45

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Mercury Dissolved						

Component	Method Code	QC 2351
Mercury Dissolved (CVAF)	TM183	102.0 74.00 : 116.00

Metals in solid samples by OES

Component	Method Code	QC 2357
Aluminium	TM181	81.86 73.56 : 108.85
Antimony	TM181	98.37 76.89 : 111.24
Arsenic	TM181	103.78 88.53 : 111.01
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	101.87 85.44 : 109.61
Boron	TM181	90.26 73.51 : 104.66
Cadmium	TM181	90.53 77.67 : 104.12
Chromium	TM181	86.0 79.64 : 105.83
Cobalt	TM181	92.14 84.60 : 104.13
Copper	TM181	94.54 82.40 : 105.45
Iron	TM181	95.24 82.95 : 110.58
Lead	TM181	93.47 78.24 : 104.05
Manganese	TM181	111.39 94.29 : 119.51
Mercury	TM181	98.79 83.16 : 107.81
Molybdenum	TM181	100.41 87.11 : 106.87
Nickel	TM181	90.95 80.26 : 102.28
Phosphorus	TM181	110.71 94.56 : 124.28
Selenium	TM181	101.96 82.28 : 110.48
Strontium	TM181	95.32 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	101.52 86.72 : 110.03
Titanium	TM181	84.73 66.23 : 102.06

Metals in solid samples by OES

		QC 2357
Vanadium	TM181	98.17 86.19 : 109.45
Zinc	TM181	101.64 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2369
Acenaphthene	TM218	89.5 78.59 : 112.16
Acenaphthylene	TM218	88.5 75.11 : 109.01
Anthracene	TM218	89.5 73.99 : 113.85
Benz(a)anthracene	TM218	88.0 69.31 : 119.18
Benzo(a)pyrene	TM218	80.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	83.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	85.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	85.0 69.98 : 116.49
Chrysene	TM218	87.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	83.5 64.54 : 115.22
Fluoranthene	TM218	93.5 72.56 : 111.70
Fluorene	TM218	88.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	79.5 61.22 : 113.25
Naphthalene	TM218	92.5 77.96 : 110.91
Phenanthrene	TM218	92.5 76.83 : 113.25
Pyrene	TM218	93.0 72.45 : 110.77

pH

Component	Method Code	QC 2362
pH	TM133	101.05 98.71 : 102.32

pH Value of Filtered Water

pH Value of Filtered Water

Component	Method Code	QC 2310
pH	TM256	100.8 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2333
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 68.54 : 123.77
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.78 68.54 : 123.77
Catechol by HPLC (S)	TM062 (S)	15.24 19.39 : 135.70
Cresols by HPLC (S)	TM062 (S)	44.89 77.98 : 111.41
Napthol by HPLC (S)	TM062 (S)	38.57 57.50 : 102.50
Phenol by HPLC (S)	TM062 (S)	52.32 68.24 : 117.99
Resorcinol HPLC (S)	TM062 (S)	47.8 69.99 : 127.22
Xylenols by HPLC (S)	TM062 (S)	49.48 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2323
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	49.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	48.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	57.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	50.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.67 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2391
Total Organic Carbon	TM132	98.44 87.02 : 113.45

Total Sulphur

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210302-77	Client Reference:	B025563	Report Number:	590317	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2382				
Total Sulphur %	TM132	104.15 61.64 : 114.47				

VOC MS (S)			
Component	Method Code	QC 2362	QC 2336
1,1,1,2-tetrachloroethane	TM116	102.8 79.10 : 119.66	102.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	105.2 84.25 : 112.57	108.2 86.26 : 117.53
1,1,2-Trichloroethane	TM116	95.4 81.29 : 113.79	95.8 75.16 : 112.70
1,1-Dichloroethane	TM116	112.6 86.77 : 122.11	110.4 83.27 : 122.16
1,2-Dichloroethane	TM116	109.4 90.04 : 132.28	137.4 89.30 : 133.10
1,4-Dichlorobenzene	TM116	102.6 80.81 : 125.07	101.2 82.59 : 123.23
2-Chlorotoluene	TM116	87.4 73.13 : 114.13	98.0 66.81 : 118.43
4-Chlorotoluene	TM116	89.2 68.66 : 109.13	94.2 65.88 : 114.76
Benzene	TM116	98.8 84.29 : 112.22	101.8 93.16 : 123.63
Carbon Disulphide	TM116	93.2 75.11 : 124.81	100.4 75.11 : 124.81
Carbontetrachloride	TM116	106.2 82.35 : 126.46	111.0 82.35 : 126.46
Chlorobenzene	TM116	101.8 82.88 : 122.42	97.4 85.07 : 118.13
Chloroform	TM116	110.6 90.35 : 120.38	113.0 88.13 : 122.71
Chloromethane	TM116	115.0 65.80 : 138.88	120.0 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	106.6 78.27 : 128.90	106.4 78.27 : 128.90
Dibromomethane	TM116	97.8 76.00 : 120.73	98.6 77.47 : 121.29
Dichloromethane	TM116	116.8 92.27 : 134.36	116.0 87.89 : 134.72
Ethylbenzene	TM116	84.4 70.95 : 113.07	92.8 79.92 : 110.05
Hexachlorobutadiene	TM116	37.8 14.55 : 147.92	70.4 16.78 : 153.29
Isopropylbenzene	TM116	67.4 52.00 : 108.19	85.4 64.20 : 119.59
Naphthalene	TM116	103.6 80.29 : 135.77	114.4 79.29 : 125.59
o-Xylene	TM116	80.4 64.92 : 98.85	87.4 72.86 : 102.10

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210302-77	Client Reference:	B025563	Report Number:	590317	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2362	QC 2336			
p/m-Xylene	TM116	77.2 72.04 : 104.04	86.6 74.06 : 106.47			
Sec-Butylbenzene	TM116	53.2 27.03 : 135.73	74.0 44.71 : 117.87			
Tetrachloroethene	TM116	98.8 81.43 : 126.65	100.8 85.86 : 122.95			
Toluene	TM116	89.2 82.44 : 103.50	90.6 87.82 : 116.21			
Trichloroethene	TM116	92.8 79.80 : 112.33	100.8 79.80 : 112.33			
Trichlorofluoromethane	TM116	107.8 89.67 : 132.09	115.0 80.52 : 132.12			
Vinyl Chloride	TM116	117.8 69.66 : 136.55	108.8 74.57 : 146.88			

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

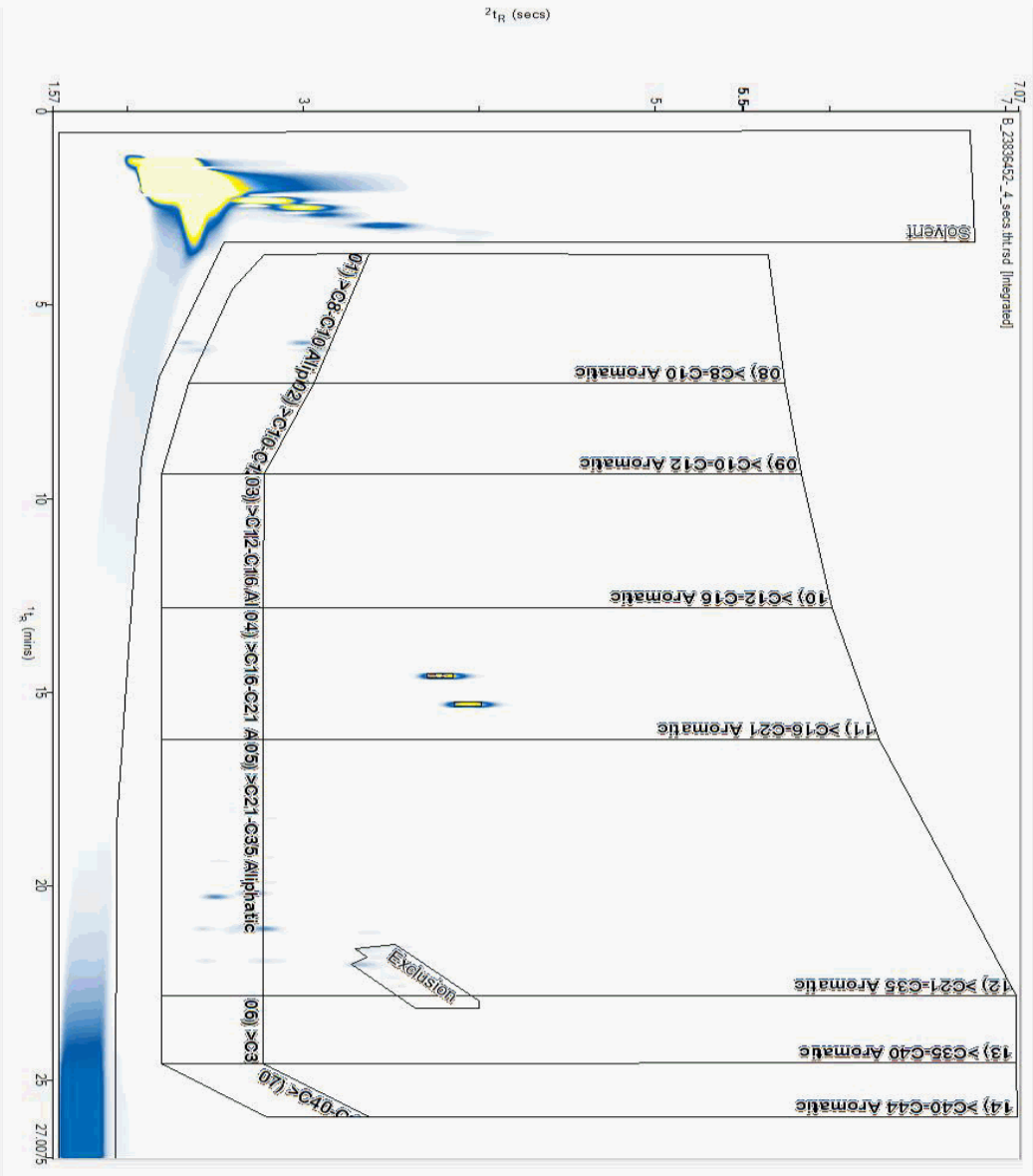
Validated

SDG: 210302-77 Client Reference: B025563 Report Number: 590317
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23836452 Depth : 0.10
Sample ID : BH-PTR-21

ChromSpace LIMS export
Current batch
Sample Identity: B_23836452-4_secs.tht
Date Acquired : 06/03/21 08:32:41
Units : ppm
Dilution : 0
CF :
Multiplier :



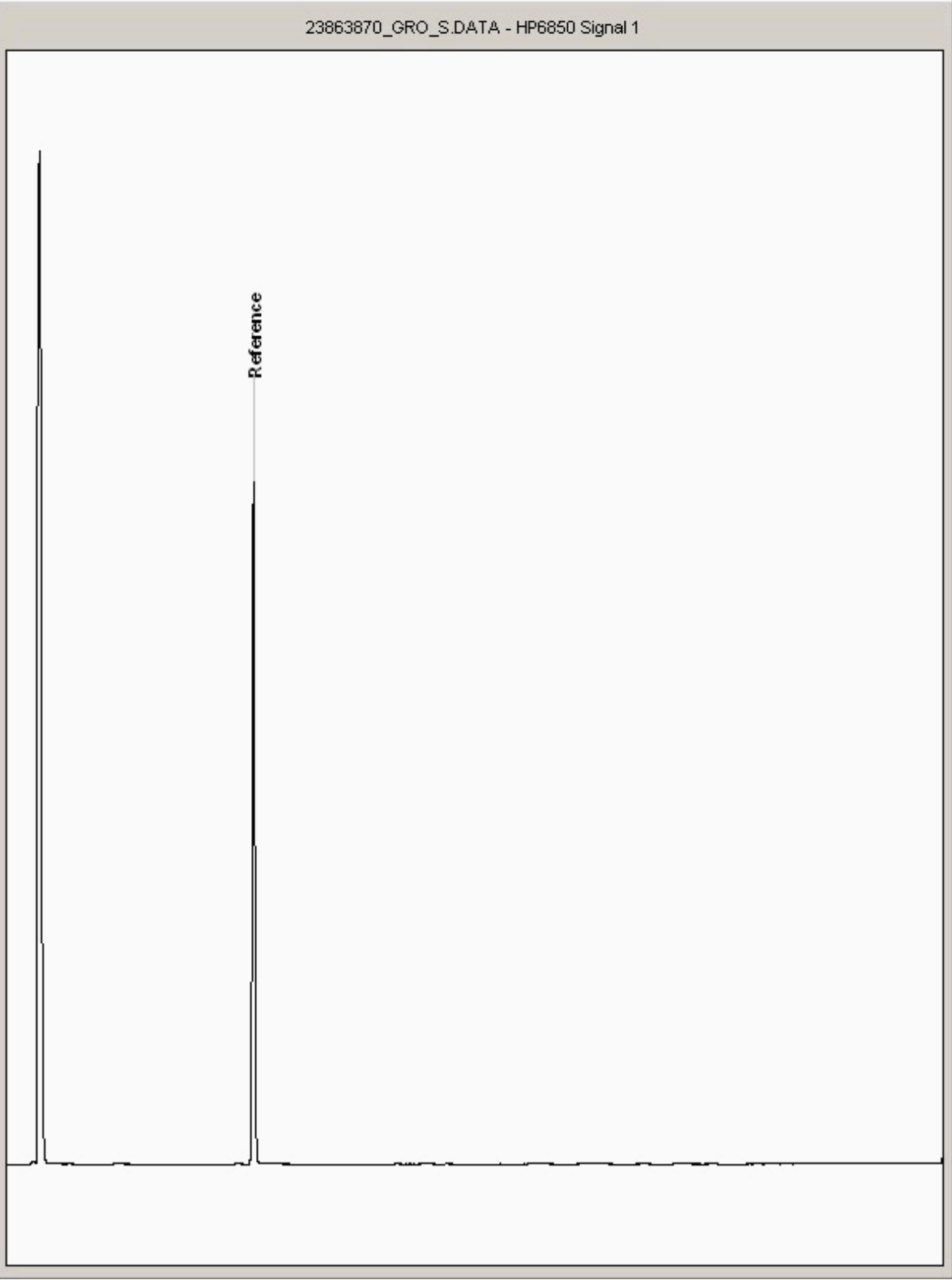
CERTIFICATE OF ANALYSIS

Validated

SDG: 210302-77 Client Reference: B025563 Report Number: 590317
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23863870 Depth : 0.10
Sample ID : BH-PTR-21





CERTIFICATE OF ANALYSIS

SDG:	210302-77	Client Reference:	B025563	Report Number:	590317
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	13 March 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210304-137
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	590462

We received 8 samples on Thursday March 04, 2021 and 4 of these samples were scheduled for analysis which was completed on Saturday March 13, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 13/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23840141	BH-OBC-015		2.30 - 2.30	02/03/2021
23840134	BH-OBC-15		0.10 - 0.10	01/03/2021
23840135	BH-OBC-15		0.20 - 0.20	01/03/2021
23840136	BH-OBC-15		0.50 - 0.50	01/03/2021
23840137	BH-OBC-15		1.00 - 1.00	01/03/2021
23840138	SPOIL HEAP 1			02/03/2021
23840139	SPOIL HEAP 2			02/03/2021
23840140	SPOIL HEAP 3			02/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)						23840140	23840139	23840138	23840135	
	Customer Sample Reference						SPOIL HEAP 3	SPOIL HEAP 2	SPOIL HEAP 1	BH-OBC-15	
	AGS Reference									0.20 - 0.20	
	Depth (m)										
	Container		250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	S	S	S	S
	Sample Type		S	S	S	S	S	S	S	S	S
			S	S	S	S	S	S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X								
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X							
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X								
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4	X					X	X	X	
Boron Water Soluble	All	NDPs: 0 Tests: 4		X				X	X	X	
CEN Readings	All	NDPs: 0 Tests: 1	X								
Chromium III	All	NDPs: 0 Tests: 5	X	X				X	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4		X				X	X	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X								
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X								
EPH by GCxGC-FID	All	NDPs: 0 Tests: 3						X	X	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X							
Fluoride	All	NDPs: 0 Tests: 1	X								
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4						X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4		X				X	X	X	

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)						23840135	23840138	23840139	23840140
	Customer Sample Reference						BH-OBC-15	SPOIL HEAP 1	SPOIL HEAP 2	SPOIL HEAP 3
	AGS Reference									
	Depth (m)						0.20 - 0.20			
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)		
	Sample Type		S	S	S	S	S	S		
	Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X						
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X							
Mercury Dissolved	All	NDPs: 0 Tests: 1	X							
Metals in solid samples by OES	All	NDPs: 0 Tests: 4		X		X	X	X		
PAH by GCMS	All	NDPs: 0 Tests: 4		X		X	X	X		
pH	All	NDPs: 0 Tests: 4		X		X	X	X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X							
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4		X		X	X	X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X							
Sample description	All	NDPs: 0 Tests: 4		X		X	X	X		
Total Organic Carbon	All	NDPs: 0 Tests: 4		X		X	X	X		
Total Sulphur	All	NDPs: 0 Tests: 1		X						
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X						
VOC MS (S)	All	NDPs: 0 Tests: 4				X	X	X	X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23840135	BH-OBC-15	0.20 - 0.20	Dark Brown	Sandy Loam	Stones	None
23840138	SPOIL HEAP 1		Light Brown	Sandy Loam	Stones	None
23840139	SPOIL HEAP 2		Light Brown	Clay Loam	Stones	Vegetation
23840140	SPOIL HEAP 3		Light Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

		CERTIFICATE OF ANALYSIS						Validated	
SDG: 210304-137		Client Reference: B025563		Report Number: 590462					
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:					

CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

GRO by GC-FID (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

Results Legend			Customer Sample Ref.		BH-OBC-15		SPOIL HEAP 1		SPOIL HEAP 2		SPOIL HEAP 3					
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 01/03/2021 . 04/03/2021 210304-137 23840135	SPOIL HEAP 1 Soil/Solid (S) 02/03/2021 . 04/03/2021 210304-137 23840138	SPOIL HEAP 2 Soil/Solid (S) 02/03/2021 . 04/03/2021 210304-137 23840139	SPOIL HEAP 3 Soil/Solid (S) 02/03/2021 . 04/03/2021 210304-137 23840140									
M	Aqueous / settled sample.															
aq	Disolved / filtered sample.															
dis.filt	Total / unfiltered sample.															
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.															
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery															
**	Trigger breach confirmed															
(F)	Sample deviation (see appendix)															
1-4	Sample deviation (see appendix)															
5-6	Sample deviation (see appendix)															
7-8	Sample deviation (see appendix)															
9-10	Sample deviation (see appendix)															
11-12	Sample deviation (see appendix)															
13-14	Sample deviation (see appendix)															
15-16	Sample deviation (see appendix)															
17-18	Sample deviation (see appendix)															
19-20	Sample deviation (see appendix)															
21-22	Sample deviation (see appendix)															
23-24	Sample deviation (see appendix)															
25-26	Sample deviation (see appendix)															
27-28	Sample deviation (see appendix)															
29-30	Sample deviation (see appendix)															
31-32	Sample deviation (see appendix)															
33-34	Sample deviation (see appendix)															
35-36	Sample deviation (see appendix)															
37-38	Sample deviation (see appendix)															
39-40	Sample deviation (see appendix)															
41-42	Sample deviation (see appendix)															
43-44	Sample deviation (see appendix)															
45-46	Sample deviation (see appendix)															
47-48	Sample deviation (see appendix)															
49-50	Sample deviation (see appendix)															
51-52	Sample deviation (see appendix)															
53-54	Sample deviation (see appendix)															
55-56	Sample deviation (see appendix)															
57-58	Sample deviation (see appendix)															
59-60	Sample deviation (see appendix)															
61-62	Sample deviation (see appendix)															
63-64	Sample deviation (see appendix)															
65-66	Sample deviation (see appendix)															
67-68	Sample deviation (see appendix)															
69-70	Sample deviation (see appendix)															
71-72	Sample deviation (see appendix)															
73-74	Sample deviation (see appendix)															
75-76	Sample deviation (see appendix)															
77-78	Sample deviation (see appendix)															
79-80	Sample deviation (see appendix)															
81-82	Sample deviation (see appendix)															
83-84	Sample deviation (see appendix)															
85-86	Sample deviation (see appendix)															
87-88	Sample deviation (see appendix)															
89-90	Sample deviation (see appendix)															
91-92	Sample deviation (see appendix)															
93-94	Sample deviation (see appendix)															
95-96	Sample deviation (see appendix)															
97-98	Sample deviation (see appendix)															
99-100	Sample deviation (see appendix)															

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBC-15	SPOIL HEAP 1	SPOIL HEAP 2	SPOIL HEAP 3		
# M aq dis.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 01/03/2021	Soil/Solid (S) 02/03/2021	Soil/Solid (S) 02/03/2021	Soil/Solid (S) 02/03/2021		
(F) 1-44\$@				04/03/2021 210304-137 23840135	04/03/2021 210304-137 23840138	04/03/2021 210304-137 23840139	04/03/2021 210304-137 23840140		
Component		LOD/Units	Method						
Dibromofluoromethane**		%	TM116	109	129	119	122		
Toluene-d8**		%	TM116	93.1	83.8	95.5	83.4		
4-Bromofluorobenzene**		%	TM116	78	71	94.9	71.9		
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M					
Chloromethane		<7 µg/kg	TM116	<7 #					
Vinyl Chloride		<6 µg/kg	TM116	<6 @ M					
Bromomethane		<10 µg/kg	TM116	<10 M					
Chloroethane		<10 µg/kg	TM116	<10 M					
Trichlorofluorormethane		<6 µg/kg	TM116	<6 M					
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #					
Carbon Disulphide		<7 µg/kg	TM116	<7 M					
Dichloromethane		<10 µg/kg	TM116	<10 #					
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M	<10 2 M	<200 2 M	<10 2 M		
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M					
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M					
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M					
2,2-Dichloropropane		<10 µg/kg	TM116	<10					
Bromochloromethane		<10 µg/kg	TM116	<10 M					
Chloroform		<8 µg/kg	TM116	<8 M					
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M					
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M					
Carbontetrachloride		<10 µg/kg	TM116	<10 M					
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M					
Benzene		<9 µg/kg	TM116	<9 M	<9 2 M	<180 2 M	<9 2 M		
Trichloroethene		<9 µg/kg	TM116	<9 #					
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M					
Dibromomethane		<9 µg/kg	TM116	<9 M					
Bromodichloromethane		<7 µg/kg	TM116	<7 M					
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M					
Toluene		<7 µg/kg	TM116	<7 M	<7 2 M	272 2 M	<7 2 M		
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M					

CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBC-15	SPOIL HEAP 1	SPOIL HEAP 2	SPOIL HEAP 3		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20					
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
+	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			04/03/2021	04/03/2021	04/03/2021	04/03/2021		
	Trigger breach confirmed			210304-137	210304-137	210304-137	210304-137		
(F)	Sample deviation (see appendix)			23840135	23840138	23840139	23840140		
1-4+5@									
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 2 M	<80 2 M	<4 2 M			
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 2 #	<200 2 #	<10 2 #			
o-Xylene	<10 µg/kg	TM116	<10 M	<10 2 M	<200 2 M	<10 2 M			
Styrene	<10 µg/kg	TM116	<10 @ #						
Bromoform	<10 µg/kg	TM116	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13 M						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*#@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH-OBC-15 0.20 - 0.20 SOLID 01/03/2021 00:00:00 04/03/2021 13:30:00 210304-137 23840135 TM048	10/03/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	SPOIL HEAP 1 SOLID 02/03/2021 00:00:00 04/03/2021 13:30:00 210304-137 23840138 TM048	11/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	SPOIL HEAP 2 SOLID 02/03/2021 00:00:00 04/03/2021 13:30:00 210304-137 23840139 TM048	11/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	SPOIL HEAP 3 SOLID 02/03/2021 00:00:00 04/03/2021 13:30:00 210304-137 23840140 TM048	11/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.108	Natural Moisture Content (%)	20.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	83.1
Particle Size <4mm	>95%		

Case

SDG 210304-137

Lab Sample Number(s) 23840135

Sampled Date 01-Mar-2021

Customer Sample Ref. BH-OBC-15

Depth (m) 0.20 - 0.20

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.012	<0.01	0.12	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	0.00499	<0.0025	0.0499	<0.025	-	-	-
Dissolved Organic Carbon	6.68	<3	66.8	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00158	<0.0005	0.0158	<0.005	-	-	-
Barium	0.0888	<0.0002	0.888	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0504	<0.01	0.504	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.2	<0.2	232	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.00032	<0.0002	0.0032	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.52	<0.036	5.2	<0.36	-	-	-
Manganese	0.00348	<0.003	0.0348	<0.03	-	-	-
Molybdenum	0.00392	<0.003	0.0392	<0.03	-	-	-
Nickel	0.00178	<0.0004	0.0178	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00236	<0.001	0.0236	<0.01	-	-	-
Zinc	0.0593	<0.001	0.593	<0.01	-	-	-
Chloride	2	<2	20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	08-Mar-2021
pH (pH Units)	8.43
Conductivity (µS/cm)	108.00
Temperature (°C)	19.10
Volume Leachant (Litres)	0.882

13/03/2021 17:06:54



CERTIFICATE OF ANALYSIS

Validated

SDG:210304-137Client Reference: B025563Report Number: 590462

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.108

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport - f

20.4

83.1

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210304-137

23840135

01-Mar-2021

BH-OBC-15

0.20 - 0.20

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Hardness dissolved

60

<0.65

600

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.17

<0.019

1.7

<0.19

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

08-Mar-2021

8.43

108.00

19.10

0.882



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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23840135	23840138	23840139	23840140
Customer Sample Ref.	BH-OBC-15	SPOIL HEAP 1	SPOIL HEAP 2	SPOIL HEAP 3
AGS Ref.				
Depth	0.20 - 0.20			
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	10-Mar-2021			
Anions by Kone (soil)	10-Mar-2021			
Anions by Kone (w)	09-Mar-2021			
Asbestos ID in Solid Samples	10-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021
Boron Water Soluble	09-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
CEN 10:1 Leachate (1 Stage)	08-Mar-2021			
CEN Readings	09-Mar-2021			
Chromium III	10-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	10-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021
Dissolved Metals by ICP-MS	10-Mar-2021			
Dissolved Organic/Inorganic Carbon	13-Mar-2021			
EPH by GCxGC-FID		11-Mar-2021	11-Mar-2021	11-Mar-2021
EPH CWG GC (S)	10-Mar-2021			
Fluoride	10-Mar-2021			
GRO by GC-FID (S)	10-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021
Hexavalent Chromium (s)	10-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Low Level Cyanide (W)	11-Mar-2021			
Low Level Hexavalent Chromium (w)	10-Mar-2021			
Mercury Dissolved	13-Mar-2021			
Metals in solid samples by OES	10-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Moisture at 105C	08-Mar-2021			
PAH by GCMS	09-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021
pH	10-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
pH Value of Filtered Water	11-Mar-2021			
Phenols by HPLC (S)	09-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021
Phenols by HPLC (W)	10-Mar-2021			
Sample description	06-Mar-2021	10-Mar-2021	10-Mar-2021	10-Mar-2021
Total Organic Carbon	12-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Total Sulphur	11-Mar-2021			
TPH CWG GC (S)	10-Mar-2021			
VOC MS (S)	10-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low			
Component	Method Code	QC 2318	
Ammoniacal Nitrogen as N	TM099	100.2	96.04 : 106.80

Anions by Kone (soil)			
Component	Method Code	QC 2375	
Chloride (soluble)	TM243	136.27	83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	154.67	70.00 : 130.00

Anions by Kone (w)			
Component	Method Code	QC 2343	
Chloride	TM184	107.0	92.93 : 115.43
Sulphate (soluble)	TM184	96.8	90.53 : 113.03

Boron Water Soluble			
Component	Method Code	QC 2397	QC 2333
Water Soluble Boron	TM222	89.5	94.0
		84.00 : 111.00	77.30 : 106.22

Cyanide Comp/Free/Total/Thiocyanate			
Component	Method Code	QC 2302	QC 2331
Free Cyanide	TM153	101.98	105.94
		79.00 : 115.00	79.00 : 115.00
Thiocyanate	TM153	101.28	101.28
		94.09 : 113.89	94.09 : 113.89
Total Cyanide	TM153	102.1	107.69
		73.07 : 107.47	73.07 : 107.47

Dissolved Metals by ICP-MS			
Component	Method Code	QC 2367	
Aluminium	TM152	103.0	90.98 : 111.82
Antimony	TM152	102.67	90.44 : 113.04
Arsenic	TM152	102.67	88.00 : 112.00



CERTIFICATE OF ANALYSIS

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SDG:

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210304-137
Cambridge South East Tra

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B025563
7000964

Report Number:

Superseded Report:

590462

Dissolved Metals by ICP-MS

		QC 2367
Barium	TM152	97.5 90.20 : 111.19
Beryllium	TM152	104.17 87.77 : 113.97
Bismuth	TM152	100.67 91.90 : 112.20
Borate	TM152	102.47 88.00 : 112.00
Boron	TM152	102.33 96.48 : 114.93
Cadmium	TM152	102.33 96.43 : 110.53
Calcium	TM152	103.33 81.38 : 119.09
Chromium	TM152	101.17 91.84 : 108.67
Cobalt	TM152	101.0 88.00 : 112.00
Copper	TM152	102.83 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00
Lead	TM152	102.83 88.00 : 112.00
Lithium	TM152	103.67 91.62 : 113.12
Magnesium	TM152	100.67 93.14 : 107.91
Manganese	TM152	101.17 95.03 : 110.58
Molybdenum	TM152	100.0 88.00 : 112.00
Nickel	TM152	102.83 88.00 : 112.00
Phosphorus	TM152	103.33 88.00 : 112.00
Potassium	TM152	102.0 93.90 : 112.36
Selenium	TM152	103.5 91.58 : 115.98
Silver	TM152	101.33 88.80 : 122.30
Sodium	TM152	102.0 94.28 : 110.71
Strontium	TM152	102.33 88.00 : 112.00
Tellurium	TM152	104.33 93.32 : 114.66
Thallium	TM152	100.5 88.00 : 112.00
Tin	TM152	102.17 92.63 : 109.70
Titanium	TM152	102.5 95.58 : 111.68



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Dissolved Metals by ICP-MS

		QC 2367
Tungsten	TM152	101.0 81.32 : 124.72
Uranium	TM152	99.5 88.00 : 112.00
Vanadium	TM152	103.17 88.00 : 112.00
Zinc	TM152	103.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2351
Dissolved Inorganic Carbon	TM090	115.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	99.0 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2394
EPH >C10-C40 Raw	TM415	92.15 59.15 : 115.05

EPH CWG GC (S)

Component	Method Code	QC 2315
EPH >C8-C40 Raw	TM414	88.7 57.98 : 125.66
Total Aliphatics Raw	TM414	93.52 64.55 : 136.91
Total Aromatics Raw	TM414	104.32 55.89 : 144.43

Fluoride

Component	Method Code	QC 2356
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2348	QC 2317
QC	TM089	88.32 70.34 : 111.95	82.05 70.34 : 111.95

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
GRO by GC-FID (S)						

Hexavalent Chromium (s)			
Component	Method Code	QC 2363	QC 2352
Hexavalent Chromium	TM151	102.0 92.00 : 111.20	104.0 92.00 : 111.20

Low Level Cyanide (W)		
Component	Method Code	QC 2384
Free Cyanide - Low Level	TM279	86.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	103.5 81.83 : 110.45

Mercury Dissolved		
Component	Method Code	QC 2357
Mercury Dissolved (CVAf)	TM183	95.6 74.00 : 116.00

Metals in solid samples by OES			
Component	Method Code	QC 2394	QC 2392
Aluminium	TM181	85.22 73.56 : 108.85	109.73 73.56 : 108.85
Antimony	TM181	95.53 76.89 : 111.24	112.6 76.89 : 111.24
Arsenic	TM181	97.97 88.53 : 111.01	110.76 88.53 : 111.01
Barium	TM181	88.07 77.67 : 105.35	106.42 77.67 : 105.35
Beryllium	TM181	95.52 85.44 : 109.61	97.39 85.44 : 109.61
Boron	TM181	85.39 73.51 : 104.66	100.0 73.51 : 104.66
Cadmium	TM181	88.48 77.67 : 104.12	96.3 77.67 : 104.12
Chromium	TM181	83.57 79.64 : 105.83	96.75 79.64 : 105.83
Cobalt	TM181	89.31 84.60 : 104.13	99.06 84.60 : 104.13
Copper	TM181	93.31 82.40 : 105.45	101.58 82.40 : 105.45
Iron	TM181	94.44 82.95 : 110.58	107.94 82.95 : 110.58
Lead	TM181	91.67 78.24 : 104.05	97.97 78.24 : 104.05

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES						

		QC 2394	QC 2392
Manganese	TM181	100.83 94.29 : 119.51	121.11 94.29 : 119.51
Mercury	TM181	95.89 83.16 : 107.81	106.76 83.16 : 107.81
Molybdenum	TM181	94.24 87.11 : 106.87	109.88 87.11 : 106.87
Nickel	TM181	87.04 80.26 : 102.28	100.0 80.26 : 102.28
Phosphorus	TM181	105.66 94.56 : 124.28	118.18 94.56 : 124.28
Selenium	TM181	96.47 82.28 : 110.48	107.84 82.28 : 110.48
Strontium	TM181	89.53 79.13 : 102.79	103.56 79.13 : 102.79
Thallium	TM181	96.02 82.94 : 111.86	107.96 82.94 : 111.86
Tin	TM181	97.34 86.72 : 110.03	112.55 86.72 : 110.03
Titanium	TM181	75.95 66.23 : 102.06	92.37 66.23 : 102.06
Vanadium	TM181	93.04 86.19 : 109.45	108.06 86.19 : 109.45
Zinc	TM181	93.84 84.68 : 113.99	110.06 84.68 : 113.99

PAH by GCMS			
Component	Method Code	QC 2366	QC 2367
Acenaphthene	TM218	94.0 80.97 : 105.99	103.5 73.47 : 109.80
Acenaphthylene	TM218	95.5 74.76 : 107.36	99.5 70.00 : 130.00
Anthracene	TM218	91.5 73.04 : 106.97	100.0 68.68 : 111.89
Benz(a)anthracene	TM218	86.5 68.79 : 119.64	87.0 68.12 : 118.39
Benzo(a)pyrene	TM218	82.5 66.17 : 117.52	78.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	87.5 66.40 : 118.34	80.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	85.5 67.68 : 112.07	78.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	87.0 72.84 : 114.66	82.5 73.10 : 117.03
Chrysene	TM218	86.5 68.39 : 115.56	84.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	82.5 69.03 : 110.45	91.0 67.32 : 121.35
Fluoranthene	TM218	103.0 69.37 : 117.19	78.0 75.16 : 117.28
Fluorene	TM218	93.0 75.38 : 105.98	104.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	86.0 65.91 : 113.61	80.5 68.91 : 117.62

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
PAH by GCMS						

		QC 2366	QC 2367
Naphthalene	TM218	96.0 71.40 : 105.87	92.0 72.12 : 106.18
Phenanthrene	TM218	102.0 74.04 : 109.30	87.0 69.01 : 113.72
Pyrene	TM218	98.0 69.68 : 115.27	82.5 64.28 : 115.75

Component	Method Code	QC 2321	QC 2388
pH	TM133	101.45 98.71 : 102.32	101.71 98.71 : 102.32

Component	Method Code	QC 2383
pH	TM256	99.73 99.33 : 102.54

Component	Method Code	QC 2366	QC 2319
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.61 64.54 : 117.79	47.95 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	16.19 22.43 : 157.02	18.1 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	48.85 74.40 : 108.98	50.73 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	33.57 47.22 : 132.72	38.57 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18	54.97 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	51.57 71.43 : 129.59	52.83 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	49.06 76.56 : 106.38	51.25 76.56 : 106.38

Component	Method Code	QC 2342
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	50.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.33 76.60 : 126.28

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Phenols by HPLC (W)						

		QC 2342
Napthol by HPLC (W)	TM259	56.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	51.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.83 79.09 : 131.82

Component	Method Code	QC 2364	QC 2312
Total Organic Carbon	TM132	100.39 87.02 : 113.45	99.22 87.02 : 113.45

Component	Method Code	QC 2336
Total Sulphur %	TM132	96.89 61.64 : 114.47

Component	Method Code	QC 2307	QC 2316	QC 2336	QC 2333
1,1,1,2-tetrachloroethane	TM116	100.2 84.84 : 116.25	103.4 79.10 : 119.66	102.0 86.59 : 118.97	98.4 79.10 : 119.66
1,1,1-Trichloroethane	TM116	99.4 73.73 : 118.05	103.2 84.25 : 112.57	108.2 86.26 : 117.53	97.4 84.25 : 112.57
1,1,2-Trichloroethane	TM116	95.4 77.12 : 116.04	96.8 81.29 : 113.79	95.8 75.16 : 112.70	95.6 81.29 : 113.79
1,1-Dichloroethane	TM116	109.2 74.46 : 129.15	109.0 86.77 : 122.11	110.4 83.27 : 122.16	102.6 86.77 : 122.11
1,2-Dichloroethane	TM116	108.2 92.38 : 131.65	112.0 90.04 : 132.28	137.4 89.30 : 133.10	109.6 90.04 : 132.28
1,4-Dichlorobenzene	TM116	96.4 83.64 : 126.18	105.8 80.81 : 125.07	101.2 82.59 : 123.23	90.2 80.81 : 125.07
2-Chlorotoluene	TM116	83.6 76.03 : 113.25	87.0 73.13 : 114.13	98.0 66.81 : 118.43	80.0 73.13 : 114.13
4-Chlorotoluene	TM116	81.0 66.90 : 112.46	86.6 68.66 : 109.13	94.2 65.88 : 114.76	77.8 68.66 : 109.13
Benzene	TM116	99.4 88.60 : 113.80	98.8 84.29 : 112.22	101.8 93.16 : 123.63	97.0 84.29 : 112.22
Carbon Disulphide	TM116	88.4 74.91 : 122.14	92.4 75.11 : 124.81	100.4 75.11 : 124.81	89.2 75.11 : 124.81
Carbontetrachloride	TM116	98.8 80.31 : 124.50	106.8 82.35 : 126.46	111.0 82.35 : 126.46	105.6 82.35 : 126.46
Chlorobenzene	TM116	102.4 83.81 : 114.18	104.6 82.88 : 122.42	97.4 85.07 : 118.13	101.6 82.88 : 122.42
Chloroform	TM116	109.0 87.40 : 122.49	112.0 90.35 : 120.38	113.0 88.13 : 122.71	105.4 90.35 : 120.38

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210304-137	Client Reference:	B025563	Report Number:	590462	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						

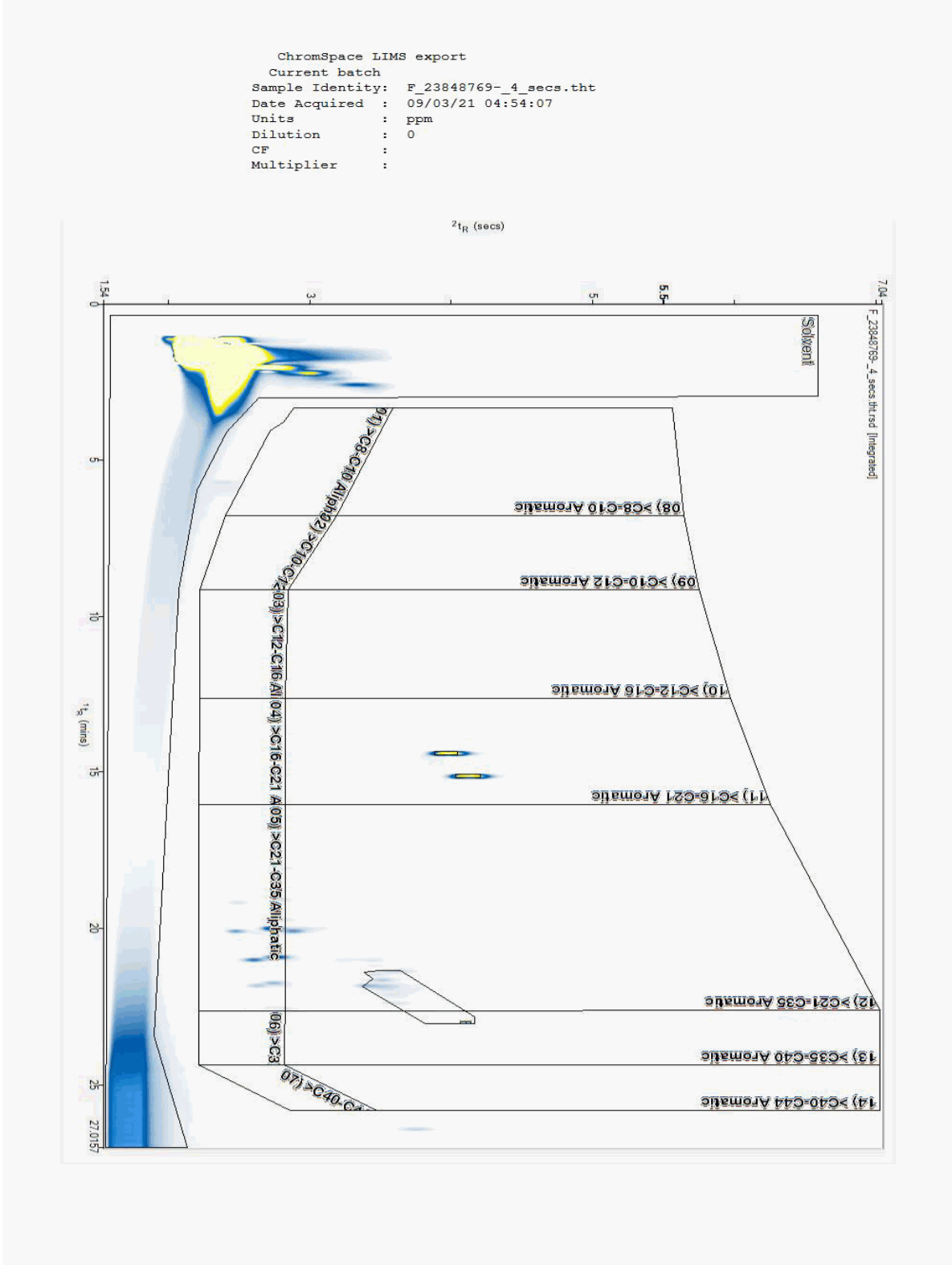
		QC 2307	QC 2316	QC 2336	QC 2333
Chloromethane	TM116	104.0 65.89 : 136.93	110.8 65.80 : 138.88	120.0 61.62 : 145.66	102.2 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	103.0 80.67 : 126.72	105.0 78.27 : 128.90	106.4 78.27 : 128.90	100.4 78.27 : 128.90
Dibromomethane	TM116	91.4 73.23 : 118.35	100.6 76.00 : 120.73	98.6 77.47 : 121.29	98.6 76.00 : 120.73
Dichloromethane	TM116	113.2 81.11 : 133.25	115.0 92.27 : 134.36	116.0 87.89 : 134.72	110.0 92.27 : 134.36
Ethylbenzene	TM116	79.6 75.92 : 110.41	81.4 70.95 : 113.07	92.8 79.92 : 110.05	80.2 70.95 : 113.07
Hexachlorobutadiene	TM116	41.0 12.82 : 152.73	46.0 14.55 : 147.92	70.4 16.78 : 153.29	36.0 14.55 : 147.92
Isopropylbenzene	TM116	63.6 55.79 : 97.59	60.8 52.00 : 108.19	85.4 64.20 : 119.59	57.4 52.00 : 108.19
Naphthalene	TM116	108.8 80.86 : 128.81	111.2 80.29 : 135.77	114.4 79.29 : 125.59	103.0 80.29 : 135.77
o-Xylene	TM116	78.2 69.99 : 108.74	78.4 64.92 : 98.85	87.4 72.86 : 102.10	78.0 64.92 : 98.85
p/m-Xylene	TM116	74.2 68.32 : 108.91	74.5 69.47 : 97.31	86.6 74.06 : 106.47	73.9 69.47 : 97.31
Sec-Butylbenzene	TM116	49.2 38.50 : 101.50	51.2 27.03 : 135.73	74.0 44.71 : 117.87	42.2 27.03 : 135.73
Tetrachloroethene	TM116	92.2 76.95 : 121.02	98.2 81.43 : 126.65	100.8 85.86 : 122.95	95.4 81.43 : 126.65
Toluene	TM116	87.2 74.24 : 107.42	88.4 82.44 : 103.50	90.6 87.82 : 116.21	87.8 82.44 : 103.50
Trichloroethene	TM116	96.6 85.28 : 109.36	94.2 79.80 : 112.33	100.8 79.80 : 112.33	95.2 79.80 : 112.33
Trichlorofluoromethane	TM116	105.0 84.55 : 133.27	109.6 89.67 : 132.09	115.0 80.52 : 132.12	102.0 89.67 : 132.09
Vinyl Chloride	TM116	108.2 68.02 : 143.37	110.8 69.66 : 136.55	108.8 74.57 : 146.88	101.2 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210304-137	Client Reference:	B025563	Report Number:	590462	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Chromatogram						
Analysis:	EPH CWG GC (S)	Sample No :	23848769	Depth :	0.20 - 0.20	
		Sample ID :	BH-OBC-15			





CERTIFICATE OF ANALYSIS

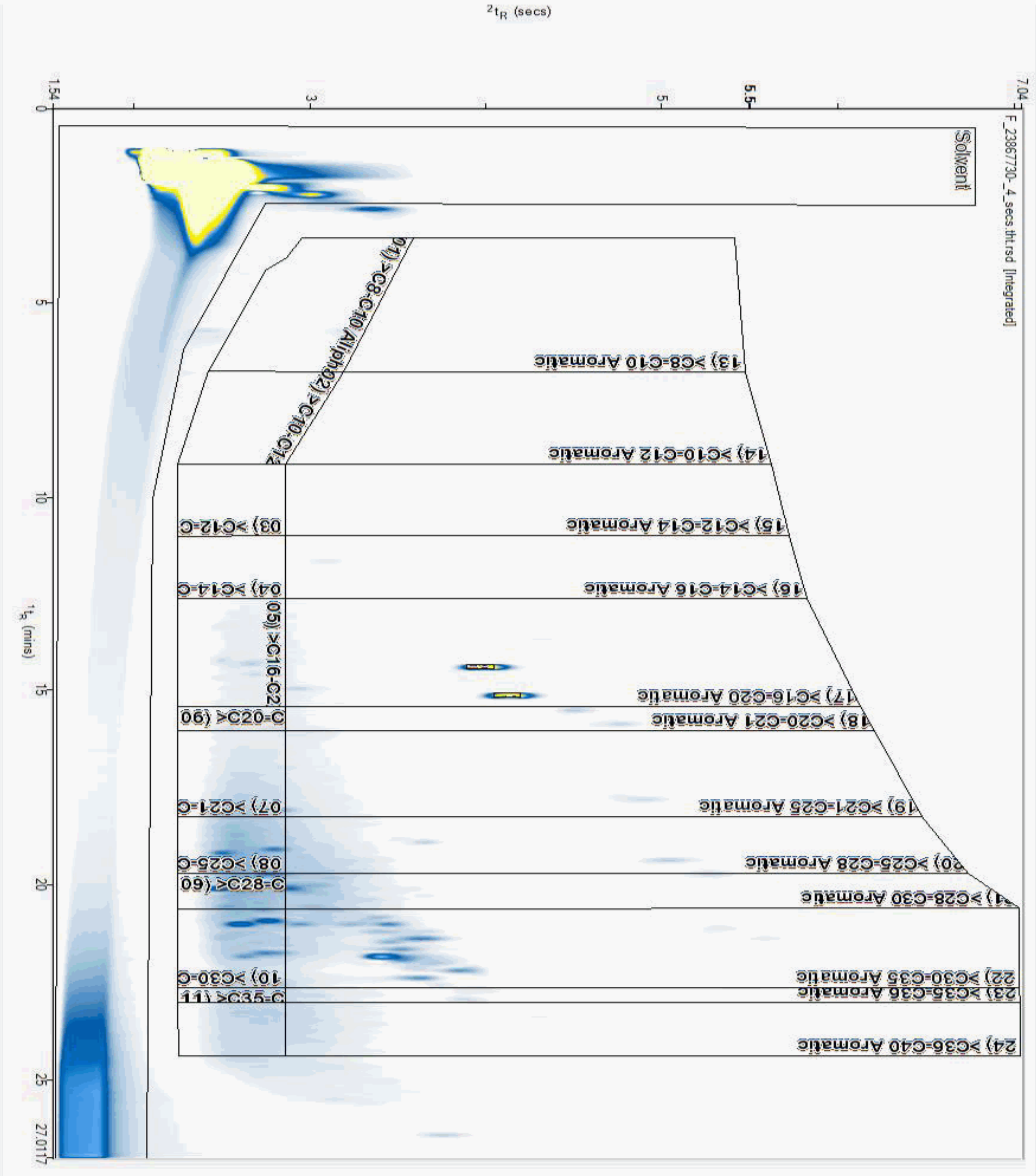
Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23867730 Depth :
Sample ID : SPOIL HEAP 3

ChromSpace LIMS export
Current batch
Sample Identity: F_23867730-4_secs.tht
Date Acquired : 10/03/21 11:38:11
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

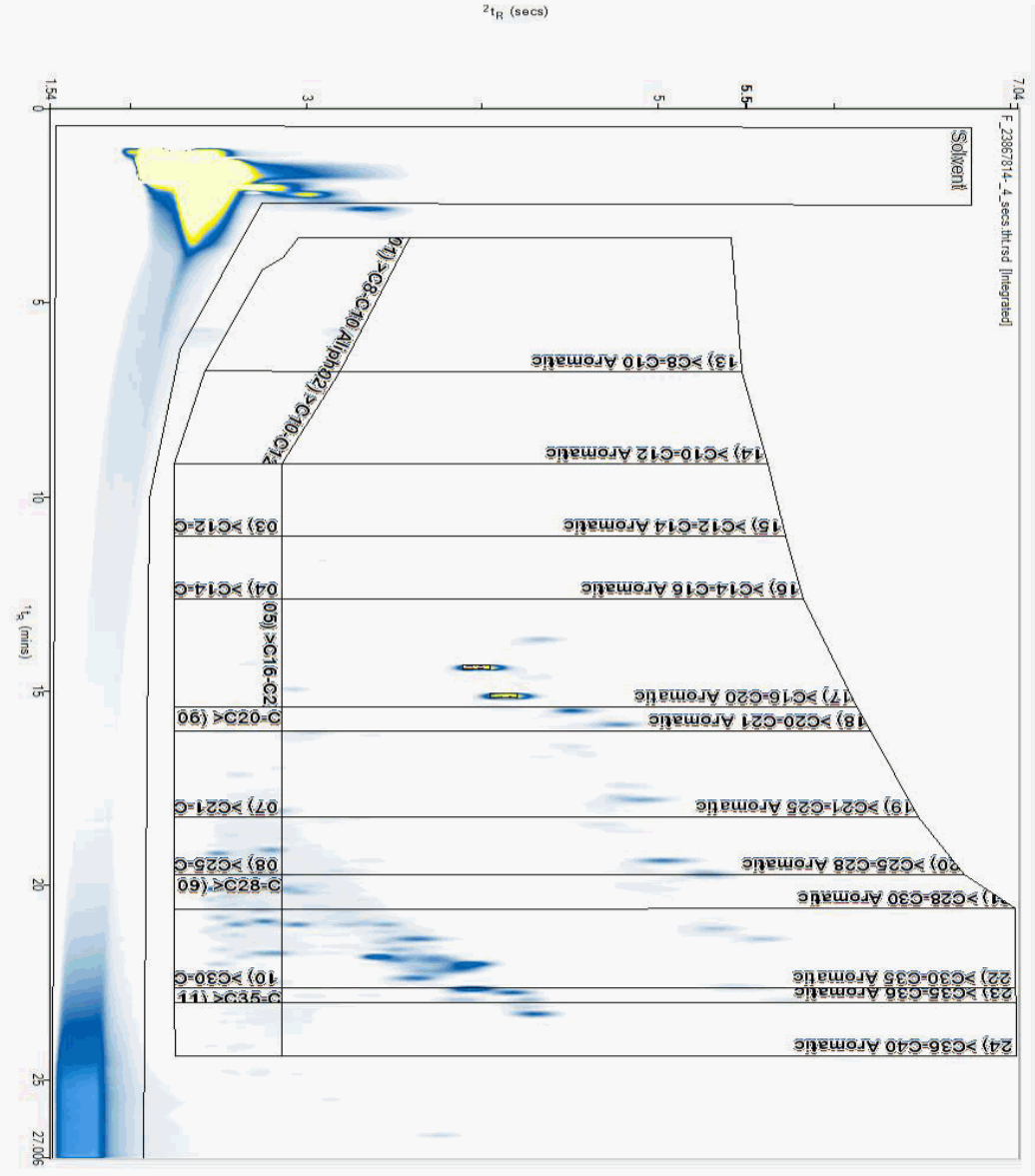
Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23867814 Depth :
Sample ID : SPOIL HEAP 2

ChromSpace LIMS export
Current batch
Sample Identity: F_23867814-4_secs.tht
Date Acquired : 10/03/21 10:57:02
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23868041 Depth :
Sample ID : SPOIL HEAP 1



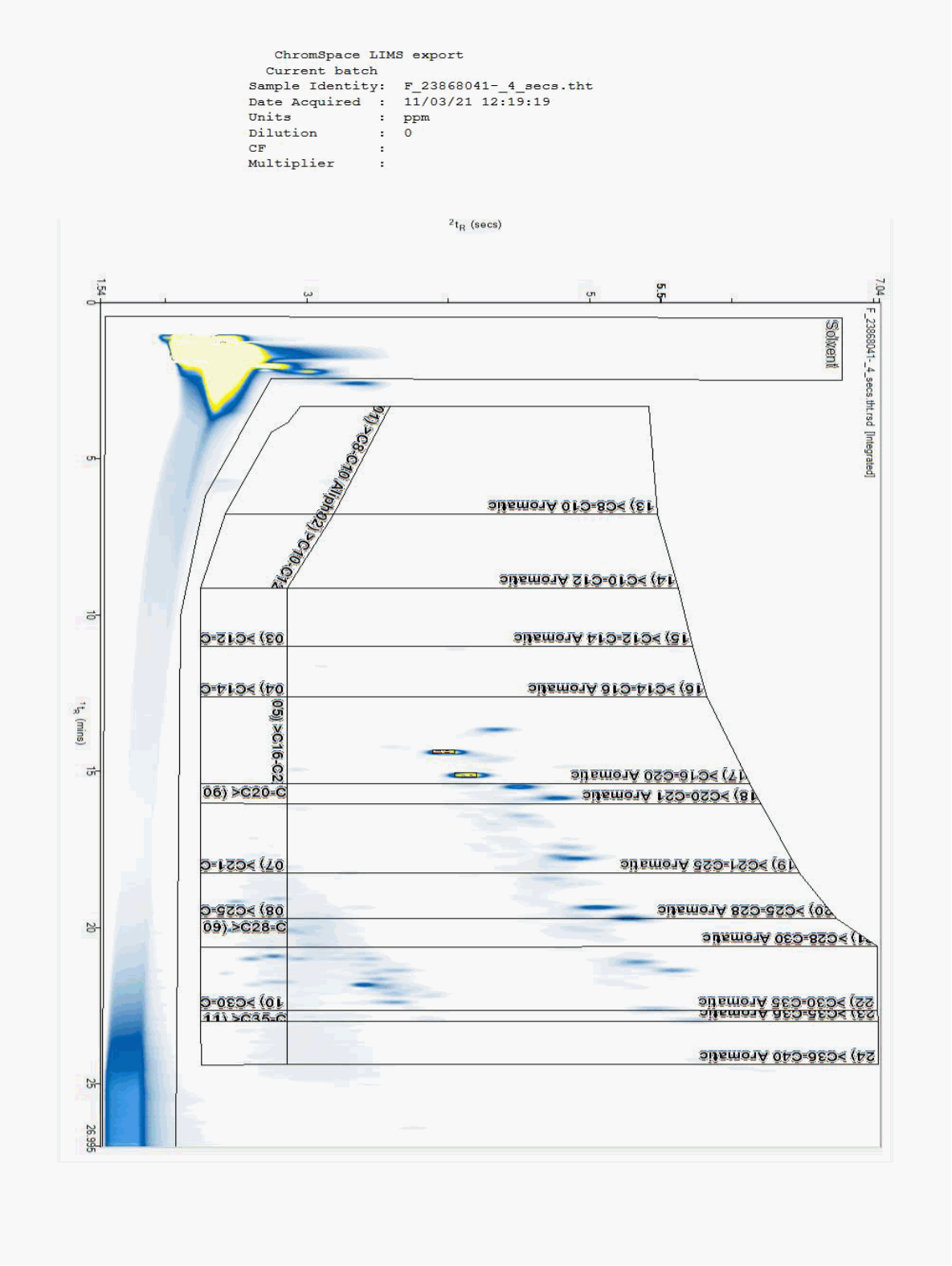
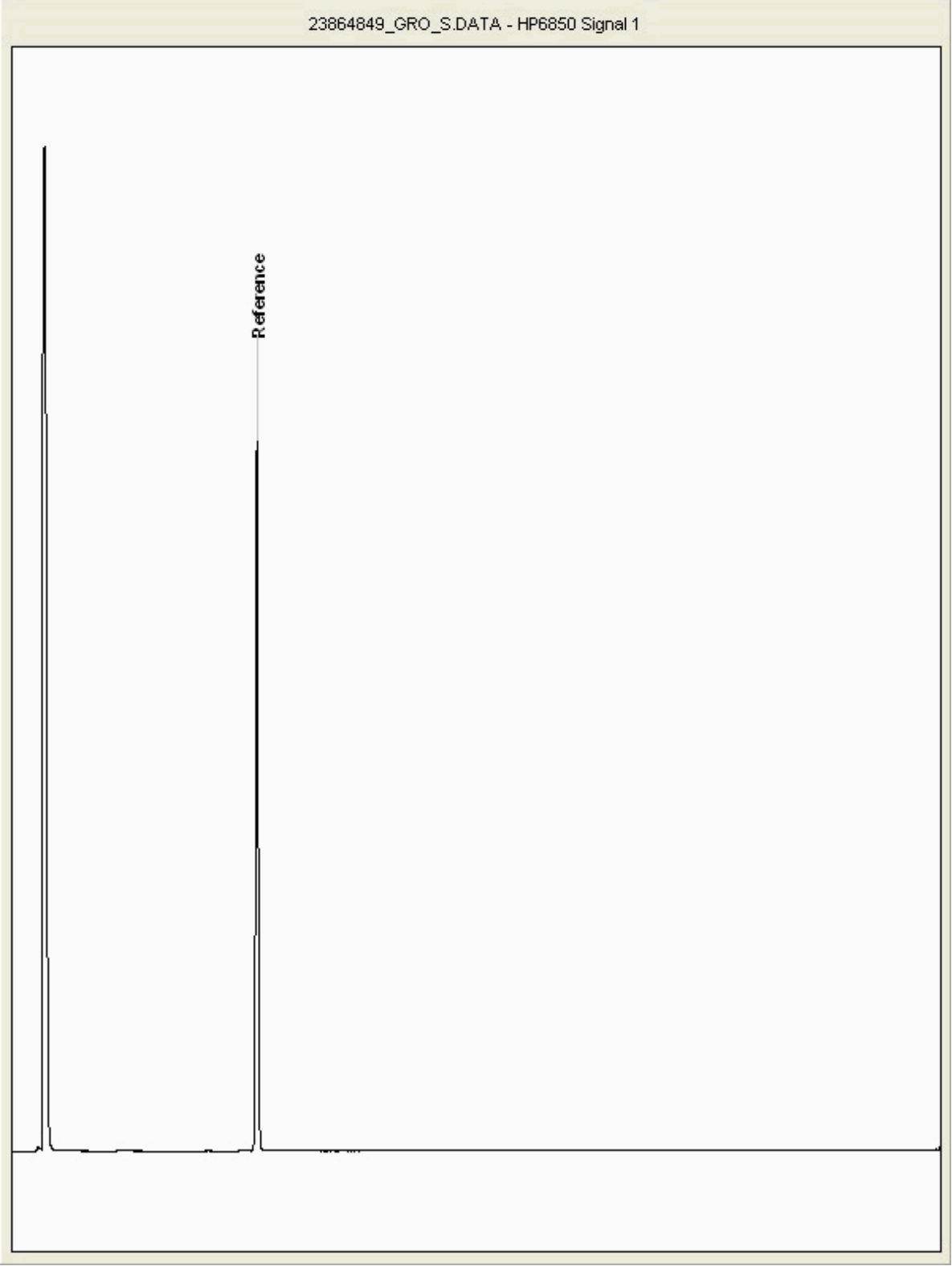
CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23864849 Depth : 0.20 - 0.20
Sample ID : BH-OBC-15





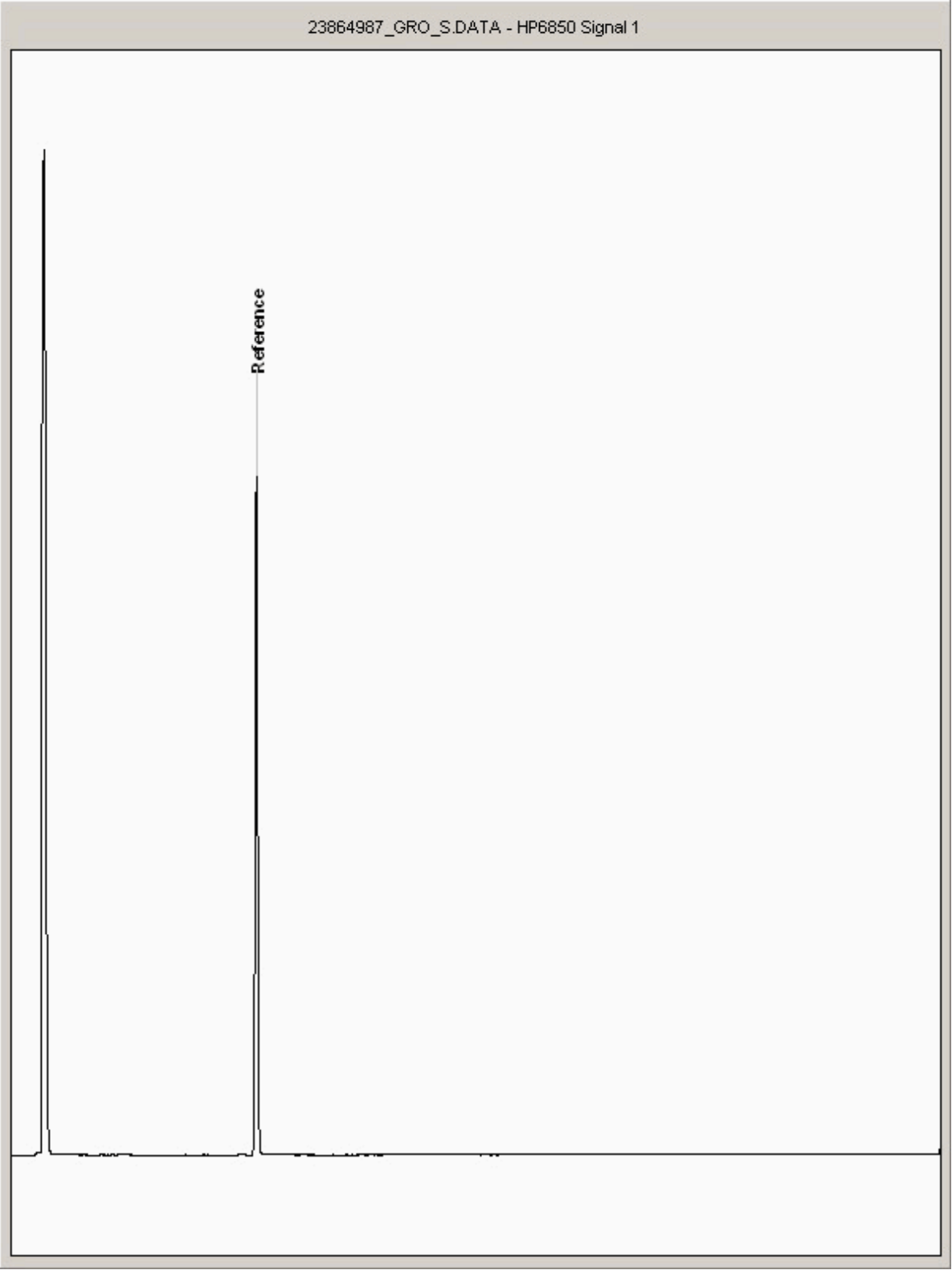
CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23864987 Depth :
Sample ID : SPOIL HEAP 1



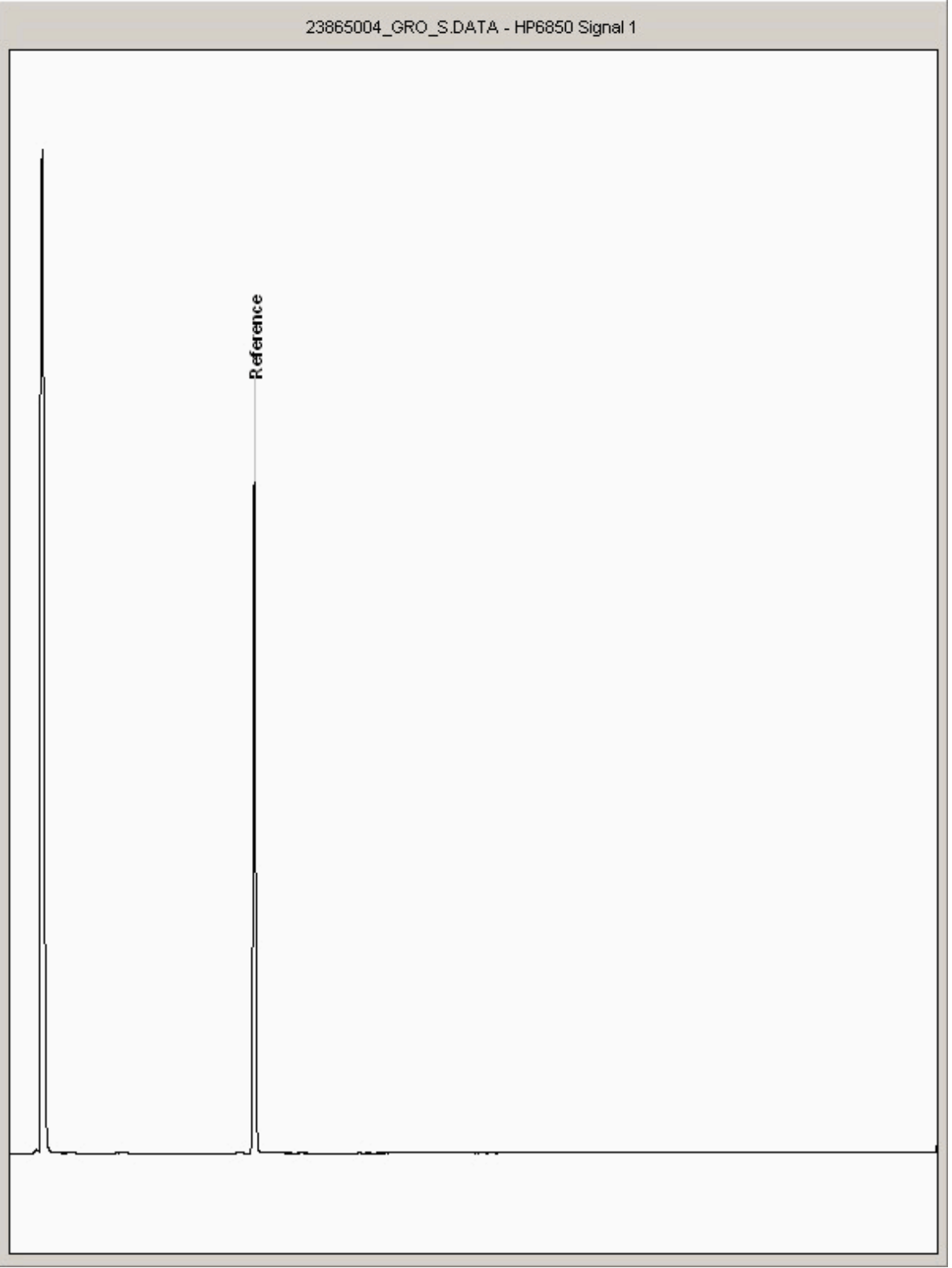
CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-137	Client Reference:	B025563	Report Number:	590462
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23865004 Depth :
Sample ID : SPOIL HEAP 2





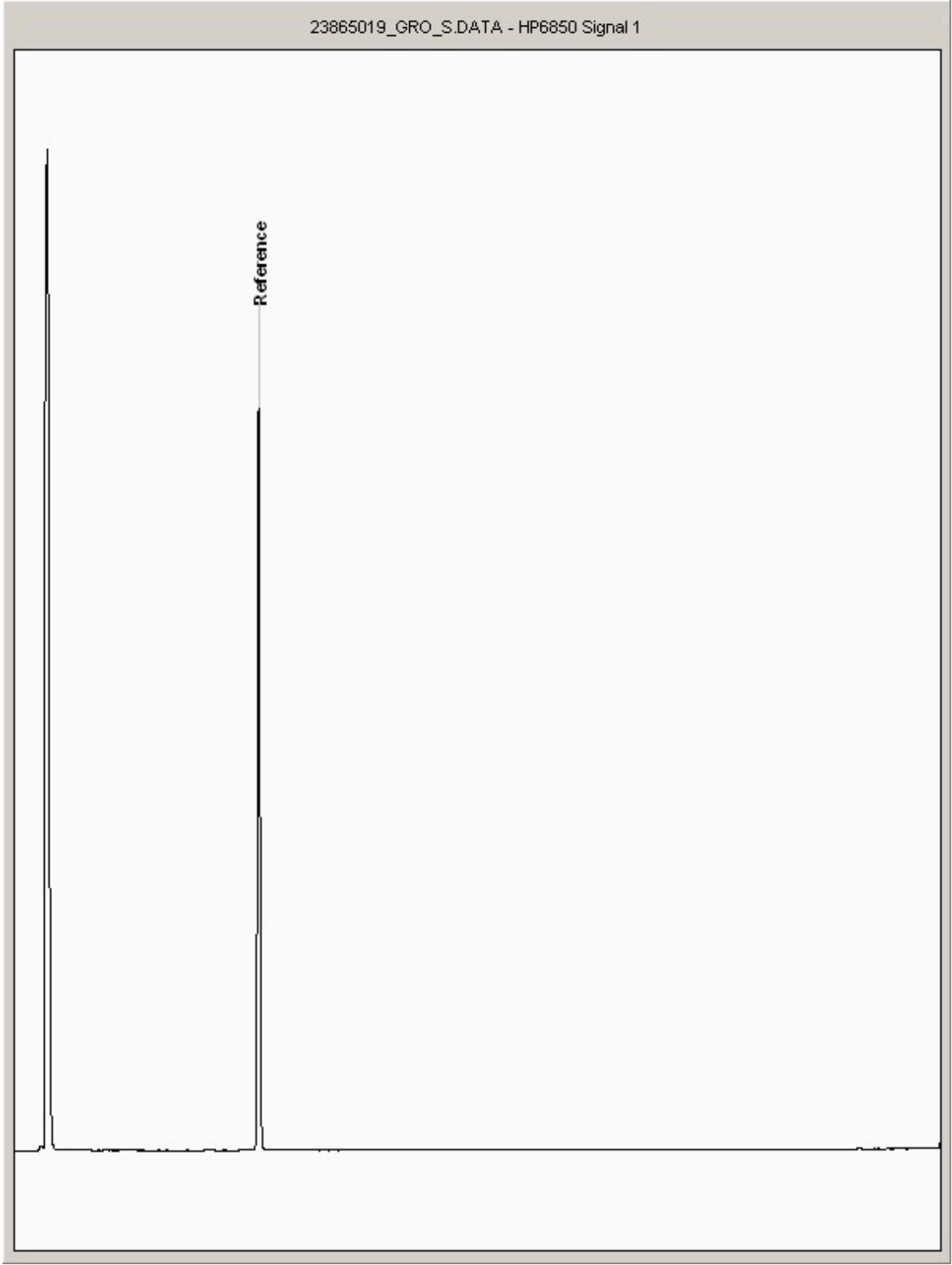
CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23865019 Depth :
Sample ID : SPOIL HEAP 3



CERTIFICATE OF ANALYSIS

SDG: 210304-137 Client Reference: B025563 Report Number: 590462
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

Attention: Richard Tonge

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Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 13 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210304-157
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 590446

We received 8 samples on Thursday March 04, 2021 and 2 of these samples were scheduled for analysis which was completed on Saturday March 13, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23841034	BHPTR33	ES1	0.10 - 0.10	02/03/2021
23841035	BHPTR33	ES2	0.20 - 0.20	02/03/2021
23841036	BHPTR33	ES3	0.50 - 0.50	02/03/2021
23841031	BHPTR33	ES4	1.00 - 1.00	02/03/2021
23841026	BHPTR34	ES1	0.10 - 0.10	02/03/2021
23841027	BHPTR34	ES2	0.20 - 0.20	02/03/2021
23841025	BHPTR34	ES3	0.50 - 0.50	02/03/2021
23841029	BHPTR34	ES4	1.00 - 1.00	02/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23841035	23841025
	Customer Sample Reference		BHPT R33	BHPT R34
	AGS Reference		ES2	ES3
	Depth (m)		0.20 - 0.20	0.50 - 0.50
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)
	Sample Type		S	S
			S	S
Ammonium Low	All	NDPs: 0 Tests: 2	X	X
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1	X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2	X	X
CEN Readings	All	NDPs: 0 Tests: 2	X	X
Chromium III	All	NDPs: 0 Tests: 4	X	X
Coronene	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X	X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
Fluoride	All	NDPs: 0 Tests: 2	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23841035	23841025
	Customer Sample Reference		BHPT R33	BHPT R34
	AGS Reference		ES2	ES3
	Depth (m)		0.20 - 0.20	0.50 - 0.50
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)
	Sample Type		S	S
			S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X	X
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 2	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1	X	
PAH by GCMS	All	NDPs: 0 Tests: 2	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 1	X	
pH	All	NDPs: 0 Tests: 2	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X	X
Sample description	All	NDPs: 0 Tests: 2	X	X

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23841035		23841025	
	Customer Sample Reference		BHPTR33		BHPTR34	
	AGS Reference		ES2		ES3	
	Depth (m)		0.20 - 0.20		0.50 - 0.50	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)
	Sample Type		S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X			
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23841035	BHPTR33	0.20 - 0.20	Dark Brown	Sandy Loam	Stones	Vegetation
23841025	BHPTR34	0.50 - 0.50	Light Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref.	BHPTR33	BHPTR34				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*\$@ Sample deviation (see appendix)							
Component	LOD/Units	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 02/03/2021 04/03/2021 210304-157 23841035 ES2	0.50 - 0.50 Soil/Solid (S) 02/03/2021 04/03/2021 210304-157 23841025 ES3				
Moisture Content Ratio (% of as received sample)	%	PM024	17	10				
Loss on ignition	<0.7 %	TM018	8.16 M					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Organic Carbon, Total	<0.2 %	TM132	0.902 M					
Sulphur, Total	<0.02 %	TM132	0.0682	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00902 #	0.0279 #				
pH	1 pH Units	TM133	8.52 M	8.6 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #				
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M				
PCB congener 28	<3 µg/kg	TM168	<3 M					
PCB congener 52	<3 µg/kg	TM168	<3 M					
PCB congener 101	<3 µg/kg	TM168	<3 M					
PCB congener 118	<3 µg/kg	TM168	<3 M					
PCB congener 138	<3 µg/kg	TM168	<3 M					
PCB congener 153	<3 µg/kg	TM168	<3 M					
PCB congener 180	<3 µg/kg	TM168	<3 M					
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21					
Chromium, Trivalent	<0.9 mg/kg	TM181	12.5	6.96				
Antimony	<0.6 mg/kg	TM181	3.57 #	<0.6 #				
Arsenic	<0.6 mg/kg	TM181	21.4 M	10.8 M				
Barium	<0.6 mg/kg	TM181	61 #	33.6 #				
Beryllium	<0.01 mg/kg	TM181	0.634 M	0.431 M				
Cadmium	<0.02 mg/kg	TM181	2.12 M	0.0896 M				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:210304-157

Location:Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 590446

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BHPTR33	BHPTR34				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	107	103				
Toluene-d8**	%	TM116	93.8	93.7				
4-Bromofluorobenzene**	%	TM116	76.8	74.7				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M				
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M				
Benzene	<9 µg/kg	TM116	<9 M	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M				
Toluene	<7 µg/kg	TM116	<7 M	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M				

SDG:210304-157

Location:Cambridge South East Tra

Client Reference: B025563

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Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BHPTR33	BHPTR34				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20				
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M				

SDG:210304-157

Location:Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

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ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-157

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 590446

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BHPTR33	BHPTR34				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20	0.50 - 0.50				
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		02/03/2021	02/03/2021				
diss.filt	Dissolved / filtered sample.		-	-				
tot.unfilt	Total / unfiltered sample.		04/03/2021	04/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210304-157	210304-157				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23841035	23841025				
(F)	Trigger breach confirmed		ES2	ES3				
1-44@	Sample deviation (see appendix)							
Component	LOD/Units		Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20				
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M				

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SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport -
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)	22
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	82
Particle Size <4mm	>95%		

Case		Landfill Waste Acceptance		
SDG	210304-157	Criteria Limits		
Lab Sample Number(s)	23841035	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous	Hazardous Waste Landfill
Sampled Date	02-Mar-2021			
Customer Sample Ref.	BHPTR33 ES2			
Depth (m)	0.20 - 0.20			

Solid Waste Analysis		Result
Total Organic Carbon (%)	0.902	
Loss on Ignition (%)	8.16	
Sum of BTEX (mg/kg)	<0.04	
Sum of 7 PCBs (mg/kg)	<0.021	
Mineral Oil (mg/kg)	<5	
PAH Sum of 17 (mg/kg)	<10	
pH (pH Units)	8.52	
ANC to pH 6 (mol/kg)	0.0628	
ANC to pH 4 (mol/kg)	0.326	

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	-	-	-	-	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	-	-	-	-	0.5	10	70
Copper	-	-	-	-	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	-	-	-	-	0.4	10	40
Lead	-	-	-	-	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	-	-	-	-	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	1	<0.5	10	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	95.2	<5	952	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	8.54	<3	85.4	<30	500	800	1000

Leach Test Information

Date Prepared	06-Mar-2021
pH (pH Units)	7.71
Conductivity (µS/cm)	55.70
Temperature (°C)	20.40
Volume Leachant (Litres)	0.880

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

13/03/2021 08:01:51



SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - I
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)		12.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		88.8
Particle Size <4mm	>95%			

Case				
SDG	210304-157			
Lab Sample Number(s)	23841025			
Sampled Date	02-Mar-2021			
Customer Sample Ref.	BHPTR34 ES3			
Depth (m)	0.50 - 0.50			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.054	<0.01	0.54	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	10.5	<3	105	<30	-	-	-
Fluoride	0.889	<0.5	8.89	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.00415	<0.0002	0.0415	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0294	<0.01	0.294	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	22.1	<0.2	221	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.0012	<0.0002	0.012	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.298	<0.036	2.98	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00115	<0.0004	0.0115	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.333	<0.001	3.33	<0.01	-	-	-
Chloride	2.3	<2	23	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	06-Mar-2021
pH (pH Units)	8.77
Conductivity (µS/cm)	110.00
Temperature (°C)	14.70
Volume Leachant (Litres)	0.889

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - P
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)	12.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.8
Particle Size <4mm	>95%		

Case

SDG	210304-157			
Lab Sample Number(s)	23841025			
Sampled Date	02-Mar-2021			
Customer Sample Ref.	BHPTR34 ES3			
Depth (m)	0.50 - 0.50			

Eluate Analysis	C ₂	Conc ⁿ in 10:1 eluate (mg/l)	A ₂	10:1 conc ⁿ leached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	56.4	<0.65	564	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.795	<0.019	7.95	<0.19	-	-	-

Leach Test Information

Date Prepared	06-Mar-2021
pH (pH Units)	8.77
Conductivity (µS/cm)	110.00
Temperature (°C)	14.70
Volume Leachant (Litres)	0.889

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)		22
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		82
Particle Size <4mm	>95%			

Case

SDG	210304-157			
Lab Sample Number(s)	23841035			
Sampled Date	02-Mar-2021			
Customer Sample Ref.	BHPTR33 ES2			
Depth (m)	0.20 - 0.20			

Eluate Analysis	C2		A2				
	Conc ⁿ in 10:1 eluate (mg/l)		10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.02	<0.01	0.2	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.00644	<0.0002	0.0644	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0421	<0.01	0.421	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.5	<0.2	235	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000959	<0.0003	0.00959	<0.003	-	-	-
Hardness dissolved	59.9	<0.65	599	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.389	<0.019	3.89	<0.19	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.319	<0.036	3.19	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00423	<0.003	0.0423	<0.03	-	-	-
Nickel	0.0011	<0.0004	0.011	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00113	<0.001	0.0113	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	06-Mar-2021
pH (pH Units)	7.71
Conductivity (µS/cm)	55.70
Temperature (°C)	20.40
Volume Leachant (Litres)	0.880

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23841035	23841025
Customer Sample Ref.	BHPTR33	BHPTR34
AGS Ref.	ES2	ES3
Depth	0.20 - 0.20	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	10-Mar-2021	10-Mar-2021
Anions by Kone (soil)		10-Mar-2021
Anions by Kone (w)	09-Mar-2021	09-Mar-2021
Asbestos ID in Solid Samples		11-Mar-2021
Boron Water Soluble		09-Mar-2021
CEN 10:1 Leachate (1 Stage)	06-Mar-2021	06-Mar-2021
CEN Readings	08-Mar-2021	08-Mar-2021
Chromium III	10-Mar-2021	10-Mar-2021
Coronene	11-Mar-2021	
Cyanide Comp/Free/Total/Thiocyanate		10-Mar-2021
Dissolved Metals by ICP-MS	10-Mar-2021	10-Mar-2021
Dissolved Organic/Inorganic Carbon	13-Mar-2021	13-Mar-2021
EPH CWG GC (S)		09-Mar-2021
Fluoride	09-Mar-2021	09-Mar-2021
GRO by GC-FID (S)	10-Mar-2021	10-Mar-2021
Hexavalent Chromium (s)		10-Mar-2021
Low Level Cyanide (W)	10-Mar-2021	10-Mar-2021
Low Level Hexavalent Chromium (w)	09-Mar-2021	09-Mar-2021
Mercury Dissolved	10-Mar-2021	12-Mar-2021
Metals in solid samples by OES		09-Mar-2021
Moisture at 105C		06-Mar-2021
PAH 16 & 17 Calc	11-Mar-2021	
PAH by GCMS		09-Mar-2021
pH		10-Mar-2021
pH Value of Filtered Water	10-Mar-2021	10-Mar-2021
Phenols by HPLC (S)		10-Mar-2021
Phenols by HPLC (W)	10-Mar-2021	10-Mar-2021
Sample description	05-Mar-2021	05-Mar-2021
Total Dissolved Solids	10-Mar-2021	
Total Organic Carbon		11-Mar-2021
Total Sulphur		10-Mar-2021
TPH CWG GC (S)	10-Mar-2021	10-Mar-2021
VOC MS (S)	10-Mar-2021	10-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2318
Ammoniacal Nitrogen as N	TM099	100.2 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2384
ANC pH_4 dry soil	TM182	107.92 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2392
Chloride (soluble)	TM243	134.2 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	153.27 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2343
Chloride	TM184	107.0 92.93 : 115.43
Sulphate (soluble)	TM184	96.8 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2388
Water Soluble Boron	TM222	90.5 84.00 : 111.00

Coronene

Component	Method Code	QC 2367
Coronene RAW	TM410	103.0 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2302
Free Cyanide	TM153	101.98 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	102.1 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2392	QC 2337
Aluminium	TM152	97.33 90.98 : 111.82	103.67 90.98 : 111.82
Antimony	TM152	97.0 90.44 : 113.04	102.83 90.44 : 113.04
Arsenic	TM152	96.67 88.00 : 112.00	102.5 88.00 : 112.00
Barium	TM152	93.83 90.20 : 111.19	97.67 90.20 : 111.19
Beryllium	TM152	98.17 87.77 : 113.97	104.67 87.77 : 113.97
Bismuth	TM152	95.5 91.90 : 112.20	102.17 91.90 : 112.20
Borate	TM152	98.77 88.00 : 112.00	104.32 88.00 : 112.00
Boron	TM152	98.67 96.48 : 114.93	104.33 96.48 : 114.93
Cadmium	TM152	97.17 96.43 : 110.53	102.5 96.43 : 110.53
Calcium	TM152	99.33 81.38 : 119.09	104.0 81.38 : 119.09
Chromium	TM152	97.83 91.84 : 108.67	101.83 91.84 : 108.67
Cobalt	TM152	95.17 88.00 : 112.00	101.0 88.00 : 112.00
Copper	TM152	97.17 92.47 : 118.11	102.83 92.47 : 118.11
Iron	TM152	97.33 92.00 : 113.00	102.0 92.00 : 113.00
Lead	TM152	98.33 88.00 : 112.00	103.0 88.00 : 112.00
Lithium	TM152	98.83 91.62 : 113.12	104.67 91.62 : 113.12
Magnesium	TM152	96.67 93.14 : 107.91	101.33 93.14 : 107.91
Manganese	TM152	98.33 95.03 : 110.58	102.17 95.03 : 110.58
Molybdenum	TM152	94.0 88.00 : 112.00	99.67 88.00 : 112.00
Nickel	TM152	97.5 88.00 : 112.00	102.17 88.00 : 112.00
Phosphorus	TM152	98.83 88.00 : 112.00	104.0 88.00 : 112.00
Potassium	TM152	98.0 93.90 : 112.36	103.33 93.90 : 112.36

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2392	QC 2337
Selenium	TM152	98.17 91.58 : 115.98	103.33 91.58 : 115.98
Silver	TM152	89.83 88.80 : 122.30	101.33 88.80 : 122.30
Sodium	TM152	96.67 94.28 : 110.71	101.33 94.28 : 110.71
Strontium	TM152	99.0 88.00 : 112.00	102.0 88.00 : 112.00
Tellurium	TM152	97.5 93.32 : 114.66	103.17 93.32 : 114.66
Thallium	TM152	87.67 88.00 : 112.00	101.17 88.00 : 112.00
Tin	TM152	96.83 92.63 : 109.70	102.17 92.63 : 109.70
Titanium	TM152	100.17 95.58 : 111.68	104.83 95.58 : 111.68
Tungsten	TM152	96.0 81.32 : 124.72	100.33 81.32 : 124.72
Uranium	TM152	96.5 88.00 : 112.00	101.17 88.00 : 112.00
Vanadium	TM152	98.67 88.00 : 112.00	100.5 88.00 : 112.00
Zinc	TM152	97.33 92.98 : 118.95	103.0 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2351
Dissolved Inorganic Carbon	TM090	115.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	99.0 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2390
EPH >C8-C40 Raw	TM414	87.46 57.98 : 125.66
Total Aliphatics Raw	TM414	93.23 64.55 : 136.91
Total Aromatics Raw	TM414	95.33 55.89 : 144.43

Fluoride

Component	Method Code	QC 2358
Fluoride	TM104	100.67 96.67 : 108.67

GRO by GC-FID (S)

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
GRO by GC-FID (S)						

Component	Method Code	QC 2317
QC	TM089	82.05 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2367
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2366
Loss on Ignition	TM018	94.55 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2317
Free Cyanide - Low Level	TM279	80.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	98.25 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2380	QC 2346
Mercury Dissolved (CVAf)	TM183	90.9 74.00 : 116.00	92.8 74.00 : 116.00

Metals in solid samples by OES

Component	Method Code	QC 2394
Aluminium	TM181	86.64 73.56 : 108.85
Antimony	TM181	100.41 76.89 : 111.24
Arsenic	TM181	102.91 88.53 : 111.01
Barium	TM181	100.0 77.67 : 105.35



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Validated

SDG:210304-157Client Reference: B025563Report Number: 590446

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Metals in solid samples by OES

		QC 2394
Beryllium	TM181	102.24 85.44 : 109.61
Boron	TM181	97.99 73.51 : 104.66
Cadmium	TM181	89.71 77.67 : 104.12
Chromium	TM181	91.08 79.64 : 105.83
Cobalt	TM181	91.51 84.60 : 104.13
Copper	TM181	96.13 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	92.34 78.24 : 104.05
Manganese	TM181	111.67 94.29 : 119.51
Mercury	TM181	100.97 83.16 : 107.81
Molybdenum	TM181	100.0 87.11 : 106.87
Nickel	TM181	92.42 80.26 : 102.28
Phosphorus	TM181	113.54 94.56 : 124.28
Selenium	TM181	102.75 82.28 : 110.48
Strontium	TM181	97.77 79.13 : 102.79
Thallium	TM181	100.44 82.94 : 111.86
Tin	TM181	101.52 86.72 : 110.03
Titanium	TM181	96.18 66.23 : 102.06
Vanadium	TM181	104.4 86.19 : 109.45
Zinc	TM181	102.87 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2366
Acenaphthene	TM218	94.0 80.97 : 105.99
Acenaphthylene	TM218	95.5 74.76 : 107.36
Anthracene	TM218	91.5 73.04 : 106.97
Benz(a)anthracene	TM218	86.5 68.79 : 119.64
Benzo(a)pyrene	TM218	82.5 66.17 : 117.52



CERTIFICATE OF ANALYSIS

Validated

SDG:210304-157Client Reference: B025563Report Number: 590446

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

PAH by GCMS

		QC 2366
Benzo(b)fluoranthene	TM218	87.5 66.40 : 118.34
Benzo(ghi)perylene	TM218	85.5 67.68 : 112.07
Benzo(k)fluoranthene	TM218	87.0 72.84 : 114.66
Chrysene	TM218	86.5 68.39 : 115.56
Dibenzo(ah)anthracene	TM218	82.5 69.03 : 110.45
Fluoranthene	TM218	103.0 69.37 : 117.19
Fluorene	TM218	93.0 75.38 : 105.98
Indeno(123cd)pyrene	TM218	86.0 65.91 : 113.61
Naphthalene	TM218	96.0 71.40 : 105.87
Phenanthrene	TM218	102.0 74.04 : 109.30
Pyrene	TM218	98.0 69.68 : 115.27

PCBs by GCMS

Component	Method Code	QC 2370
PCB congener 101	TM168	86.1 65.66 : 110.06
PCB congener 105	TM168	82.5 58.10 : 106.34
PCB congener 114	TM168	83.8 59.38 : 106.48
PCB congener 118	TM168	83.8 60.02 : 106.23
PCB congener 123	TM168	90.5 65.01 : 99.81
PCB congener 126	TM168	82.7 59.31 : 109.23
PCB congener 138	TM168	87.0 63.95 : 107.63
PCB congener 153	TM168	88.1 62.65 : 108.85
PCB congener 156	TM168	84.4 61.69 : 112.27
PCB congener 157	TM168	80.0 55.37 : 104.81
PCB congener 167	TM168	83.4 65.58 : 109.14
PCB congener 169	TM168	86.3 56.84 : 112.10
PCB congener 180	TM168	88.0 66.99 : 111.63
PCB congener 189	TM168	85.4 57.75 : 112.59

PCBs by GCMS

		QC 2370
PCB congener 28	TM168	87.7 73.68 : 105.96
PCB congener 52	TM168	87.1 67.24 : 107.62
PCB congener 77	TM168	87.0 64.87 : 108.49
PCB congener 81	TM168	87.2 70.78 : 110.80

pH

Component	Method Code	QC 2334
pH	TM133	101.71 98.71 : 102.32

pH Value of Filtered Water

Component	Method Code	QC 2310
pH	TM256	100.8 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2366
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.61 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	16.19 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	48.85 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	33.57 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	51.57 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	49.06 76.56 : 106.38

Phenols by HPLC (W)

Phenols by HPLC (W)

Component	Method Code	QC 2323
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	49.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	48.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	57.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	50.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.67 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2361
Total Dissolved Solids	TM123	99.0 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2310
Total Organic Carbon	TM132	97.27 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2396	QC 2336
Total Sulphur %	TM132	92.23 61.64 : 114.47	96.89 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2307	QC 2336
1,1,1,2-tetrachloroethane	TM116	100.2 84.84 : 116.25	102.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	99.4 73.73 : 118.05	108.2 86.26 : 117.53
1,1,2-Trichloroethane	TM116	95.4 77.12 : 116.04	95.8 75.16 : 112.70
1,1-Dichloroethane	TM116	109.2 74.46 : 129.15	110.4 83.27 : 122.16
1,2-Dichloroethane	TM116	108.2 92.38 : 131.65	137.4 89.30 : 133.10

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210304-157	Client Reference:	B025563	Report Number:	590446	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						

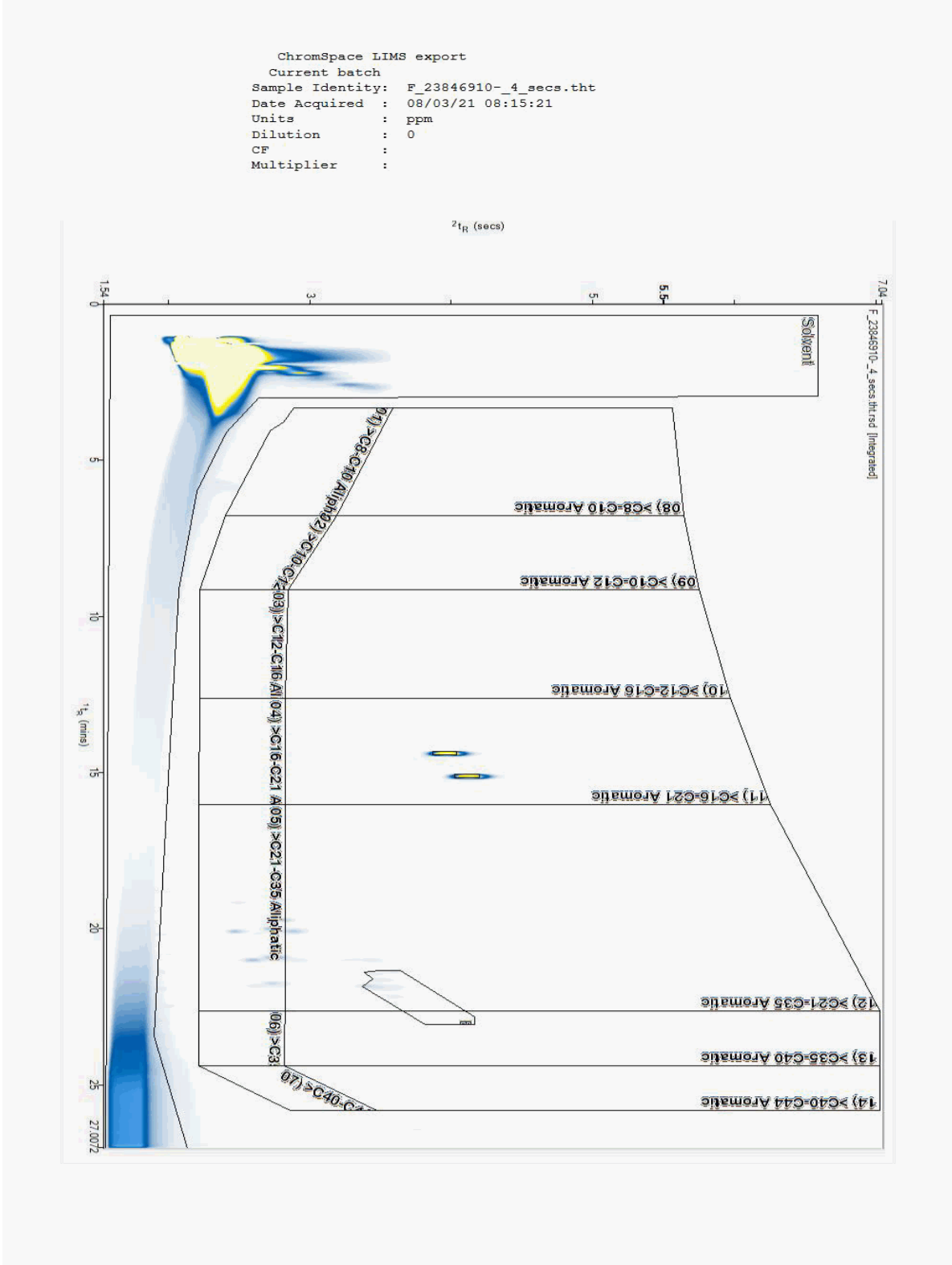
		QC 2307	QC 2336
1,4-Dichlorobenzene	TM116	96.4 83.64 : 126.18	101.2 82.59 : 123.23
2-Chlorotoluene	TM116	83.6 76.03 : 113.25	98.0 66.81 : 118.43
4-Chlorotoluene	TM116	81.0 66.90 : 112.46	94.2 65.88 : 114.76
Benzene	TM116	99.4 88.60 : 113.80	101.8 93.16 : 123.63
Carbon Disulphide	TM116	88.4 74.91 : 122.14	100.4 75.11 : 124.81
Carbontetrachloride	TM116	98.8 80.31 : 124.50	111.0 82.35 : 126.46
Chlorobenzene	TM116	102.4 83.81 : 114.18	97.4 85.07 : 118.13
Chloroform	TM116	109.0 87.40 : 122.49	113.0 88.13 : 122.71
Chloromethane	TM116	104.0 65.89 : 136.93	120.0 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	103.0 80.67 : 126.72	106.4 78.27 : 128.90
Dibromomethane	TM116	91.4 73.23 : 118.35	98.6 77.47 : 121.29
Dichloromethane	TM116	113.2 81.11 : 133.25	116.0 87.89 : 134.72
Ethylbenzene	TM116	79.6 75.92 : 110.41	92.8 79.92 : 110.05
Hexachlorobutadiene	TM116	41.0 12.82 : 152.73	70.4 16.78 : 153.29
Isopropylbenzene	TM116	63.6 55.79 : 97.59	85.4 64.20 : 119.59
Naphthalene	TM116	108.8 80.86 : 128.81	114.4 79.29 : 125.59
o-Xylene	TM116	78.2 69.99 : 108.74	87.4 72.86 : 102.10
p/m-Xylene	TM116	74.2 68.32 : 108.91	86.6 74.06 : 106.47
Sec-Butylbenzene	TM116	49.2 38.50 : 101.50	74.0 44.71 : 117.87
Tetrachloroethene	TM116	92.2 76.95 : 121.02	100.8 85.86 : 122.95
Toluene	TM116	87.2 74.24 : 107.42	90.6 87.82 : 116.21
Trichloroethene	TM116	96.6 85.28 : 109.36	100.8 79.80 : 112.33
Trichlorofluoromethane	TM116	105.0 84.55 : 133.27	115.0 80.52 : 132.12
Vinyl Chloride	TM116	108.2 68.02 : 143.37	108.8 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210304-157	Client Reference:	B025563	Report Number:	590446	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Chromatogram						
Analysis:	EPH CWG GC (S)	Sample No :	23846910	Depth :	0.20 - 0.20	
		Sample ID :	BHPTR33			





CERTIFICATE OF ANALYSIS

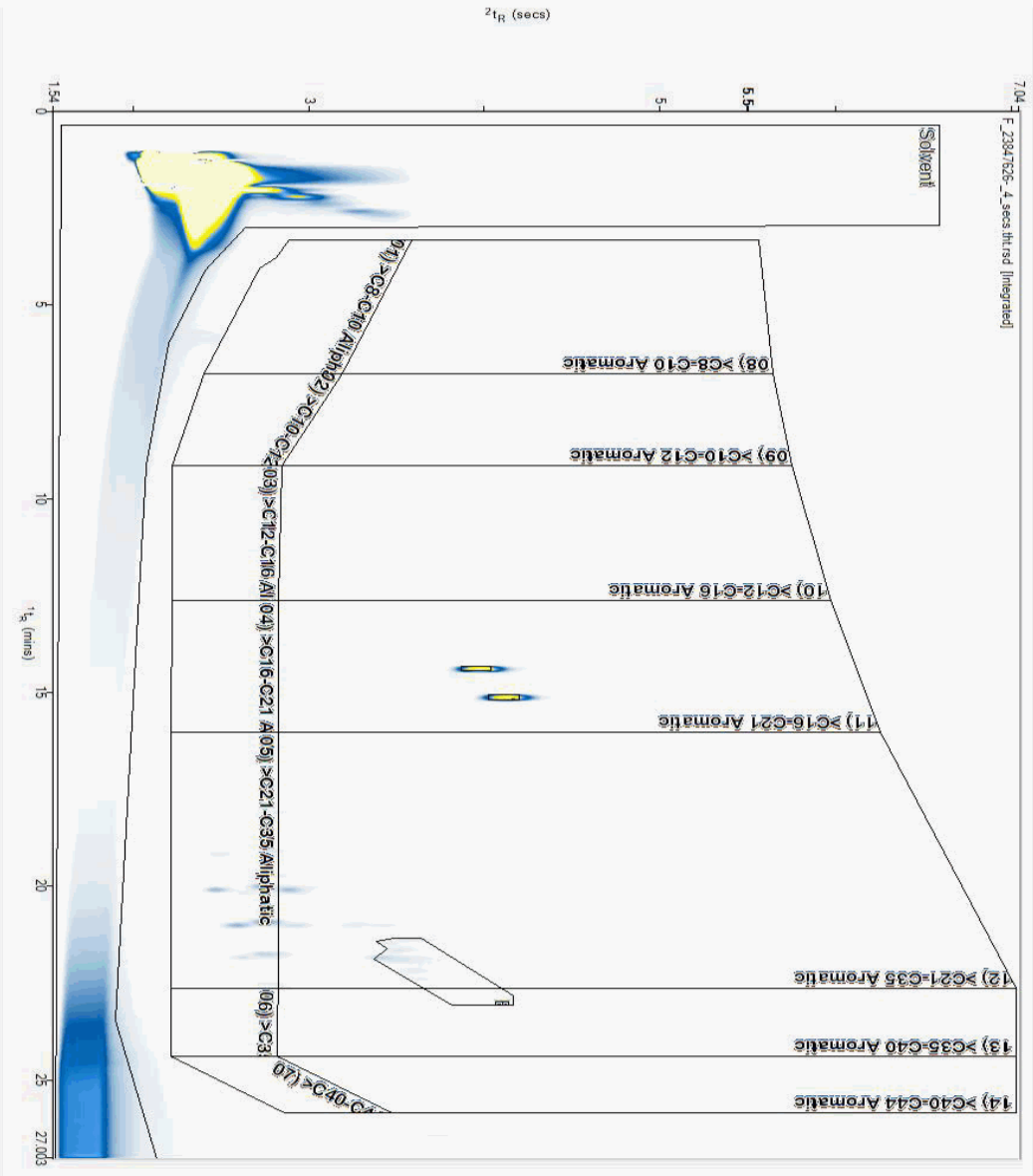
Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23847626 Depth : 0.50 - 0.50
Sample ID : BHPTR34

ChromSpace LIMS export
Current batch
Sample Identity: F_23847626-4_secs.tht
Date Acquired : 08/03/21 07:43:52
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

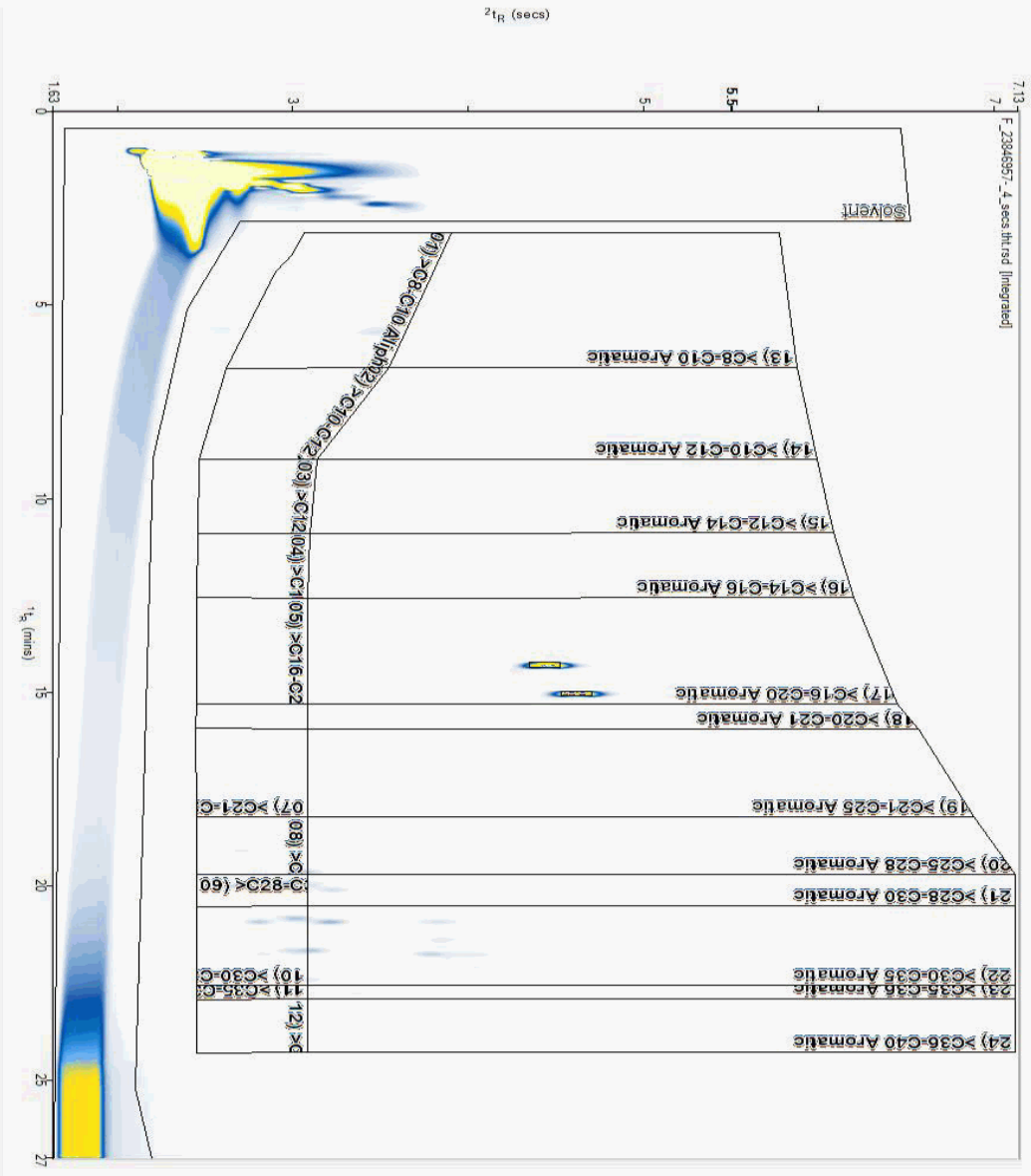
Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23846957 Depth : 0.20 - 0.20
Sample ID : BHPTR33

ChromSpace LIMS export
Current batch
Sample Identity: F_23846957-4_secs.tht
Date Acquired : 08/03/21 08:34:26
Units : ppm
Dilution : 0
CF :
Multiplier :





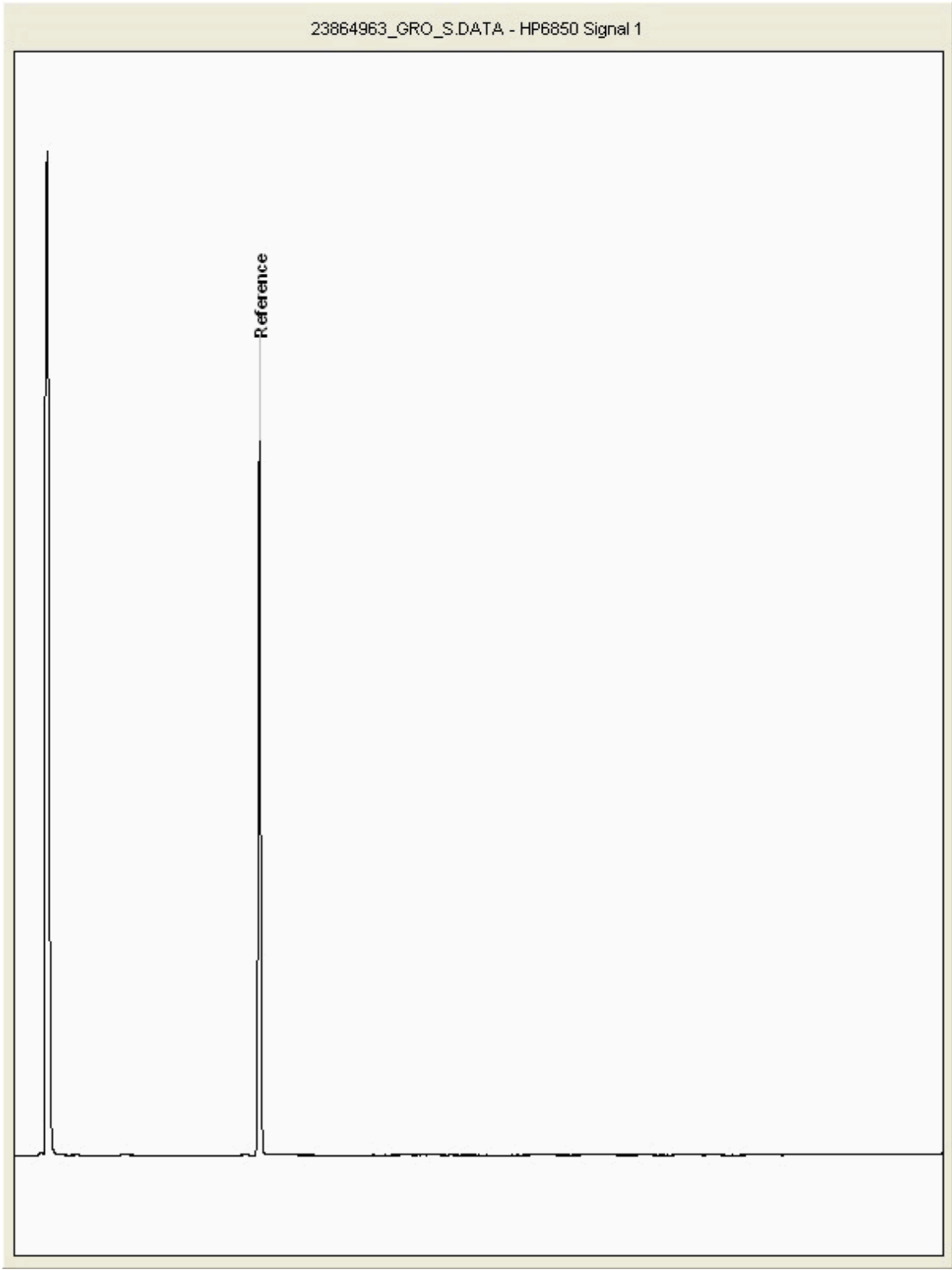
CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23864963 Depth : 0.20 - 0.20
Sample ID : BHPTR33



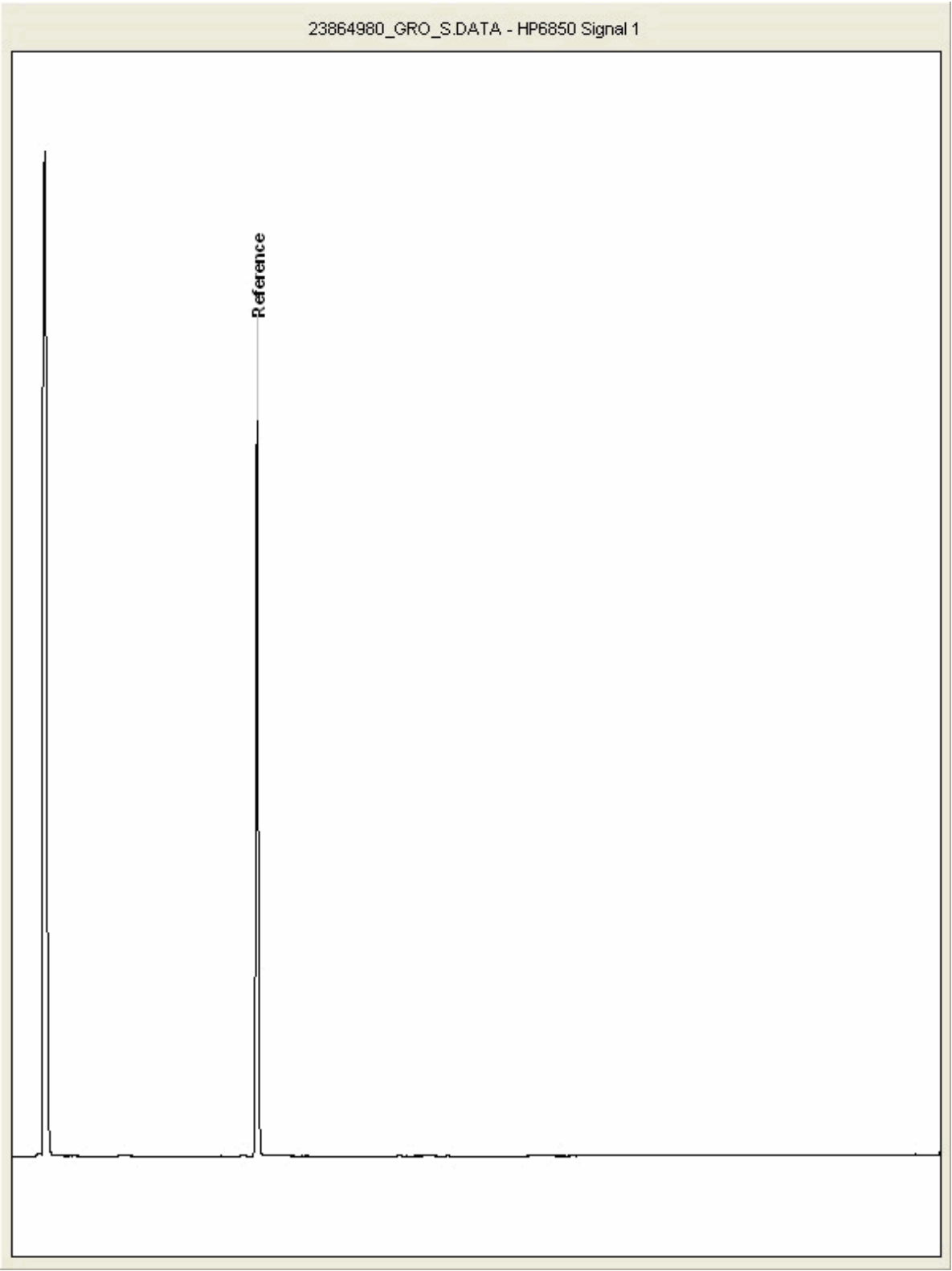
CERTIFICATE OF ANALYSIS

Validated

SDG: 210304-157 Client Reference: B025563 Report Number: 590446
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23864980 Depth : 0.50 - 0.50
Sample ID : BHPTR34





CERTIFICATE OF ANALYSIS

SDG:	210304-157	Client Reference:	B025563	Report Number:	590446
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Hawarden

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CH5 3US

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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

17 March 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210309-70

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

590960

We received 16 samples on Tuesday March 09, 2021 and 4 of these samples were scheduled for analysis which was completed on Wednesday March 17, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 17/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23865612	CPT-OBC-01	ES1	0.10 - 0.10	05/03/2021
23865613	CPT-OBC-01	ES2	0.20 - 0.20	05/03/2021
23865614	CPT-OBC-01	ES3	0.50 - 0.50	05/03/2021
23865615	CPT-OBC-01	ES4	1.00 - 1.00	05/03/2021
23865610	CPT-OBC-02	ES1	0.00 - 0.20	05/03/2021
23865611	CPT-OBC-02	ES2	0.60 - 0.60	05/03/2021
23865607	CPT-OBC-03	ES1	0.00 - 0.20	05/03/2021
23865609	CPT-OBC-03	ES2	0.60 - 0.60	05/03/2021
23865603	CPT-OBC-04	ES1	0.10 - 0.10	05/03/2021
23865604	CPT-OBC-04	ES2	0.20 - 0.20	05/03/2021
23865605	CPT-OBC-04	ES3	0.50 - 0.50	05/03/2021
23865606	CPT-OBC-04	ES4	1.00 - 1.00	05/03/2021
23865599	CPT-OBC-05	ES1	0.10 - 0.10	05/03/2021
23865600	CPT-OBC-05	ES2	0.20 - 0.20	05/03/2021
23865601	CPT-OBC-05	ES3	0.50 - 0.50	05/03/2021
23865602	CPT-OBC-05	ES4	1.00 - 1.00	05/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23865612	23865610	23865611	23865604
						CPT-OBC-01	CPT-OBC-02	CPT-OBC-02	CPT-OBC-04
						ES1	ES1	ES2	ES2
						0.10 - 0.10	0.00 - 0.20	0.60 - 0.60	0.20 - 0.20
						60g VOC (ALE215)	60g VOC (ALE210)	60g VOC (ALE215)	60g VOC (ALE215)
						1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)
						S	S	S	S
						S	S	S	S
Ammonium Low	All	NDPs: 1 Tests: 0							
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1							
Anions by Kone (soil)	All	NDPs: 0 Tests: 4							
Anions by Kone (w)	All	NDPs: 1 Tests: 1							
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4							
Boron Water Soluble	All	NDPs: 0 Tests: 4							
CEN Readings	All	NDPs: 1 Tests: 1							
Chromium III	All	NDPs: 1 Tests: 4							
Coronene	All	NDPs: 0 Tests: 1							
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4							
Dissolved Metals by ICP-MS	All	NDPs: 1 Tests: 1							
Dissolved Organic/Inorganic Carbon	All	NDPs: 1 Tests: 1							
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1							
EPH CWG GC (S)	All	NDPs: 0 Tests: 4							
Fluoride	All	NDPs: 1 Tests: 1							

CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Lab Sample No(s)		Customer Sample Reference						AGS Reference		Depth (m)		Container				Sample Type	
	23865604		CPT-OBC-04						ES2		0.20 - 0.20		60g VOC (ALE215)				S	
	23865611		CPT-OBC-02						ES2		0.60 - 0.60		Kone Cup				S	
	23865610		CPT-OBC-02						ES1		0.00 - 0.20		60g VOC (ALE215)				S	
	23865612		CPT-OBC-01						ES1		0.10 - 0.10		250g Amber Jar (ALE210)				S	
													1kg TUB with Handle (ALE280)				S	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4				X		X	X					X				
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4				X		X	X					X				
Loss on Ignition in soils	All	NDPs: 0 Tests: 1						X										
Low Level Cyanide (W)	All	NDPs: 1 Tests: 0								N								
Low Level Hexavalent Chromium (w)	All	NDPs: 1 Tests: 0								N								
Mercury Dissolved	All	NDPs: 1 Tests: 1				X				N								
Metals in solid samples by OES	All	NDPs: 0 Tests: 4				X		X	X					X				
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1						X										
PAH by GCMS	All	NDPs: 1 Tests: 3				X		X	N					X				
PCBs by GCMS	All	NDPs: 0 Tests: 1						X										
pH	All	NDPs: 0 Tests: 4				X		X	X					X				
pH Value of Filtered Water	All	NDPs: 1 Tests: 0								N								
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4				X		X	X					X				
Phenols by HPLC (W)	All	NDPs: 1 Tests: 1					X			N								
Sample description	All	NDPs: 0 Tests: 4				X		X	X					X				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23865612	CPT-OBC-01	0.10 - 0.10	Dark Brown	Loamy Sand	Stones	None
23865610	CPT-OBC-02	0.00 - 0.20	Dark Brown	Sandy Loam	Vegetation	None
23865611	CPT-OBC-02	0.60 - 0.60	Dark Brown	Loamy Sand	None	None
23865604	CPT-OBC-04	0.20 - 0.20	Dark Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	CPT-OBC-01	CPT-OBC-02	CPT-OBC-02	CPT-OBC-04		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.		0.10 - 0.10	0.00 - 0.20	0.60 - 0.60	0.20 - 0.20		
tot.unfilt	Total / unfiltered sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
*	Subcontracted - refer to subcontractor report for accreditation status.		05/03/2021	05/03/2021	05/03/2021	05/03/2021		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		09/03/2021	09/03/2021	09/03/2021	09/03/2021		
(F)	Trigger breach confirmed		210309-70	210309-70	210309-70	210309-70		
1-445@	Sample deviation (see appendix)		23865612	23865610	23865611	23865604		
			ES1	ES1	ES2	ES2		
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	10	22	23	15		
Loss on ignition	<0.7 %	TM018		13.5				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01		
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01		
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05	<0.05		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015	<0.015		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01		
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015	<0.015		
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06	<0.06	<0.06		
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13	<0.13		
Organic Carbon, Total	<0.2 %	TM132		2.24				
Sulphur, Total	<0.02 %	TM132	<0.02	0.0475	0.0308	0.0564		
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00727	0.0224	0.0156	0.00939		
pH	1 pH Units	TM133	8.64	8.32	8.43	8.83		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6	<0.6		
Cyanide, Free	<1 mg/kg	TM153	<1	<1	<1	<1		
PCB congener 28	<3 µg/kg	TM168		<3				
PCB congener 52	<3 µg/kg	TM168		<3				
PCB congener 101	<3 µg/kg	TM168		<3				
PCB congener 118	<3 µg/kg	TM168		<3				
PCB congener 138	<3 µg/kg	TM168		<3				
PCB congener 153	<3 µg/kg	TM168		<3				
PCB congener 180	<3 µg/kg	TM168		<3				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21				
Chromium, Trivalent	<0.9 mg/kg	TM181	11.4	21.9	27.5	13.4		
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6	<0.6	<0.6		
Arsenic	<0.6 mg/kg	TM181	13.2	12.4	14.5	13.6		
Barium	<0.6 mg/kg	TM181	46.9	84.7	113	60.6		
Beryllium	<0.01 mg/kg	TM181	0.508	1.13	1.49	0.697		
Cadmium	<0.02 mg/kg	TM181	0.326	0.151	0.093	0.111		

		CERTIFICATE OF ANALYSIS					Validated	
SDG: 210309-70		Client Reference: B025563		Report Number: 590960				
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:				
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44\$@ Sample deviation (see appendix)</div>		Customer Sample Ref.	CPT-OBC-01	CPT-OBC-02	CPT-OBC-02	CPT-OBC-04		
Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference			0.10 - 0.10 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865612 ES1	0.00 - 0.20 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865610 ES1	0.60 - 0.60 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865611 ES2	0.20 - 0.20 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865604 ES2		
Component	LOD/Units	Method						
Chromium	<0.9 mg/kg	TM181	11.4 M	21.9 M	27.5 M	13.4 M		
Copper	<1.4 mg/kg	TM181	10.9 M	17.9 M	20.4 M	14 M		
Iron	<1000 mg/kg	TM181	21800 #	27300 #	34800 #	22000 #		
Lead	<0.7 mg/kg	TM181	15.7 M	24.6 M	22.5 M	17.5 M		
Manganese	<0.13 mg/kg	TM181	373 M	427 M	431 M	373 M		
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M		
Molybdenum	<0.1 mg/kg	TM181	0.442 #	0.309 #	0.223 #	0.27 #		
Nickel	<0.2 mg/kg	TM181	15.6 M	24.8 M	30.5 M	17.3 M		
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	<1 #		
Vanadium	<0.2 mg/kg	TM181	32.8 #	48.4 #	58.9 #	37.7 #		
Zinc	<1.9 mg/kg	TM181	47.9 M	96.2 M	111 M	66.1 M		
ANC @ pH 4	<0.03 mol/kg	TM182		0.515				
ANC @ pH 6	<0.03 mol/kg	TM182		0.067				
Boron, water soluble	<1 mg/kg	TM222	<1 M	1.38 M	1.33 M	1.06 M		
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.0142 M	0.0164 M	0.034 M	0.62 M		
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410		<10				
Coronene	<200 µg/kg	TM410		<200				
EPH Surrogate % recovery**	%	TM415		102				
Mineral Oil >C10-C40	<5 mg/kg	TM415		<5				
	</							

CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	CPT-OBC-01		CPT-OBC-02		CPT-OBC-02		CPT-OBC-04			
#	ISO17025 accredited.	Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)		0.10 - 0.10		0.00 - 0.20		0.60 - 0.60		0.20 - 0.20			
M	mCERTS accredited.			Soil/Solid (S)		Soil/Solid (S)		Soil/Solid (S)		Soil/Solid (S)			
aq	Aqueous / settled sample.			05/03/2021		05/03/2021		05/03/2021		05/03/2021			
diss.filt	Dissolved / filtered sample.			09/03/2021		09/03/2021		09/03/2021		09/03/2021			
tot.unfilt	Total / unfiltered sample.			210309-70		210309-70		210309-70		210309-70			
+	Subcontracted - refer to subcontractor report for accreditation status.			23865612		23865610		23865611		23865604			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			ES1		ES1		ES2		ES2			
(F)	Trigger breach confirmed												
1-4+5@	Sample deviation (see appendix)												
Component		LOD/Units	Method										
Dibromofluoromethane**		%	TM116	116		103		104		106			
Toluene-d8**		%	TM116	99.8		93.6		95.2		96.2			
4-Bromofluorobenzene**		%	TM116	87.4		74.3		81.4		81.6			
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
Chloromethane		<7 µg/kg	TM116	<7 #		<7 #		<7 #		<7 #			
Vinyl Chloride		<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
Bromomethane		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Chloroethane		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Trichlorofluorormethane		<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #		<10 #		<10 #		<10 #			
Carbon Disulphide		<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
Dichloromethane		<10 µg/kg	TM116	17.6 #		<10 #		<10 #		<10 #			
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M		<8 M		<8 M		<8 M			
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
2,2-Dichloropropane		<10 µg/kg	TM116	<10		<10		<10		<10			
Bromochloromethane		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Chloroform		<8 µg/kg	TM116	<8 M		<8 M		<8 M		<8 M			
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Carbontetrachloride		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M		<5 M		<5 M		<5 M			
Benzene		<9 µg/kg	TM116	<9 M		<9 M		<9 M		<9 M			
Trichloroethene		<9 µg/kg	TM116	<9 #		<9 #		<9 #		<9 #			
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Dibromomethane		<9 µg/kg	TM116	<9 M		<9 M		<9 M		<9 M			
Bromodichloromethane		<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Toluene		<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10		<10		<10		<10			
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	CPT-OBC-01	CPT-OBC-02	CPT-OBC-02	CPT-OBC-04		
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.10 - 0.10 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865612 ES1	0.00 - 0.20 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865610 ES1	0.60 - 0.60 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865611 ES2	0.20 - 0.20 Soil/Solid (S) 05/03/2021 . 09/03/2021 210309-70 23865604 ES2		
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M			
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M			
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M			
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M	<4 M			
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #			
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
Styrene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #			
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #	<5 #	<5 #			
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #			
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M	<16 M	<16 M			
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M	<8 M			
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M	<14 M	<14 M			
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #			
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10	<10	<10			
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M	<8 M			
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M			
n-Butylbenzene	<11 µg/kg	TM116	<11	<11	<11	<11			
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M			
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M	<14 M			
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #			
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20	<20	<20			
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20	<20	<20			
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M	<13 M	<13 M			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*§@	Sample deviation (see appendix)										
Cust. Sample Ref.	CPT-OBC-01ES1	15/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.10 - 0.10										
Sample Type	SOLID										
Date Sampled	05/03/2021 00:00:00										
Date Received	09/03/2021 14:10:00										
SDG	210309-70										
Original Sample	23865612										
Method Number	TM048										
Cust. Sample Ref.	CPT-OBC-02ES1	12/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.00 - 0.20										
Sample Type	SOLID										
Date Sampled	05/03/2021 00:00:00										
Date Received	09/03/2021 14:10:00										
SDG	210309-70										
Original Sample	23865610										
Method Number	TM048										
Cust. Sample Ref.	CPT-OBC-02ES2	12/03/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.60 - 0.20										
Sample Type	SOLID										
Date Sampled	05/03/2021 00:00:00										
Date Received	09/03/2021 14:10:00										
SDG	210309-70										
Original Sample	23865611										
Method Number	TM048										
Cust. Sample Ref.	CPT-OBC-04ES2	12/03/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20 - 0.20										
Sample Type	SOLID										
Date Sampled	05/03/2021 00:00:00										
Date Received	09/03/2021 14:10:00										
SDG	210309-70										
Original Sample	23865604										
Method Number	TM048										



SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.125	Natural Moisture Content (%)	38
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	72.5
Particle Size <4mm	>95%		

Case

SDG	210309-70
Lab Sample Number(s)	23865610
Sampled Date	05-Mar-2021
Customer Sample Ref.	CPT-OBC-02 ES1
Depth (m)	0.00 - 0.20

Landfill Waste Acceptance Criteria Limits

Solid Waste Analysis		Result
Total Organic Carbon (%)	2.24	
Loss on Ignition (%)	13.5	
Sum of BTEX (mg/kg)	<0.04	
Sum of 7 PCBs (mg/kg)	<0.021	
Mineral Oil (mg/kg)	<5	
PAH Sum of 17 (mg/kg)	<10	
pH (pH Units)	8.32	
ANC to pH 6 (mol/kg)	0.067	
ANC to pH 4 (mol/kg)	0.515	

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00111	<0.0005	0.0111	<0.005	0.5	2	25
Barium	0.0307	<0.0002	0.307	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00185	<0.0003	0.0185	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00232	<0.0004	0.0232	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0236	<0.001	0.236	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.653	<0.5	6.53	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	115	<5	1150	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	8.53	<3	85.3	<30	500	800	1000

Leach Test Information

Date Prepared	10-Mar-2021
pH (pH Units)	7.94
Conductivity (µS/cm)	137.00
Temperature (°C)	19.90
Volume Leachant (Litres)	0.865

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

17/03/2021 13:59:37

Notification of NDPs (No determination possible)

Date Received : 09/03/2021 15:56:10

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
23865611	CPT-OBC-02	0.60 - 0.60	Fluoride	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Phenols by HPLC (W)	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	pH Value of Filtered Water	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Mercury Dissolved	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Dissolved Metals by ICP-MS	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Low Level Hexavalent Chromium (w)	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Low Level Cyanide (W)	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Dissolved Organic/Inorganic Carbon	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Anions by Kone (w)	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Ammonium Low	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	Chromium III	Insufficient Sample
23865611	CPT-OBC-02	0.60 - 0.60	CEN Readings	Insufficient Sample
23865611	CPT-OBC-02 ES2	0.60 - 0.60	PAH by GCMS	Insufficient Sample

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23865612	23865610	23865611	23865604
Customer Sample Ref.	CPT-OBC-01	CPT-OBC-02	CPT-OBC-02	CPT-OBC-04
AGS Ref.	ES1	ES1	ES2	ES2
Depth	0.10 - 0.10	0.00 - 0.20	0.60 - 0.60	0.20 - 0.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6		15-Mar-2021		
Anions by Kone (soil)	12-Mar-2021	15-Mar-2021	15-Mar-2021	15-Mar-2021
Anions by Kone (w)		15-Mar-2021		
Asbestos ID in Solid Samples	15-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Boron Water Soluble	17-Mar-2021	17-Mar-2021	17-Mar-2021	17-Mar-2021
CEN 10:1 Leachate (1 Stage)		11-Mar-2021		
CEN Readings		15-Mar-2021		
Chromium III	15-Mar-2021	16-Mar-2021	16-Mar-2021	16-Mar-2021
Coronene		12-Mar-2021		
Cyanide Comp/Free/Total/Thiocyanate	16-Mar-2021	16-Mar-2021	16-Mar-2021	16-Mar-2021
Dissolved Metals by ICP-MS		15-Mar-2021		
Dissolved Organic/Inorganic Carbon		16-Mar-2021		
EPH by GCxGC-FID		15-Mar-2021		
EPH CWG GC (S)	15-Mar-2021	15-Mar-2021	15-Mar-2021	15-Mar-2021
Fluoride		15-Mar-2021		
GRO by GC-FID (S)	12-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Hexavalent Chromium (s)	12-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021
Loss on Ignition in soils		16-Mar-2021		
Mercury Dissolved		16-Mar-2021		
Metals in solid samples by OES	17-Mar-2021	17-Mar-2021	17-Mar-2021	17-Mar-2021
Moisture at 105C		10-Mar-2021	12-Mar-2021	
PAH 16 & 17 Calc		12-Mar-2021		
PAH by GCMS	12-Mar-2021	12-Mar-2021		12-Mar-2021
PCBs by GCMS		12-Mar-2021		
pH	15-Mar-2021	15-Mar-2021	15-Mar-2021	15-Mar-2021
Phenols by HPLC (S)	12-Mar-2021	15-Mar-2021	15-Mar-2021	15-Mar-2021
Phenols by HPLC (W)		16-Mar-2021		
Sample description	10-Mar-2021	11-Mar-2021	11-Mar-2021	11-Mar-2021
Total Dissolved Solids		17-Mar-2021		
Total Organic Carbon	16-Mar-2021	16-Mar-2021	16-Mar-2021	16-Mar-2021
Total Sulphur	15-Mar-2021	15-Mar-2021	15-Mar-2021	15-Mar-2021
TPH CWG GC (S)	15-Mar-2021	15-Mar-2021	15-Mar-2021	15-Mar-2021
VOC MS (S)	15-Mar-2021	12-Mar-2021	12-Mar-2021	12-Mar-2021

ASSOCIATED AQC DATA

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2379
ANC pH_4 dry soil	TM182	109.68 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2389	QC 2306	QC 2341
Chloride (soluble)	TM243	142.49 86.68 : 115.67	141.97 86.68 : 115.67	138.86 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	164.49 70.00 : 130.00	169.16 70.00 : 130.00	157.94 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2398
Chloride	TM184	103.0 91.40 : 109.10
Sulphate (soluble)	TM184	102.0 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2318	QC 2370
Water Soluble Boron	TM222	93.0 77.30 : 106.22	95.0 77.30 : 106.22

Coronene

Component	Method Code	QC 2316
Coronene RAW	TM410	114.0 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2359
Free Cyanide	TM153	97.82 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	99.3 73.07 : 107.47



CERTIFICATE OF ANALYSIS

Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

Component	Method Code	QC 2353
Aluminium	TM152	103.67 90.98 : 111.82
Antimony	TM152	98.67 90.44 : 113.04
Arsenic	TM152	105.0 88.00 : 112.00
Barium	TM152	101.5 90.20 : 111.19
Beryllium	TM152	106.5 87.77 : 113.97
Bismuth	TM152	104.0 91.90 : 112.20
Borate	TM152	104.94 88.00 : 112.00
Boron	TM152	105.0 96.48 : 114.93
Cadmium	TM152	103.83 96.43 : 110.53
Calcium	TM152	103.33 81.38 : 119.09
Chromium	TM152	100.83 91.84 : 108.67
Cobalt	TM152	99.0 88.00 : 112.00
Copper	TM152	103.5 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00
Lead	TM152	100.67 88.00 : 112.00
Lithium	TM152	104.5 91.62 : 113.12
Magnesium	TM152	98.67 93.14 : 107.91
Manganese	TM152	101.67 95.03 : 110.58
Molybdenum	TM152	100.33 88.00 : 112.00
Nickel	TM152	103.5 88.00 : 112.00
Phosphorus	TM152	104.67 88.00 : 112.00
Potassium	TM152	103.33 93.90 : 112.36
Selenium	TM152	107.5 91.58 : 115.98
Silver	TM152	103.33 88.80 : 122.30
Sodium	TM152	99.33 94.28 : 110.71
Strontium	TM152	104.33 88.00 : 112.00
Tellurium	TM152	106.83 93.32 : 114.66



CERTIFICATE OF ANALYSIS

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Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2353
Thallium	TM152	96.83 88.00 : 112.00
Tin	TM152	101.5 92.63 : 109.70
Titanium	TM152	104.83 95.58 : 111.68
Tungsten	TM152	100.83 81.32 : 124.72
Uranium	TM152	102.67 88.00 : 112.00
Vanadium	TM152	103.33 88.00 : 112.00
Zinc	TM152	104.0 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2308
Dissolved Inorganic Carbon	TM090	101.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2376
EPH >C10-C40 Raw	TM415	76.89 56.36 : 129.92

EPH CWG GC (S)

Component	Method Code	QC 2345
EPH >C8-C40 Raw	TM414	91.45 58.74 : 124.10
Total Aliphatics Raw	TM414	97.18 64.15 : 136.53
Total Aromatics Raw	TM414	101.88 57.33 : 145.15

Fluoride

Component	Method Code	QC 2391
Fluoride	TM104	105.33 96.67 : 108.67

GRO by GC-FID (S)

GRO by GC-FID (S)

Component	Method Code	QC 2323
QC	TM089	94.46 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2339	QC 2352
Hexavalent Chromium	TM151	98.0 92.00 : 111.20	104.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2301
Loss on Ignition	TM018	96.45 87.10 : 102.39

Metals in solid samples by OES

Component	Method Code	QC 2358	QC 2373
Aluminium	TM181	90.27 73.56 : 108.85	88.5 73.56 : 108.85
Antimony	TM181	99.59 76.89 : 111.24	97.97 76.89 : 111.24
Arsenic	TM181	102.91 88.53 : 111.01	99.42 88.53 : 111.01
Barium	TM181	98.17 77.67 : 105.35	93.58 77.67 : 105.35
Beryllium	TM181	101.87 85.44 : 109.61	104.48 85.44 : 109.61
Boron	TM181	91.12 73.51 : 104.66	90.54 73.51 : 104.66
Cadmium	TM181	90.53 77.67 : 104.12	95.88 77.67 : 104.12
Chromium	TM181	96.96 79.64 : 105.83	88.24 79.64 : 105.83
Cobalt	TM181	92.77 84.60 : 104.13	94.34 84.60 : 104.13
Copper	TM181	96.13 82.40 : 105.45	99.3 82.40 : 105.45
Iron	TM181	96.03 82.95 : 110.58	100.0 82.95 : 110.58
Lead	TM181	93.24 78.24 : 104.05	92.34 78.24 : 104.05
Manganese	TM181	110.28 94.29 : 119.51	113.33 94.29 : 119.51

Metals in solid samples by OES

		QC 2358	QC 2373
Mercury	TM181	99.76 83.16 : 107.81	99.52 83.16 : 107.81
Molybdenum	TM181	101.65 87.11 : 106.87	102.88 87.11 : 106.87
Nickel	TM181	96.58 80.26 : 102.28	91.2 80.26 : 102.28
Phosphorus	TM181	112.12 94.56 : 124.28	106.06 94.56 : 124.28
Selenium	TM181	102.75 82.28 : 110.48	106.27 82.28 : 110.48
Strontium	TM181	94.88 79.13 : 102.79	94.43 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86	97.79 82.94 : 111.86
Tin	TM181	102.28 86.72 : 110.03	102.66 86.72 : 110.03
Titanium	TM181	83.21 66.23 : 102.06	74.66 66.23 : 102.06
Vanadium	TM181	98.9 86.19 : 109.45	98.9 86.19 : 109.45
Zinc	TM181	106.78 84.68 : 113.99	101.85 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2389	QC 2300	QC 2358
Acenaphthene	TM218	96.0 73.47 : 109.80	96.5 76.79 : 103.90	90.5 76.79 : 103.90
Acenaphthylene	TM218	95.0 70.00 : 130.00	95.5 78.40 : 108.66	89.5 78.40 : 108.66
Anthracene	TM218	93.5 68.68 : 111.89	96.0 70.90 : 109.22	87.0 70.90 : 109.22
Benz(a)anthracene	TM218	96.0 68.12 : 118.39	96.5 73.77 : 119.26	81.5 73.77 : 119.26
Benzo(a)pyrene	TM218	88.0 71.72 : 115.31	87.0 73.20 : 114.18	79.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	100.0 66.89 : 120.40	93.5 75.36 : 117.58	81.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	94.0 67.82 : 118.49	97.5 70.73 : 116.12	75.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	85.5 73.10 : 117.03	95.0 75.98 : 116.59	83.5 75.98 : 116.59
Chrysene	TM218	96.0 69.58 : 115.47	93.5 74.82 : 114.18	81.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	89.5 67.32 : 121.35	94.0 69.17 : 115.30	76.5 69.17 : 115.30
Fluoranthene	TM218	110.5 75.16 : 117.28	93.0 75.88 : 112.84	88.0 75.88 : 112.84
Fluorene	TM218	94.0 73.81 : 108.66	96.0 76.66 : 107.56	89.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	88.0 68.91 : 117.62	86.0 70.26 : 117.95	72.5 70.26 : 117.95
Naphthalene	TM218	97.0 72.12 : 106.18	98.5 74.70 : 101.83	91.5 74.70 : 101.83

ALS

CERTIFICATE OF ANALYSIS

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SDG:210309-70

Client Reference: B025563

Report Number: 590960

Location:Cambridge South East Tra

Order Number: 7000964

Superseded Report:

PAH by GCMS

		QC 2389	QC 2300	QC 2358
Phenanthrene	TM218	101.0 69.01 : 113.72	95.5 73.62 : 109.34	89.5 73.62 : 109.34
Pyrene	TM218	106.5 64.28 : 115.75	93.5 71.46 : 117.00	86.0 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2364
PCB congener 101	TM168	77.8 65.66 : 110.06
PCB congener 105	TM168	74.0 58.10 : 106.34
PCB congener 114	TM168	76.2 59.38 : 106.48
PCB congener 118	TM168	74.8 60.02 : 106.23
PCB congener 123	TM168	82.0 65.01 : 99.81
PCB congener 126	TM168	75.5 59.31 : 109.23
PCB congener 138	TM168	79.4 63.95 : 107.63
PCB congener 153	TM168	81.2 62.65 : 108.85
PCB congener 156	TM168	75.7 61.69 : 112.27
PCB congener 157	TM168	71.1 55.37 : 104.81
PCB congener 167	TM168	74.9 65.58 : 109.14
PCB congener 169	TM168	76.8 56.84 : 112.10
PCB congener 180	TM168	78.9 66.99 : 111.63
PCB congener 189	TM168	77.6 57.75 : 112.59
PCB congener 28	TM168	79.7 73.68 : 105.96
PCB congener 52	TM168	77.5 67.24 : 107.62
PCB congener 77	TM168	78.0 64.87 : 108.49
PCB congener 81	TM168	80.0 70.78 : 110.80

pH

Component	Method Code	QC 2354	QC 2382	QC 2317
pH	TM133	101.45 98.71 : 102.32	101.58 98.71 : 102.32	101.58 98.71 : 102.32



CERTIFICATE OF ANALYSIS

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SDG:210309-70

Client Reference: B025563

Report Number: 590960

Location:Cambridge South East Tra

Order Number: 7000964

Superseded Report:

Phenols by HPLC (S)

Component	Method Code	QC 2314	QC 2316
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	56.49 70.71 : 116.42	48.7 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	50.29 64.54 : 117.79	42.69 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	14.29 22.43 : 157.02	17.14 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	50.73 74.40 : 108.98	42.8 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	49.29 47.22 : 132.72	33.57 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	56.95 69.44 : 122.18	49.67 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	54.72 71.43 : 129.59	51.57 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	53.65 76.56 : 106.38	45.94 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2367
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	55.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	56.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	53.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	63.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	55.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	54.5 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2376
Total Dissolved Solids	TM123	98.7 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2358
Total Organic Carbon	TM132	104.3 84.82 : 117.61

Total Sulphur

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210309-70	Client Reference:	B025563	Report Number:	590960	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2363	QC 2340	QC 2372		
Total Sulphur %	TM132	90.67 61.64 : 114.47	97.93 61.64 : 114.47	93.26 61.64 : 114.47		

VOC MS (S)			
Component	Method Code	QC 2326	QC 2349
1,1,1,2-tetrachloroethane	TM116	101.4 84.84 : 116.25	96.2 86.59 : 118.97
1,1,1-Trichloroethane	TM116	99.2 73.73 : 118.05	101.4 86.26 : 117.53
1,1,2-Trichloroethane	TM116	96.8 77.12 : 116.04	88.0 75.16 : 112.70
1,1-Dichloroethane	TM116	106.2 74.46 : 129.15	105.6 83.27 : 122.16
1,2-Dichloroethane	TM116	113.8 92.38 : 131.65	117.4 89.30 : 133.10
1,4-Dichlorobenzene	TM116	107.2 83.64 : 126.18	102.2 82.59 : 123.23
2-Chlorotoluene	TM116	101.4 76.03 : 113.25	94.2 66.81 : 118.43
4-Chlorotoluene	TM116	88.6 66.90 : 112.46	89.8 65.88 : 114.76
Benzene	TM116	97.0 88.60 : 113.80	97.2 93.16 : 123.63
Carbon Disulphide	TM116	84.8 74.91 : 122.14	96.6 75.11 : 124.81
Carbontetrachloride	TM116	100.6 80.31 : 124.50	103.4 82.35 : 126.46
Chlorobenzene	TM116	103.2 83.81 : 114.18	96.0 85.07 : 118.13
Chloroform	TM116	109.0 87.40 : 122.49	107.4 88.13 : 122.71
Chloromethane	TM116	101.0 65.89 : 136.93	119.0 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	107.2 80.67 : 126.72	101.2 78.27 : 128.90
Dibromomethane	TM116	94.8 73.23 : 118.35	92.8 77.47 : 121.29
Dichloromethane	TM116	110.0 81.11 : 133.25	110.4 87.89 : 134.72
Ethylbenzene	TM116	90.0 75.92 : 110.41	90.0 79.92 : 110.05
Hexachlorobutadiene	TM116	102.2 12.82 : 152.73	52.6 16.78 : 153.29
Isopropylbenzene	TM116	81.4 55.79 : 97.59	86.0 64.20 : 119.59
Naphthalene	TM116	106.0 80.86 : 128.81	99.0 79.29 : 125.59
o-Xylene	TM116	82.2 69.99 : 108.74	84.6 72.86 : 102.10

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210309-70	Client Reference:	B025563	Report Number:	590960	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2326	QC 2349			
p/m-Xylene	TM116	81.3 68.32 : 108.91	84.2 74.06 : 106.47			
Sec-Butylbenzene	TM116	73.2 38.50 : 101.50	65.8 44.71 : 117.87			
Tetrachloroethene	TM116	98.8 76.95 : 121.02	100.4 85.86 : 122.95			
Toluene	TM116	89.6 74.24 : 107.42	84.6 87.82 : 116.21			
Trichloroethene	TM116	94.0 85.28 : 109.36	94.4 79.80 : 112.33			
Trichlorofluoromethane	TM116	103.4 84.55 : 133.27	107.2 80.52 : 132.12			
Vinyl Chloride	TM116	102.8 68.02 : 143.37	107.0 74.57 : 146.88			

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

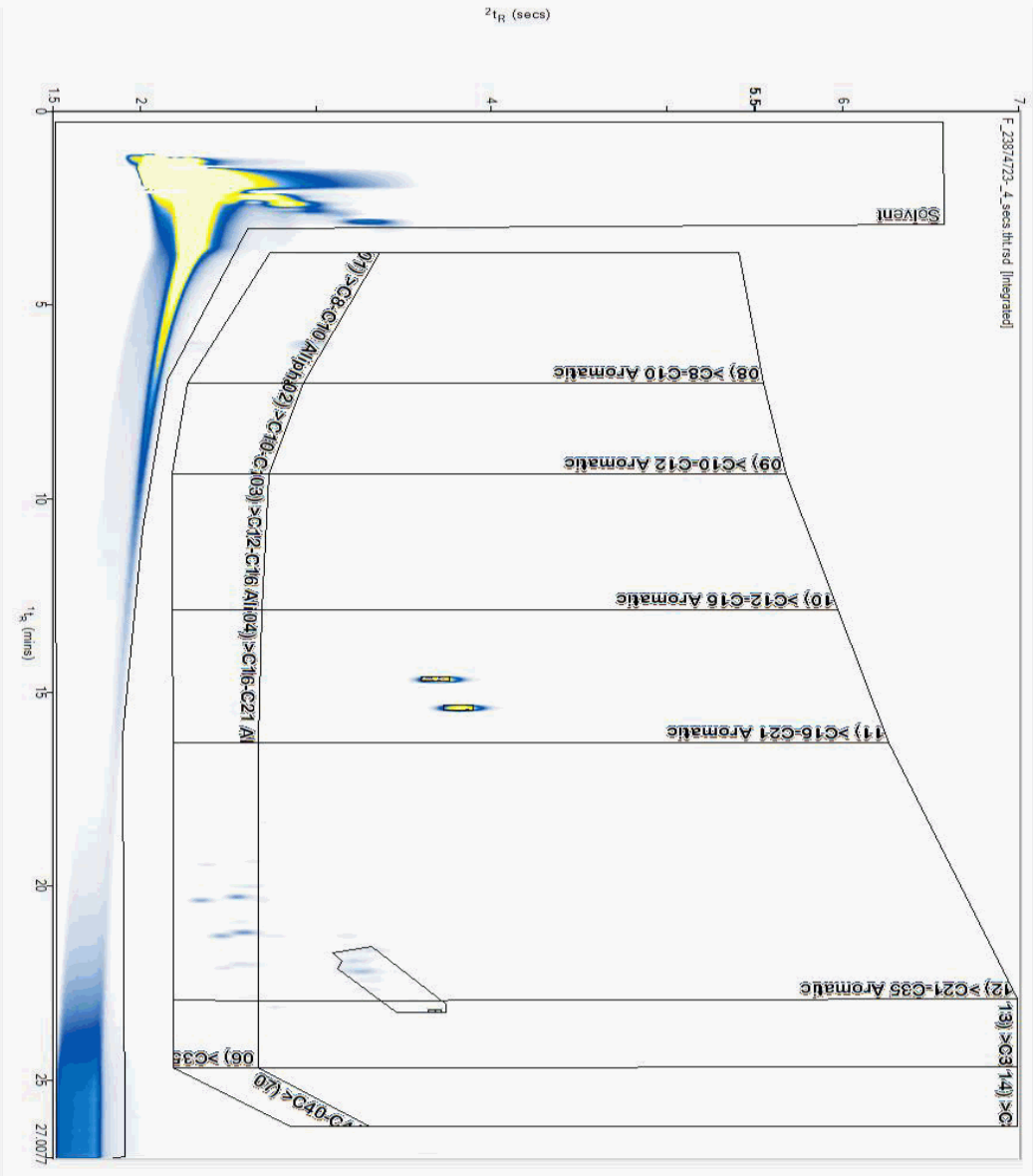
Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23874723 Depth : 0.10 - 0.10
Sample ID : CPT-OBC-01

ChromSpace LIMS export
Current batch
Sample Identity: F_23874723-4_secs.tht
Date Acquired : 13/03/21 08:46:27
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

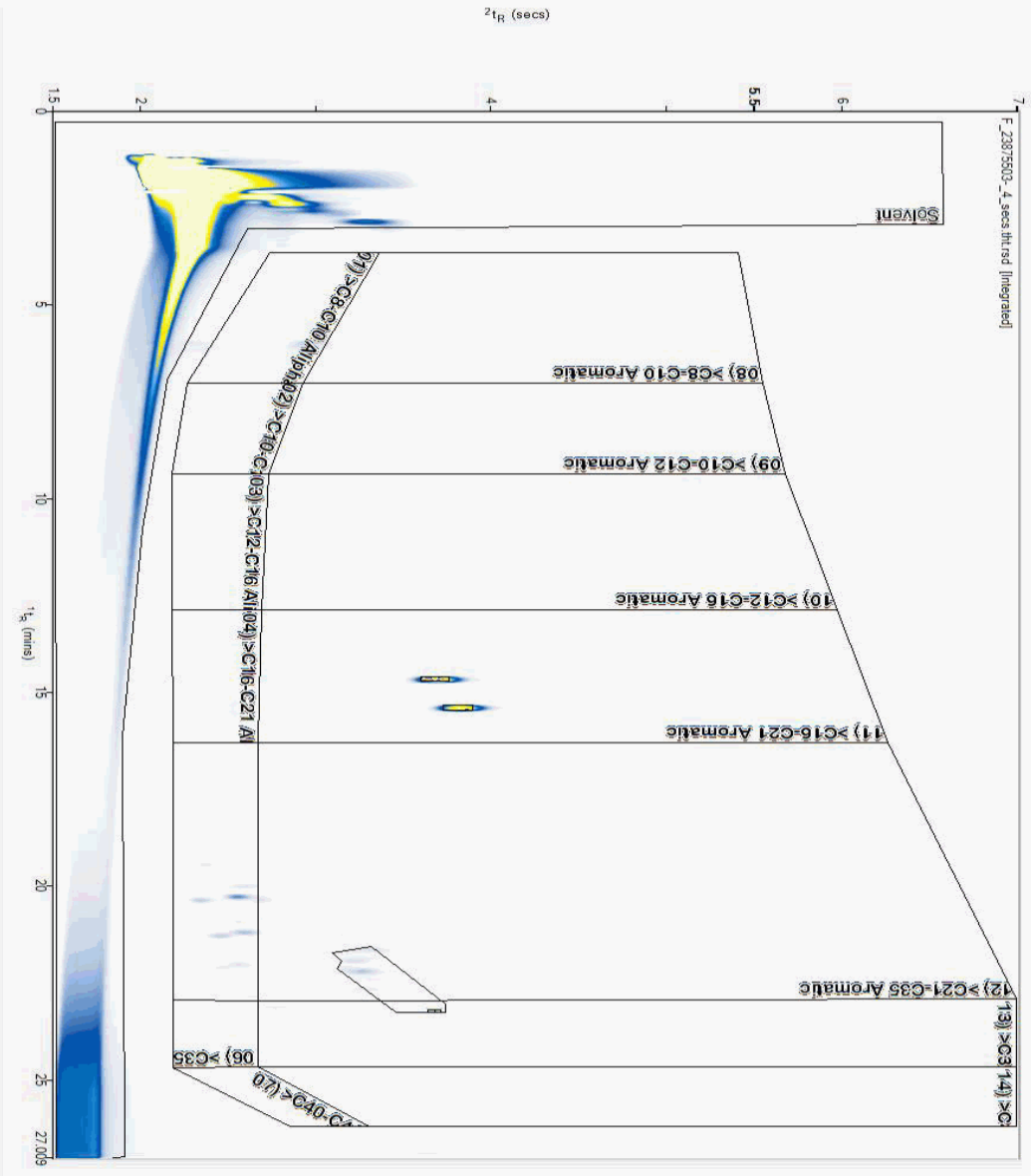
Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23875503 Depth : 0.00 - 0.20
Sample ID : CPT-OBC-02

ChromSpace LIMS export
Current batch
Sample Identity: F_23875503-4_secs.tht
Date Acquired : 13/03/21 07:12:26
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

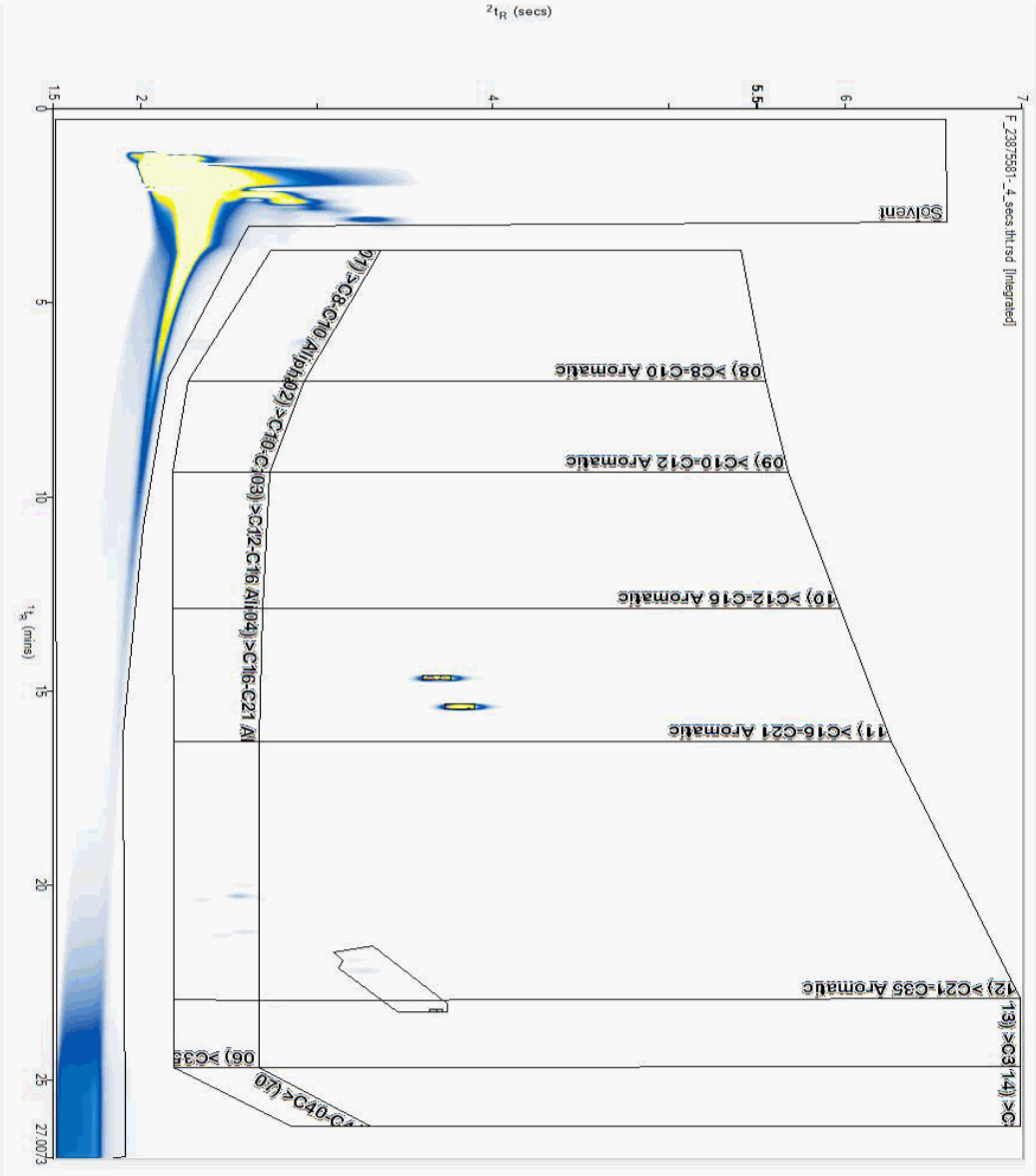
Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23875581 Depth : 0.60 - 0.60
Sample ID : CPT-OBC-02

ChromSpace LIMS export
Current batch
Sample Identity: F_23875581-4_secs.tht
Date Acquired : 13/03/21 07:43:45
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

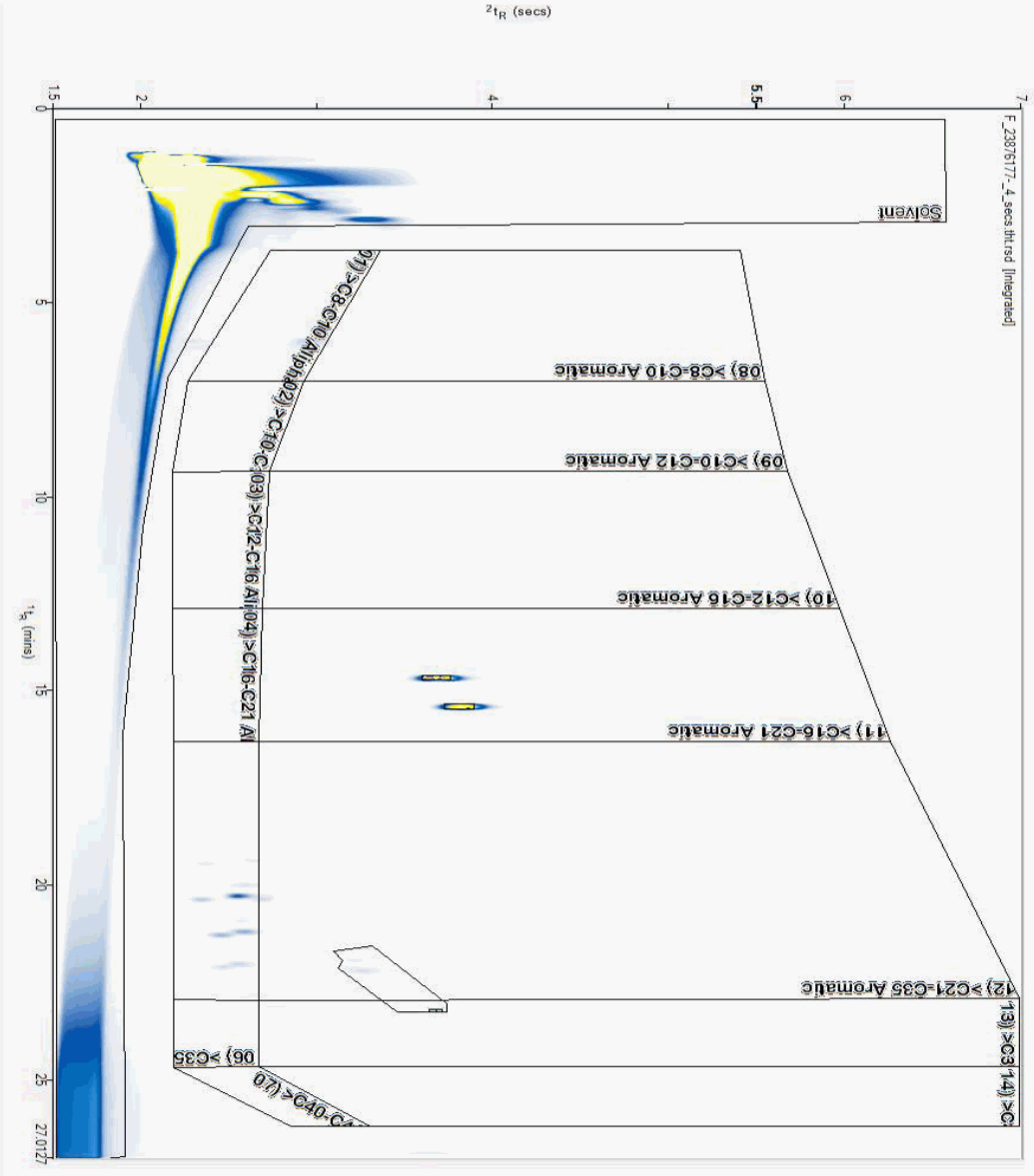
Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23876177 Depth : 0.20 - 0.20
Sample ID : CPT-OBC-04

ChromSpace LIMS export
Current batch
Sample Identity: F_23876177-4_secs.tht
Date Acquired : 13/03/21 05:38:31
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23875525 Depth : 0.00 - 0.20
Sample ID : CPT-OBC-02



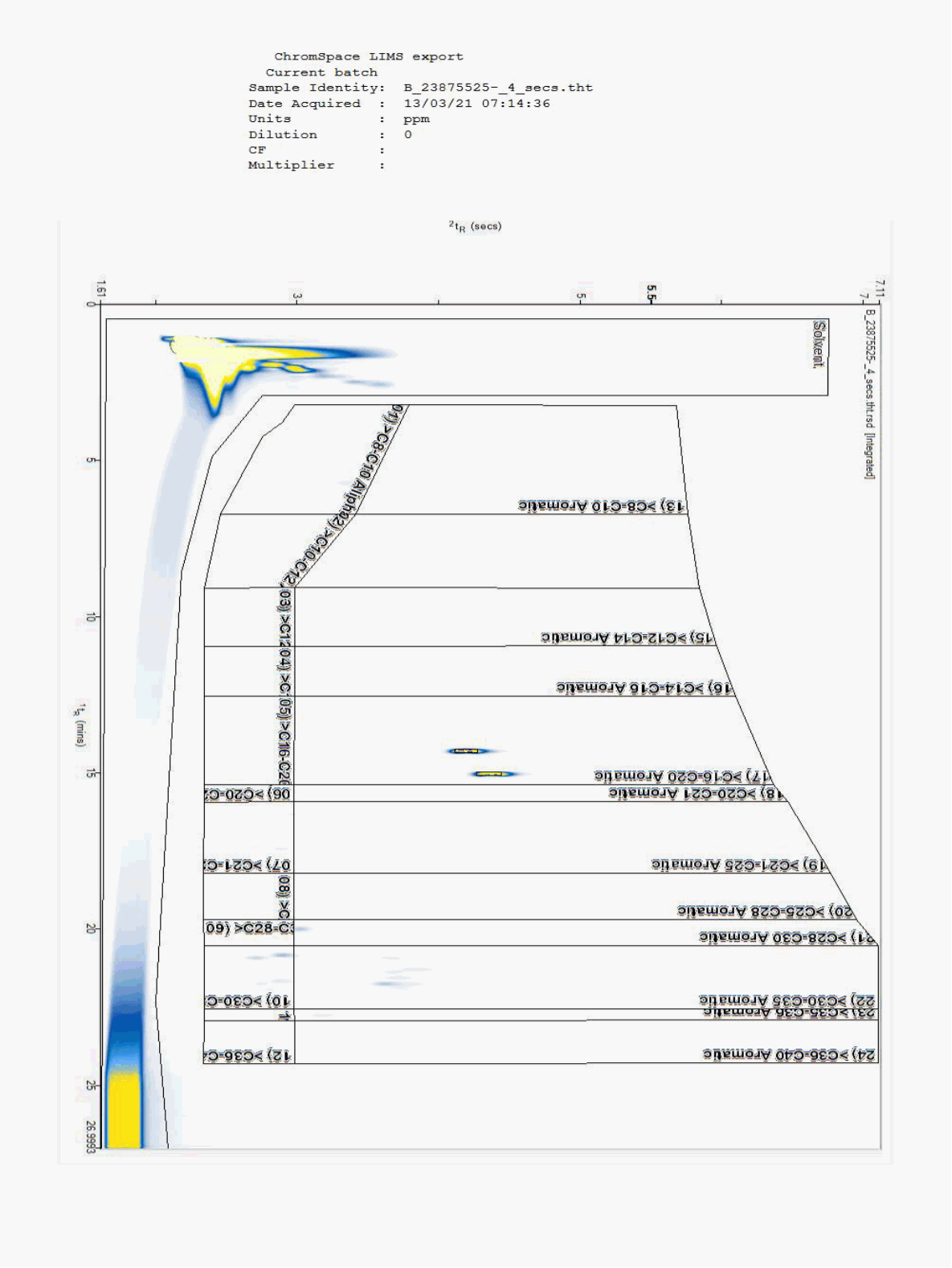
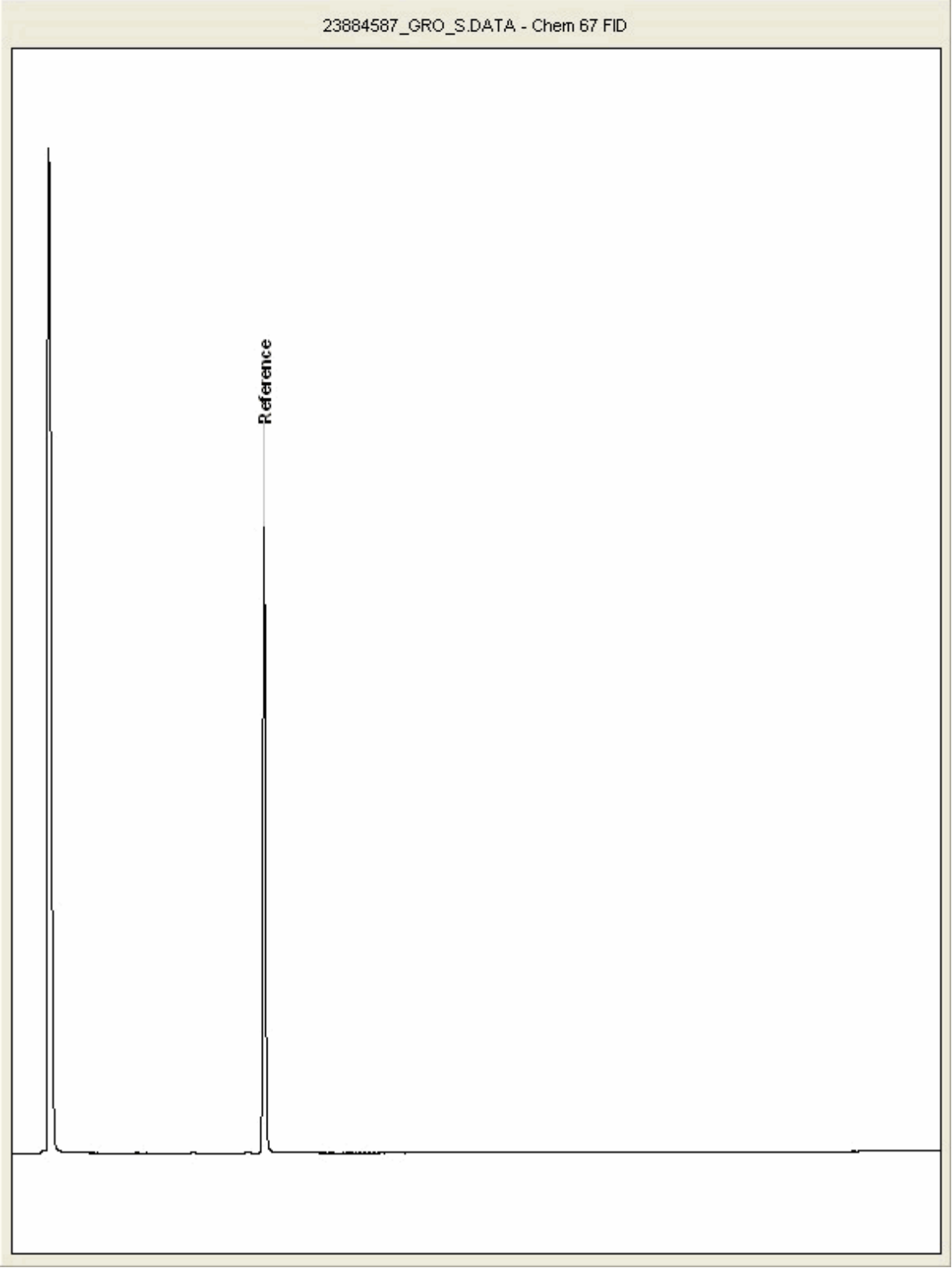
CERTIFICATE OF ANALYSIS

Validated

SDG:	210309-70	Client Reference:	B025563	Report Number:	590960
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23884587 Depth : 0.10 - 0.10
Sample ID : CPT-OBC-01





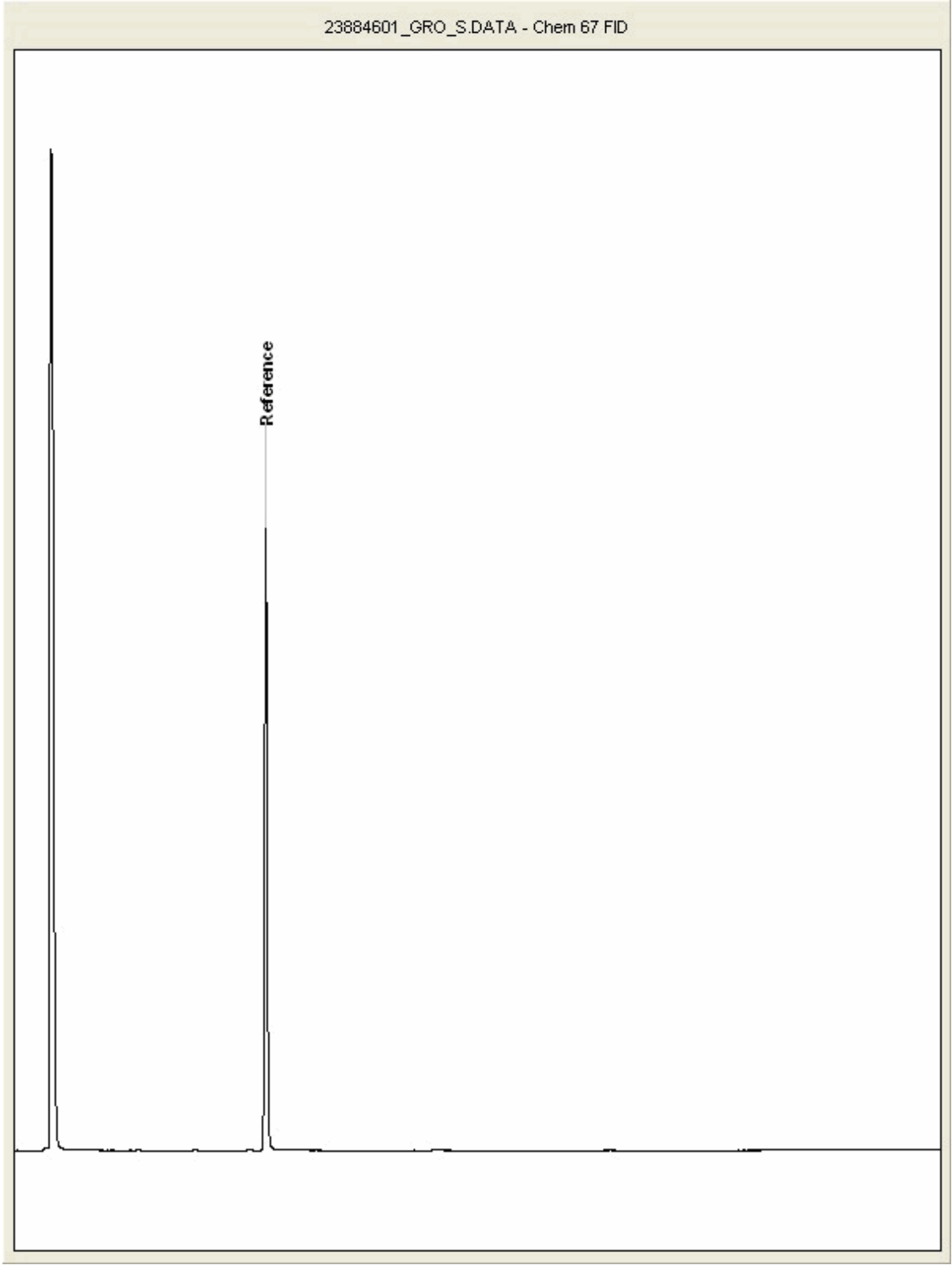
CERTIFICATE OF ANALYSIS

Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23884601 Depth : 0.00 - 0.20
Sample ID : CPT-OBC-02



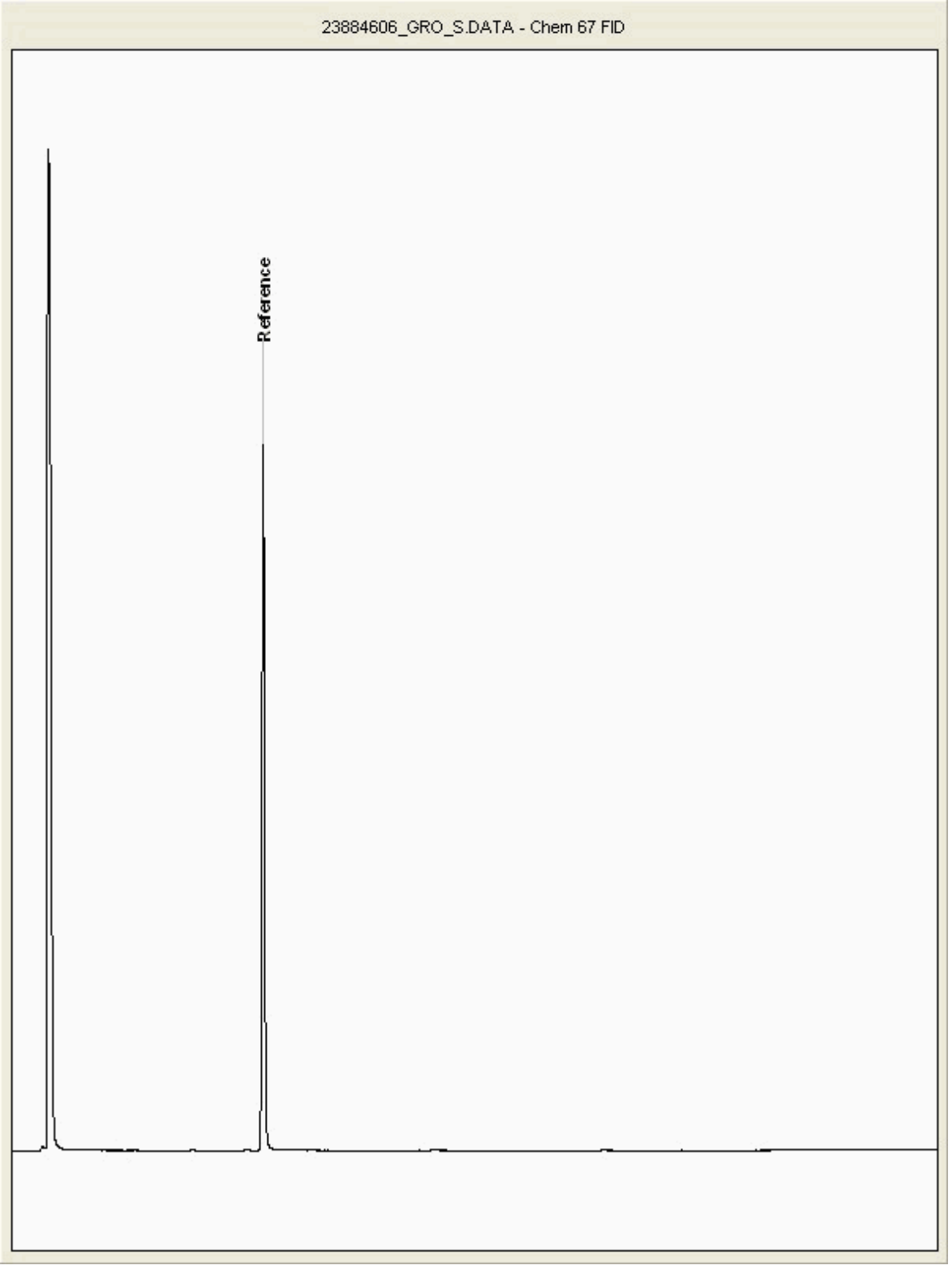
CERTIFICATE OF ANALYSIS

Validated

SDG: 210309-70 Client Reference: B025563 Report Number: 590960
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23884606 Depth : 0.60 - 0.60
Sample ID : CPT-OBC-02



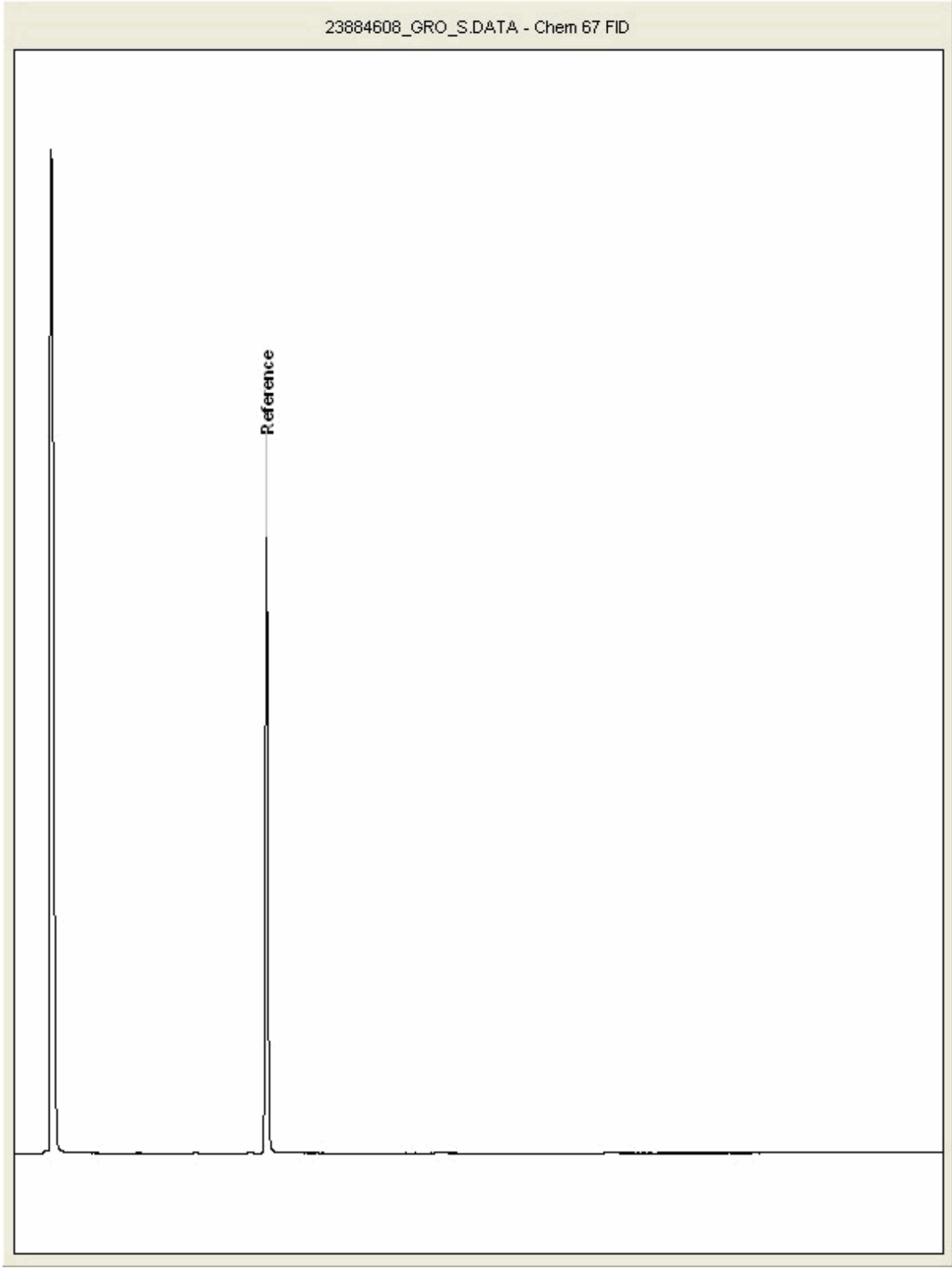
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23884608

Sample ID : CPT-OBC-04

Depth : 0.20 - 0.20



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 18 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210311-145
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 591106

We received 8 samples on Thursday March 11, 2021 and 1 of these samples were scheduled for analysis which was completed on Thursday March 18, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210311-145 Client Reference: B025563 Report Number: 591106
Location: Cambridge South East Transport Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23882466	BHPTR 36		0.10	09/03/2021
23882469	BHPTR 36		0.20	09/03/2021
23882471	BHPTR 36		0.50	09/03/2021
23882472	BHPTR 36		1.00	09/03/2021
23882474	BHPTR 37		0.10	09/03/2021
23882475	BHPTR 37		0.20	09/03/2021
23882476	BHPTR 37		0.50	09/03/2021
23882477	BHPTR 37		1.00	09/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210311-145 Client Reference: B025563 Report Number: 591106
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23882469		
	Customer Sample Reference		BHPTR 36		
	AGS Reference				
	Depth (m)		0.20		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210311-145 Client Reference: B025563 Report Number: 591106
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23882469		
	Customer Sample Reference		BHPTR 36		
	AGS Reference				
	Depth (m)		0.20		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23882469	BHPTR 36	0.20	Dark Brown	Sand	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BHPTR 36				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		09/03/2021				
disa.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		11/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210311-145				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23882469				
(F)	Trigger breach confirmed						
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	22				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0425				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0179	#			
pH	1 pH Units	TM133	8.64	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	10.4				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	15.7	M			
Barium	<0.6 mg/kg	TM181	64.7	#			
Beryllium	<0.01 mg/kg	TM181	0.57	M			
Cadmium	<0.02 mg/kg	TM181	0.176	M			
Chromium	<0.9 mg/kg	TM181	10.4	M			
Copper	<1.4 mg/kg	TM181	10.3	M			
Iron	<1000 mg/kg	TM181	33800	#			
Lead	<0.7 mg/kg	TM181	11.2	M			
Manganese	<0.13 mg/kg	TM181	211	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.41	#			
Nickel	<0.2 mg/kg	TM181	19.7	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	45.7	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		BHPTR 36					
# M aq dis.filt tot.unfilt + ** (F) 1-44\$@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 09/03/2021 . 11/03/2021 210311-145 23882469						
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	113						
Toluene-d8**	%	TM116	97.7						
4-Bromofluorobenzene**	%	TM116	102						
Dichlorodifluoromethane	<6 µg/kg	TM116	<120						
Chloromethane	<7 µg/kg	TM116	<140						
Vinyl Chloride	<6 µg/kg	TM116	<120						
Bromomethane	<10 µg/kg	TM116	<200						
Chloroethane	<10 µg/kg	TM116	<200						
Trichlorofluorormethane	<6 µg/kg	TM116	<120						
1,1-Dichloroethene	<10 µg/kg	TM116	<200						
Carbon Disulphide	<7 µg/kg	TM116	<140						
Dichloromethane	<10 µg/kg	TM116	<200						
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200						
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200						
1,1-Dichloroethane	<8 µg/kg	TM116	<160						
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120						
2,2-Dichloropropane	<10 µg/kg	TM116	<200						
Bromochloromethane	<10 µg/kg	TM116	<200						
Chloroform	<8 µg/kg	TM116	<160						
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140						
1,1-Dichloropropene	<10 µg/kg	TM116	<200						
Carbontetrachloride	<10 µg/kg	TM116	<200						
1,2-Dichloroethane	<5 µg/kg	TM116	<100						
Benzene	<9 µg/kg	TM116	<180						
Trichloroethene	<9 µg/kg	TM116	<180						
1,2-Dichloropropane	<10 µg/kg	TM116	<200						
Dibromomethane	<9 µg/kg	TM116	<180						
Bromodichloromethane	<7 µg/kg	TM116	<140						
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200						
Toluene	<7 µg/kg	TM116	<140						
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200						

CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BHPTR 36</div> <div>0.20 Soil/Solid (S) 09/03/2021 . 11/03/2021 210311-145 23882469</div>					
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<140 M						
Tetrachloroethene	<5 µg/kg	TM116	<100 M						
Dibromochloromethane	<10 µg/kg	TM116	<200 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<200 M						
Chlorobenzene	<5 µg/kg	TM116	<100 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<200 M						
Ethylbenzene	<4 µg/kg	TM116	<80 M						
p/m-Xylene	<10 µg/kg	TM116	<200 #						
o-Xylene	<10 µg/kg	TM116	<200 M						
Styrene	<10 µg/kg	TM116	<200 #						
Bromoform	<10 µg/kg	TM116	<200 M						
Isopropylbenzene	<5 µg/kg	TM116	<100 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<200 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<320 M						
Bromobenzene	<10 µg/kg	TM116	<200 M						
Propylbenzene	<10 µg/kg	TM116	<200 M						
2-Chlorotoluene	<9 µg/kg	TM116	<180 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<160 M						
4-Chlorotoluene	<10 µg/kg	TM116	<200 M						
tert-Butylbenzene	<14 µg/kg	TM116	<280 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<180 #						
sec-Butylbenzene	<10 µg/kg	TM116	<200						
4-Isopropyltoluene	<10 µg/kg	TM116	<200 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<160 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<100 M						
n-Butylbenzene	<11 µg/kg	TM116	<220						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<200 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<280 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<200 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<400						
Hexachlorobutadiene	<20 µg/kg	TM116	<400						
Naphthalene	<13 µg/kg	TM116	<260 M						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref.	BHPTR 36	15/03/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20										
Sample Type	SOLID										
Date Sampled	09/03/2021 00:00:00										
Date Received	11/03/2021 11:50:00										
SDG	210311-145										
Original Sample	23882469										
Method Number	TM048										

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.114	Natural Moisture Content (%)	26.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	79.1
Particle Size <4mm	>95%		

Case

SDG 210311-145

Lab Sample Number(s) 23882469

Sampled Date 09-Mar-2021

Customer Sample Ref. BHPTR 36

Depth (m) 0.20

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.019	<0.01	0.19	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	7.22	<3	72.2	<30	-	-	-
Fluoride	1.25	<0.5	12.5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00054	<0.0005	0.0054	<0.005	-	-	-
Barium	0.0049	<0.0002	0.049	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0366	<0.01	0.366	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	20.6	<0.2	206	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00237	<0.0003	0.0237	<0.003	-	-	-
Lead	0.00197	<0.0002	0.0197	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.34	<0.036	3.4	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.0017	<0.0004	0.017	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0014	<0.001	0.014	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	12-Mar-2021
pH (pH Units)	8.83
Conductivity (µS/cm)	116.00
Temperature (°C)	19.10
Volume Leachant (Litres)	0.876



CERTIFICATE OF ANALYSIS

Validated

SDG:210311-145Client Reference: B025563Report Number: 591106

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.114

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport - f

26.4

79.1

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210311-145

23882469

09-Mar-2021

BHPTR 36

0.20

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Hardness dissolved

52.8

<0.65

528

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.227

<0.019

2.27

<0.19

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

12-Mar-2021

8.83

116.00

19.10

0.876



CERTIFICATE OF ANALYSIS

Validated

SDG:210311-145Client Reference: B025563Report Number: 591106

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23882469
Customer Sample Ref.	BHPTR 36
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
Ammonium Low	17-Mar-2021
Anions by Kone (soil)	16-Mar-2021
Anions by Kone (w)	16-Mar-2021
Asbestos ID in Solid Samples	15-Mar-2021
Boron Water Soluble	17-Mar-2021
CEN 10:1 Leachate (1 Stage)	15-Mar-2021
CEN Readings	17-Mar-2021
Chromium III	18-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	17-Mar-2021
Dissolved Metals by ICP-MS	17-Mar-2021
Dissolved Organic/Inorganic Carbon	18-Mar-2021
EPH CWG GC (S)	16-Mar-2021
Fluoride	17-Mar-2021
GRO by GC-FID (S)	15-Mar-2021
Hexavalent Chromium (s)	16-Mar-2021
Low Level Cyanide (W)	17-Mar-2021
Low Level Hexavalent Chromium (w)	17-Mar-2021
Mercury Dissolved	17-Mar-2021
Metals in solid samples by OES	18-Mar-2021
Moisture at 105C	12-Mar-2021
PAH by GCMS	16-Mar-2021
pH	16-Mar-2021
pH Value of Filtered Water	17-Mar-2021
Phenols by HPLC (S)	15-Mar-2021
Phenols by HPLC (W)	17-Mar-2021
Sample description	12-Mar-2021
Total Organic Carbon	18-Mar-2021
Total Sulphur	17-Mar-2021
TPH CWG GC (S)	16-Mar-2021
VOC MS (S)	15-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low		
Component	Method Code	QC 2348
Ammoniacal Nitrogen as N	TM099	101.8 96.04 : 106.80

Anions by Kone (soil)		
Component	Method Code	QC 2357
Chloride (soluble)	TM243	150.26 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	166.36 70.00 : 130.00

Anions by Kone (w)		
Component	Method Code	QC 2307
Chloride	TM184	102.0 91.40 : 109.10
Sulphate (soluble)	TM184	100.8 91.99 : 109.30

Boron Water Soluble		
Component	Method Code	QC 2316
Water Soluble Boron	TM222	91.0 77.30 : 106.22

Cyanide Comp/Free/Total/Thiocyanate		
Component	Method Code	QC 2311
Free Cyanide	TM153	98.32 79.00 : 115.00
Thiocyanate	TM153	99.36 94.09 : 113.89
Total Cyanide	TM153	102.1 73.07 : 107.47

Dissolved Metals by ICP-MS		
Component	Method Code	QC 2345
Aluminium	TM152	101.67 90.98 : 111.82
Antimony	TM152	102.5 90.44 : 113.04
Arsenic	TM152	99.67 88.00 : 112.00



CERTIFICATE OF ANALYSIS

Validated

SDG:

Location:

210311-145
Cambridge South East Tra

Client Reference:

Order Number:

B025563
7000964

Report Number:

Superseded Report:

591106

Dissolved Metals by ICP-MS

		QC 2345
Barium	TM152	98.0 90.20 : 111.19
Beryllium	TM152	100.67 87.77 : 113.97
Bismuth	TM152	99.67 91.90 : 112.20
Borate	TM152	100.0 88.00 : 112.00
Boron	TM152	100.33 96.48 : 114.93
Cadmium	TM152	100.5 96.43 : 110.53
Calcium	TM152	100.0 81.38 : 119.09
Chromium	TM152	97.5 91.84 : 108.67
Cobalt	TM152	97.5 88.00 : 112.00
Copper	TM152	99.0 92.47 : 118.11
Iron	TM152	98.67 92.00 : 113.00
Lead	TM152	99.83 88.00 : 112.00
Lithium	TM152	99.67 91.62 : 113.12
Magnesium	TM152	96.0 93.14 : 107.91
Manganese	TM152	98.67 95.03 : 110.58
Molybdenum	TM152	97.33 88.00 : 112.00
Nickel	TM152	98.83 88.00 : 112.00
Phosphorus	TM152	99.83 88.00 : 112.00
Potassium	TM152	99.33 93.90 : 112.36
Selenium	TM152	103.0 91.58 : 115.98
Silver	TM152	99.0 88.80 : 122.30
Sodium	TM152	96.67 94.28 : 110.71
Strontium	TM152	100.0 88.00 : 112.00
Tellurium	TM152	99.5 93.32 : 114.66
Thallium	TM152	93.5 88.00 : 112.00
Tin	TM152	100.0 92.63 : 109.70
Titanium	TM152	102.83 95.58 : 111.68



CERTIFICATE OF ANALYSIS

Validated

SDG:

Location:

210311-145
Cambridge South East Tra

Client Reference:

Order Number:

B025563
7000964

Report Number:

Superseded Report:

591106

Dissolved Metals by ICP-MS

		QC 2345
Tungsten	TM152	98.33 81.32 : 124.72
Uranium	TM152	98.67 88.00 : 112.00
Vanadium	TM152	98.83 88.00 : 112.00
Zinc	TM152	100.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2331
Dissolved Inorganic Carbon	TM090	113.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.17 96.13 : 109.53

Fluoride

Component	Method Code	QC 2358
Fluoride	TM104	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2382
QC	TM089	92.14 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2383
Hexavalent Chromium	TM151	100.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2332
Free Cyanide - Low Level	TM279	79.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	99.0 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210311-145	Client Reference:	B025563	Report Number:	591106	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2348				
Mercury Dissolved (CVAF)	TM183	96.4 69.30 : 128.70				

Metals in solid samples by OES		
Component	Method Code	QC 2381
Aluminium	TM181	97.35 73.56 : 108.85
Antimony	TM181	97.15 76.89 : 111.24
Arsenic	TM181	102.03 88.53 : 111.01
Barium	TM181	93.58 77.67 : 105.35
Beryllium	TM181	100.37 85.44 : 109.61
Boron	TM181	92.26 73.51 : 104.66
Cadmium	TM181	90.12 77.67 : 104.12
Chromium	TM181	87.63 79.64 : 105.83
Cobalt	TM181	91.19 84.60 : 104.13
Copper	TM181	92.78 82.40 : 105.45
Iron	TM181	100.79 82.95 : 110.58
Lead	TM181	91.44 78.24 : 104.05
Manganese	TM181	108.33 94.29 : 119.51
Mercury	TM181	99.76 83.16 : 107.81
Molybdenum	TM181	100.82 87.11 : 106.87
Nickel	TM181	92.18 80.26 : 102.28
Phosphorus	TM181	110.1 94.56 : 124.28
Selenium	TM181	102.35 82.28 : 110.48
Strontium	TM181	93.1 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86
Tin	TM181	101.14 86.72 : 110.03
Titanium	TM181	81.68 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210311-145	Client Reference:	B025563	Report Number:	591106	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2381				
Vanadium	TM181	96.7 86.19 : 109.45				
Zinc	TM181	100.21 84.68 : 113.99				

Component	Method Code	QC 2311
Acenaphthene	TM218	91.5 78.59 : 112.16
Acenaphthylene	TM218	90.0 75.11 : 109.01
Anthracene	TM218	91.5 73.99 : 113.85
Benz(a)anthracene	TM218	94.0 69.31 : 119.18
Benzo(a)pyrene	TM218	89.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	94.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	97.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	90.5 69.98 : 116.49
Chrysene	TM218	89.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	92.5 64.54 : 115.22
Fluoranthene	TM218	97.0 72.56 : 111.70
Fluorene	TM218	93.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	95.0 61.22 : 113.25
Naphthalene	TM218	88.5 77.96 : 110.91
Phenanthrene	TM218	92.5 76.83 : 113.25
Pyrene	TM218	95.0 72.45 : 110.77

pH		
Component	Method Code	QC 2342
pH	TM133	101.45 98.71 : 102.32

pH Value of Filtered Water



CERTIFICATE OF ANALYSIS

Validated

SDG:210311-145

Client Reference: B025563

Report Number: 591106

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

pH Value of Filtered Water

Component	Method Code	QC 2361
pH	TM256	100.8 99.33 : 102.54

Phenols by HPLC (S)		
Component	Method Code	QC 2366
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	55.84 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	50.29 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	0.95 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	49.69 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	26.43 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	56.29 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	56.6 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	54.17 76.56 : 106.38

Phenols by HPLC (W)		
Component	Method Code	QC 2372
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	51.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	51.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.33 76.60 : 126.28
Napthol by HPLC (W)	TM259	59.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	52.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	51.17 79.09 : 131.82

Total Organic Carbon		
Component	Method Code	QC 2306
Total Organic Carbon	TM132	101.56 87.02 : 113.45

Total Sulphur

		CERTIFICATE OF ANALYSIS				Validated		
SDG:		210311-145	Client Reference:		B025563	Report Number:		591106
Location:		Cambridge South East Tra	Order Number:		7000964	Superseded Report:		
Total Sulphur								
Component		Method Code		QC 2318				
Total Sulphur %		TM132		92.75 61.64 : 114.47				

VOC MS (S)		
Component	Method Code	QC 2369
1,1,1,2-tetrachloroethane	TM116	101.2 79.10 : 119.66
1,1,1-Trichloroethane	TM116	101.0 84.25 : 112.57
1,1,2-Trichloroethane	TM116	91.2 81.29 : 113.79
1,1-Dichloroethane	TM116	105.0 86.77 : 122.11
1,2-Dichloroethane	TM116	112.0 90.04 : 132.28
1,4-Dichlorobenzene	TM116	108.0 80.81 : 125.07
2-Chlorotoluene	TM116	92.8 73.13 : 114.13
4-Chlorotoluene	TM116	90.2 68.66 : 109.13
Benzene	TM116	96.4 84.29 : 112.22
Carbon Disulphide	TM116	94.6 75.11 : 124.81
Carbontetrachloride	TM116	108.4 82.35 : 126.46
Chlorobenzene	TM116	104.0 82.88 : 122.42
Chloroform	TM116	107.0 90.35 : 120.38
Chloromethane	TM116	106.8 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	100.4 78.27 : 128.90
Dibromomethane	TM116	99.2 76.00 : 120.73
Dichloromethane	TM116	110.0 92.27 : 134.36
Ethylbenzene	TM116	87.8 70.95 : 113.07
Hexachlorobutadiene	TM116	59.8 14.55 : 147.92
Isopropylbenzene	TM116	71.4 52.00 : 108.19
Naphthalene	TM116	112.6 80.29 : 135.77
o-Xylene	TM116	82.2 64.92 : 98.85



CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2369
p/m-Xylene	TM116	83.1 69.47 : 97.31
Sec-Butylbenzene	TM116	63.0 27.03 : 135.73
Tetrachloroethene	TM116	103.6 81.43 : 126.65
Toluene	TM116	89.0 82.44 : 103.50
Trichloroethene	TM116	95.8 79.80 : 112.33
Trichlorofluoromethane	TM116	105.4 89.67 : 132.09
Vinyl Chloride	TM116	105.8 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



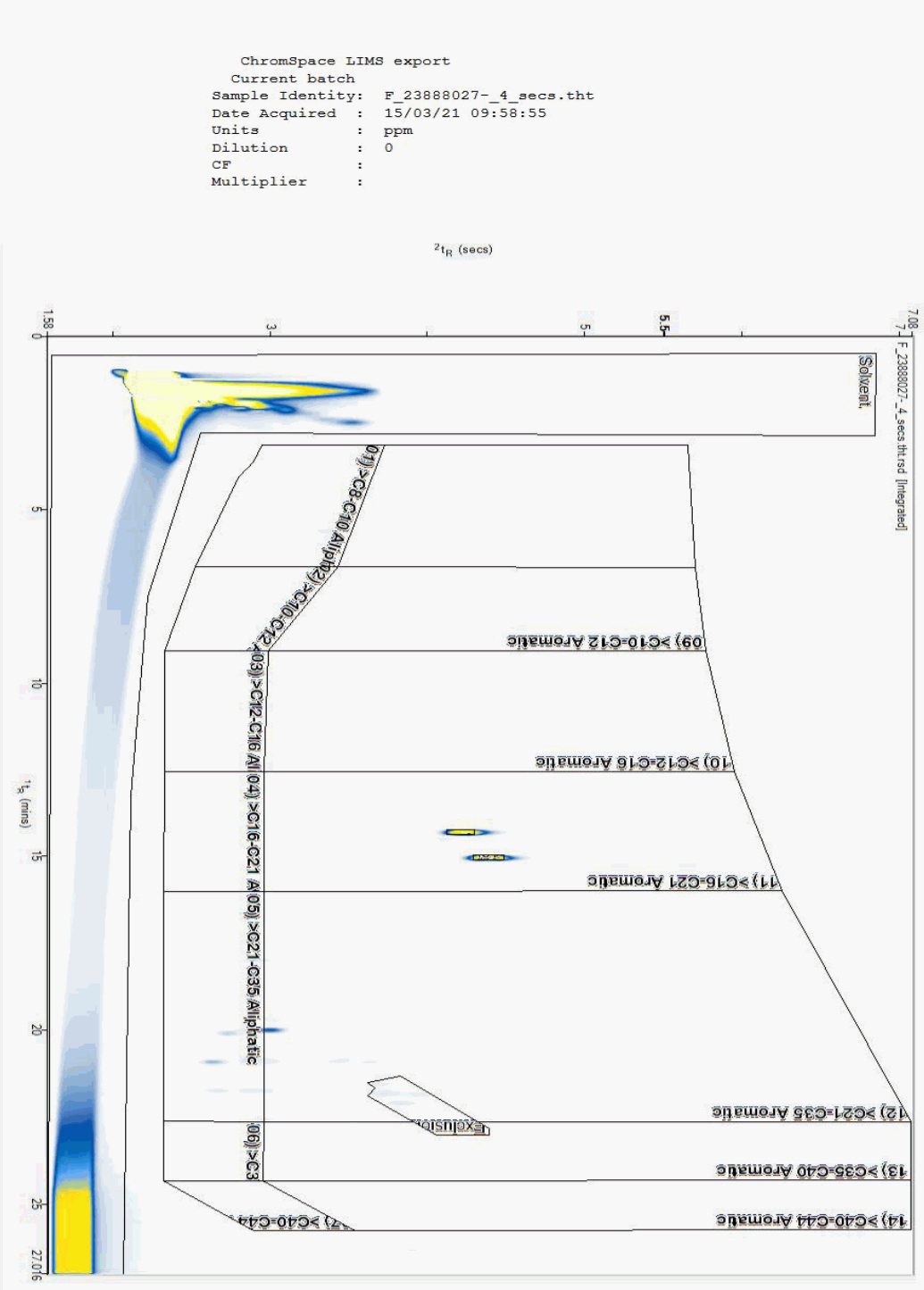
CERTIFICATE OF ANALYSIS

Validated

SDG:	210311-145	Client Reference:	B025563	Report Number:	591106
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23888027	Depth :	0.20
		Sample ID :	BHPTR 36		





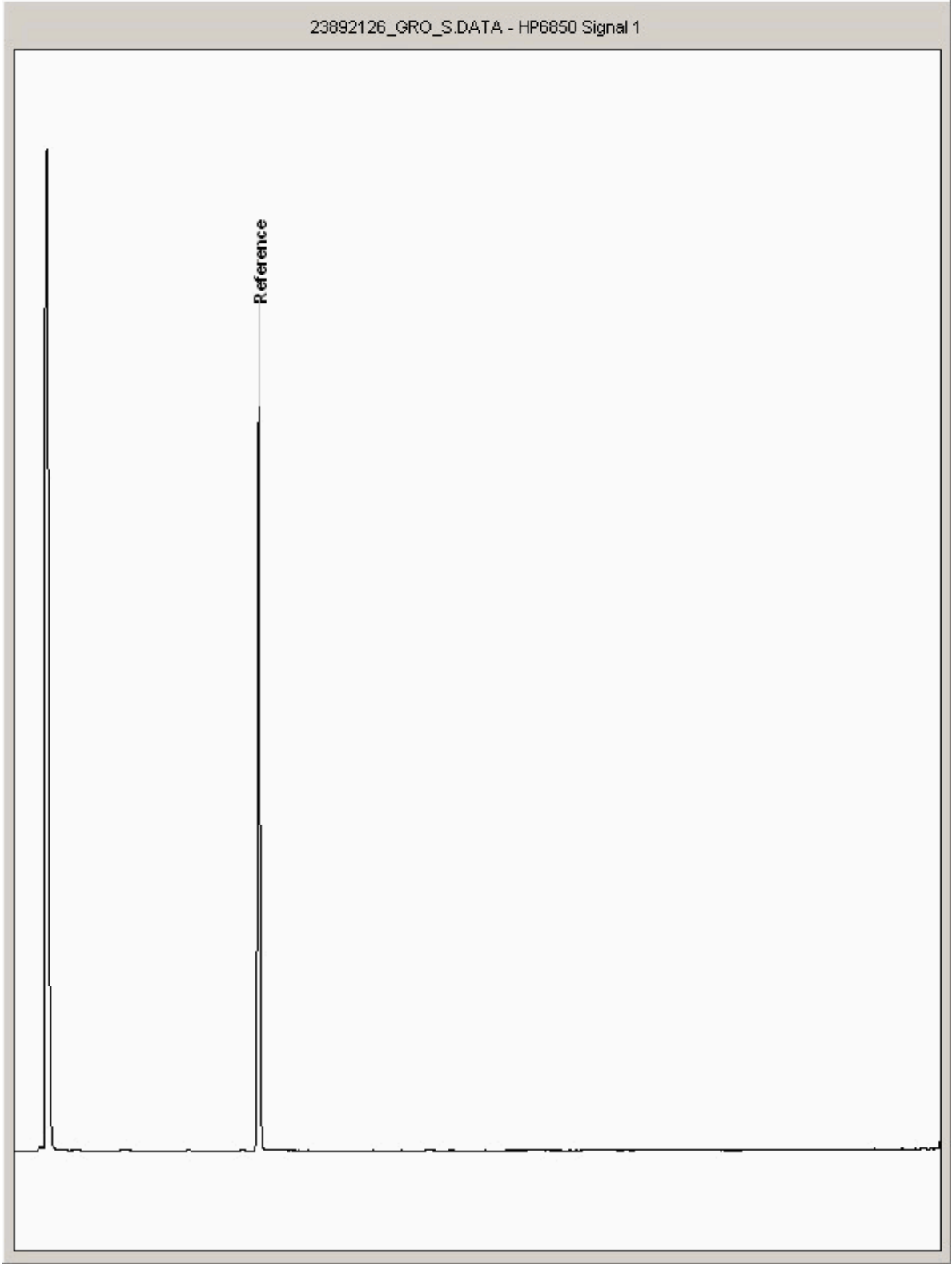
CERTIFICATE OF ANALYSIS

Validated

SDG: 210311-145 Client Reference: B025563 Report Number: 591106
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23892126 Depth : 0.20
Sample ID : BHPTR 36



CERTIFICATE OF ANALYSIS

SDG: 210311-145 Client Reference: B025563 Report Number: 591106
Location: idge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Hawarden
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CH5 3US
Tel: (01244) 528700
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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 19 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210312-157
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 591245

We received 10 samples on Wednesday March 10, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday March 19, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-157 Client Reference: B025563 Report Number: 591245
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23891565	BH-OBC-013		0.00 - 0.10	08/03/2021
23891567	BH-OBC-013		0.20 - 0.20	08/03/2021
23891569	BH-OBC-013		0.80 - 0.80	08/03/2021
23891571	BH-OBC-013		1.00 - 1.00	08/03/2021
23891572	BH-OBC-013		1.80 - 1.80	08/03/2021
23891574	BH-PIR-07		0.10 - 0.10	08/03/2021
23891576	BH-PIR-07		0.20 - 0.20	08/03/2021
23891577	BH-PIR-07		0.50 - 0.50	08/03/2021
23891578	BH-PIR-07		1.00 - 1.00	08/03/2021
23891579	BH-PIR-07		3.20 - 3.20	08/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-157 Client Reference: B025563 Report Number: 591245
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23891576		
	Customer Sample Reference		BH-PIR-07		
	AGS Reference				
	Depth (m)		0.20 - 0.20		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-157 Client Reference: B025563 Report Number: 591245
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23891576		
	Customer Sample Reference		BH-PIR-07		
	AGS Reference				
	Depth (m)		0.20 - 0.20		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23891576	BH-PIR-07	0.20 - 0.20	Dark Brown	Loamy Sand	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PIR-07				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		08/03/2021				
disa.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		10/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210312-157				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23891576				
(F)	Trigger breach confirmed						
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	20				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	0.0125	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0519				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0164	#			
pH	1 pH Units	TM133	8.43	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	5				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	5.62	M			
Barium	<0.6 mg/kg	TM181	56.9	#			
Beryllium	<0.01 mg/kg	TM181	0.339	M			
Cadmium	<0.02 mg/kg	TM181	0.113	M			
Chromium	<0.9 mg/kg	TM181	5	M			
Copper	<1.4 mg/kg	TM181	15.6	M			
Iron	<1000 mg/kg	TM181	8100	#			
Lead	<0.7 mg/kg	TM181	13.7	M			
Manganese	<0.13 mg/kg	TM181	280	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.218	#			
Nickel	<0.2 mg/kg	TM181	11.5	M			
Selenium	<1 mg/kg	TM181	1.45	#			
Vanadium	<0.2 mg/kg	TM181	12.2	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

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Validated

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-PIR-07					
# M aq dis.filt tot.unfilt + ** (F) 1-44\$@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 08/03/2021 . 10/03/2021 210312-157 23891576						
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	106						
Toluene-d8**	%	TM116	89.8						
4-Bromofluorobenzene**	%	TM116	70.5						
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M						
Chloromethane	<7 µg/kg	TM116	<7 #						
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M						
Bromomethane	<10 µg/kg	TM116	<10 M						
Chloroethane	<10 µg/kg	TM116	<10 M						
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M						
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #						
Carbon Disulphide	<7 µg/kg	TM116	<7 M						
Dichloromethane	<10 µg/kg	TM116	<100 #						
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M						
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M						
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M						
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M						
2,2-Dichloropropane	<10 µg/kg	TM116	<10						
Bromochloromethane	<10 µg/kg	TM116	<10 M						
Chloroform	<8 µg/kg	TM116	<8 M						
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M						
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M						
Carbontetrachloride	<10 µg/kg	TM116	<10 M						
1,2-Dichloroethane	<5 µg/kg	TM116	<5 3 M						
Benzene	<9 µg/kg	TM116	<9 M						
Trichloroethene	<9 µg/kg	TM116	<9 #						
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M						
Dibromomethane	<9 µg/kg	TM116	<9 M						
Bromodichloromethane	<7 µg/kg	TM116	<7 M						
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M						
Toluene	<7 µg/kg	TM116	<7 M						
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M						

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-PIR-07					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.20 Soil/Solid (S) 08/03/2021 . 10/03/2021 210312-157 23891576						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<50 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M						
Styrene	<10 µg/kg	TM116	<10 @ #						
Bromoform	<10 µg/kg	TM116	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13 M						



CERTIFICATE OF ANALYSIS

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend																				
#	ISO17025 accredited.																			
M	mCERTS accredited.																			
*	Subcontracted test.																			
(F)	Trigger breach confirmed																			
1-5&*\$@	Sample deviation (see appendix)																			
Cust. Sample Ref.	BH-PIR-07	16/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected										
Depth (m)	0.20 - 0.20																			
Sample Type	SOLID																			
Date Sampled	08/03/2021 00:00:00																			
Date Received	10/03/2021 13:40:00																			
SDG	210312-157																			
Original Sample	23891576																			
Method Number	TM048																			

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.112	Natural Moisture Content (%)	24.2
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	80.5
Particle Size <4mm	>95%		

Case

SDG	210312-157			
Lab Sample Number(s)	23891576			
Sampled Date	08-Mar-2021			
Customer Sample Ref.	BH-PIR-07			
Depth (m)	0.20 - 0.20			

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.019	<0.01	0.19	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	7.11	<3	71.1	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.0035	<0.0005	0.035	<0.005	-	-	-
Barium	0.00933	<0.0002	0.0933	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0151	<0.01	0.151	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	18.3	<0.2	183	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00703	<0.0003	0.0703	<0.003	-	-	-
Lead	0.000367	<0.0002	0.00367	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.245	<0.036	2.45	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00348	<0.0004	0.0348	<0.004	-	-	-
Selenium	0.00107	<0.001	0.0107	<0.01	-	-	-
Vanadium	0.00343	<0.001	0.0343	<0.01	-	-	-
Zinc	0.00325	<0.001	0.0325	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	15-Mar-2021
pH (pH Units)	8.47
Conductivity (µS/cm)	96.80
Temperature (°C)	19.30
Volume Leachant (Litres)	0.879



CERTIFICATE OF ANALYSIS

Validated

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.112	Natural Moisture Content (%)	24.2
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	80.5
Particle Size <4mm	>95%		

Case

SDG 210312-157

Lab Sample Number(s) 23891576

Sampled Date 08-Mar-2021

Customer Sample Ref. BH-PIR-07

Depth (m) 0.20 - 0.20

[illegible]

Leach Test Information

Date Prepared	15-Mar-2021
pH (pH Units)	8.47
Conductivity (µS/cm)	96.80
Temperature (°C)	19.30
Volume Leachant (Litres)	0.879

19/03/2021 08:18:17



CERTIFICATE OF ANALYSIS

Validated

SDG:	210312-157	Client Reference:	B025563	Report Number:	591245
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990/BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

08:17:26 19/03/2021

Test Completion Dates

Lab Sample No(s)	23891576
Customer Sample Ref.	BH-PIR-07
AGS Ref.	
Depth	0.20 - 0.20
Type	Soil/Solid (S)
Ammonium Low	18-Mar-2021
Anions by Kone (soil)	18-Mar-2021
Anions by Kone (w)	18-Mar-2021
Asbestos ID in Solid Samples	16-Mar-2021
Boron Water Soluble	18-Mar-2021
CEN 10:1 Leachate (1 Stage)	15-Mar-2021
CEN Readings	18-Mar-2021
Chromium III	18-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	17-Mar-2021
Dissolved Metals by ICP-MS	18-Mar-2021
Dissolved Organic/Inorganic Carbon	18-Mar-2021
EPH CWG GC (S)	17-Mar-2021
Fluoride	18-Mar-2021
GRO by GC-FID (S)	16-Mar-2021
Hexavalent Chromium (s)	17-Mar-2021
Low Level Cyanide (W)	19-Mar-2021
Low Level Hexavalent Chromium (w)	18-Mar-2021
Mercury Dissolved	18-Mar-2021
Metals in solid samples by OES	17-Mar-2021
Moisture at 105C	15-Mar-2021
PAH by GCMS	16-Mar-2021
pH	17-Mar-2021
pH Value of Filtered Water	19-Mar-2021
Phenols by HPLC (S)	16-Mar-2021
Phenols by HPLC (W)	18-Mar-2021
Sample description	13-Mar-2021
Total Organic Carbon	18-Mar-2021
Total Sulphur	17-Mar-2021
TPH CWG GC (S)	17-Mar-2021
VOC MS (S)	17-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2312
Ammoniacal Nitrogen as N	TM099	100.6 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2358
Chloride (soluble)	TM243	151.3 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	165.89 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2350
Chloride	TM184	103.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.0 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2309
Water Soluble Boron	TM222	94.0 77.30 : 106.22

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2340
Free Cyanide	TM153	97.92 79.00 : 115.00
Thiocyanate	TM153	100.0 94.09 : 113.89
Total Cyanide	TM153	100.7 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2304
Aluminium	TM152	102.67 90.98 : 111.82
Antimony	TM152	102.0 90.44 : 113.04
Arsenic	TM152	100.83 88.00 : 112.00



CERTIFICATE OF ANALYSIS

Validated

SDG:210312-157

Client Reference: B025563

Report Number: 591245

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

Dissolved Metals by ICP-MS

		QC 2304
Barium	TM152	100.17 90.20 : 111.19
Beryllium	TM152	103.83 87.77 : 113.97
Bismuth	TM152	100.83 91.90 : 112.20
Borate	TM152	102.47 88.00 : 112.00
Boron	TM152	102.67 96.48 : 114.93
Cadmium	TM152	103.0 96.43 : 110.53
Calcium	TM152	99.33 81.38 : 119.09
Chromium	TM152	97.67 91.84 : 108.67
Cobalt	TM152	95.5 88.00 : 112.00
Copper	TM152	100.33 92.47 : 118.11
Iron	TM152	99.33 92.00 : 113.00
Lead	TM152	98.67 88.00 : 112.00
Lithium	TM152	104.0 91.62 : 113.12
Magnesium	TM152	96.0 93.14 : 107.91
Manganese	TM152	98.83 95.03 : 110.58
Molybdenum	TM152	99.33 88.00 : 112.00
Nickel	TM152	99.67 88.00 : 112.00
Phosphorus	TM152	98.5 88.00 : 112.00
Potassium	TM152	99.33 93.90 : 112.36
Selenium	TM152	101.17 91.58 : 115.98
Silver	TM152	101.5 88.80 : 122.30
Sodium	TM152	96.67 94.28 : 110.71
Strontium	TM152	101.67 88.00 : 112.00
Tellurium	TM152	99.67 93.32 : 114.66
Thallium	TM152	98.33 88.00 : 112.00
Tin	TM152	101.33 92.63 : 109.70
Titanium	TM152	103.33 95.58 : 111.68



CERTIFICATE OF ANALYSIS

Validated

SDG:210312-157

Client Reference: B025563

Report Number: 591245

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

Dissolved Metals by ICP-MS

		QC 2304
Tungsten	TM152	97.83 81.32 : 124.72
Uranium	TM152	100.5 88.00 : 112.00
Vanadium	TM152	104.17 88.00 : 112.00
Zinc	TM152	101.67 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2361
Dissolved Inorganic Carbon	TM090	102.33 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.17 96.13 : 109.53

Fluoride

Component	Method Code	QC 2392
Fluoride	TM104	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2387
QC	TM089	83.7 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2306
Hexavalent Chromium	TM151	100.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2354
Free Cyanide - Low Level	TM279	77.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	95.75 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210312-157	Client Reference:	B025563	Report Number:	591245	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2374				
Mercury Dissolved (CVAF)	TM183	98.0 69.30 : 128.70				

Metals in solid samples by OES		
Component	Method Code	QC 2328
Aluminium	TM181	94.69 73.56 : 108.85
Antimony	TM181	99.19 76.89 : 111.24
Arsenic	TM181	104.94 88.53 : 111.01
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	101.49 85.44 : 109.61
Boron	TM181	92.26 73.51 : 104.66
Cadmium	TM181	88.89 77.67 : 104.12
Chromium	TM181	91.48 79.64 : 105.83
Cobalt	TM181	91.82 84.60 : 104.13
Copper	TM181	95.42 82.40 : 105.45
Iron	TM181	96.03 82.95 : 110.58
Lead	TM181	91.22 78.24 : 104.05
Manganese	TM181	110.56 94.29 : 119.51
Mercury	TM181	101.21 83.16 : 107.81
Molybdenum	TM181	99.18 87.11 : 106.87
Nickel	TM181	92.67 80.26 : 102.28
Phosphorus	TM181	110.1 94.56 : 124.28
Selenium	TM181	103.53 82.28 : 110.48
Strontium	TM181	92.87 79.13 : 102.79
Thallium	TM181	98.67 82.94 : 111.86
Tin	TM181	102.66 86.72 : 110.03
Titanium	TM181	85.5 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210312-157	Client Reference:	B025563	Report Number:	591245	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2328				
Vanadium	TM181	98.17 86.19 : 109.45				
Zinc	TM181	101.64 84.68 : 113.99				

Component	Method Code	QC 2395
Acenaphthene	TM218	91.0 76.79 : 103.90
Acenaphthylene	TM218	91.0 78.40 : 108.66
Anthracene	TM218	89.5 70.90 : 109.22
Benz(a)anthracene	TM218	92.0 73.77 : 119.26
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	90.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	90.0 75.98 : 116.59
Chrysene	TM218	87.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	83.0 69.17 : 115.30
Fluoranthene	TM218	97.0 75.88 : 112.84
Fluorene	TM218	91.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	83.0 70.26 : 117.95
Naphthalene	TM218	84.0 74.70 : 101.83
Phenanthrene	TM218	94.5 73.62 : 109.34
Pyrene	TM218	93.5 71.46 : 117.00

pH		
Component	Method Code	QC 2367
pH	TM133	101.98 98.71 : 102.32

pH Value of Filtered Water

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210312-157	Client Reference:	B025563	Report Number:	591245	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
pH Value of Filtered Water						
Component	Method Code	QC 2334				
pH	TM256	100.8 99.33 : 102.54				

Phenols by HPLC (S)		
Component	Method Code	QC 2380
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.3 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Catechol by HPLC (S)	TM062 (S)	13.33 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	45.3 74.40 : 108.98
Napthol by HPLC (S)	TM062 (S)	28.57 47.22 : 132.72
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18
Resorcinol HPLC (S)	TM062 (S)	51.57 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	48.96 76.56 : 106.38

Phenols by HPLC (W)		
Component	Method Code	QC 2310
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	51.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	50.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	60.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	52.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.83 79.09 : 131.82

Total Organic Carbon		
Component	Method Code	QC 2306
Total Organic Carbon	TM132	101.56 87.02 : 113.45

Total Sulphur

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210312-157	Client Reference:	B025563	Report Number:	591245	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2318				
Total Sulphur %	TM132	92.75 61.64 : 114.47				

VOC MS (S)			
Component	Method Code	QC 2342	QC 2323
1,1,1,2-tetrachloroethane	TM116	104.0 86.59 : 118.97	101.2 84.84 : 116.25
1,1,1-Trichloroethane	TM116	108.4 86.26 : 117.53	99.8 73.73 : 118.05
1,1,2-Trichloroethane	TM116	93.6 75.16 : 112.70	91.4 77.12 : 116.04
1,1-Dichloroethane	TM116	108.2 83.27 : 122.16	100.8 74.46 : 129.15
1,2-Dichloroethane	TM116	139.0 89.30 : 133.10	107.6 92.38 : 131.65
1,4-Dichlorobenzene	TM116	103.0 82.59 : 123.23	110.0 83.64 : 126.18
2-Chlorotoluene	TM116	93.6 66.81 : 118.43	99.8 76.03 : 113.25
4-Chlorotoluene	TM116	92.4 65.88 : 114.76	91.8 66.90 : 112.46
Benzene	TM116	98.0 93.16 : 123.63	95.8 88.60 : 113.80
Carbon Disulphide	TM116	93.8 75.11 : 124.81	91.6 74.91 : 122.14
Carbontetrachloride	TM116	111.4 82.35 : 126.46	100.4 80.31 : 124.50
Chlorobenzene	TM116	97.6 85.07 : 118.13	103.0 83.81 : 114.18
Chloroform	TM116	115.2 88.13 : 122.71	105.4 87.40 : 122.49
Chloromethane	TM116	110.6 61.62 : 145.66	92.0 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	103.4 78.27 : 128.90	98.8 80.67 : 126.72
Dibromomethane	TM116	100.4 77.47 : 121.29	94.2 73.23 : 118.35
Dichloromethane	TM116	110.6 87.89 : 134.72	105.0 81.11 : 133.25
Ethylbenzene	TM116	90.2 79.92 : 110.05	91.6 75.92 : 110.41
Hexachlorobutadiene	TM116	48.6 16.78 : 153.29	63.2 12.82 : 152.73
Isopropylbenzene	TM116	85.4 64.20 : 119.59	83.8 55.79 : 97.59
Naphthalene	TM116	104.6 79.29 : 125.59	112.0 80.86 : 128.81
o-Xylene	TM116	81.4 72.86 : 102.10	85.8 69.99 : 108.74

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210312-157	Client Reference:	B025563	Report Number:	591245	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						

		QC 2342	QC 2323
p/m-Xylene	TM116	82.4	85.3
		74.06 : 106.47	68.32 : 108.91
Sec-Butylbenzene	TM116	64.6	78.4
		44.71 : 117.87	38.50 : 101.50
Tetrachloroethene	TM116	99.0	106.6
		85.86 : 122.95	76.95 : 121.02
Toluene	TM116	86.6	90.4
		87.82 : 116.21	74.24 : 107.42
Trichloroethene	TM116	97.8	97.2
		79.80 : 112.33	85.28 : 109.36
Trichlorofluoromethane	TM116	112.0	100.4
		80.52 : 132.12	84.55 : 133.27
Vinyl Chloride	TM116	99.8	97.4
		74.57 : 146.88	68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210312-157	Client Reference:	B025563	Report Number:	591245	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Chromatogram						
Analysis:	EPH CWG GC (S)	Sample No :	23894828	Depth :	0.20 - 0.20	
		Sample ID :	BH-PIR-07			



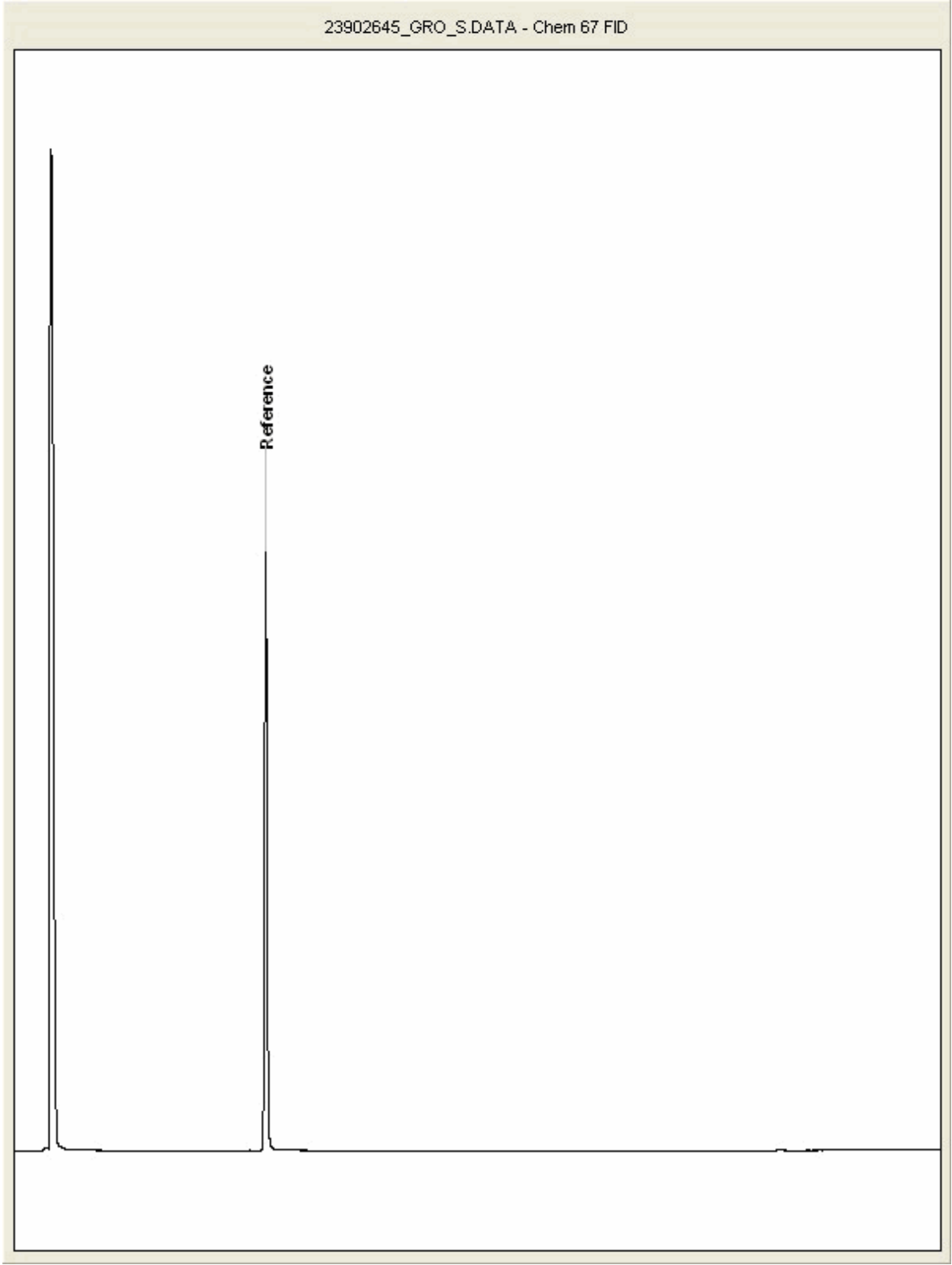
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23902645

Sample ID : BH-PIR-07

Depth : 0.20 - 0.20



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Leeds
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LS1 4ER

Attention: Richard Tonge

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23892605	BH-OBC-02		2.40 - 2.40	09/03/2021
23892600	BH-OBC-10		0.10 - 0.10	10/03/2021
23892601	BH-OBC-10		0.20 - 0.20	10/03/2021
23892602	BH-OBC-10		0.50 - 0.50	10/03/2021
23892603	BH-OBC-10		1.00 - 1.00	10/03/2021
23892604	BH-OBC-10		1.60 - 1.60	10/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 07 March 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210312-165
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 636380
Order Number: 7000964

This report has been revised and directly supersedes 591584 in its entirety.

We received 6 samples on Friday March 12, 2021 and 1 of these samples were scheduled for analysis which was completed on Monday March 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23892600		
	Customer Sample Reference		BH-OBC-10		
	AGS Reference				
	Depth (m)		0.10 - 0.10		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23892600		
	Customer Sample Reference		BH-OBC-10		
	AGS Reference				
	Depth (m)		0.10 - 0.10		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle
	Sample Type		S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

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Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23892600	BH-OBC-10	0.10 - 0.10	Light Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

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SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

Results Legend		Customer Sample Ref.	BH-OBC-10					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 - 0.10					
M	MCERTS accredited.		Soil/Solid (S)					
aq	Aqueous / settled sample.		10/03/2021					
diss.filt	Dissolved / filtered sample.		12/03/2021					
tot.unfilt	Total / unfiltered sample.		210312-165					
*	Subcontracted - refer to subcontractor report for accreditation status.		23892600					
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44\$@	Sample deviation (see appendix)							
Component		LOD/Units	Method					
Moisture Content Ratio (% of as received sample)		%	PM024	14				
Catechol		<0.01 mg/kg	TM062 (S)	<0.01				
Phenol		<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols		<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol		<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols		<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol		<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol		<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol		<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated		<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated		<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total		<0.02 %	TM132	<0.02				
Fraction Organic Carbon (FOC)		<0.002	TM132	0.0182	#			
pH		1 pH Units	TM133	8.3	M			
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free		<1 mg/kg	TM153	<1	M			
Chromium, Trivalent		<0.9 mg/kg	TM181	16.6				
Antimony		<0.6 mg/kg	TM181	<0.6	#			
Arsenic		<0.6 mg/kg	TM181	12.3	M			
Barium		<0.6 mg/kg	TM181	64	#			
Beryllium		<0.01 mg/kg	TM181	0.734	M			
Cadmium		<0.02 mg/kg	TM181	0.175	M			
Chromium		<0.9 mg/kg	TM181	16.6	M			
Copper		<1.4 mg/kg	TM181	12.3	M			
Iron		<1000 mg/kg	TM181	24200	#			
Lead		<0.7 mg/kg	TM181	20.2	M			
Manganese		<0.13 mg/kg	TM181	327	M			
Mercury		<0.1 mg/kg	TM181	<0.1	M			
Molybdenum		<0.1 mg/kg	TM181	0.19	#			
Nickel		<0.2 mg/kg	TM181	19.1	M			
Selenium		<1 mg/kg	TM181	<1	#			
Vanadium		<0.2 mg/kg	TM181	39.7	#			

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380

Superseded Report: 591584

Location: Cambridge South East Transport - Phase 2

[illegible]

CERTIFICATE OF ANALYSIS

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380

Superseded Report: 591584

Location: Cambridge South East Transport - Phase 2

PAH by GCMS

[illegible]

ALS

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SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

TPH CWG (S)

Results Legend		Customer Sample Ref.	BH-OBC-10				
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44\$@ Sample deviation (see appendix)			0.10 - 0.10 Soil/Solid (S) 10/03/2021 . 12/03/2021 210312-165 23892600				
Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference							
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM089	102				
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089	<10				
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089	<10				
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089	<10				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000				
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000				
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000				
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414	25800				
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414	3800				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414	29900				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414	37800				
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089	<10				
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089	<10				
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089	<10				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000				
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000				
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000				
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414	5970				
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414	1080				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414	7840				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414	37800				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089	<50				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089	<50				
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089	<20				

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380

Superseded Report: 591584

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-OBC-10				
# M aq diss.filt tot.unfilt + ** (F) 1-4*\$@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 - 0.10 Soil/Solid (S) 10/03/2021 . 12/03/2021 210312-165 23892600				
Component		LOD/Units	Method				
1,3-Dichloropropane	<7 µg/kg	TM116	<140 M				
Tetrachloroethene	<5 µg/kg	TM116	<100 M				
Dibromochloromethane	<10 µg/kg	TM116	<200 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<200 M				
Chlorobenzene	<5 µg/kg	TM116	<100 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<200 M				
Ethylbenzene	<4 µg/kg	TM116	<80 M				
p/m-Xylene	<10 µg/kg	TM116	<200 #				
o-Xylene	<10 µg/kg	TM116	<200 M				
Styrene	<10 µg/kg	TM116	<200 @ #				
Bromoform	<10 µg/kg	TM116	<200 M				
Isopropylbenzene	<5 µg/kg	TM116	<100 #				
1,1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<200 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<320 M				
Bromobenzene	<10 µg/kg	TM116	<200 M				
Propylbenzene	<10 µg/kg	TM116	<200 M				
2-Chlorotoluene	<9 µg/kg	TM116	<180 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<160 M				
4-Chlorotoluene	<10 µg/kg	TM116	<200 M				
tert-Butylbenzene	<14 µg/kg	TM116	<280 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<180 #				
sec-Butylbenzene	<10 µg/kg	TM116	<200				
4-Isopropyltoluene	<10 µg/kg	TM116	<200 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<160 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<100 M				
n-Butylbenzene	<11 µg/kg	TM116	<220				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<200 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<280 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<200 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<400				
Hexachlorobutadiene	<20 µg/kg	TM116	<400				
Naphthalene	<13 µg/kg	TM116	<260 M				



CERTIFICATE OF ANALYSIS

SDG: 210312-165
Client Ref.: B025563

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VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165

Report Number: 636380

Superseded Report: 591584

Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&+&\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-OBC-10 0.10 - 0.10	18/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	SOLID										
Sample Type	10/03/2021 00:00:00										
Date Sampled	12/03/2021 08:10:00										
Date Receieved	210312-165										
SDG	23892600										
Original Sample Method Number	TM048										



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165

Report Number: 636380

Superseded Report: 591584

Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

Test Completion Dates

Lab Sample No(s)	23892600
Customer Sample Ref.	BH-OBC-10
AGS Ref.	
Depth	0.10 - 0.10
Type	Soil/Solid (S)
Anions by Kone (soil)	18-Mar-2021
Asbestos ID in Solid Samples	18-Mar-2021
Boron Water Soluble	18-Mar-2021
Chromium III	22-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	17-Mar-2021
EPH CWG GC (S)	17-Mar-2021
GRO by GC-FID (S)	18-Mar-2021
Hexavalent Chromium (s)	19-Mar-2021
Metals in solid samples by OES	22-Mar-2021
PAH by GCMS	17-Mar-2021
pH	18-Mar-2021
Phenols by HPLC (S)	16-Mar-2021
Sample description	15-Mar-2021
Total Organic Carbon	22-Mar-2021
Total Sulphur	18-Mar-2021
TPH CWG GC (S)	18-Mar-2021
VOC MS (S)	19-Mar-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2397
Chloride (soluble)	TM243	149.74 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2352
Water Soluble Boron	TM222	100.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2375
Free Cyanide	TM153	100.99 79.00 : 115.00
Thiocyanate	TM153	100.64 94.09 : 113.89
Total Cyanide	TM153	103.5 73.07 : 107.47

EPH CWG GC (S)

Component	Method Code	QC 2301
EPH >C8-C40 Raw	TM414	90.56 72.57 : 112.44
Total Aliphatics Raw	TM414	96.46 72.68 : 112.55
Total Aromatics Raw	TM414	99.2 58.44 : 124.94

GRO by GC-FID (S)

Component	Method Code	QC 2318
QC	TM089	84.82 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2383
Hexavalent Chromium	TM151	100.0 92.00 : 111.20



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Metals in solid samples by OES

Component	Method Code	QC 2386
Aluminium	TM181	84.87 73.56 : 108.85
Antimony	TM181	97.56 76.89 : 111.24
Arsenic	TM181	103.78 88.53 : 111.01
Barium	TM181	93.58 77.67 : 105.35
Beryllium	TM181	102.99 85.44 : 109.61
Boron	TM181	92.84 73.51 : 104.66
Cadmium	TM181	92.18 77.67 : 104.12
Chromium	TM181	89.66 79.64 : 105.83
Cobalt	TM181	92.77 84.60 : 104.13
Copper	TM181	95.07 82.40 : 105.45
Iron	TM181	101.59 82.95 : 110.58
Lead	TM181	92.57 78.24 : 104.05
Manganese	TM181	112.78 94.29 : 119.51
Mercury	TM181	100.0 83.16 : 107.81
Molybdenum	TM181	101.65 87.11 : 106.87
Nickel	TM181	92.91 80.26 : 102.28
Phosphorus	TM181	111.92 94.56 : 124.28
Selenium	TM181	103.53 82.28 : 110.48
Strontium	TM181	94.65 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86
Tin	TM181	102.28 86.72 : 110.03
Titanium	TM181	87.79 66.23 : 102.06
Vanadium	TM181	98.9 86.19 : 109.45
Zinc	TM181	100.62 84.68 : 113.99

PAH by GCMS



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Validated

SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591584

PAH by GCMS

Component	Method Code	QC 2398
Acenaphthene	TM218	90.0 73.47 : 109.80
Acenaphthylene	TM218	89.5 70.00 : 130.00
Anthracene	TM218	89.0 68.68 : 111.89
Benz(a)anthracene	TM218	88.0 68.12 : 118.39
Benzo(a)pyrene	TM218	86.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	93.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	91.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	90.0 73.10 : 117.03
Chrysene	TM218	87.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	88.5 67.32 : 121.35
Fluoranthene	TM218	88.5 75.16 : 117.28
Fluorene	TM218	88.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	84.5 68.91 : 117.62
Naphthalene	TM218	89.0 72.12 : 106.18
Phenanthrene	TM218	90.0 69.01 : 113.72
Pyrene	TM218	89.5 64.28 : 115.75

pH

Component	Method Code	QC 2328
pH	TM133	100.26 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2321
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	46.1 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	40.94 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	40.5 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	46.36 69.44 : 122.18



CERTIFICATE OF ANALYSIS

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Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

Phenols by HPLC (S)

		QC 2321
Xylenols by HPLC (S)	TM062 (S)	44.17 76.56 : 106.38

Total Organic Carbon

Component	Method Code	QC 2391
Total Organic Carbon	TM132	100.39 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2344
Total Sulphur %	TM132	93.78 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2379
1,1,1,2-tetrachloroethane	TM116	99.4 86.59 : 118.97
1,1,1-Trichloroethane	TM116	95.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	106.6 75.16 : 112.70
1,1-Dichloroethane	TM116	102.2 83.27 : 122.16
1,2-Dichloroethane	TM116	116.8 89.30 : 133.10
1,4-Dichlorobenzene	TM116	103.8 82.59 : 123.23
2-Chlorotoluene	TM116	92.0 66.81 : 118.43
4-Chlorotoluene	TM116	91.0 65.88 : 114.76
Benzene	TM116	97.4 93.16 : 123.63
Carbon Disulphide	TM116	89.8 75.11 : 124.81
Carbontetrachloride	TM116	99.8 82.35 : 126.46
Chlorobenzene	TM116	97.8 85.07 : 118.13
Chloroform	TM116	103.8 88.13 : 122.71
Chloromethane	TM116	91.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	98.4 78.27 : 128.90



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SDG: 210312-165

Report Number: 636380

Superseded Report: 591584

Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

		QC 2379
Dibromomethane	TM116	100.8 77.47 : 121.29
Dichloromethane	TM116	105.6 87.89 : 134.72
Ethylbenzene	TM116	88.0 79.92 : 110.05
Hexachlorobutadiene	TM116	45.8 16.78 : 153.29
Isopropylbenzene	TM116	75.2 64.20 : 119.59
Naphthalene	TM116	100.8 79.29 : 125.59
o-Xylene	TM116	84.8 72.86 : 102.10
p/m-Xylene	TM116	80.8 74.06 : 106.47
Sec-Butylbenzene	TM116	61.4 44.71 : 117.87
Tetrachloroethene	TM116	91.4 85.86 : 122.95
Toluene	TM116	99.6 87.82 : 116.21
Trichloroethene	TM116	96.4 79.80 : 112.33
Trichlorofluoromethane	TM116	92.4 80.52 : 132.12
Vinyl Chloride	TM116	99.0 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Superseded Report: 591584
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23901943
Sample ID : BH-OBC-10
Depth : 0.10 - 0.10



CERTIFICATE OF ANALYSIS

Validated

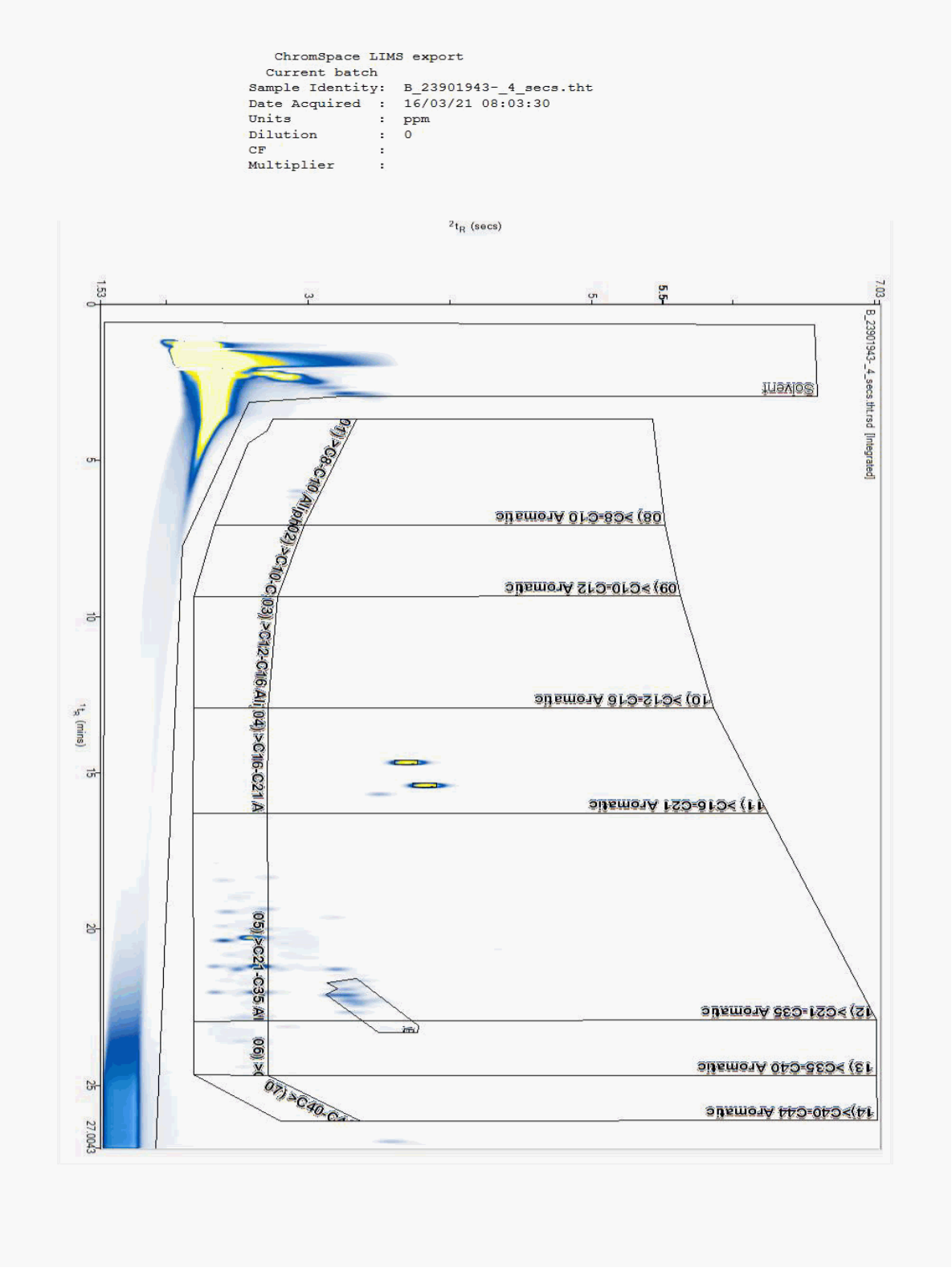
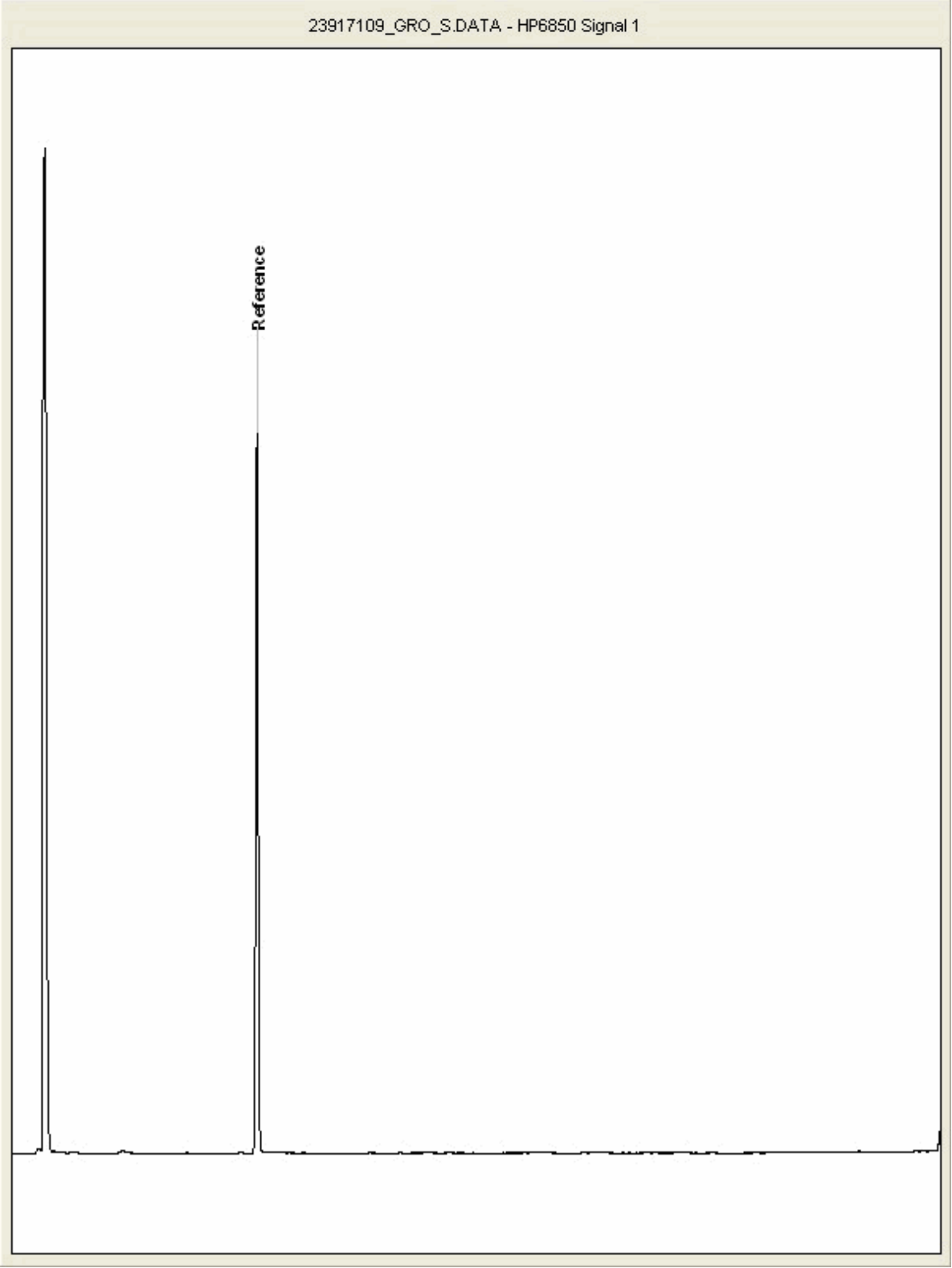
SDG: 210312-165
Client Ref.: B025563

Report Number: 636380
Superseded Report: 591584
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23917109
Sample ID : BH-OBC-10
Depth : 0.10 - 0.10



SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis/Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210312-165	N/A	N/A	07/03/2022	IT Issue	Report Formatting	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	591584



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**
If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 07 March 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210312-166
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 636389
Order Number: 7000964

This report has been revised and directly supersedes 591555 in its entirety.

We received 4 samples on Friday March 12, 2021 and 1 of these samples were scheduled for analysis which was completed on Monday March 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-166
Client Ref.: B025563

Report Number: 636389
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591555

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23892766	BHPTR38		0.10	10/03/2021
23892767	BHPTR38		0.20	10/03/2021
23892768	BHPTR38		0.50	10/03/2021
23892770	BHPTR38		1.00	10/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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Client Ref.: B025563

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Location: Cambridge South East Transport - Phase 2

Superseded Report: 591555

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23892767		
	Customer Sample Reference		BHPTR38		
	AGS Reference				
	Depth (m)		0.20		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 1		X	
Coronene	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-166
Client Ref.: B025563

Report Number: 636389
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591555

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23892767		
	Customer Sample Reference		BHPTR38		
	AGS Reference				
	Depth (m)		0.20		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X	
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
PCBs by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	

SDG: 210312-166
Client Ref.: B025563

Report Number: 636389

Superseded Report: 591555

Location: Cambridge South East Transport - Phase 2

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23892767		
	Customer Sample Reference		BHPTR38		
	AGS Reference				
	Depth (m)		0.20		
	Container		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE220)	609 VOC (ALE215)	
	Sample Type		S	S	S
VOC MS (S)	All	NDPs: 0 Tests: 1		X	



SDG: 210312-166
Client Ref.: B025563

Report Number: 636389

Superseded Report: 591555

Location: Cambridge South East Transport - Phase 2

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23892767	BHPTR38	0.20	Light Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 210312-166
Client Ref.: B025563

Report Number: 636389

Superseded Report: 591555

Location: Cambridge South East Transport - Phase 2

<div>Results Legend</div> <div># M ISO17025 accredited. aq mCERTS accredited. diss.filt Aqueous / settled sample. tot.unfilt Dissolved / filtered sample. + Total / unfiltered sample. - Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*\$@ Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>	<div>BHPTR38</div> <div>0.20 Soil/Solid (S) 10/03/2021 . 12/03/2021 210312-166 23892767</div>				
Component		LOD/Units	Method				
Moisture Content Ratio (% of as received sample)		%	PM024	11			
Loss on ignition		<0.7 %	TM018	7.67 M			
Catechol		<0.01 mg/kg	TM062 (S)	<0.01			
Phenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
Cresols		<0.01 mg/kg	TM062 (S)	<0.01 M			
Resorcinol		<0.05 mg/kg	TM062 (S)	<0.05			
Xylenols		<0.015 mg/kg	TM062 (S)	<0.015 M			
1-Naphthol		<0.01 mg/kg	TM062 (S)	<0.01			
2,3,5-Trimethylphenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
2-Isopropylphenol		<0.015 mg/kg	TM062 (S)	<0.015 M			
Phenols, Total Detected 5 speciated		<0.06 mg/kg	TM062 (S)	<0.06 M			
Phenols, Total Detected 8 Speciated		<0.13 mg/kg	TM062 (S)	<0.13			
Organic Carbon, Total		<0.2 %	TM132	1.23 M			
Sulphur, Total		<0.02 %	TM132	<0.02			
Fraction Organic Carbon (FOC)		<0.002	TM132	0.0123 #			
pH		1 pH Units	TM133	8.59 M			
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6 #			
Cyanide, Free		<1 mg/kg	TM153	<1 M			
PCB congener 28		<3 µg/kg	TM168	<3 M			
PCB congener 52		<3 µg/kg	TM168	<3 M			
PCB congener 101		<3 µg/kg	TM168	<3 M			
PCB congener 118		<3 µg/kg	TM168	<3 M			
PCB congener 138		<3 µg/kg	TM168	<3 M			
PCB congener 153		<3 µg/kg	TM168	<3 M			
PCB congener 180		<3 µg/kg	TM168	<3 M			
Sum of detected PCB 7 Congeners		<21 µg/kg	TM168	<21			
Chromium, Trivalent		<0.9 mg/kg	TM181	8.28			
Antimony		<0.6 mg/kg	TM181	<0.6 #			
Arsenic		<0.6 mg/kg	TM181	9.41 M			
Barium		<0.6 mg/kg	TM181	47 #			
Beryllium		<0.01 mg/kg	TM181	0.386 M			
Cadmium		<0.02 mg/kg	TM181	0.116 M			



CERTIFICATE OF ANALYSIS

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PAH by GCMS

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TPH CWG (S)

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VOC MS (S)

Results Legend		Customer Sample Ref.	BHPTR38					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 10/03/2021 . 12/03/2021 210312-166 23892767					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4\$@	Sample deviation (see appendix)							
Component	LOD/Units			Method				
Dibromofluoromethane**	%	TM116	110					
Toluene-d8**	%	TM116	101					
4-Bromofluorobenzene**	%	TM116	96.3					
Dichlorodifluoromethane	<6 µg/kg	TM116	<120 M					
Chloromethane	<7 µg/kg	TM116	<140 #					
Vinyl Chloride	<6 µg/kg	TM116	<120 @ M					
Bromomethane	<10 µg/kg	TM116	<200 M					
Chloroethane	<10 µg/kg	TM116	<200 M					
Trichlorofluoromethane	<6 µg/kg	TM116	<120 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<200 #					
Carbon Disulphide	<7 µg/kg	TM116	<140 M					
Dichloromethane	<10 µg/kg	TM116	<200 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<160 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<200					
Bromochloromethane	<10 µg/kg	TM116	<200 M					
Chloroform	<8 µg/kg	TM116	<160 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<200 M					
Carbontetrachloride	<10 µg/kg	TM116	<200 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<100 M					
Benzene	<9 µg/kg	TM116	<180 M					
Trichloroethene	<9 µg/kg	TM116	<180 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<200 M					
Dibromomethane	<9 µg/kg	TM116	<180 M					
Bromodichloromethane	<7 µg/kg	TM116	<140 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200 M					
Toluene	<7 µg/kg	TM116	<140 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200 M					

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VOC MS (S)

Results Legend		Customer Sample Ref.	BHPTR38				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		10/03/2021				
diss.filt	Dissolved / filtered sample.		12/03/2021				
tot.unfilt	Total / unfiltered sample.		210312-166				
*	Subcontracted - refer to subcontractor report for accreditation status.		23892767				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<140	M			
Tetrachloroethene	<5 µg/kg	TM116	<100	M			
Dibromochloromethane	<10 µg/kg	TM116	<200	M			
1,2-Dibromoethane	<10 µg/kg	TM116	<200	M			
Chlorobenzene	<5 µg/kg	TM116	<100	M			
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<200	M			
Ethylbenzene	<4 µg/kg	TM116	<80	M			
p/m-Xylene	<10 µg/kg	TM116	<200	#			
o-Xylene	<10 µg/kg	TM116	<200	M			
Styrene	<10 µg/kg	TM116	<200	@ #			
Bromoform	<10 µg/kg	TM116	<200	M			
Isopropylbenzene	<5 µg/kg	TM116	<100	#			
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<200	#			
1,2,3-Trichloropropane	<16 µg/kg	TM116	<320	M			
Bromobenzene	<10 µg/kg	TM116	<200	M			
Propylbenzene	<10 µg/kg	TM116	<200	M			
2-Chlorotoluene	<9 µg/kg	TM116	<180	M			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<160	M			
4-Chlorotoluene	<10 µg/kg	TM116	<200	M			
tert-Butylbenzene	<14 µg/kg	TM116	<280	M			
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<180	#			
sec-Butylbenzene	<10 µg/kg	TM116	<200				
4-Isopropyltoluene	<10 µg/kg	TM116	<200	M			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<160	M			
1,4-Dichlorobenzene	<5 µg/kg	TM116	<100	M			
n-Butylbenzene	<11 µg/kg	TM116	<220				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<200	M			
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<280	M			
Tert-amyl methyl ether	<10 µg/kg	TM116	<200	#			
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<400				
Hexachlorobutadiene	<20 µg/kg	TM116	<400				
Naphthalene	<13 µg/kg	TM116	<260	M			

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VOC MS (S)

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Location: Cambridge South East Transport - Phase 2

Asbestos Identification - Solid Samples

[illegible]

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

Client Reference		Site Location	
Mass Sample taken (kg)		Cambridge South East Transport	
Mass of dry sample (kg)		Natural Moisture Content (%)	
Particle Size <4mm		Dry Matter Content (%)	
0.106		17.3	
0.090		85.3	
>95%			

Case	
SDG	210312-166
Lab Sample Number(s)	23892767
Sampled Date	10-Mar-2021
Customer Sample Ref.	BHPTTR38
Depth (m)	0.20

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.23
Loss on Ignition (%)	7.67
Sum of BTEX (mg/kg)	<0.8
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	5.21
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.59
ANC to pH 6 (mol/kg)	0.0382
ANC to pH 4 (mol/kg)	0.913

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000867	<0.0005	0.00867	<0.005	0.5	2	25
Barium	0.00819	<0.0002	0.0819	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00112	<0.001	0.0112	<0.01	0.5	10	70
Copper	0.00292	<0.0003	0.0292	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00588	<0.003	0.0588	<0.03	0.5	10	30
Nickel	0.00184	<0.0004	0.0184	<0.004	0.4	10	40
Lead	0.000642	<0.0002	0.00642	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	0.00106	<0.001	0.0106	<0.01	0.1	0.5	7
Zinc	0.00389	<0.001	0.0389	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.925	<0.5	9.25	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	83.8	<5	838	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	7.08	<3	70.8	<30	500	800	1000

Leach Test Information

Date Prepared	16-Mar-2021
pH (pH Units)	8.01
Conductivity (µS/cm)	106.00
Temperature (°C)	19.30
Volume Leachant (Litres)	0.884

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



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Superseded Report: 591555

Test Completion Dates

Lab Sample No(s)	23892767
Customer Sample Ref.	BHPTR38
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	18-Mar-2021
Anions by Kone (soil)	18-Mar-2021
Anions by Kone (w)	19-Mar-2021
Asbestos ID in Solid Samples	17-Mar-2021
Boron Water Soluble	18-Mar-2021
CEN 10:1 Leachate (1 Stage)	17-Mar-2021
CEN Readings	20-Mar-2021
Chromium III	22-Mar-2021
Coronene	18-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	17-Mar-2021
Dissolved Metals by ICP-MS	22-Mar-2021
Dissolved Organic/Inorganic Carbon	19-Mar-2021
EPH by GCxGC-FID	19-Mar-2021
EPH CWG GC (S)	18-Mar-2021
Fluoride	19-Mar-2021
GRO by GC-FID (S)	18-Mar-2021
Hexavalent Chromium (s)	18-Mar-2021
Loss on Ignition in soils	22-Mar-2021
Mercury Dissolved	22-Mar-2021
Metals in solid samples by OES	22-Mar-2021
Moisture at 105C	16-Mar-2021
PAH 16 & 17 Calc	19-Mar-2021
PAH by GCMS	19-Mar-2021
PCBs by GCMS	22-Mar-2021
pH	18-Mar-2021
Phenols by HPLC (S)	16-Mar-2021
Phenols by HPLC (W)	22-Mar-2021
Sample description	15-Mar-2021
Total Dissolved Solids	19-Mar-2021
Total Organic Carbon	22-Mar-2021
Total Sulphur	18-Mar-2021
TPH CWG GC (S)	18-Mar-2021
VOC MS (S)	19-Mar-2021



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ASSOCIATED AQC DATA

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2394
ANC pH_4 dry soil	TM182	106.16 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2397
Chloride (soluble)	TM243	149.74 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2390
Chloride	TM184	94.9 91.40 : 109.10
Sulphate (soluble)	TM184	99.6 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2352
Water Soluble Boron	TM222	100.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2360
Coronene RAW	TM410	107.0 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2340
Free Cyanide	TM153	97.92 79.00 : 115.00
Thiocyanate	TM153	100.0 94.09 : 113.89
Total Cyanide	TM153	100.7 73.07 : 107.47



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Dissolved Metals by ICP-MS

Component	Method Code	QC 2317	QC 2370
Aluminium	TM152	101.33 94.21 : 111.52	101.33 90.78 : 110.89
Antimony	TM152	100.0 88.37 : 130.57	100.5 77.22 : 119.42
Arsenic	TM152	101.0 92.62 : 113.52	102.67 86.77 : 107.67
Barium	TM152	105.0 88.62 : 113.14	101.33 87.86 : 110.23
Beryllium	TM152	100.33 87.08 : 111.38	102.5 86.19 : 112.98
Bismuth	TM152	101.33 92.62 : 115.02	102.33 84.06 : 106.46
Borate	TM152		101.85 88.00 : 112.00
Boron	TM152	97.33 86.31 : 120.88	101.67 83.92 : 114.90
Cadmium	TM152	100.17 93.85 : 111.65	102.33 88.89 : 106.69
Calcium	TM152	98.0 89.20 : 126.91	101.33 80.24 : 117.95
Chromium	TM152	101.5 92.50 : 113.03	102.33 83.22 : 110.16
Cobalt	TM152	101.33 85.01 : 114.87	101.67 82.49 : 112.36
Copper	TM152	101.67 89.87 : 119.73	103.5 83.14 : 113.00
Iron	TM152	102.0 93.02 : 113.86	102.67 88.40 : 109.24
Lead	TM152	103.33 91.11 : 116.98	101.5 83.71 : 109.58
Lithium	TM152	99.5 87.70 : 115.90	101.17 84.50 : 114.28
Magnesium	TM152	96.0 89.60 : 116.61	97.33 87.56 : 114.57
Manganese	TM152	102.17 93.97 : 112.46	101.83 90.01 : 108.72
Molybdenum	TM152	99.83 89.07 : 110.96	101.17 85.53 : 107.42
Nickel	TM152	102.67 93.70 : 112.15	103.83 88.05 : 106.42
Phosphorus	TM152	100.33 89.24 : 114.18	101.33 82.76 : 107.72
Potassium	TM152	98.67 93.20 : 115.55	98.0 88.45 : 106.42
Selenium	TM152	101.17 91.69 : 117.12	103.83 85.61 : 111.03
Silver	TM152	101.33 90.93 : 121.73	101.67 88.48 : 110.48
Sodium	TM152	96.0 92.42 : 113.24	97.33 88.32 : 106.30
Strontium	TM152	101.0 92.14 : 116.24	101.67 83.77 : 107.87
Tellurium	TM152	98.17 89.88 : 111.78	101.0 82.83 : 104.73



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Dissolved Metals by ICP-MS

		QC 2317	QC 2370
Thallium	TM152	112.0 82.43 : 113.83	106.33 77.47 : 113.87
Tin	TM152	98.67 94.62 : 107.79	100.0 87.36 : 109.55
Titanium	TM152	98.83 90.29 : 115.23	100.83 87.29 : 108.31
Tungsten	TM152	99.33 77.61 : 132.31	99.33 68.27 : 122.97
Uranium	TM152	99.67 86.97 : 115.76	100.83 82.46 : 105.16
Vanadium	TM152	101.17 89.61 : 115.48	106.0 88.43 : 114.30
Zinc	TM152	102.33 87.51 : 116.26	103.33 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2364
Dissolved Inorganic Carbon	TM090	102.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.17 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2337
EPH >C10-C40 Raw	TM415	97.32 56.36 : 129.92

Fluoride

Component	Method Code	QC 2367
Fluoride	TM104	105.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2318
QC	TM089	84.82 70.34 : 111.95

Hexavalent Chromium (s)



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Hexavalent Chromium (s)

Component	Method Code	QC 2369
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2393
Loss on Ignition	TM018	98.82 87.10 : 102.39

Mercury Dissolved

Component	Method Code	QC 2332
Mercury Dissolved (CVAf)	TM183	93.5 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2386
Aluminium	TM181	84.87 73.56 : 108.85
Antimony	TM181	97.56 76.89 : 111.24
Arsenic	TM181	103.78 88.53 : 111.01
Barium	TM181	93.58 77.67 : 105.35
Beryllium	TM181	102.99 85.44 : 109.61
Boron	TM181	92.84 73.51 : 104.66
Cadmium	TM181	92.18 77.67 : 104.12
Chromium	TM181	89.66 79.64 : 105.83
Cobalt	TM181	92.77 84.60 : 104.13
Copper	TM181	95.07 82.40 : 105.45
Iron	TM181	101.59 82.95 : 110.58
Lead	TM181	92.57 78.24 : 104.05
Manganese	TM181	112.78 94.29 : 119.51



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-166
Client Ref.: B025563

Report Number: 636389
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591555

Metals in solid samples by OES

		QC 2386
Mercury	TM181	100.0 83.16 : 107.81
Molybdenum	TM181	101.65 87.11 : 106.87
Nickel	TM181	92.91 80.26 : 102.28
Phosphorus	TM181	111.92 94.56 : 124.28
Selenium	TM181	103.53 82.28 : 110.48
Strontium	TM181	94.65 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86
Tin	TM181	102.28 86.72 : 110.03
Titanium	TM181	87.79 66.23 : 102.06
Vanadium	TM181	98.9 86.19 : 109.45
Zinc	TM181	100.62 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2387
Acenaphthene	TM218	99.0 78.59 : 112.16
Acenaphthylene	TM218	95.0 75.11 : 109.01
Anthracene	TM218	98.0 73.99 : 113.85
Benz(a)anthracene	TM218	98.5 69.31 : 119.18
Benzo(a)pyrene	TM218	88.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	97.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	87.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	91.0 69.98 : 116.49
Chrysene	TM218	96.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	85.0 64.54 : 115.22
Fluoranthene	TM218	104.0 72.56 : 111.70
Fluorene	TM218	95.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	89.5 61.22 : 113.25
Naphthalene	TM218	95.5 77.96 : 110.91



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Report Number: 636389
Location: Cambridge South East Transport - Phase 2

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PAH by GCMS

		QC 2387
Phenanthrene	TM218	102.5 76.83 : 113.25
Pyrene	TM218	102.5 72.45 : 110.77

PCBs by GCMS

Component	Method Code	QC 2382
PCB congener 101	TM168	83.1 65.66 : 110.06
PCB congener 105	TM168	78.1 58.10 : 106.34
PCB congener 114	TM168	79.5 59.38 : 106.48
PCB congener 118	TM168	79.8 60.02 : 106.23
PCB congener 123	TM168	84.3 65.01 : 99.81
PCB congener 126	TM168	78.6 59.31 : 109.23
PCB congener 138	TM168	83.9 63.95 : 107.63
PCB congener 153	TM168	86.2 62.65 : 108.85
PCB congener 156	TM168	79.6 61.69 : 112.27
PCB congener 157	TM168	76.6 55.37 : 104.81
PCB congener 167	TM168	79.2 65.58 : 109.14
PCB congener 169	TM168	80.2 56.84 : 112.10
PCB congener 180	TM168	83.9 66.99 : 111.63
PCB congener 189	TM168	79.2 57.75 : 112.59
PCB congener 28	TM168	84.3 73.68 : 105.96
PCB congener 52	TM168	84.5 67.24 : 107.62
PCB congener 77	TM168	81.5 64.87 : 108.49
PCB congener 81	TM168	83.4 70.78 : 110.80

pH

Component	Method Code	QC 2328
pH	TM133	100.26 99.08 : 102.24



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SDG: 210312-166
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Location: Cambridge South East Transport - Phase 2

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Phenols by HPLC (S)

Component	Method Code	QC 2321
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	46.1 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	40.94 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	40.5 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	46.36 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	44.17 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2307
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	50.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	47.33 76.60 : 126.28
Napthol by HPLC (W)	TM259	52.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	49.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.5 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2363
Total Dissolved Solids	TM123	99.0 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2391
Total Organic Carbon	TM132	100.39 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2344
Total Sulphur %	TM132	93.78 61.64 : 114.47



CERTIFICATE OF ANALYSIS

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SDG: 210312-166 Report Number: 636389 Superseded Report: 591555
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

VOC MS (S)

Component	Method Code	QC 2379
1,1,1,2-tetrachloroethane	TM116	99.4 86.59 : 118.97
1,1,1-Trichloroethane	TM116	95.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	106.6 75.16 : 112.70
1,1-Dichloroethane	TM116	102.2 83.27 : 122.16
1,2-Dichloroethane	TM116	116.8 89.30 : 133.10
1,4-Dichlorobenzene	TM116	103.8 82.59 : 123.23
2-Chlorotoluene	TM116	92.0 66.81 : 118.43
4-Chlorotoluene	TM116	91.0 65.88 : 114.76
Benzene	TM116	97.4 93.16 : 123.63
Carbon Disulphide	TM116	89.8 75.11 : 124.81
Carbontetrachloride	TM116	99.8 82.35 : 126.46
Chlorobenzene	TM116	97.8 85.07 : 118.13
Chloroform	TM116	103.8 88.13 : 122.71
Chloromethane	TM116	91.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	98.4 78.27 : 128.90
Dibromomethane	TM116	100.8 77.47 : 121.29
Dichloromethane	TM116	105.6 87.89 : 134.72
Ethylbenzene	TM116	88.0 79.92 : 110.05
Hexachlorobutadiene	TM116	45.8 16.78 : 153.29
Isopropylbenzene	TM116	75.2 64.20 : 119.59
Naphthalene	TM116	100.8 79.29 : 125.59
o-Xylene	TM116	84.8 72.86 : 102.10
p/m-Xylene	TM116	80.8 74.06 : 106.47
Sec-Butylbenzene	TM116	61.4 44.71 : 117.87
Tetrachloroethene	TM116	91.4 85.86 : 122.95
Toluene	TM116	99.6 87.82 : 116.21
Trichloroethene	TM116	96.4 79.80 : 112.33



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Validated

SDG: 210312-166 Report Number: 636389 Superseded Report: 591555
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

VOC MS (S)

		QC 2379
Trichlorofluoromethane	TM116	92.4 80.52 : 132.12
Vinyl Chloride	TM116	99.0 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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Report Number: 636389
Location: Cambridge South East Transport - Phase 2

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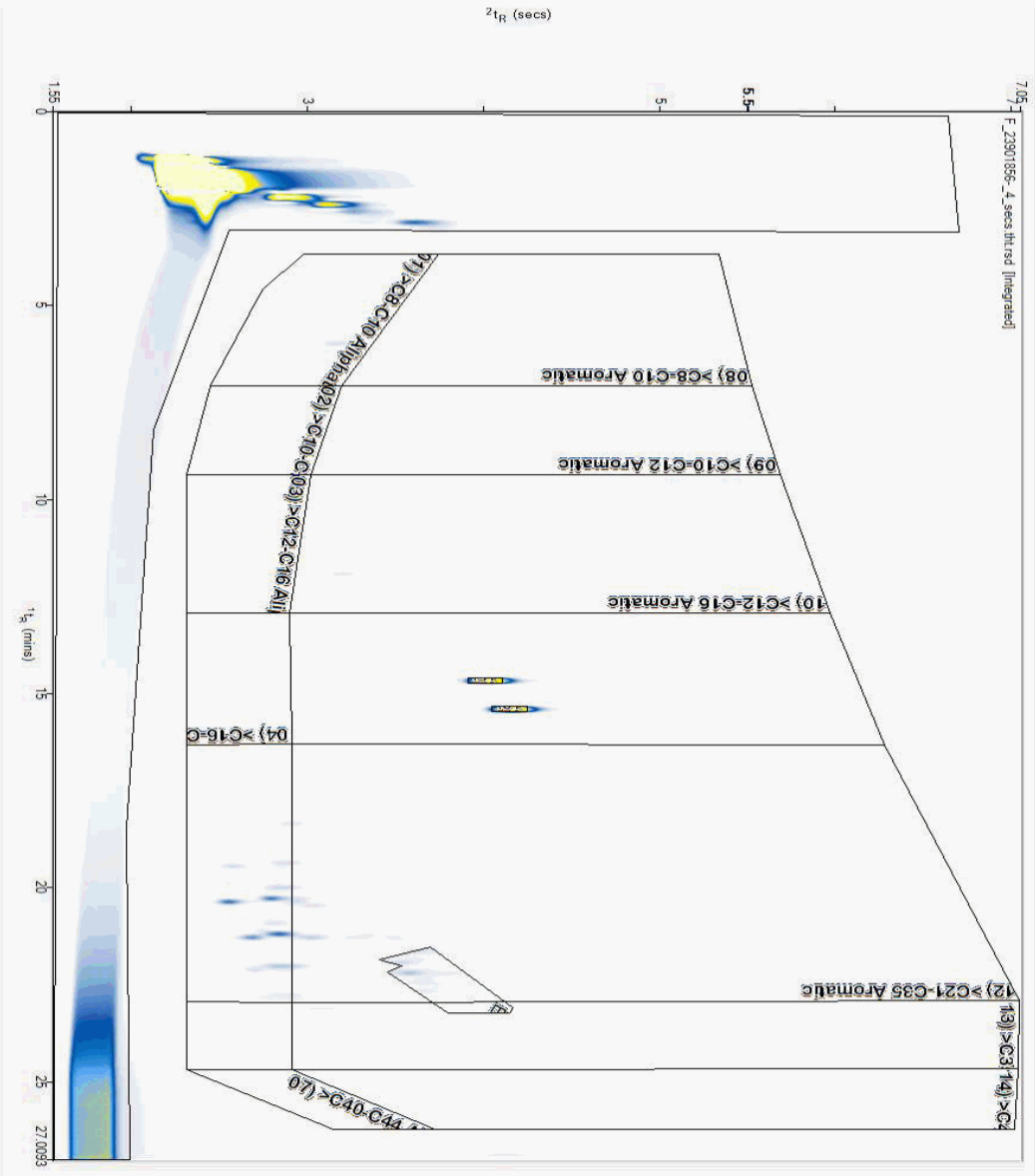
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23901856
Sample ID : BHPTR38

Depth : 0.20

ChromSpace LIMS export
Current batch
Sample Identity: F_23901856-_4_secs.tht
Date Acquired : 17/03/21 05:33:50
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

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Client Ref.: B025563

Report Number: 636389
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591555

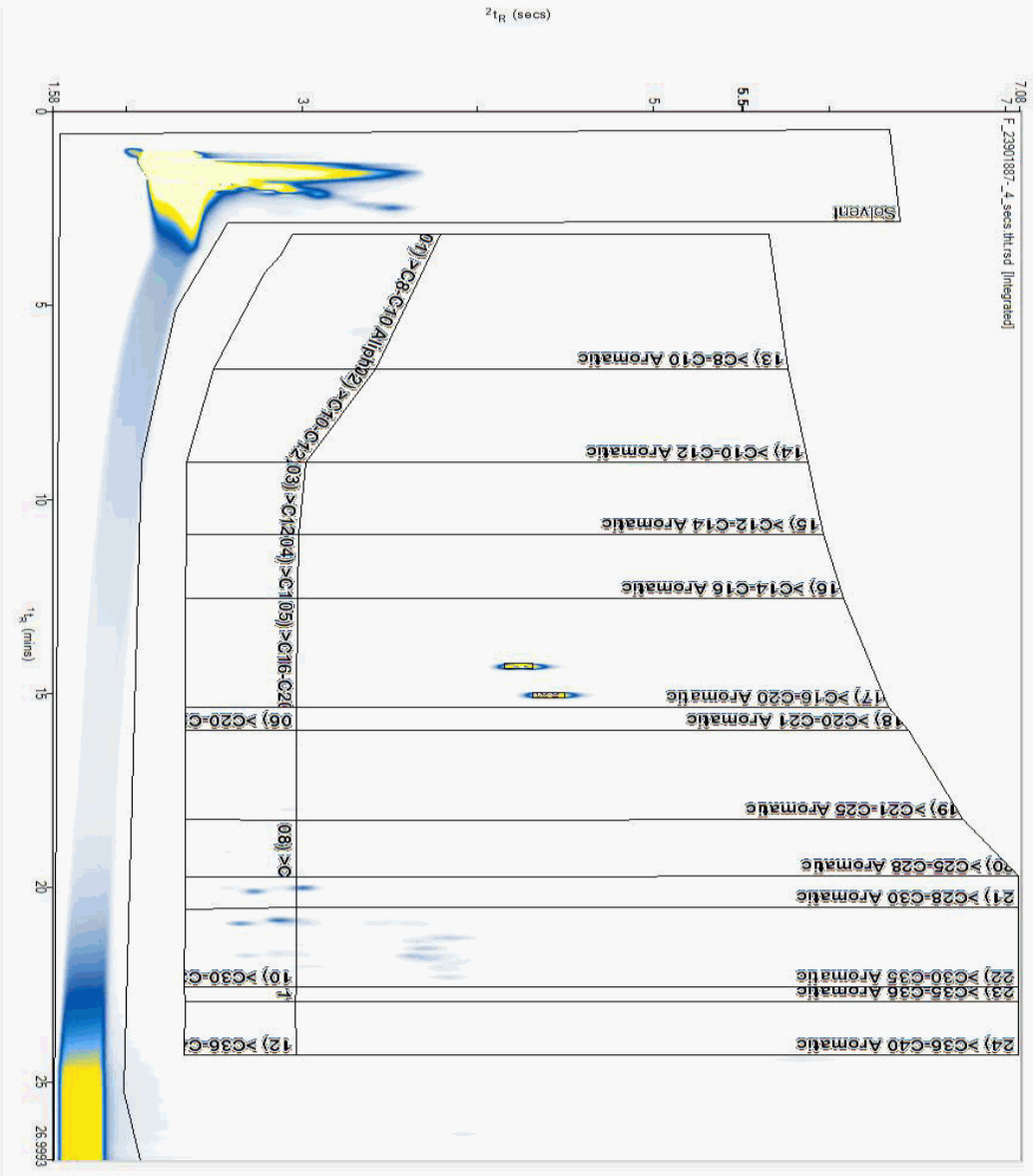
Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 23901887
Sample ID : BHPTR38

Depth : 0.20

ChromSpace LIMS export
Current batch
Sample Identity: F_23901887-_4_secs.tht
Date Acquired : 18/03/21 06:32:44
Units : ppm
Dilution : 0
CF :
Multiplier :





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SDG: 210312-166
Client Ref.: B025563

Report Number: 636389
Location: Cambridge South East Transport - Phase 2

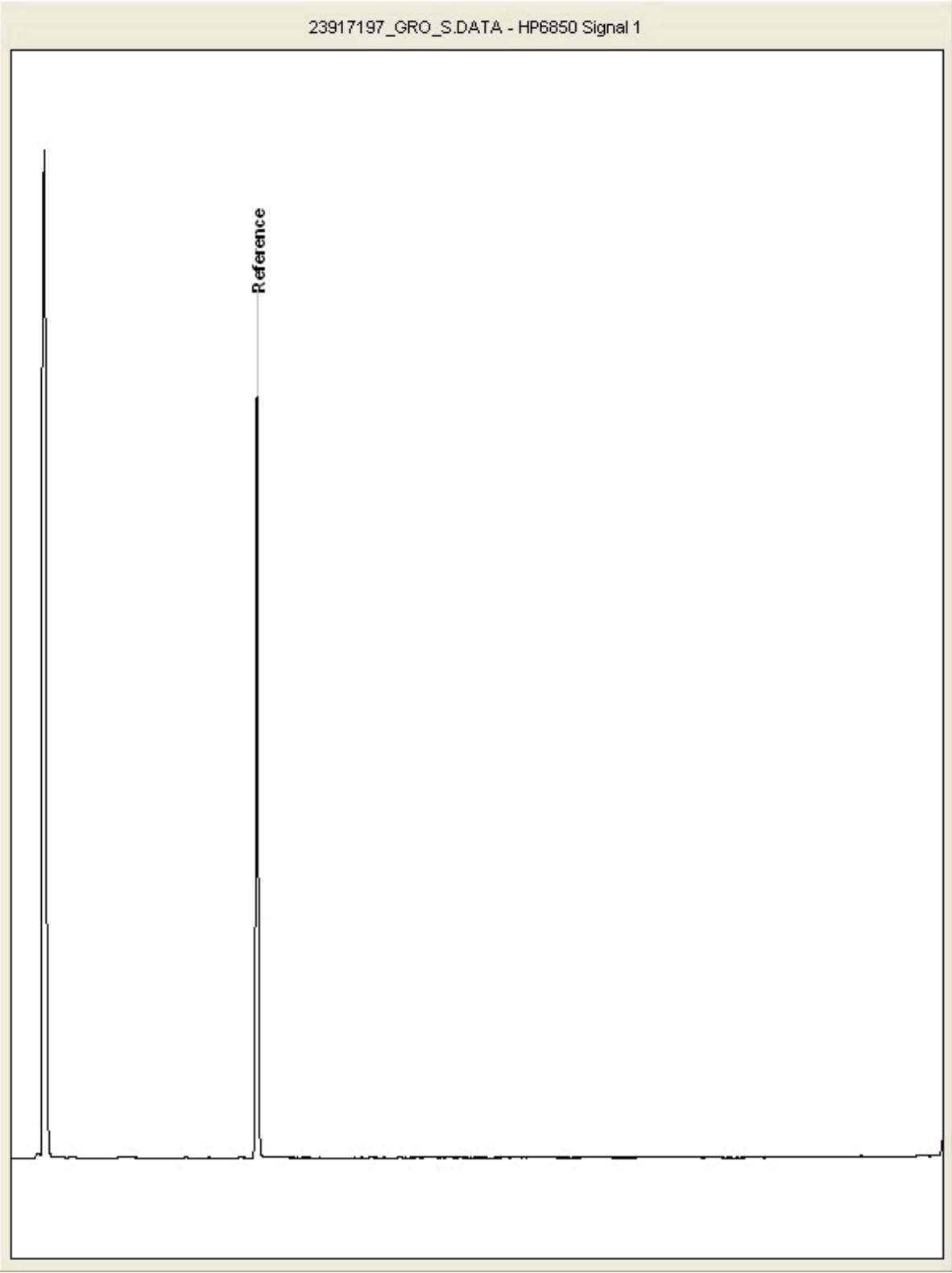
Superseded Report: 591555

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23917197
Sample ID : BHPTR38

Depth : 0.20



ALS Environmental, Land		Issue No. 4
		Date: 03/03/2020
QF.7.5.1 Data Amendments Form		Issued and Authorised by Quality Manager

SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis/Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210312-166	N/A	N/A	07/03/2022	IT Issue	Report Formatting	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	591555



CERTIFICATE OF ANALYSIS

SDG:	210312-166	Client Reference:	B025563	Report Number:	636389
Location:	idge South East Transport -	Order Number:	7000964	Superseded Report:	591555

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subject to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

CERTIFICATE OF ANALYSIS

Date of report Generation:	07 March 2022
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210312-169
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	636399
Order Number:	7000964

This report has been revised and directly supersedes 591520 in its entirety.

We received 4 samples on Friday March 12, 2021 and 2 of these samples were scheduled for analysis which was completed on Monday March 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results. The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
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ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 3.1 Version Issued: 07/03/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169 Report Number: 636399 Superseded Report: 591520
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23892873	BH-PTR-05		0.10 - 0.10	10/03/2021
23892875	BH-PTR-05		0.20 - 0.20	10/03/2021
23892877	BH-PTR-05		0.50 - 0.50	10/03/2021
23892878	BH-PTR-05		1.00 - 1.00	10/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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SDG: 210312-169 Report Number: 636399 Superseded Report: 591520
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Results Legend

- Test
- No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23892873	23892877
						BH-PTR-05	BH-PTR-05
						0.10 - 0.10	0.50 - 0.50
						1kg TUB with Handle (ALE210)	250g Amber Jar (ALE215)
						1kg TUB with Handle (ALE210)	250g Amber Jar (ALE215)
						60g VOC (ALE210)	60g VOC (ALE215)
						1kg TUB with Handle (ALE210)	250g Amber Jar (ALE215)
						60g VOC (ALE210)	60g VOC (ALE215)
Ammonium Low	All	NDPs: 0 Tests: 1				X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 2				X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1				X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2				X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2				X	X
CEN Readings	All	NDPs: 0 Tests: 1				X	
Chromium III	All	NDPs: 0 Tests: 3				X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2				X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1				X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1				X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2				X	X
Fluoride	All	NDPs: 0 Tests: 1				X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2					X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2				X	X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1				X	



CERTIFICATE OF ANALYSIS

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SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23892873		23892877	
	Customer Sample Reference		BH-PTR-05		BH-PTR-05	
	AGS Reference					
	Depth (m)		0.10 - 0.10		0.50 - 0.50	
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Sample description	All	NDPs: 0 Tests: 2		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X



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SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23892873	BH-PTR-05	0.10 - 0.10	Dark Brown	Sandy Silt Loam	Stones	None
23892877	BH-PTR-05	0.50 - 0.50	Beige	Clay	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169
Client Ref.: B025563

Report Number: 636399

Superseded Report: 591520

Location: Cambridge South East Transport - Phase 2

Results Legend			Customer Sample Ref.		BH-PTR-05		BH-PTR-05					
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref	0.10 - 0.10 Soil/Solid (S) 10/03/2021	0.50 - 0.50 Soil/Solid (S) 10/03/2021							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Lab Sample No.(s) AGS Reference	12/03/2021 210312-169 23892873	12/03/2021 210312-169 23892877							
(F) 1-4*\$@	Trigger breach confirmed Sample deviation (see appendix)											
Component		LOD/Units	Method									
Moisture Content Ratio (% of as received sample)		%	PM024	18		11						
Catechol		<0.01 mg/kg	TM062 (S)	<0.01		<0.01						
Phenol		<0.01 mg/kg	TM062 (S)	<0.01 M		<0.01 M						
Cresols		<0.01 mg/kg	TM062 (S)	0.0122 M		<0.01 M						
Resorcinol		<0.05 mg/kg	TM062 (S)	<0.05		<0.05						
Xylenols		<0.015 mg/kg	TM062 (S)	0.244 M		<0.015 M						
1-Naphthol		<0.01 mg/kg	TM062 (S)	<0.01		<0.01						
2,3,5-Trimethylphenol		<0.01 mg/kg	TM062 (S)	<0.01 M		<0.01 M						
2-Isopropylphenol		<0.015 mg/kg	TM062 (S)	<0.015 M		<0.015 M						
Phenols, Total Detected 5 speciated		<0.06 mg/kg	TM062 (S)	0.256 M		<0.06 M						
Phenols, Total Detected 8 Speciated		<0.13 mg/kg	TM062 (S)	0.256		<0.13						
Sulphur, Total		<0.02 %	TM132	0.037		<0.02						
Fraction Organic Carbon (FOC)		<0.002	TM132	0.0182 #		0.00202 #						
pH		1 pH Units	TM133	8.05 M		8.56 M						
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6 #		<0.6 #						
Cyanide, Free		<1 mg/kg	TM153	<1 M		<1 M						
Chromium, Trivalent		<0.9 mg/kg	TM181	4.81		2.53						
Antimony		<0.6 mg/kg	TM181	0.601 #		<0.6 #						
Arsenic		<0.6 mg/kg	TM181	3.18 M		2.71 M						
Barium		<0.6 mg/kg	TM181	74.1 #		19.4 #						
Beryllium		<0.01 mg/kg	TM181	0.278 M		0.179 M						
Cadmium		<0.02 mg/kg	TM181	0.123 M		0.0714 M						
Chromium		<0.9 mg/kg	TM181	4.81 M		2.53 M						
Copper		<1.4 mg/kg	TM181	14.5 M		4.34 M						
Iron		<1000 mg/kg	TM181	5740 #		5160 #						
Lead		<0.7 mg/kg	TM181	11.1 M		1.66 M						
Manganese		<0.13 mg/kg	TM181	185 M		398 M						
Mercury		<0.1 mg/kg	TM181	<0.1 M		<0.1 M						
Molybdenum		<0.1 mg/kg	TM181	0.244 #		0.26 #						
Nickel		<0.2 mg/kg	TM181	10.3 M		7.13 M						
Selenium		<1 mg/kg	TM181	1.82 #		<1 #						
Vanadium		<0.2 mg/kg	TM181	8.3 #		5.81 #						



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169
Client Ref.: B025563

Report Number: 636399

Superseded Report: 591520

Location: Cambridge South East Transport - Phase 2

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		CERTIFICATE OF ANALYSIS										Validated	
SDG: 210312-169 Client Ref.: B025563				Report Number: 636399 Location: Cambridge South East Transport - Phase 2				Superseded Report: 591520					
PAH by GCMS													
<div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44\$@ Sample deviation (see appendix)</div>		Customer Sample Ref.		BH-PTR-05 0.10 - 0.10 Soil/Solid (S) 10/03/2021 12/03/2021 210312-169 23892873		BH-PTR-05 0.50 - 0.50 Soil/Solid (S) 10/03/2021 12/03/2021 210312-169 23892877							
Component		LOD/Units	Method										
Naphthalene-d8 % recovery**		%	TM218	87.3		89.7							
Acenaphthene-d10 % recovery**		%	TM218	83.6		84.8							
Phenanthrene-d10 % recovery**		%	TM218	82		85							
Chrysene-d12 % recovery**		%	TM218	75.6		77.8							
Perylene-d12 % recovery**		%	TM218	76.7		79							
Naphthalene		<9 µg/kg	TM218	<45 M		<9 M							
Acenaphthylene		<12 µg/kg	TM218	<60 M		<12 M							
Acenaphthene		<8 µg/kg	TM218	<40 M		<8 M							
Fluorene		<10 µg/kg	TM218	<50 M		<10 M							
Phenanthrene		<15 µg/kg	TM218	173 M		<15 M							
Anthracene		<16 µg/kg	TM218	<80 M		<16 M							
Fluoranthene		<17 µg/kg	TM218	158 M		<17 M							
Pyrene		<15 µg/kg	TM218	132 M		<15 M							
Benz(a)anthracene		<14 µg/kg	TM218	<70 M		<14 M							
Chrysene		<10 µg/kg	TM218	88.7 M		<10 M							
Benzo(b)fluoranthene		<15 µg/kg	TM218	175 M		<15 M							
Benzo(k)fluoranthene		<14 µg/kg	TM218	<70 M		<14 M							
Benzo(a)pyrene		<15 µg/kg	TM218	173 M		<15 M							
Indeno(1,2,3-cd)pyrene		<18 µg/kg	TM218	246 M		<18 M							
Dibenzo(a,h)anthracene		<23 µg/kg	TM218	<115 M		<23 M							
Benzo(g,h,i)perylene		<24 µg/kg	TM218	303 M		<24 M							
PAH, Total Detected USEPA 16		<118 µg/kg	TM218	1450		<118							

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VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-05					
#	ISO17025 accredited.		0.10 - 0.10 Soil/Solid (S) 10/03/2021	0.50 - 0.50 Soil/Solid (S) 10/03/2021				
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	12/03/2021 210312-169 23892873	12/03/2021 210312-169 23892877				
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4*5@	Sample deviation (see appendix)							
Component		LOD/Units	Method					
1,2,3-Trichlorobenzene		<20 µg/kg	TM116	<400 #	<400 #			
1,3,5-Trichlorobenzene		<20 µg/kg	TM116	<400	<400			
Sum of Detected Xylenes		<0.02 mg/kg	TM116	<0.4	<0.4			
Sum of BTEX		<40 µg/kg	TM116	<800	<800			

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - Phase 2
Mass Sample taken (kg)	0.120	Natural Moisture Content (%)	33.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	75.1
Particle Size <4mm	>95%		

Case

SDG	210312-169			
Lab Sample Number(s)	23892873			
Sampled Date	10-Mar-2021			
Customer Sample Ref.	BH-PTR-05			
Depth (m)	0.10 - 0.10			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.014	<0.01	0.14	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	8.11	<3	81.1	<30	-	-	-
Fluoride	0.761	<0.5	7.61	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00179	<0.0005	0.0179	<0.005	-	-	-
Barium	0.107	<0.0002	1.07	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.06	<0.01	0.6	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.0062	<0.0003	0.062	<0.003	-	-	-
Lead	0.000383	<0.0002	0.00383	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.437	<0.036	4.37	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00405	<0.0004	0.0405	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00113	<0.001	0.0113	<0.01	-	-	-
Zinc	0.0238	<0.001	0.238	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
pH Value of Filtered Water	8.3	<0.001	83	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	16-Mar-2021
pH (pH Units)	8.17
Conductivity (µS/cm)	110.00
Temperature (°C)	19.40
Volume Leachant (Litres)	0.870

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CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - Phase 2
Mass Sample taken (kg)	0.120	Natural Moisture Content (%)	33.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	75.1
Particle Size <4mm	>95%		

Case

SDG	210312-169			
Lab Sample Number(s)	23892873			
Sampled Date	10-Mar-2021			
Customer Sample Ref.	BH-PTR-05			
Depth (m)	0.10 - 0.10			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Calcium (Dis.Filt) mg/l	20.5	<0.2	205	<2	-	-	-
Hardness dissolved	53	<0.65	530	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.138	<0.019	1.38	<0.19	-	-	-

Leach Test Information

Date Prepared	16-Mar-2021
pH (pH Units)	8.17
Conductivity (µS/cm)	110.00
Temperature (°C)	19.40
Volume Leachant (Litres)	0.870

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23892873	23892877
Customer Sample Ref.	BH-PTR-05	BH-PTR-05
AGS Ref.		
Depth	0.10 - 0.10	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	19-Mar-2021	
Anions by Kone (soil)	18-Mar-2021	18-Mar-2021
Anions by Kone (w)	19-Mar-2021	
Asbestos ID in Solid Samples	18-Mar-2021	18-Mar-2021
Boron Water Soluble	18-Mar-2021	18-Mar-2021
CEN 10:1 Leachate (1 Stage)	17-Mar-2021	
CEN Readings	20-Mar-2021	
Chromium III	22-Mar-2021	22-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	18-Mar-2021	18-Mar-2021
Dissolved Metals by ICP-MS	22-Mar-2021	
Dissolved Organic/Inorganic Carbon	19-Mar-2021	
EPH CWG GC (S)	17-Mar-2021	18-Mar-2021
Fluoride	19-Mar-2021	
GRO by GC-FID (S)	18-Mar-2021	19-Mar-2021
Hexavalent Chromium (s)	19-Mar-2021	18-Mar-2021
Low Level Cyanide (W)	22-Mar-2021	
Low Level Hexavalent Chromium (w)	19-Mar-2021	
Mercury Dissolved	22-Mar-2021	
Metals in solid samples by OES	22-Mar-2021	22-Mar-2021
Moisture at 105C	16-Mar-2021	
PAH by GCMS	17-Mar-2021	17-Mar-2021
pH	18-Mar-2021	18-Mar-2021
pH Value of Filtered Water	19-Mar-2021	
Phenols by HPLC (S)	16-Mar-2021	16-Mar-2021
Phenols by HPLC (W)	22-Mar-2021	
Sample description	15-Mar-2021	15-Mar-2021
Total Organic Carbon	22-Mar-2021	22-Mar-2021
Total Sulphur	18-Mar-2021	18-Mar-2021
TPH CWG GC (S)	18-Mar-2021	19-Mar-2021
VOC MS (S)	19-Mar-2021	19-Mar-2021



CERTIFICATE OF ANALYSIS

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SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2396
Ammoniacal Nitrogen as N	TM099	99.2 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2397	QC 2307
Chloride (soluble)	TM243	149.74 86.68 : 115.67	158.03 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00	169.16 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2390
Chloride	TM184	94.9 91.40 : 109.10
Sulphate (soluble)	TM184	99.6 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2352
Water Soluble Boron	TM222	100.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2362
Free Cyanide	TM153	97.72 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	95.1 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2317	QC 2370
Aluminium	TM152	101.33 94.21 : 111.52	101.33 90.78 : 110.89
Antimony	TM152	100.0 88.37 : 130.57	100.5 77.22 : 119.42
Arsenic	TM152	101.0 92.62 : 113.52	102.67 86.77 : 107.67



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Dissolved Metals by ICP-MS

		QC 2317	QC 2370
Barium	TM152	105.0 88.62 : 113.14	101.33 87.86 : 110.23
Beryllium	TM152	100.33 87.08 : 111.38	102.5 86.19 : 112.98
Bismuth	TM152	101.33 92.62 : 115.02	102.33 84.06 : 106.46
Borate	TM152		101.85 88.00 : 112.00
Boron	TM152	97.33 86.31 : 120.88	101.67 83.92 : 114.90
Cadmium	TM152	100.17 93.85 : 111.65	102.33 88.89 : 106.69
Calcium	TM152	98.0 89.20 : 126.91	101.33 80.24 : 117.95
Chromium	TM152	101.5 92.50 : 113.03	102.33 83.22 : 110.16
Cobalt	TM152	101.33 85.01 : 114.87	101.67 82.49 : 112.36
Copper	TM152	101.67 89.87 : 119.73	103.5 83.14 : 113.00
Iron	TM152	102.0 93.02 : 113.86	102.67 88.40 : 109.24
Lead	TM152	103.33 91.11 : 116.98	101.5 83.71 : 109.58
Lithium	TM152	99.5 87.70 : 115.90	101.17 84.50 : 114.28
Magnesium	TM152	96.0 89.60 : 116.61	97.33 87.56 : 114.57
Manganese	TM152	102.17 93.97 : 112.46	101.83 90.01 : 108.72
Molybdenum	TM152	99.83 89.07 : 110.96	101.17 85.53 : 107.42
Nickel	TM152	102.67 93.70 : 112.15	103.83 88.05 : 106.42
Phosphorus	TM152	100.33 89.24 : 114.18	101.33 82.76 : 107.72
Potassium	TM152	98.67 93.20 : 115.55	98.0 88.45 : 106.42
Selenium	TM152	101.17 91.69 : 117.12	103.83 85.61 : 111.03
Silver	TM152	101.33 90.93 : 121.73	101.67 88.48 : 110.48
Sodium	TM152	96.0 92.42 : 113.24	97.33 88.32 : 106.30
Strontium	TM152	101.0 92.14 : 116.24	101.67 83.77 : 107.87
Tellurium	TM152	98.17 89.88 : 111.78	101.0 82.83 : 104.73
Thallium	TM152	112.0 82.43 : 113.83	106.33 77.47 : 113.87
Tin	TM152	98.67 94.62 : 107.79	100.0 87.36 : 109.55
Titanium	TM152	98.83 90.29 : 115.23	100.83 87.29 : 108.31



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Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

Dissolved Metals by ICP-MS

		QC 2317	QC 2370
Tungsten	TM152	99.33 77.61 : 132.31	99.33 68.27 : 122.97
Uranium	TM152	99.67 86.97 : 115.76	100.83 82.46 : 105.16
Vanadium	TM152	101.17 89.61 : 115.48	106.0 88.43 : 114.30
Zinc	TM152	102.33 87.51 : 116.26	103.33 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2364
Dissolved Inorganic Carbon	TM090	102.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.17 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2301
EPH >C8-C40 Raw	TM414	90.56 72.57 : 112.44
Total Aliphatics Raw	TM414	96.46 72.68 : 112.55
Total Aromatics Raw	TM414	99.2 58.44 : 124.94

Fluoride

Component	Method Code	QC 2367
Fluoride	TM104	105.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2318	QC 2378
QC	TM089	84.82 70.34 : 111.95	92.08 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2369	QC 2383
Hexavalent Chromium	TM151	102.0 92.00 : 111.20	100.0 92.00 : 111.20



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Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

Hexavalent Chromium (s)

Low Level Cyanide (W)

Component	Method Code	QC 2332
Free Cyanide - Low Level	TM279	81.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2332
Mercury Dissolved (CVAF)	TM183	93.5 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2386
Aluminium	TM181	84.87 73.56 : 108.85
Antimony	TM181	97.56 76.89 : 111.24
Arsenic	TM181	103.78 88.53 : 111.01
Barium	TM181	93.58 77.67 : 105.35
Beryllium	TM181	102.99 85.44 : 109.61
Boron	TM181	92.84 73.51 : 104.66
Cadmium	TM181	92.18 77.67 : 104.12
Chromium	TM181	89.66 79.64 : 105.83
Cobalt	TM181	92.77 84.60 : 104.13
Copper	TM181	95.07 82.40 : 105.45
Iron	TM181	101.59 82.95 : 110.58
Lead	TM181	92.57 78.24 : 104.05
Manganese	TM181	112.78 94.29 : 119.51
Mercury	TM181	100.0 83.16 : 107.81
Molybdenum	TM181	101.65 87.11 : 106.87
Nickel	TM181	92.91 80.26 : 102.28



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

Metals in solid samples by OES

		QC 2386
Phosphorus	TM181	111.92 94.56 : 124.28
Selenium	TM181	103.53 82.28 : 110.48
Strontium	TM181	94.65 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86
Tin	TM181	102.28 86.72 : 110.03
Titanium	TM181	87.79 66.23 : 102.06
Vanadium	TM181	98.9 86.19 : 109.45
Zinc	TM181	100.62 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2398
Acenaphthene	TM218	90.0 73.47 : 109.80
Acenaphthylene	TM218	89.5 70.00 : 130.00
Anthracene	TM218	89.0 68.68 : 111.89
Benz(a)anthracene	TM218	88.0 68.12 : 118.39
Benzo(a)pyrene	TM218	86.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	93.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	91.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	90.0 73.10 : 117.03
Chrysene	TM218	87.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	88.5 67.32 : 121.35
Fluoranthene	TM218	88.5 75.16 : 117.28
Fluorene	TM218	88.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	84.5 68.91 : 117.62
Naphthalene	TM218	89.0 72.12 : 106.18
Phenanthrene	TM218	90.0 69.01 : 113.72
Pyrene	TM218	89.5 64.28 : 115.75

pH



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Client Ref.: B025563

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Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

pH

Component	Method Code	QC 2328	QC 2323
pH	TM133	100.26 99.08 : 102.24	100.53 99.08 : 102.24

pH Value of Filtered Water

Component	Method Code	QC 2330
pH	TM256	101.74 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2321
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	46.1 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	40.94 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	40.5 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	46.36 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	44.17 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2307
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	50.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	47.33 76.60 : 126.28
Napthol by HPLC (W)	TM259	52.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	49.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.5 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2391
Total Organic Carbon	TM132	100.39 87.02 : 113.45



CERTIFICATE OF ANALYSIS

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SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

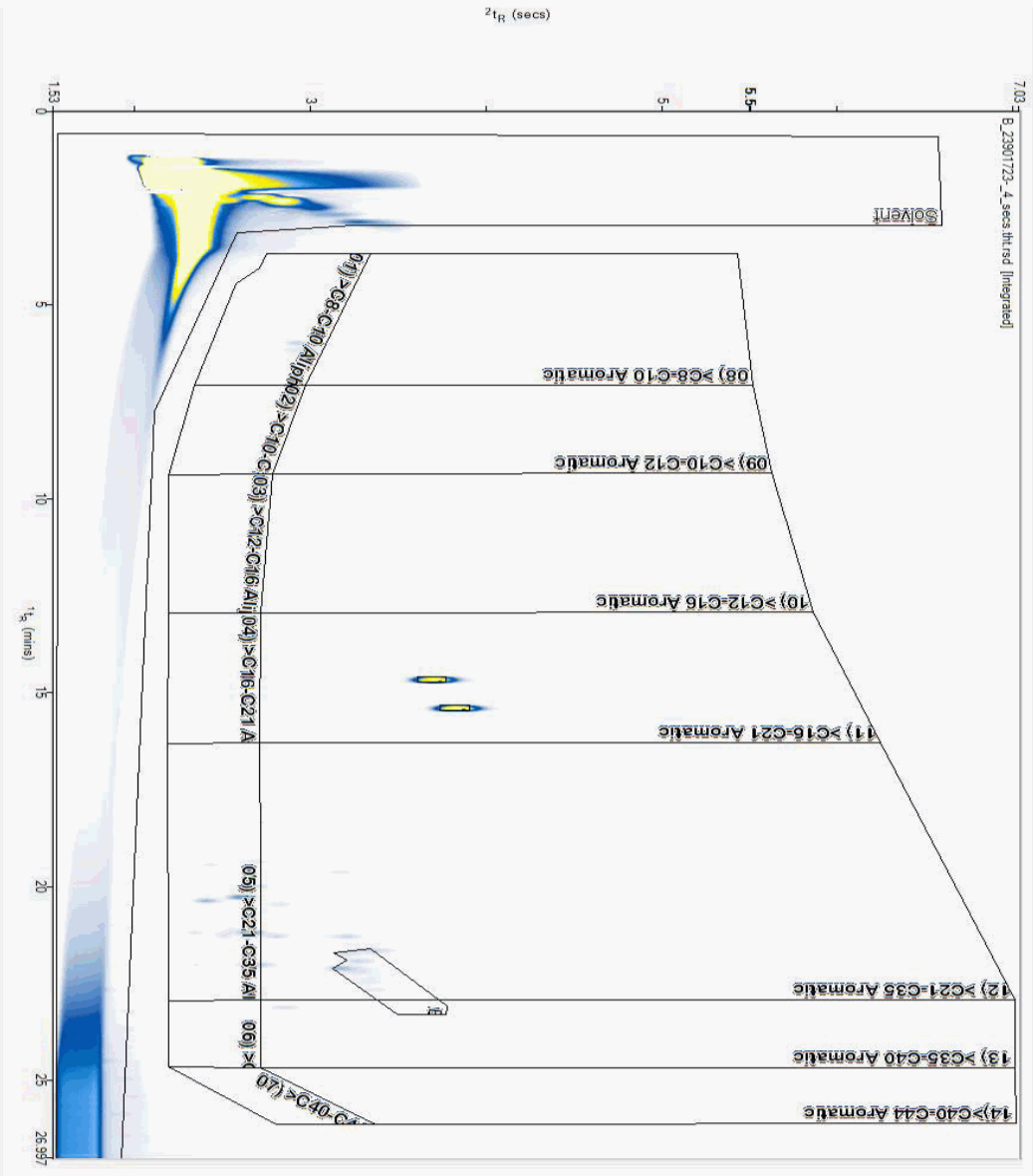
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23901723
Sample ID : BH-PTR-05

Depth : 0.10 - 0.10

ChromSpace LIMS export
Current batch
Sample Identity: B_23901723-4_secs.tht
Date Acquired : 16/03/21 09:37:07
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591520

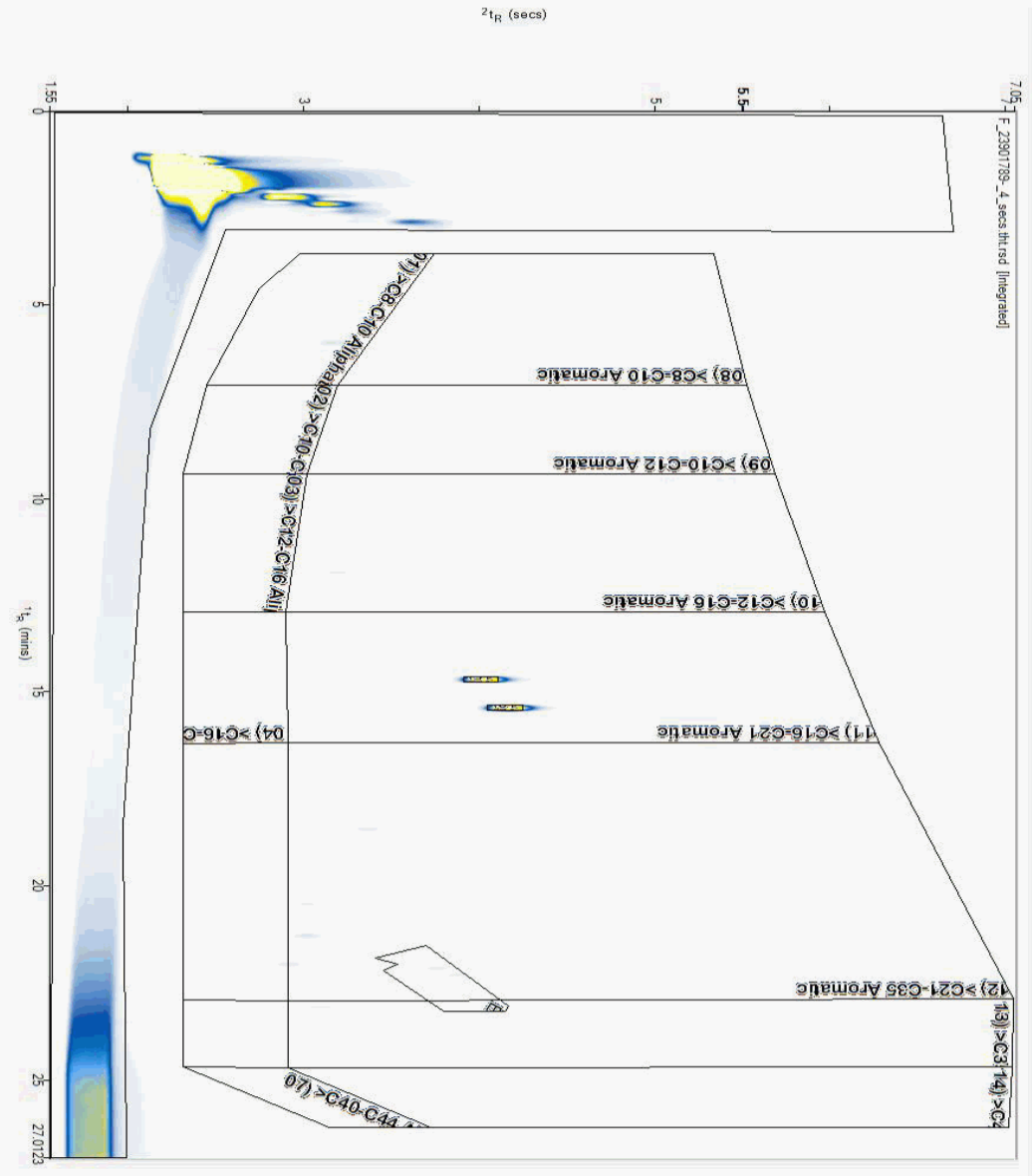
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23901789
Sample ID : BH-PTR-05

Depth : 0.50 - 0.50

ChromSpace LIMS export
Current batch
Sample Identity: F_23901789-4_secs.tht
Date Acquired : 17/03/21 01:55:19
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

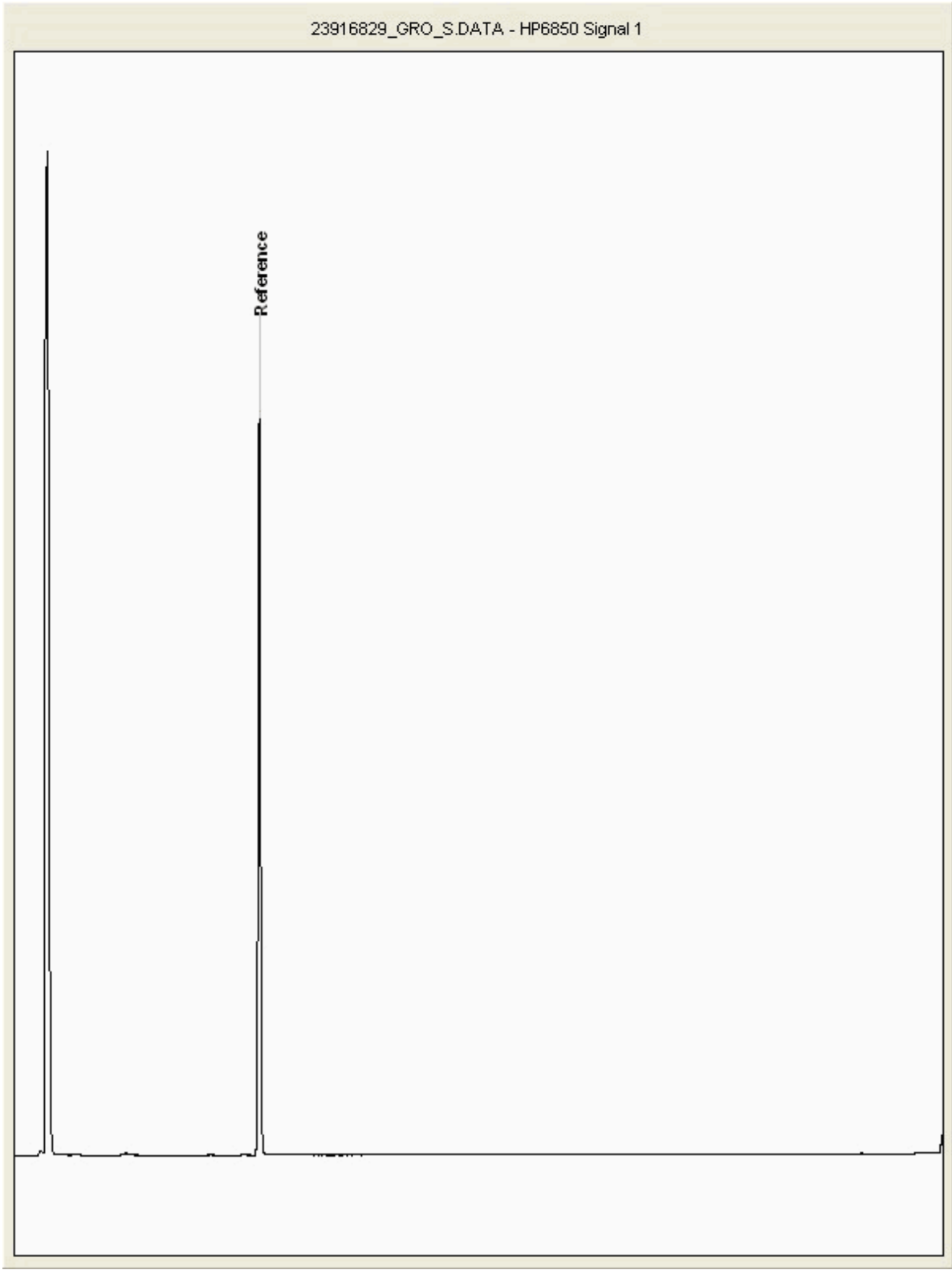
Superseded Report: 591520

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23916829
Sample ID : BH-PTR-05

Depth : 0.10 - 0.10



CERTIFICATE OF ANALYSIS

Validated

SDG: 210312-169
Client Ref.: B025563

Report Number: 636399
Location: Cambridge South East Transport - Phase 2

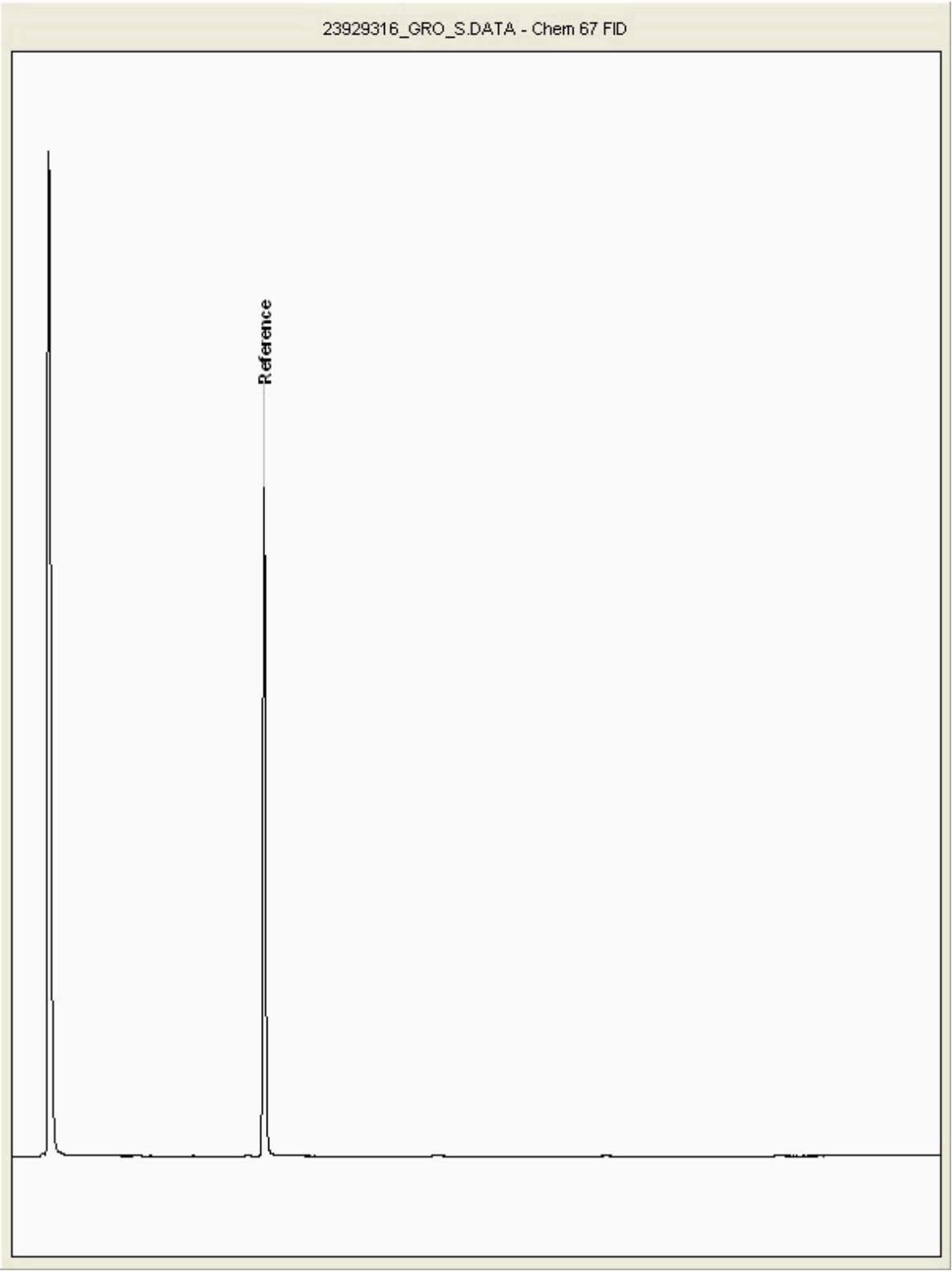
Superseded Report: 591520

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23929316
Sample ID : BH-PTR-05

Depth : 0.50 - 0.50



SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis/Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210312-169	N/A	N/A	07/03/2022	IT Issue	Report Formatting	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	591520



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591543

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23901208	BH-OBC-01			11/03/2021
23901204	BH-OBC-01		0.10 - 0.10	11/03/2021
23901205	BH-OBC-01		0.20 - 0.20	11/03/2021
23901206	BH-OBC-01		0.50 - 0.50	11/03/2021
23901207	BH-OBC-01		1.00 - 1.00	11/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 March 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210315-53
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 636504
Order Number: 7000964

This report has been revised and directly supersedes 591543 in its entirety.

We received 5 samples on Monday March 15, 2021 and 2 of these samples were scheduled for analysis which was completed on Monday March 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504

Superseded Report: 591543
Location: Cambridge South East Transport - Phase 2

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23901204	23901206
	Customer Sample Reference		BH-OBC-01	BH-OBC-01
	AGS Reference			
	Depth (m)		0.10 - 0.10	0.50 - 0.50
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)
	Sample Type		S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2		X
CEN Readings	All	NDPs: 0 Tests: 1	X	
Chromium III	All	NDPs: 0 Tests: 3	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X
Fluoride	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X	



CERTIFICATE OF ANALYSIS

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SDG: 210315-53
Client Ref.: B025563

Report Number: 636504

Superseded Report: 591543
Location: Cambridge South East Transport - Phase 2

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23901204	23901206
	Customer Sample Reference		BH-OBC-01	BH-OBC-01
	AGS Reference			
	Depth (m)		0.10 - 0.10	0.50 - 0.50
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)
	Sample Type		S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X	
Mercury Dissolved	All	NDPs: 0 Tests: 1	X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X
pH	All	NDPs: 0 Tests: 2		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X	
Sample description	All	NDPs: 0 Tests: 2		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X
Total Sulphur	All	NDPs: 0 Tests: 2		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X
VOC MS (S)	All	NDPs: 0 Tests: 2		X



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Client Ref.: B025563

Report Number: 636504
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591543

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23901204	BH-OBC-01	0.10 - 0.10	Dark Brown	Sandy Loam	Stones	Vegetation
23901206	BH-OBC-01	0.50 - 0.50	Light Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

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SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591543

Results Legend		Customer Sample Ref.	BH-OBC-01	BH-OBC-01				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 - 0.10	0.50 - 0.50				
M	MCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		11/03/2021	11/03/2021				
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.		15/03/2021	15/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210315-53	210315-53				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23901204	23901206				
(F)	Trigger breach confirmed							
1-44\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	9.6	6.8				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xlenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00685 #	0.00273 #				
pH	1 pH Units	TM133	8.35 M	8.73 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #				
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M				
Chromium, Trivalent	<0.9 mg/kg	TM181	7.9	8.34				
Antimony	<0.6 mg/kg	TM181	<0.6 #	<0.6 #				
Arsenic	<0.6 mg/kg	TM181	17.3 M	15.8 M				
Barium	<0.6 mg/kg	TM181	40.3 #	31.4 #				
Beryllium	<0.01 mg/kg	TM181	0.44 M	0.426 M				
Cadmium	<0.02 mg/kg	TM181	0.0942 M	0.0287 M				
Chromium	<0.9 mg/kg	TM181	7.9 M	8.34 M				
Copper	<1.4 mg/kg	TM181	9.58 M	6.98 M				
Iron	<1000 mg/kg	TM181	24800 #	24300 #				
Lead	<0.7 mg/kg	TM181	14.4 M	8.24 M				
Manganese	<0.13 mg/kg	TM181	404 M	354 M				
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M				
Molybdenum	<0.1 mg/kg	TM181	0.834 #	0.572 #				
Nickel	<0.2 mg/kg	TM181	16.9 M	16.8 M				
Selenium	<1 mg/kg	TM181	<1 #	<1 #				
Vanadium	<0.2 mg/kg	TM181	32.4 #	33.8 #				

CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504

Superseded Report: 591543

Location: Cambridge South East Transport - Phase 2

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504

Superseded Report: 591543

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

<div><div>Results Legend</div><div># M aq diss.ftit tot.unfilt *</div><div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div></div>	Customer Sample Ref.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-OBC-01 0.10 - 0.10 Soil/Solid (S) 11/03/2021 15/03/2021 210315-53 23901204	BH-OBC-01 0.50 - 0.50 Soil/Solid (S) 11/03/2021 15/03/2021 210315-53 23901206								
					Component	LOD/Units	Method					
					Dibromofluoromethane**	%	TM116	102	130			
					Toluene-d8**	%	TM116	103	94.3			
					4-Bromofluorobenzene**	%	TM116	83.3	79.5			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M								
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #								
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 M								
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M								
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M								
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M								
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #								
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M								
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #								
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M								
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M								
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M								
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M								
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10								
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M								
Chloroform	<8 µg/kg	TM116	<8 M	<8 M								
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M								
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M								
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M								
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 3 M								
Benzene	<9 µg/kg	TM116	<9 M	<9 M								
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #								
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M								
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M								
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M								
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M								
Toluene	<7 µg/kg	TM116	<7 M	<7 M								
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10								
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M								

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VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBC-01	BH-OBC-01				
# M aq diss.filt tot.unfilt + ** (F) 1-4+5@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 - 0.10 Soil/Solid (S) 11/03/2021 15/03/2021 210315-53 23901204	0.50 - 0.50 Soil/Solid (S) 11/03/2021 15/03/2021 210315-53 23901206				
Component		LOD/Units	Method						
1,3-Dichloropropane		<7 µg/kg	TM116	<7 M	<7 M				
Tetrachloroethene		<5 µg/kg	TM116	<5 M	<5 M				
Dibromochloromethane		<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromoethane		<10 µg/kg	TM116	<10 M	<10 M				
Chlorobenzene		<5 µg/kg	TM116	<5 M	<5 M				
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10 M	<10 M				
Ethylbenzene		<4 µg/kg	TM116	<4 M	<4 M				
p/m-Xylene		<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene		<10 µg/kg	TM116	<10 M	<10 M				
Styrene		<10 µg/kg	TM116	<10 @ #	<10 #				
Bromoform		<10 µg/kg	TM116	<10 M	<10 M				
Isopropylbenzene		<5 µg/kg	TM116	<5 #	<5 #				
1,1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10 #	<10 #				
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16 M	<16 M				
Bromobenzene		<10 µg/kg	TM116	<10 M	<10 M				
Propylbenzene		<10 µg/kg	TM116	<10 M	<10 M				
2-Chlorotoluene		<9 µg/kg	TM116	<9 M	<9 M				
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8 M	<8 M				
4-Chlorotoluene		<10 µg/kg	TM116	<10 M	<10 M				
tert-Butylbenzene		<14 µg/kg	TM116	<14 M	<14 M				
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9 #	<9 #				
sec-Butylbenzene		<10 µg/kg	TM116	<10	<10				
4-Isopropyltoluene		<10 µg/kg	TM116	<10 M	<10 M				
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8 M	<8 M				
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5 M	<5 M				
n-Butylbenzene		<11 µg/kg	TM116	<11	<11				
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14 M	<14 M				
Tert-amyl methyl ether		<10 µg/kg	TM116	<10 #	<10 #				
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20	<20				
Hexachlorobutadiene		<20 µg/kg	TM116	<20	<20				
Naphthalene		<13 µg/kg	TM116	<13 M	<13 M				



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[illegible]



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CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Site Location

Cambridge South East Transpo

Mass Sample taken (kg)	0.104
-------------------------------	-------

Natural Moisture Content (%)

14.9

Mass of dry sample (kg)	0.090
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Dry Matter Content (%)

87

Particle Size <4mm **>95%**

Case

SDG 210315-53

Lab Sample Number(s) 23901204

Sampled Date 11-Mar-2021

Customer Sample Ref. BH-OBC-01

Depth (m) 0.10 - 0.10

[illegible]

Leach Test Information

Date Prepared	17-Mar-2021
pH (pH Units)	8.32
Conductivity (µS/cm)	91.30
Temperature (°C)	19.50
Volume Leachant (Litres)	0.887

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	23901204	23901206
	BH-OBC-01	BH-OBC-01
AGS Ref. Depth	0.10 - 0.10	0.50 - 0.50
	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	19-Mar-2021	
Anions by Kone (soil)	18-Mar-2021	18-Mar-2021
Anions by Kone (w)	19-Mar-2021	
Asbestos ID in Solid Samples	18-Mar-2021	18-Mar-2021
Boron Water Soluble	18-Mar-2021	18-Mar-2021
CEN 10:1 Leachate (1 Stage)	17-Mar-2021	
CEN Readings	20-Mar-2021	
Chromium III	22-Mar-2021	19-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	18-Mar-2021	18-Mar-2021
Dissolved Metals by ICP-MS	22-Mar-2021	
Dissolved Organic/Inorganic Carbon	19-Mar-2021	
EPH CWG GC (S)	18-Mar-2021	18-Mar-2021
Fluoride	19-Mar-2021	
GRO by GC-FID (S)	17-Mar-2021	17-Mar-2021
Hexavalent Chromium (s)	18-Mar-2021	18-Mar-2021
Low Level Cyanide (W)	22-Mar-2021	
Low Level Hexavalent Chromium (w)	19-Mar-2021	
Mercury Dissolved	19-Mar-2021	
Metals in solid samples by OES	22-Mar-2021	22-Mar-2021
Moisture at 105C	17-Mar-2021	
PAH by GCMS	18-Mar-2021	18-Mar-2021
pH	19-Mar-2021	18-Mar-2021
pH Value of Filtered Water	19-Mar-2021	
Phenols by HPLC (S)	18-Mar-2021	18-Mar-2021
Phenols by HPLC (W)	22-Mar-2021	
Sample description	16-Mar-2021	16-Mar-2021
Total Organic Carbon	22-Mar-2021	22-Mar-2021
Total Sulphur	18-Mar-2021	18-Mar-2021
TPH CWG GC (S)	18-Mar-2021	18-Mar-2021
VOC MS (S)	18-Mar-2021	18-Mar-2021



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ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2396
Ammoniacal Nitrogen as N	TM099	99.2 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2397
Chloride (soluble)	TM243	149.74 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2390
Chloride	TM184	94.9 91.40 : 109.10
Sulphate (soluble)	TM184	99.6 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2352
Water Soluble Boron	TM222	100.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2362
Free Cyanide	TM153	97.72 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	95.1 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2317	QC 2370
Aluminium	TM152	101.33 94.21 : 111.52	101.33 90.78 : 110.89
Antimony	TM152	100.0 88.37 : 130.57	100.5 77.22 : 119.42
Arsenic	TM152	101.0 92.62 : 113.52	102.67 86.77 : 107.67



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Dissolved Metals by ICP-MS

		QC 2317	QC 2370
Barium	TM152	105.0 88.62 : 113.14	101.33 87.86 : 110.23
Beryllium	TM152	100.33 87.08 : 111.38	102.5 86.19 : 112.98
Bismuth	TM152	101.33 92.62 : 115.02	102.33 84.06 : 106.46
Borate	TM152		101.85 88.00 : 112.00
Boron	TM152	97.33 86.31 : 120.88	101.67 83.92 : 114.90
Cadmium	TM152	100.17 93.85 : 111.65	102.33 88.89 : 106.69
Calcium	TM152	98.0 89.20 : 126.91	101.33 80.24 : 117.95
Chromium	TM152	101.5 92.50 : 113.03	102.33 83.22 : 110.16
Cobalt	TM152	101.33 85.01 : 114.87	101.67 82.49 : 112.36
Copper	TM152	101.67 89.87 : 119.73	103.5 83.14 : 113.00
Iron	TM152	102.0 93.02 : 113.86	102.67 88.40 : 109.24
Lead	TM152	103.33 91.11 : 116.98	101.5 83.71 : 109.58
Lithium	TM152	99.5 87.70 : 115.90	101.17 84.50 : 114.28
Magnesium	TM152	96.0 89.60 : 116.61	97.33 87.56 : 114.57
Manganese	TM152	102.17 93.97 : 112.46	101.83 90.01 : 108.72
Molybdenum	TM152	99.83 89.07 : 110.96	101.17 85.53 : 107.42
Nickel	TM152	102.67 93.70 : 112.15	103.83 88.05 : 106.42
Phosphorus	TM152	100.33 89.24 : 114.18	101.33 82.76 : 107.72
Potassium	TM152	98.67 93.20 : 115.55	98.0 88.45 : 106.42
Selenium	TM152	101.17 91.69 : 117.12	103.83 85.61 : 111.03
Silver	TM152	101.33 90.93 : 121.73	101.67 88.48 : 110.48
Sodium	TM152	96.0 92.42 : 113.24	97.33 88.32 : 106.30
Strontium	TM152	101.0 92.14 : 116.24	101.67 83.77 : 107.87
Tellurium	TM152	98.17 89.88 : 111.78	101.0 82.83 : 104.73
Thallium	TM152	112.0 82.43 : 113.83	106.33 77.47 : 113.87
Tin	TM152	98.67 94.62 : 107.79	100.0 87.36 : 109.55
Titanium	TM152	98.83 90.29 : 115.23	100.83 87.29 : 108.31



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Dissolved Metals by ICP-MS

		QC 2317	QC 2370
Tungsten	TM152	99.33 77.61 : 132.31	99.33 68.27 : 122.97
Uranium	TM152	99.67 86.97 : 115.76	100.83 82.46 : 105.16
Vanadium	TM152	101.17 89.61 : 115.48	106.0 88.43 : 114.30
Zinc	TM152	102.33 87.51 : 116.26	103.33 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2364
Dissolved Inorganic Carbon	TM090	102.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.17 96.13 : 109.53

Fluoride

Component	Method Code	QC 2367
Fluoride	TM104	105.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2391
QC	TM089	89.61 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2312	QC 2369
Hexavalent Chromium	TM151	102.0 92.00 : 111.20	102.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2332
Free Cyanide - Low Level	TM279	81.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2315
Mercury Dissolved (CVAF)	TM183	91.4 74.00 : 116.00

Metals in solid samples by OES

Component	Method Code	QC 2302
Aluminium	TM181	92.92 73.56 : 108.85
Antimony	TM181	101.22 76.89 : 111.24
Arsenic	TM181	107.27 88.53 : 111.01
Barium	TM181	99.08 77.67 : 105.35
Beryllium	TM181	101.12 85.44 : 109.61
Boron	TM181	93.12 73.51 : 104.66
Cadmium	TM181	91.36 77.67 : 104.12
Chromium	TM181	89.45 79.64 : 105.83
Cobalt	TM181	95.28 84.60 : 104.13
Copper	TM181	96.48 82.40 : 105.45
Iron	TM181	97.62 82.95 : 110.58
Lead	TM181	94.59 78.24 : 104.05
Manganese	TM181	111.39 94.29 : 119.51
Mercury	TM181	98.31 83.16 : 107.81
Molybdenum	TM181	104.94 87.11 : 106.87
Nickel	TM181	96.58 80.26 : 102.28
Phosphorus	TM181	117.37 94.56 : 124.28
Selenium	TM181	105.1 82.28 : 110.48
Strontium	TM181	97.33 79.13 : 102.79
Thallium	TM181	105.75 82.94 : 111.86
Tin	TM181	104.18 86.72 : 110.03
Titanium	TM181	85.5 66.23 : 102.06

Metals in solid samples by OES

		QC 2302
Vanadium	TM181	100.37 86.19 : 109.45
Zinc	TM181	102.67 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2341
Acenaphthene	TM218	88.5 73.47 : 109.80
Acenaphthylene	TM218	89.5 70.00 : 130.00
Anthracene	TM218	89.5 68.68 : 111.89
Benz(a)anthracene	TM218	95.0 68.12 : 118.39
Benzo(a)pyrene	TM218	93.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	101.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	94.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	102.0 73.10 : 117.03
Chrysene	TM218	92.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	92.5 67.32 : 121.35
Fluoranthene	TM218	89.0 75.16 : 117.28
Fluorene	TM218	87.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	89.5 68.91 : 117.62
Naphthalene	TM218	87.5 72.12 : 106.18
Phenanthrene	TM218	86.5 69.01 : 113.72
Pyrene	TM218	90.5 64.28 : 115.75

pH

Component	Method Code	QC 2314	QC 2326
pH	TM133	100.4 99.08 : 102.24	99.34 99.08 : 102.24

pH Value of Filtered Water

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pH Value of Filtered Water

Component	Method Code	QC 2330
pH	TM256	<div>101.74</div> <div>99.33 : 102.54</div>

Phenols by HPLC (S)

Component	Method Code	QC 2368
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<div>51.95</div> <div>70.71 : 116.42</div>
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<div>46.78</div> <div>64.54 : 117.79</div>
Cresols by HPLC (S)	TM062 (S)	<div>45.72</div> <div>74.40 : 108.98</div>
Phenol by HPLC (S)	TM062 (S)	<div>52.98</div> <div>69.44 : 122.18</div>
Xylenols by HPLC (S)	TM062 (S)	<div>49.9</div> <div>76.56 : 106.38</div>

Phenols by HPLC (W)

Component	Method Code	QC 2307
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	<div>50.0</div> <div>77.41 : 127.55</div>
2-Isopropyl Phenol by HPLC (W)	TM259	<div>50.0</div> <div>82.77 : 126.51</div>
Cresols by HPLC (W)	TM259	<div>47.33</div> <div>76.60 : 126.28</div>
Napthol by HPLC (W)	TM259	<div>52.0</div> <div>75.40 : 129.40</div>
Phenol by HPLC (W)	TM259	<div>49.0</div> <div>85.77 : 125.91</div>
Xylenols by HPLC (W)	TM259	<div>49.5</div> <div>79.09 : 131.82</div>

Total Organic Carbon

Component	Method Code	QC 2391	QC 2306
Total Organic Carbon	TM132	<div>100.39</div> <div>87.02 : 113.45</div>	<div>105.47</div> <div>87.02 : 113.45</div>

Total Sulphur

Component	Method Code	QC 2344
Total Sulphur %	TM132	<div>93.78</div> <div>61.64 : 114.47</div>

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VOC MS (S)

Component	Method Code	QC 2358	QC 2333
1,1,1,2-tetrachloroethane	TM116	<div>101.4</div> <div>86.59 : 118.97</div>	<div>99.8</div> <div>86.59 : 118.97</div>
1,1,1-Trichloroethane	TM116	<div>107.4</div> <div>86.26 : 117.53</div>	<div>101.8</div> <div>86.26 : 117.53</div>
1,1,2-Trichloroethane	TM116	<div>97.4</div> <div>75.16 : 112.70</div>	<div>96.6</div> <div>75.16 : 112.70</div>
1,1-Dichloroethane	TM116	<div>106.8</div> <div>83.27 : 122.16</div>	<div>112.4</div> <div>83.27 : 122.16</div>
1,2-Dichloroethane	TM116	<div>143.4</div> <div>89.30 : 133.10</div>	<div>111.8</div> <div>89.30 : 133.10</div>
1,4-Dichlorobenzene	TM116	<div>111.0</div> <div>82.59 : 123.23</div>	<div>111.0</div> <div>82.59 : 123.23</div>
2-Chlorotoluene	TM116	<div>93.2</div> <div>66.81 : 118.43</div>	<div>95.8</div> <div>66.81 : 118.43</div>
4-Chlorotoluene	TM116	<div>95.6</div> <div>65.88 : 114.76</div>	<div>96.8</div> <div>65.88 : 114.76</div>
Benzene	TM116	<div>97.2</div> <div>93.16 : 123.63</div>	<div>101.4</div> <div>93.16 : 123.63</div>
Carbon Disulphide	TM116	<div>84.6</div> <div>75.11 : 124.81</div>	<div>106.6</div> <div>75.11 : 124.81</div>
Carbontetrachloride	TM116	<div>116.2</div> <div>82.35 : 126.46</div>	<div>98.6</div> <div>82.35 : 126.46</div>
Chlorobenzene	TM116	<div>94.6</div> <div>85.07 : 118.13</div>	<div>99.2</div> <div>85.07 : 118.13</div>
Chloroform	TM116	<div>114.8</div> <div>88.13 : 122.71</div>	<div>108.8</div> <div>88.13 : 122.71</div>
Chloromethane	TM116	<div>103.4</div> <div>61.62 : 145.66</div>	<div>128.2</div> <div>61.62 : 145.66</div>
Cis-1,2-Dichloroethene	TM116	<div>97.8</div> <div>78.27 : 128.90</div>	<div>103.8</div> <div>78.27 : 128.90</div>
Dibromomethane	TM116	<div>98.2</div> <div>77.47 : 121.29</div>	<div>88.2</div> <div>77.47 : 121.29</div>
Dichloromethane	TM116	<div>103.6</div> <div>87.89 : 134.72</div>	<div>116.0</div> <div>87.89 : 134.72</div>
Ethylbenzene	TM116	<div>91.6</div> <div>79.92 : 110.05</div>	<div>91.6</div> <div>79.92 : 110.05</div>
Hexachlorobutadiene	TM116	<div>81.4</div> <div>16.78 : 153.29</div>	<div>79.6</div> <div>16.78 : 153.29</div>
Isopropylbenzene	TM116	<div>91.8</div> <div>64.20 : 119.59</div>	<div>86.4</div> <div>64.20 : 119.59</div>
Naphthalene	TM116	<div>110.2</div> <div>79.29 : 125.59</div>	<div>106.2</div> <div>79.29 : 125.59</div>
o-Xylene	TM116	<div>83.8</div> <div>72.86 : 102.10</div>	<div>86.0</div> <div>72.86 : 102.10</div>
p/m-Xylene	TM116	<div>82.3</div> <div>74.06 : 106.47</div>	<div>83.3</div> <div>74.06 : 106.47</div>
Sec-Butylbenzene	TM116	<div>85.8</div> <div>44.71 : 117.87</div>	<div>86.2</div> <div>44.71 : 117.87</div>
Tetrachloroethene	TM116	<div>94.6</div> <div>85.86 : 122.95</div>	<div>92.2</div> <div>85.86 : 122.95</div>
Toluene	TM116	<div>91.8</div> <div>87.82 : 116.21</div>	<div>95.4</div> <div>87.82 : 116.21</div>
Trichloroethene	TM116	<div>100.6</div> <div>79.80 : 112.33</div>	<div>95.8</div> <div>79.80 : 112.33</div>

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591543

VOC MS (S)

		QC 2358	QC 2333
Trichlorofluoromethane	TM116	108.6	103.6
		80.52 : 132.12	80.52 : 132.12
Vinyl Chloride	TM116	85.0	125.0
		74.57 : 146.88	74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Location: Cambridge South East Transport - Phase 2

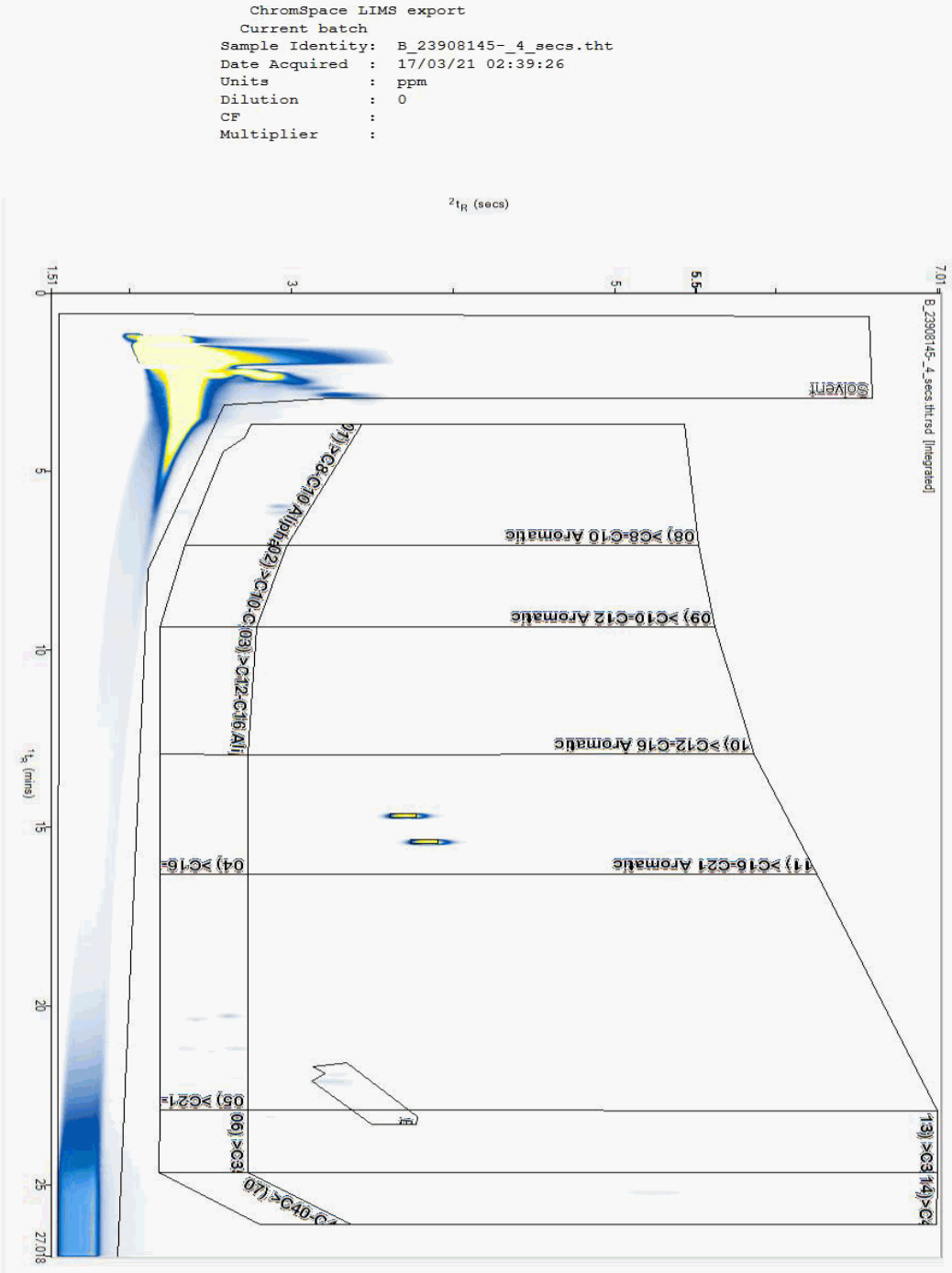
Superseded Report: 591543

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23908145
Sample ID : BH-OBC-01

Depth : 0.50 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Superseded Report: 591543
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23908364 Depth : 0.10 - 0.10
Sample ID : BH-OBC-01



CERTIFICATE OF ANALYSIS

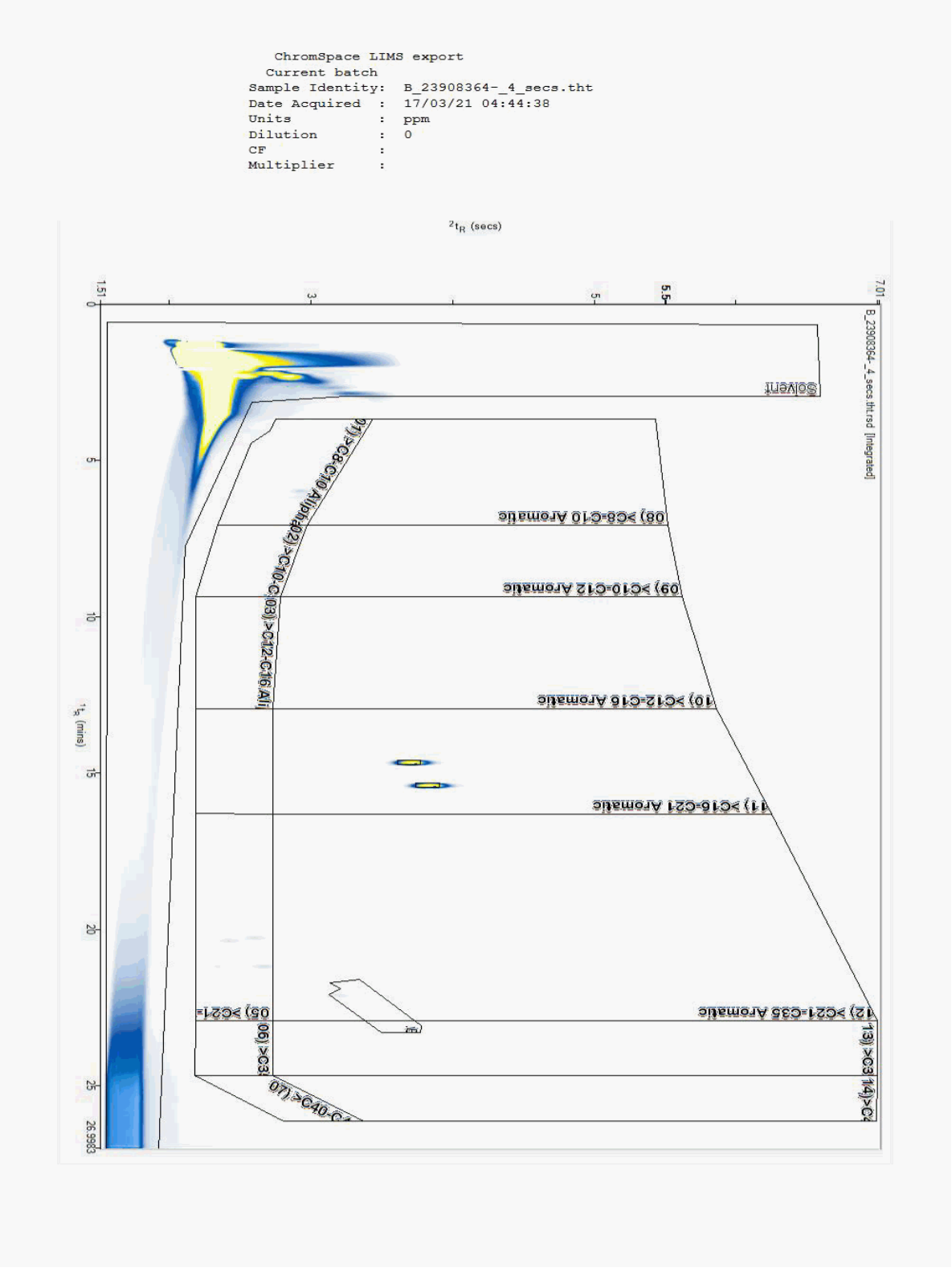
Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Superseded Report: 591543
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23914358 Depth : 0.10 - 0.10
Sample ID : BH-OBC-01





CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-53
Client Ref.: B025563

Report Number: 636504
Location: Cambridge South East Transport - Phase 2

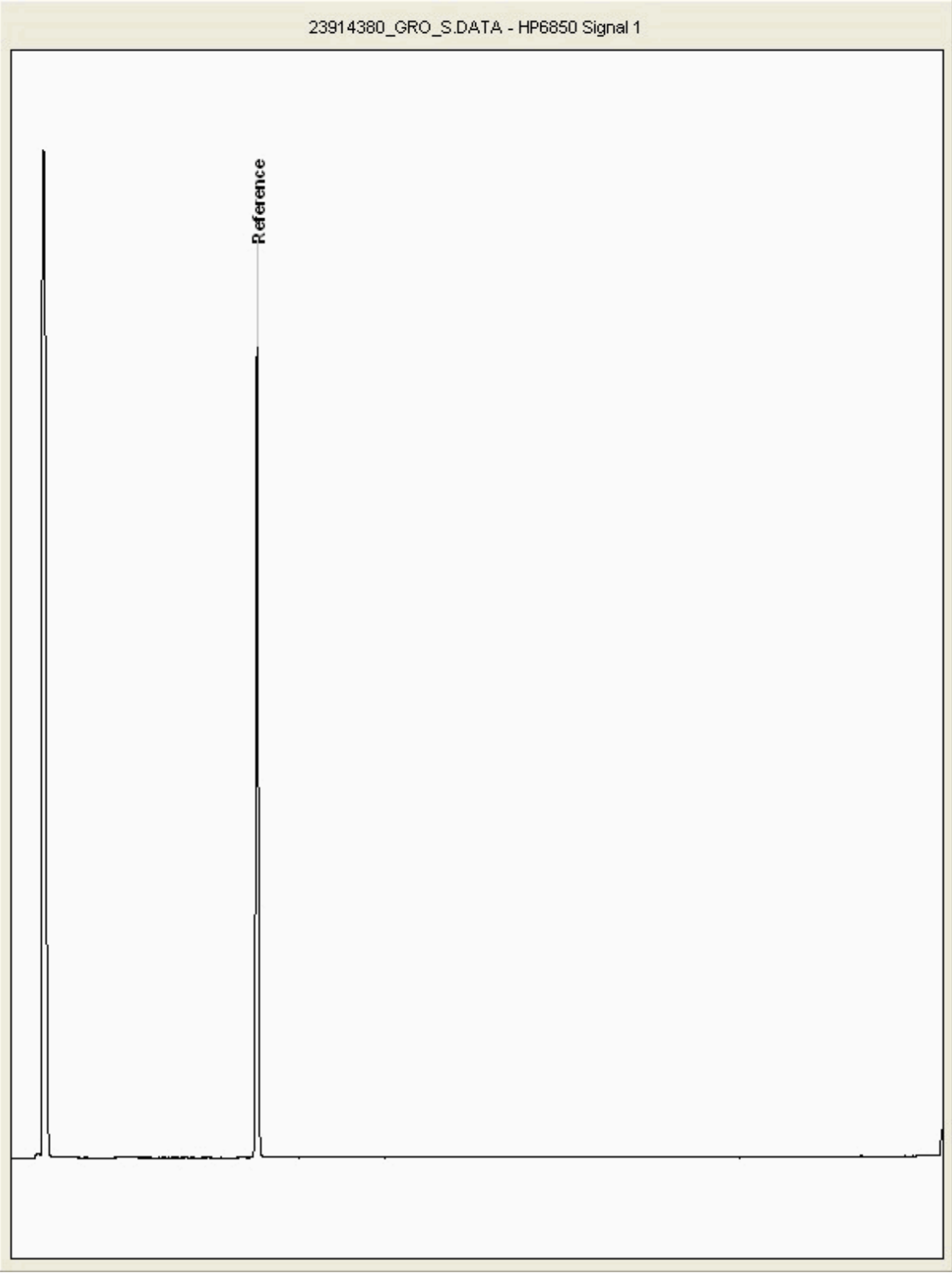
Superseded Report: 591543

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23914380
Sample ID : BH-OBC-01

Depth : 0.50 - 0.50



ALS Environmental, Land				Issue No. 4	
QF.7.5.1 Data Amendments Form				Date: 03/03/2020	
				Issued and Authorised by Quality Manager	

SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis/Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210315-53	N/A	N/A	08/03/2022	IT Issue	Reporting Issue	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	591543



CERTIFICATE OF ANALYSIS

SDG:	210315-53	Client Reference:	8025563	Report Number:	636504
Location:	idge South East Transport -	Order Number:	7000964	Superseded Report:	591543

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subject to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 March 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210315-61
Your Reference: 8025563
Location: Cambridge South East Transport - Phase 2
Report No: 636508
Order Number: 7000964

This report has been revised and directly supersedes 591544 in its entirety.

We received 5 samples on Monday March 15, 2021 and 1 of these samples were scheduled for analysis which was completed on Monday March 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



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Version: 3.1 Version Issued: 08/03/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61 Report Number: 636508 Superseded Report: 591544
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23901562	BH-PTR-04		0.10 - 0.10	11/03/2021
23901563	BH-PTR-04		0.20 - 0.20	11/03/2021
23901564	BH-PTR-04		0.50 - 0.50	11/03/2021
23901565	BH-PTR-04		1.00 - 1.00	11/03/2021
23901566	BH-PTR-38		2.60 - 2.60	

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61 Report Number: 636508 Superseded Report: 591544
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23901564		
	Customer Sample Reference		BH-PTR-04		
	AGS Reference				
	Depth (m)		0.50 - 0.50		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61

Client Ref.: B025563

Report Number: 636508

Location: Cambridge South East Transport - Phase 2

Superseded Report: 591544

X

Test

N

No Determination Possible

Sample Types -

S - Soil/Solid

UNS - Unspecified Solid

GW - Ground Water

SW - Surface Water

LE - Land Leachate

PL - Prepared Leachate

PR - Process Water

SA - Saline Water

TE - Trade Effluent

TS - Treated Sewage

US - Untreated Sewage

RE - Recreational Water

DW - Drinking Water

Non-regulatory

UNL - Unspecified Liquid

SL - Sludge

G - Gas

OTH - Other

Lab Sample No(s)

23901564

Customer Sample Reference

BH-PTR-04

AGS Reference

Depth (m)

0.50 - 0.50

Container

60g VOC (ALE215)

250g Amber Jar (ALE210)

1kg TUB with Handle (ALE205)

Sample Type

S

S

S

TPH CWG GC (S)

All

NDPs: 0

Tests: 1

X

VOC MS (S)

All

NDPs: 0

Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61

Client Ref.: B025563

Report Number: 636508

Location: Cambridge South East Transport - Phase 2

Superseded Report: 591544

Sample Descriptions

Grain Sizes

very fine

<0.063mm

fine

0.063mm - 0.1mm

medium

0.1mm - 2mm

coarse

2mm - 10mm

very coarse

>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23901564	BH-PTR-04	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 210315-61
Client Ref.: B025563

Report Number: 636508

Superseded Report: 591544

Location: Cambridge South East Transport - Phase 2

Results Legend		Customer Sample Ref.	BH-PTR-04				
# M aq diss.filt tot.unfilt + ** (F) 1-4*\$@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 11/03/2021 . 15/03/2021 210315-61 23901564				
Component		LOD/Units	Method				
Moisture Content Ratio (% of as received sample)		%	PM024	11			
Catechol		<0.01 mg/kg	TM062 (S)	<0.01			
Phenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
Cresols		<0.01 mg/kg	TM062 (S)	<0.01 M			
Resorcinol		<0.05 mg/kg	TM062 (S)	<0.05			
Xylenols		<0.015 mg/kg	TM062 (S)	<0.015 M			
1-Naphthol		<0.01 mg/kg	TM062 (S)	<0.01			
2,3,5-Trimethylphenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
2-Isopropylphenol		<0.015 mg/kg	TM062 (S)	<0.015 M			
Phenols, Total Detected 5 speciated		<0.06 mg/kg	TM062 (S)	<0.06 M			
Phenols, Total Detected 8 Speciated		<0.13 mg/kg	TM062 (S)	<0.13			
Sulphur, Total		<0.02 %	TM132	<0.02			
Fraction Organic Carbon (FOC)		<0.002	TM132	<0.002 #			
pH		1 pH Units	TM133	8.87 M			
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6 #			
Cyanide, Free		<1 mg/kg	TM153	<1 M			
Chromium, Trivalent		<0.9 mg/kg	TM181	5.44			
Antimony		<0.6 mg/kg	TM181	<0.6 #			
Arsenic		<0.6 mg/kg	TM181	1.45 M			
Barium		<0.6 mg/kg	TM181	30.5 #			
Beryllium		<0.01 mg/kg	TM181	0.278 M			
Cadmium		<0.02 mg/kg	TM181	0.0513 M			
Chromium		<0.9 mg/kg	TM181	5.44 M			
Copper		<1.4 mg/kg	TM181	6.82 M			
Iron		<1000 mg/kg	TM181	4070 #			
Lead		<0.7 mg/kg	TM181	2.33 M			
Manganese		<0.13 mg/kg	TM181	301 M			
Mercury		<0.1 mg/kg	TM181	<0.1 M			
Molybdenum		<0.1 mg/kg	TM181	<0.1 #			
Nickel		<0.2 mg/kg	TM181	8.87 M			
Selenium		<1 mg/kg	TM181	<1 #			
Vanadium		<0.2 mg/kg	TM181	11.2 #			

SDG: 210315-61
Client Ref.: B025563

Report Number: 636508

Superseded Report: 591544

Location: Cambridge South East Transport - Phase 2

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61
Client Ref.: B025563

Report Number: 636508

Superseded Report: 591544

Location: Cambridge South East Transport - Phase 2

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61
Client Ref.: B025563

Report Number: 636508

Superseded Report: 591544

Location: Cambridge South East Transport - Phase 2

TPH CWG (S)

[illegible]

		Validated												Validated																																			
SDG: 210315-61 Client Ref.: B025563										Report Number: 636508 Location: Cambridge South East Transport - Phase 2										SDG: 210315-61 Client Ref.: B025563										Report Number: 636508 Location: Cambridge South East Transport - Phase 2										Superseded Report: 591544									
VOC MS (S)										VOC MS (S)										VOC MS (S)										VOC MS (S)																			
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4\$@ Sample deviation (see appendix)</div>					Customer Sample Ref.					BH-PTR-04																																							
					Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference										0.50 - 0.50 Soil/Solid (S) 11/03/2021 . 15/03/2021 210315-61 23901564																																		
Component					LOD/Units					Method																																							
Dibromofluoromethane**					%					TM116					131																																		
Toluene-d8**					%					TM116					93.4																																		
4-Bromofluorobenzene**					%					TM116					93.8																																		
Dichlorodifluoromethane					<6 µg/kg					TM116					<6 M																																		
Chloromethane					<7 µg/kg					TM116					<7 #																																		
Vinyl Chloride					<6 µg/kg					TM116					<6 M																																		
Bromomethane					<10 µg/kg					TM116					<10 M																																		
Chloroethane					<10 µg/kg					TM116					<10 M																																		
Trichlorofluoromethane					<6 µg/kg					TM116					<6 M																																		
1,1-Dichloroethene					<10 µg/kg					TM116					<10 #																																		
Carbon Disulphide					<7 µg/kg					TM116					<7 M																																		
Dichloromethane					<10 µg/kg					TM116					<10 #																																		
Methyl Tertiary Butyl Ether					<10 µg/kg					TM116					<10 M																																		
trans-1,2-Dichloroethene					<10 µg/kg					TM116					<10 M																																		
1,1-Dichloroethane					<8 µg/kg					TM116					<8 M																																		
cis-1,2-Dichloroethene					<6 µg/kg					TM116					<6 M																																		
2,2-Dichloropropane					<10 µg/kg					TM116					<10																																		
Bromochloromethane					<10 µg/kg					TM116					<10 M																																		
Chloroform					<8 µg/kg					TM116					<8 M																																		
1,1,1-Trichloroethane					<7 µg/kg					TM116					<7 M																																		
1,1-Dichloropropene					<10 µg/kg					TM116					<10 M																																		
Carbontetrachloride					<10 µg/kg					TM116					<10 M																																		
1,2-Dichloroethane					<5 µg/kg					TM116					<5 M																																		
Benzene					<9 µg/kg					TM116					<9 M																																		
Trichloroethene					<9 µg/kg					TM116					<9 #																																		
1,2-Dichloropropane					<10 µg/kg					TM116					<10 M																																		
Dibromomethane					<9 µg/kg					TM116					<9 M																																		
Bromodichloromethane					<7 µg/kg					TM116					<7 M																																		
cis-1,3-Dichloropropene					<10 µg/kg					TM116					<10 M																																		
Toluene					<7 µg/kg					TM116					<7 M																																		
trans-1,3-Dichloropropene					<10 µg/kg					TM116					<10																																		
1,1,2-Trichloroethane					<10 µg/kg					TM116					<10 M																																		

SDG: 210315-61
Client Ref.: B025563

Report Number: 636508

Superseded Report: 591544

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

[illegible]

SDG: 210315-61
Client Ref.: B025563

Report Number: 636508

Superseded Report: 591544

Location: Cambridge South East Transport - Phase 2

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-PTR-04 0.50 - 0.50	18/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	SOLID										
Sample Type	11/03/2021 00:00:00										
Date Sampled	15/03/2021 09:20:00										
Date Received	210315-61										
SDG	23901564										
Original Sample Method Number	TM048										



CERTIFICATE OF ANALYSIS

Validated

SDG: 210315-61 Report Number: 636508 Superseded Report: 591544
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



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Test Completion Dates

Lab Sample No(s)	23901564
Customer Sample Ref.	BH-PTR-04
AGS Ref.	
Depth	0.50 - 0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	18-Mar-2021
Asbestos ID in Solid Samples	18-Mar-2021
Boron Water Soluble	18-Mar-2021
Chromium III	19-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	18-Mar-2021
EPH CWG GC (S)	18-Mar-2021
GRO by GC-FID (S)	18-Mar-2021
Hexavalent Chromium (s)	18-Mar-2021
Metals in solid samples by OES	22-Mar-2021
PAH by GCMS	18-Mar-2021
pH	19-Mar-2021
Phenols by HPLC (S)	18-Mar-2021
Sample description	16-Mar-2021
Total Organic Carbon	22-Mar-2021
Total Sulphur	18-Mar-2021
TPH CWG GC (S)	18-Mar-2021
VOC MS (S)	18-Mar-2021



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Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2307
Chloride (soluble)	TM243	158.03 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	169.16 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2352
Water Soluble Boron	TM222	100.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2362
Free Cyanide	TM153	97.72 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	95.1 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2318
QC	TM089	84.82 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2369
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2302
Aluminium	TM181	92.92 73.56 : 108.85
Antimony	TM181	101.22 76.89 : 111.24
Arsenic	TM181	107.27 88.53 : 111.01



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Metals in solid samples by OES

		QC 2302
Barium	TM181	99.08 77.67 : 105.35
Beryllium	TM181	101.12 85.44 : 109.61
Boron	TM181	93.12 73.51 : 104.66
Cadmium	TM181	91.36 77.67 : 104.12
Chromium	TM181	89.45 79.64 : 105.83
Cobalt	TM181	95.28 84.60 : 104.13
Copper	TM181	96.48 82.40 : 105.45
Iron	TM181	97.62 82.95 : 110.58
Lead	TM181	94.59 78.24 : 104.05
Manganese	TM181	111.39 94.29 : 119.51
Mercury	TM181	98.31 83.16 : 107.81
Molybdenum	TM181	104.94 87.11 : 106.87
Nickel	TM181	96.58 80.26 : 102.28
Phosphorus	TM181	117.37 94.56 : 124.28
Selenium	TM181	105.1 82.28 : 110.48
Strontium	TM181	97.33 79.13 : 102.79
Thallium	TM181	105.75 82.94 : 111.86
Tin	TM181	104.18 86.72 : 110.03
Titanium	TM181	85.5 66.23 : 102.06
Vanadium	TM181	100.37 86.19 : 109.45
Zinc	TM181	102.67 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2341
Acenaphthene	TM218	88.5 73.47 : 109.80
Acenaphthylene	TM218	89.5 70.00 : 130.00
Anthracene	TM218	89.5 68.68 : 111.89
Benz(a)anthracene	TM218	95.0 68.12 : 118.39



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PAH by GCMS

		QC 2341
Benzo(a)pyrene	TM218	93.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	101.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	94.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	102.0 73.10 : 117.03
Chrysene	TM218	92.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	92.5 67.32 : 121.35
Fluoranthene	TM218	89.0 75.16 : 117.28
Fluorene	TM218	87.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	89.5 68.91 : 117.62
Naphthalene	TM218	87.5 72.12 : 106.18
Phenanthrene	TM218	86.5 69.01 : 113.72
Pyrene	TM218	90.5 64.28 : 115.75

pH

Component	Method Code	QC 2326
pH	TM133	99.34 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2368
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.95 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.78 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	45.72 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	49.9 76.56 : 106.38

Total Organic Carbon



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Location: Cambridge South East Transport - Phase 2

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Total Organic Carbon

Component	Method Code	QC 2306
Total Organic Carbon	TM132	105.47 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2344
Total Sulphur %	TM132	93.78 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2316
1,1,1,2-tetrachloroethane	TM116	107.6 79.10 : 119.66
1,1,1-Trichloroethane	TM116	121.6 84.25 : 112.57
1,1,2-Trichloroethane	TM116	120.2 81.29 : 113.79
1,1-Dichloroethane	TM116	104.8 86.77 : 122.11
1,2-Dichloroethane	TM116	129.0 90.04 : 132.28
1,4-Dichlorobenzene	TM116	115.8 80.81 : 125.07
2-Chlorotoluene	TM116	101.4 73.13 : 114.13
4-Chlorotoluene	TM116	100.2 68.66 : 109.13
Benzene	TM116	105.8 84.29 : 112.22
Carbon Disulphide	TM116	89.2 75.11 : 124.81
Carbontetrachloride	TM116	116.0 82.35 : 126.46
Chlorobenzene	TM116	108.4 82.88 : 122.42
Chloroform	TM116	123.8 90.35 : 120.38
Chloromethane	TM116	108.6 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	103.0 78.27 : 128.90
Dibromomethane	TM116	112.2 76.00 : 120.73
Dichloromethane	TM116	107.0 92.27 : 134.36



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SDG: 210315-61
Client Ref.: B025563

Report Number: 636508
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591544

VOC MS (S)

		QC 2316
Ethylbenzene	TM116	93.0 70.95 : 113.07
Hexachlorobutadiene	TM116	57.4 14.55 : 147.92
Isopropylbenzene	TM116	77.0 52.00 : 108.19
Naphthalene	TM116	122.4 80.29 : 135.77
o-Xylene	TM116	87.2 64.92 : 98.85
p/m-Xylene	TM116	85.5 69.47 : 97.31
Sec-Butylbenzene	TM116	61.2 27.03 : 135.73
Tetrachloroethene	TM116	101.8 81.43 : 126.65
Toluene	TM116	98.8 82.44 : 103.50
Trichloroethene	TM116	110.8 79.80 : 112.33
Trichlorofluoromethane	TM116	103.6 89.67 : 132.09
Vinyl Chloride	TM116	99.6 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

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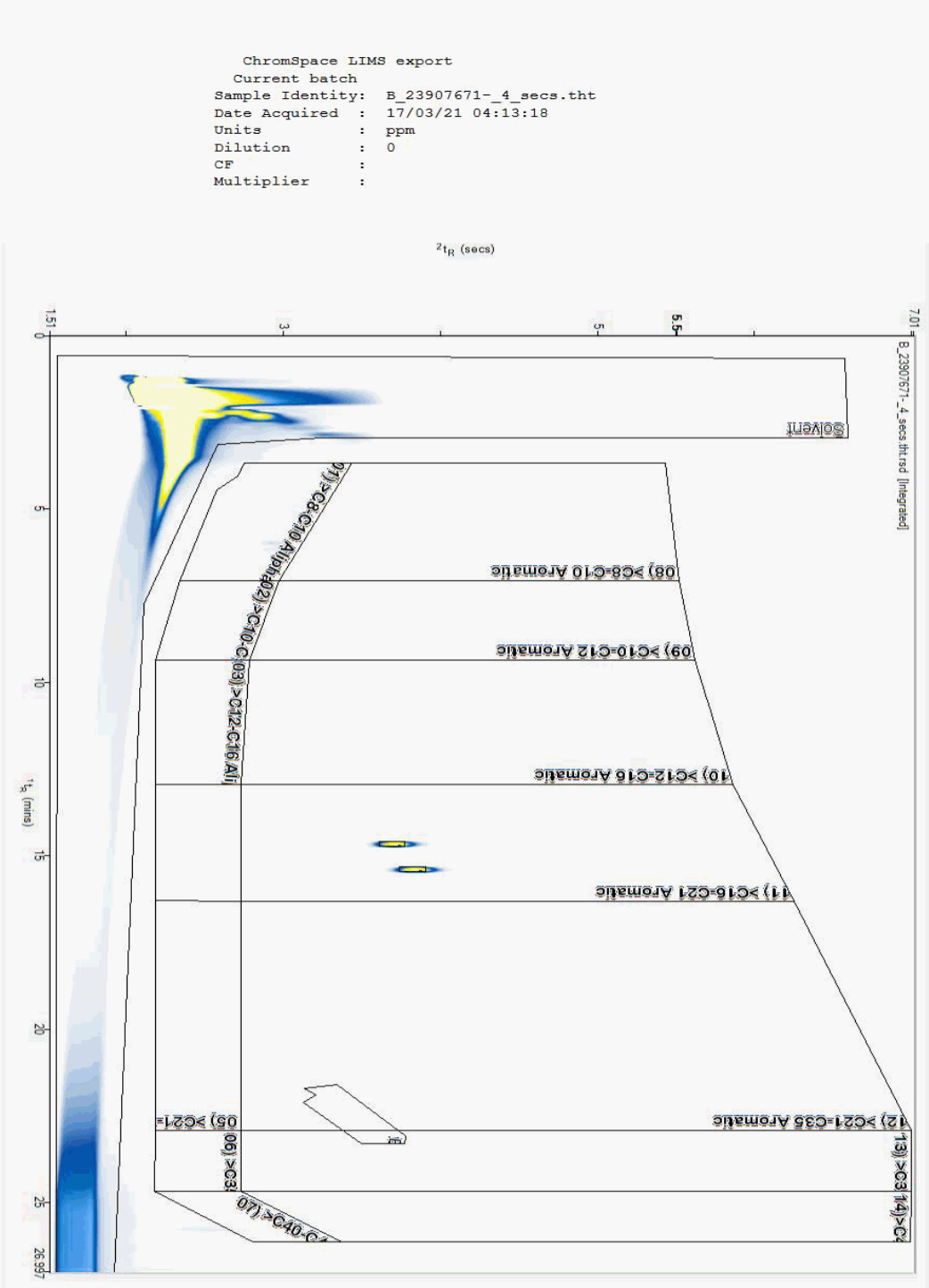
SDG: 210315-61
Client Ref.: B025563

Report Number: 636508
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591544

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23907671 Depth : 0.50 - 0.50
Sample ID : BH-PTR-04





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SDG: 210315-61
Client Ref.: B025563

Report Number: 636508
Location: Cambridge South East Transport - Phase 2

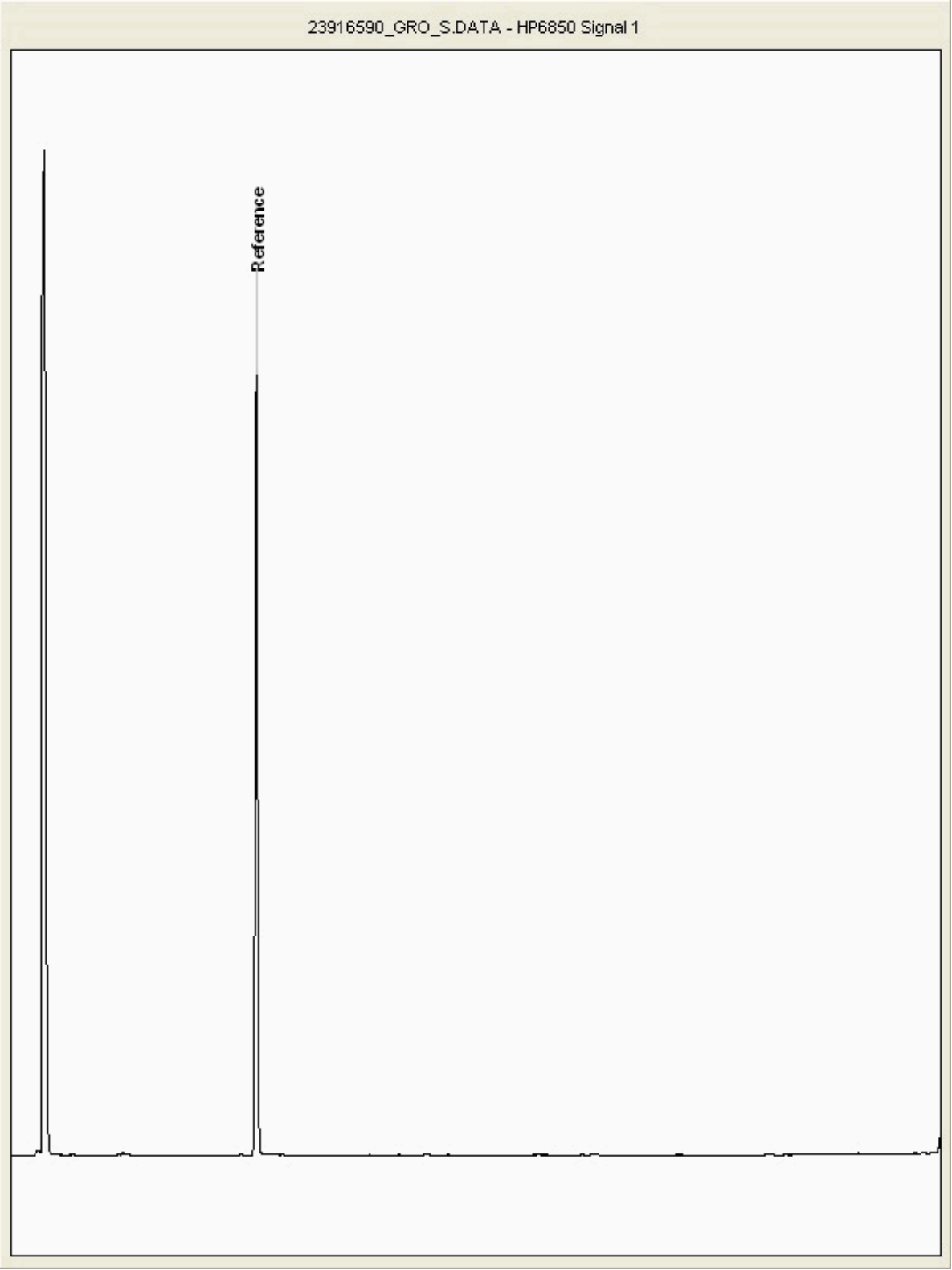
Superseded Report: 591544

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23916590
Sample ID : BH-PTR-04

Depth : 0.50 - 0.50



ALS Environmental, Land		Issue No. 4
QF.7.5.1 Data Amendments Form		Date: 03/03/2020
		Issued and Authorised by Quality Manager

SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis/Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210315-61	N/A	N/A	08/03/2022	IT Issue	Reporting Issue	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	591544



CERTIFICATE OF ANALYSIS

SDG:	210315-61	Client Reference:	8025563	Report Number:	636508
Location:	idge South East Transport -	Order Number:	7000964	Superseded Report:	591544

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subject to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 March 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210316-100
Your Reference: 8025563
Location: Cambridge South East Transport - Phase 2
Report No: 636528
Order Number: 7000964

This report has been revised and directly supersedes 591742 in its entirety.

We received 10 samples on Tuesday March 16, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 23, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 3.1 Version Issued: 08/03/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-100 Report Number: 636528 Superseded Report: 591742
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23910569	BH-OBC-05		0.10 - 0.10	12/03/2021
23910570	BH-OBC-05		0.20 - 0.20	12/03/2021
23910571	BH-OBC-05		0.50 - 0.50	12/03/2021
23910572	BH-OBC-05		1.00 - 1.00	12/03/2021
23910573	BH-OBC-05		1.70 - 1.70	12/03/2021
23910575	BH-OBC-11		0.10 - 0.10	12/03/2021
23910576	BH-OBC-11		0.20 - 0.20	12/03/2021
23910578	BH-OBC-11		0.50 - 0.50	12/03/2021
23910579	BH-OBC-11		1.00 - 1.00	12/03/2021
23910581	BH-OBC-11		1.90 - 1.90	12/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-100 Report Number: 636528 Superseded Report: 591742
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23910575		
	Customer Sample Reference		BH-OBC-11		
	AGS Reference				
	Depth (m)		0.10 - 0.10		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23910575			
	Customer Sample Reference		BH-OBC-11			
	AGS Reference					
	Depth (m)		0.10 - 0.10			
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE215)	60g VOC (ALE215)	
	Sample Type		S	S	S	
	Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
	Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X		
PAH by GCMS	All	NDPs: 0 Tests: 1		X		
pH	All	NDPs: 0 Tests: 1		X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Sample description	All	NDPs: 0 Tests: 1		X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X		
Total Sulphur	All	NDPs: 0 Tests: 1		X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X		
VOC MS (S)	All	NDPs: 0 Tests: 1			X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23910575	BH-OBC-11	0.10 - 0.10	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-100
Client Ref.: B025563

Report Number: 636528

Superseded Report: 591742

Location: Cambridge South East Transport - Phase 2

<div>Results Legend</div> <div># M ISO17025 accredited. aq mCERTS accredited. diss.filt Aqueous / settled sample. tot.unfilt Dissolved / filtered sample. + Total / unfiltered sample. - Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*\$@ Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>	<div>BH-OBC-11</div> <div>0.10 - 0.10 Soil/Solid (S) 12/03/2021 . 16/03/2021 210316-100 23910575</div>				
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	21				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0373				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0239	#			
pH	1 pH Units	TM133	8.32	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	19.7				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	12.5	M			
Barium	<0.6 mg/kg	TM181	78.9	#			
Beryllium	<0.01 mg/kg	TM181	0.804	M			
Cadmium	<0.02 mg/kg	TM181	0.175	M			
Chromium	<0.9 mg/kg	TM181	19.7	M			
Copper	<1.4 mg/kg	TM181	14	M			
Iron	<1000 mg/kg	TM181	24600	#			
Lead	<0.7 mg/kg	TM181	22.9	M			
Manganese	<0.13 mg/kg	TM181	330	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.179	#			
Nickel	<0.2 mg/kg	TM181	21.2	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	45	#			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-100
Client Ref.: B025563

Report Number: 636528

Superseded Report: 591742

Location: Cambridge South East Transport - Phase 2

[illegible]

		Validated												Validated																																																																											
SDG: 210316-100 Client Ref.: B025563										Report Number: 636528 Location: Cambridge South East Transport - Phase 2										SDG: 210316-100 Client Ref.: B025563										Report Number: 636528 Location: Cambridge South East Transport - Phase 2										Superseded Report: 591742																																																	
VOC MS (S)																				VOC MS (S)																																																																					
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4\$@ Sample deviation (see appendix)</div>										Customer Sample Ref.										BH-OBC-11																																																																					
Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference																				0.10 - 0.10 Soil/Solid (S) 12/03/2021 . 16/03/2021 210316-100 23910575																																																																					
Component										LOD/Units										Method																																																																					
Dibromofluoromethane**										%										TM116										110																																																											
Toluene-d8**										%										TM116										104																																																											
4-Bromofluorobenzene**										%										TM116										97.6																																																											
Dichlorodifluoromethane										<6 µg/kg										TM116										<60 M																																																											
Chloromethane										<7 µg/kg										TM116										<70 #																																																											
Vinyl Chloride										<6 µg/kg										TM116										<60 M																																																											
Bromomethane										<10 µg/kg										TM116										<100 M																																																											
Chloroethane										<10 µg/kg										TM116										<100 M																																																											
Trichlorofluoromethane										<6 µg/kg										TM116										<60 M																																																											
1,1-Dichloroethene										<10 µg/kg										TM116										<100 #																																																											
Carbon Disulphide										<7 µg/kg										TM116										<70 M																																																											
Dichloromethane										<10 µg/kg										TM116										<100 #																																																											
Methyl Tertiary Butyl Ether										<10 µg/kg										TM116										<100 M																																																											
trans-1,2-Dichloroethene										<10 µg/kg										TM116										<100 M																																																											
1,1-Dichloroethane										<8 µg/kg										TM116										<80 M																																																											
cis-1,2-Dichloroethene										<6 µg/kg										TM116										<60 M																																																											
2,2-Dichloropropane										<10 µg/kg										TM116										<100																																																											
Bromochloromethane										<10 µg/kg										TM116										<100 M																																																											
Chloroform										<8 µg/kg										TM116										<80 M																																																											
1,1,1-Trichloroethane										<7 µg/kg										TM116										<70 M																																																											
1,1-Dichloropropene										<10 µg/kg										TM116										<100 M																																																											
Carbontetrachloride										<10 µg/kg										TM116										<100 M																																																											
1,2-Dichloroethane										<5 µg/kg										TM116										<50 M																																																											
Benzene										<9 µg/kg										TM116										<90 M																																																											
Trichloroethene										<9 µg/kg										TM116										<90 #																																																											
1,2-Dichloropropane										<10 µg/kg										TM116										<100 M																																																											
Dibromomethane										<9 µg/kg										TM116										<90 M																																																											
Bromodichloromethane										<7 µg/kg										TM116										<70 M																																																											
cis-1,3-Dichloropropene										<10 µg/kg										TM116										<100 M																																																											
Toluene										<7 µg/kg										TM116										<70 M																																																											
trans-1,3-Dichloropropene										<10 µg/kg										TM116										<100																																																											
1,1,2-Trichloroethane										<10 µg/kg										TM116										<100 M																																																											

SDG: 210316-100
Client Ref.: B025563

Report Number: 636528

Superseded Report: 591742

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

[illegible]

SDG: 210316-100
Client Ref.: B025563

Report Number: 636528

Superseded Report: 591742

Location: Cambridge South East Transport - Phase 2

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-OBC-11 0.10 - 0.10	19/03/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	SOLID										
Sample Type	12/03/2021 00:00:00										
Date Sampled	16/03/2021 09:00:00										
Date Receieved	210316-100										
SDG	23910575										
Original Sample	TM048										
Method Number											

Validated

Location: Cambridge South East Transport - Phase 2

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transpo
Mass Sample taken (kg)	0.117	Natural Moisture Content (%)	30.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	76.7
Particle Size <4mm	>95%		

Case

SDG	210316-100			
Lab Sample Number(s)	23910575			
Sampled Date	12-Mar-2021			
Customer Sample Ref.	BH-OBC-11			
Depth (m)	0.10 - 0.10			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.024	<0.01	0.24	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	10.6	<3	106	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.000836	<0.0005	0.00836	<0.005	-	-	-
Barium	0.092	<0.0002	0.92	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.108	<0.01	1.08	<0.1	-	-	-
Cadmium	0.0000955	<0.00008	0.000955	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	26.3	<0.2	263	<2	-	-	-
Chromium	0.00129	<0.001	0.0129	<0.01	-	-	-
Copper	0.00206	<0.0003	0.0206	<0.003	-	-	-
Lead	0.000301	<0.0002	0.00301	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.919	<0.036	9.19	<0.36	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.0027	<0.0004	0.027	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00104	<0.001	0.0104	<0.01	-	-	-
Zinc	0.0815	<0.001	0.815	<0.01	-	-	-
Chloride	3.2	<2	32	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
pH Value of Filtered Water	8.5	<0.001	85	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	18-Mar-2021
pH (pH Units)	8.40
Conductivity (µS/cm)	145.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.873

08/03/2022 11:35:15

11:34:45 08/03/2022

Validated

Location: Cambridge South East Transport - Phase 2

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport
Mass Sample taken (kg)	0.117	Natural Moisture Content (%)	30.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	76.7
Particle Size <4mm	>95%		

Case

SDG	210316-100			
Lab Sample Number(s)	23910575			
Sampled Date	12-Mar-2021			
Customer Sample Ref.	BH-OBC-11			
Depth (m)	0.10 - 0.10			

Eluate Analysis	C ₂	Conc ⁿ in 10:1 eluate (mg/l)	A ₂	10:1 conc ⁿ leached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	69.5	<0.65	695	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.221	<0.019	2.21	<0.19	-	-	-

Leach Test Information

Date Prepared	18-Mar-2021
pH (pH Units)	8.40
Conductivity (µS/cm)	145.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.873

08/03/2022 11:35:15

11:34:45 08/03/2022

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23910575
Customer Sample Ref.	BH-OBC-11
AGS Ref.	
Depth	0.10 - 0.10
Type	Soil/Solid (S)
Ammonium Low	23-Mar-2021
Anions by Kone (soil)	19-Mar-2021
Anions by Kone (w)	19-Mar-2021
Asbestos ID in Solid Samples	19-Mar-2021
Boron Water Soluble	23-Mar-2021
CEN 10:1 Leachate (1 Stage)	18-Mar-2021
CEN Readings	22-Mar-2021
Chromium III	23-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Mar-2021
Dissolved Metals by ICP-MS	23-Mar-2021
Dissolved Organic/Inorganic Carbon	21-Mar-2021
EPH CWG GC (S)	19-Mar-2021
Fluoride	22-Mar-2021
GRO by GC-FID (S)	18-Mar-2021
Hexavalent Chromium (s)	19-Mar-2021
Low Level Cyanide (W)	23-Mar-2021
Low Level Hexavalent Chromium (w)	22-Mar-2021
Mercury Dissolved	22-Mar-2021
Metals in solid samples by OES	23-Mar-2021
Moisture at 105C	18-Mar-2021
PAH by GCMS	23-Mar-2021
pH	19-Mar-2021
pH Value of Filtered Water	22-Mar-2021
Phenols by HPLC (S)	19-Mar-2021
Phenols by HPLC (W)	23-Mar-2021
Sample description	17-Mar-2021
Total Organic Carbon	23-Mar-2021
Total Sulphur	22-Mar-2021
TPH CWG GC (S)	19-Mar-2021
VOC MS (S)	19-Mar-2021



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ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2391
Ammoniacal Nitrogen as N	TM099	104.4 96.04 : 106.80

Anions by Kone (w)

Component	Method Code	QC 2342
Chloride	TM184	95.8 91.40 : 109.10
Sulphate (soluble)	TM184	100.8 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2340
Water Soluble Boron	TM222	101.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2359
Free Cyanide	TM153	100.99 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	102.1 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2304	QC 2348
Aluminium	TM152	108.0 90.78 : 110.89	101.67 90.78 : 110.89
Antimony	TM152	104.67 77.22 : 119.42	100.17 77.22 : 119.42
Arsenic	TM152	108.17 86.77 : 107.67	102.17 86.77 : 107.67
Barium	TM152	105.0 87.86 : 110.23	101.33 87.86 : 110.23
Beryllium	TM152	109.67 86.19 : 112.98	103.17 86.19 : 112.98
Bismuth	TM152	103.33 84.06 : 106.46	101.33 84.06 : 106.46
Borate	TM152	109.26 88.00 : 112.00	100.62 88.00 : 112.00



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Dissolved Metals by ICP-MS

		QC 2304	QC 2348
Boron	TM152	109.33 83.92 : 114.90	100.67 83.92 : 114.90
Cadmium	TM152	108.0 88.89 : 106.69	102.17 88.89 : 106.69
Calcium	TM152	107.33 80.24 : 117.95	102.0 80.24 : 117.95
Chromium	TM152	107.0 83.22 : 110.16	101.67 83.22 : 110.16
Cobalt	TM152	107.0 82.49 : 112.36	101.0 82.49 : 112.36
Copper	TM152	108.67 83.14 : 113.00	102.83 83.14 : 113.00
Iron	TM152	108.67 88.40 : 109.24	101.33 88.40 : 109.24
Lead	TM152	102.0 83.71 : 109.58	100.83 83.71 : 109.58
Lithium	TM152	109.33 84.50 : 114.28	103.0 84.50 : 114.28
Magnesium	TM152	102.67 87.56 : 114.57	98.67 87.56 : 114.57
Manganese	TM152	108.83 90.01 : 108.72	102.33 90.01 : 108.72
Molybdenum	TM152	106.0 85.53 : 107.42	99.67 85.53 : 107.42
Nickel	TM152	108.17 88.05 : 106.42	102.83 88.05 : 106.42
Phosphorus	TM152	107.17 82.76 : 107.72	102.83 82.76 : 107.72
Potassium	TM152	104.67 88.45 : 106.42	98.0 88.45 : 106.42
Selenium	TM152	108.67 85.61 : 111.03	103.0 85.61 : 111.03
Silver	TM152	105.33 88.48 : 110.48	100.17 88.48 : 110.48
Sodium	TM152	103.33 88.32 : 106.30	98.0 88.32 : 106.30
Strontium	TM152	108.67 83.77 : 107.87	102.33 83.77 : 107.87
Tellurium	TM152	102.83 82.83 : 104.73	99.33 82.83 : 104.73
Thallium	TM152	105.33 77.47 : 113.87	104.33 77.47 : 113.87
Tin	TM152	103.17 87.36 : 109.55	99.5 87.36 : 109.55
Titanium	TM152	106.83 87.29 : 108.31	102.83 87.29 : 108.31
Tungsten	TM152	101.33 68.27 : 122.97	98.17 68.27 : 122.97
Uranium	TM152	103.17 82.46 : 105.16	100.17 82.46 : 105.16
Vanadium	TM152	102.33 88.43 : 114.30	102.0 88.43 : 114.30
Zinc	TM152	109.33 85.57 : 114.31	102.33 85.57 : 114.31



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Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2307
Dissolved Inorganic Carbon	TM090	102.33 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2339
Fluoride	TM104	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2300
QC	TM089	94.43 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2334
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2337
Free Cyanide - Low Level	TM279	78.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	98.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2355
Mercury Dissolved (CVAF)	TM183	93.8 69.30 : 128.70

Metals in solid samples by OES



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Metals in solid samples by OES

Component	Method Code	QC 2362
Aluminium	TM181	102.65 73.56 : 108.85
Antimony	TM181	82.93 76.89 : 111.24
Arsenic	TM181	108.72 88.53 : 111.01
Barium	TM181	97.25 77.67 : 105.35
Beryllium	TM181	107.84 85.44 : 109.61
Boron	TM181	102.29 73.51 : 104.66
Cadmium	TM181	97.12 77.67 : 104.12
Chromium	TM181	95.33 79.64 : 105.83
Cobalt	TM181	97.8 84.60 : 104.13
Copper	TM181	99.65 82.40 : 105.45
Iron	TM181	103.97 82.95 : 110.58
Lead	TM181	96.62 78.24 : 104.05
Manganese	TM181	118.61 94.29 : 119.51
Mercury	TM181	104.59 83.16 : 107.81
Molybdenum	TM181	102.06 87.11 : 106.87
Nickel	TM181	98.04 80.26 : 102.28
Phosphorus	TM181	115.56 94.56 : 124.28
Selenium	TM181	107.45 82.28 : 110.48
Strontium	TM181	102.0 79.13 : 102.79
Thallium	TM181	105.31 82.94 : 111.86
Tin	TM181	106.84 86.72 : 110.03
Titanium	TM181	91.6 66.23 : 102.06
Vanadium	TM181	106.96 86.19 : 109.45
Zinc	TM181	107.39 84.68 : 113.99

PAH by GCMS



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PAH by GCMS

Component	Method Code	QC 2333
Acenaphthene	TM218	87.5 76.79 : 103.90
Acenaphthylene	TM218	83.5 78.40 : 108.66
Anthracene	TM218	83.0 70.90 : 109.22
Benz(a)anthracene	TM218	81.0 73.77 : 119.26
Benzo(a)pyrene	TM218	84.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	78.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	90.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	91.5 75.98 : 116.59
Chrysene	TM218	84.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	88.5 69.17 : 115.30
Fluoranthene	TM218	76.0 75.88 : 112.84
Fluorene	TM218	84.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	83.0 70.26 : 117.95
Naphthalene	TM218	86.0 74.70 : 101.83
Phenanthrene	TM218	83.0 73.62 : 109.34
Pyrene	TM218	77.5 71.46 : 117.00

pH

Component	Method Code	QC 2361
pH	TM133	100.0 99.08 : 102.24

pH Value of Filtered Water

Component	Method Code	QC 2358
pH	TM256	100.0 99.33 : 102.54

Phenols by HPLC (S)



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Phenols by HPLC (S)

Component	Method Code	QC 2305
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.3 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	45.09 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.32 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	49.37 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2383
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	51.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	50.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	48.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	54.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	51.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.83 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2395
Total Organic Carbon	TM132	102.34 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2344
Total Sulphur %	TM132	95.85 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2379
1,1,1,2-tetrachloroethane	TM116	99.4 86.59 : 118.97
1,1,1-Trichloroethane	TM116	95.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	106.6 75.16 : 112.70



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VOC MS (S)

		QC 2379
1,1-Dichloroethane	TM116	102.2 83.27 : 122.16
1,2-Dichloroethane	TM116	116.8 89.30 : 133.10
1,4-Dichlorobenzene	TM116	103.8 82.59 : 123.23
2-Chlorotoluene	TM116	92.0 66.81 : 118.43
4-Chlorotoluene	TM116	91.0 65.88 : 114.76
Benzene	TM116	97.4 93.16 : 123.63
Carbon Disulphide	TM116	89.8 75.11 : 124.81
Carbontetrachloride	TM116	99.8 82.35 : 126.46
Chlorobenzene	TM116	97.8 85.07 : 118.13
Chloroform	TM116	103.8 88.13 : 122.71
Chloromethane	TM116	91.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	98.4 78.27 : 128.90
Dibromomethane	TM116	100.8 77.47 : 121.29
Dichloromethane	TM116	105.6 87.89 : 134.72
Ethylbenzene	TM116	88.0 79.92 : 110.05
Hexachlorobutadiene	TM116	45.8 16.78 : 153.29
Isopropylbenzene	TM116	75.2 64.20 : 119.59
Naphthalene	TM116	100.8 79.29 : 125.59
o-Xylene	TM116	84.8 72.86 : 102.10
p/m-Xylene	TM116	80.8 74.06 : 106.47
Sec-Butylbenzene	TM116	61.4 44.71 : 117.87
Tetrachloroethene	TM116	91.4 85.86 : 122.95
Toluene	TM116	99.6 87.82 : 116.21
Trichloroethene	TM116	96.4 79.80 : 112.33
Trichlorofluoromethane	TM116	92.4 80.52 : 132.12
Vinyl Chloride	TM116	99.0 74.57 : 146.88



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The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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Location: Cambridge South East Transport - Phase 2

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Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23914582
Sample ID : BH-OBC-11

Depth : 0.10 - 0.10



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Report Number: 636528
Location: Cambridge South East Transport - Phase 2

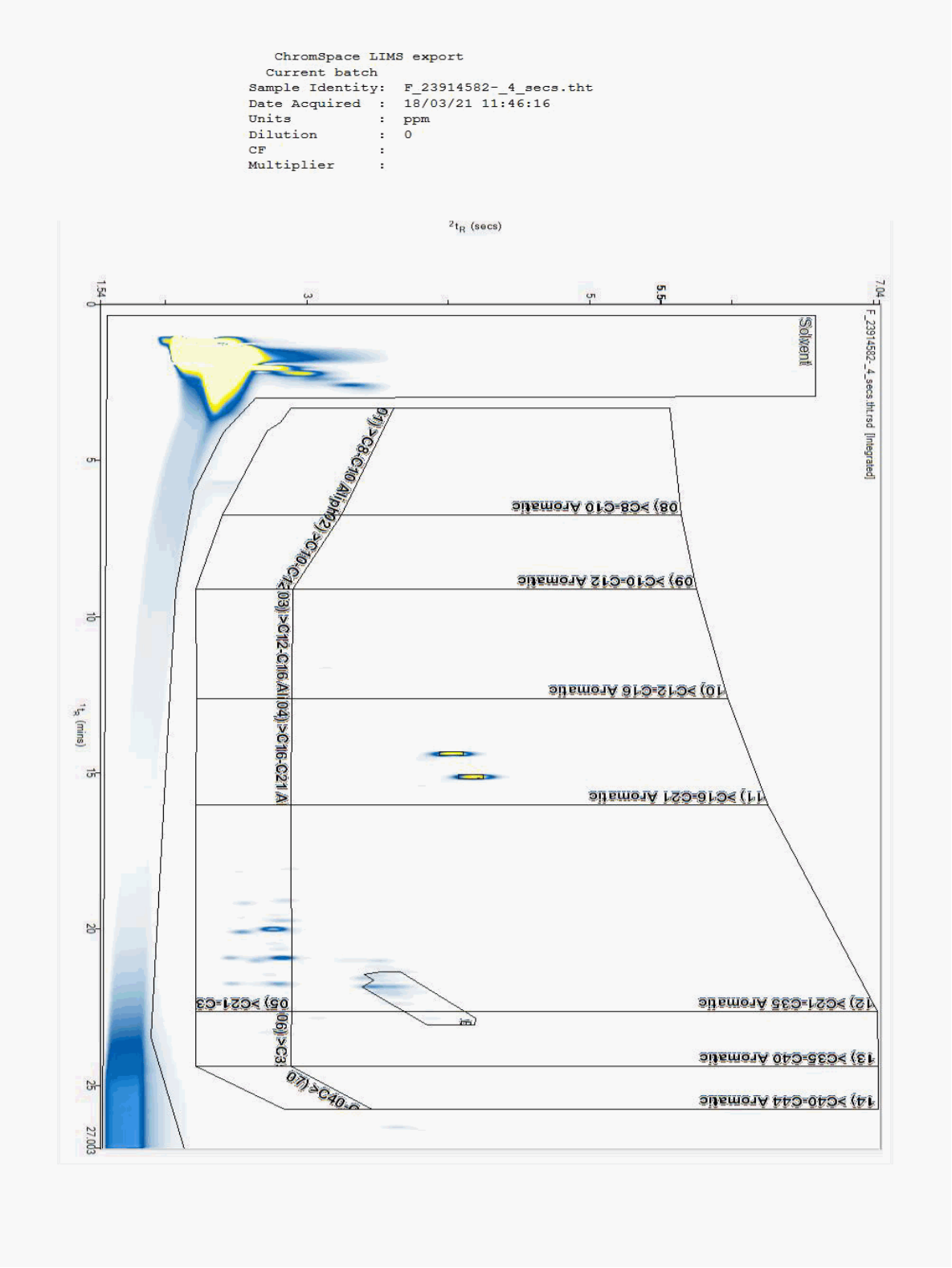
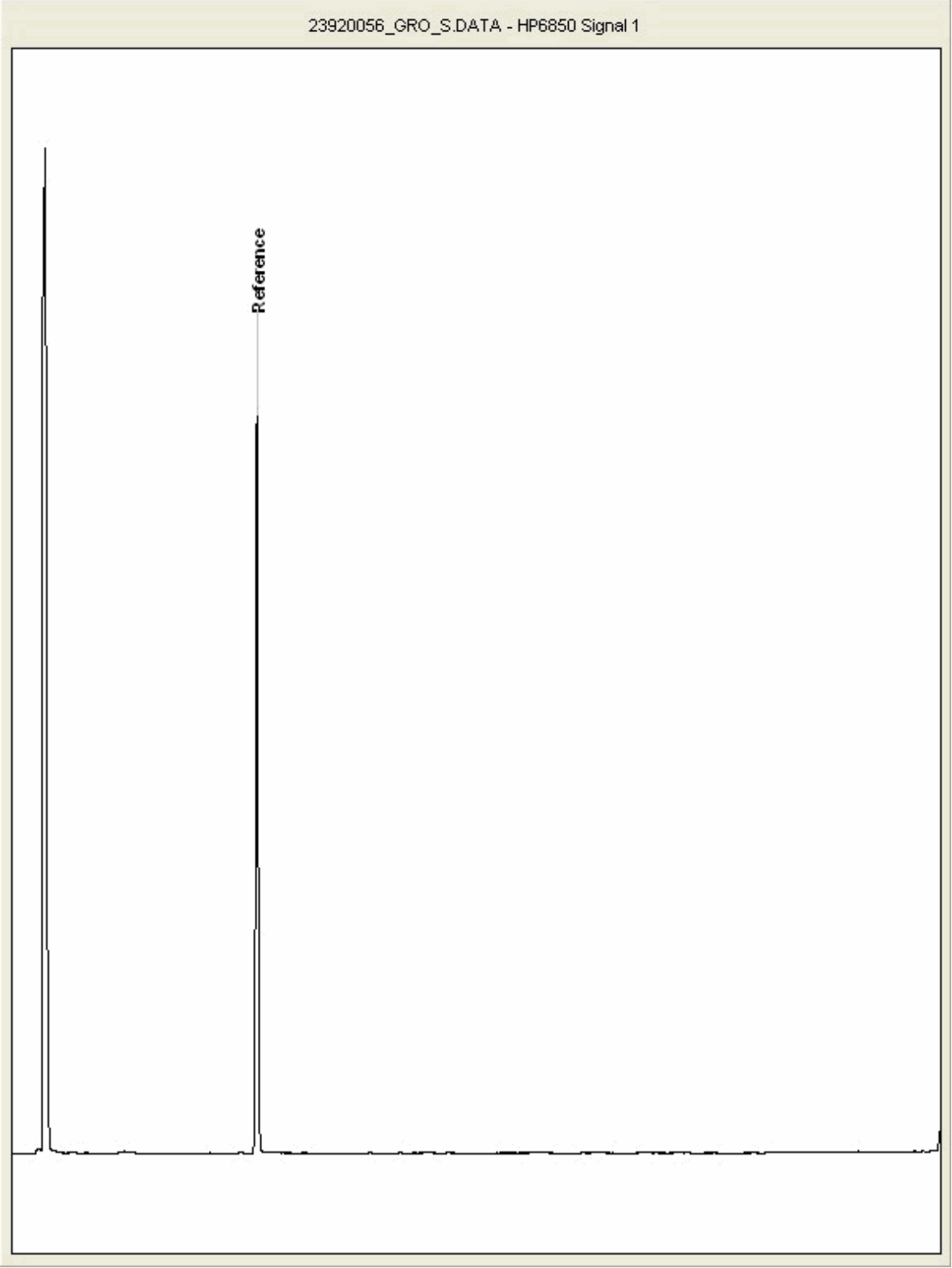
Superseded Report: 591742

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23920056
Sample ID : BH-OBC-11

Depth : 0.10 - 0.10



SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis /Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210316-100	N/A	N/A	08/03/2022	IT Issue	Reporting Issue	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	591742



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 08 March 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210316-101
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 636531
Order Number: 7000964

This report has been revised and directly supersedes 591773 in its entirety.

We received 4 samples on Tuesday March 16, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 23, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-101
Client Ref.: B025563

Report Number: 636531
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591773

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23910763	BH-PTR-39			12/03/2021
23910760	BH-PTR-39		0.10	12/03/2021
23910761	BH-PTR-39		0.20	12/03/2021
23910762	BH-PTR-39		0.50	12/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



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Location: Cambridge South East Transport - Phase 2

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23910760		
	Customer Sample Reference		BH-PTR-39		
	AGS Reference				
	Depth (m)		0.10		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle
	Sample Type		S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 1		X	
Coronene	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-101
Client Ref.: B025563

Report Number: 636531

Superseded Report: 591773
Location: Cambridge South East Transport - Phase 2

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23910760		
	Customer Sample Reference		BH-PTR-39		
	AGS Reference				
	Depth (m)		0.10		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle
	Sample Type		S	S	S
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X	
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
PCBs by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

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SDG: 210316-101
Client Ref.: B025563

Report Number: 636531

Superseded Report: 591773

Location: Cambridge South East Transport - Phase 2

Results Legend <div>  Test </div> <div>  No Determination Possible </div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	23910760
	Customer Sample Reference	BH-PTR-39
	AGS Reference	
	Depth (m)	0.10
	Container	<div> <div>60g VOC (ALE215)</div> <div>250g Amber Jar (ALE210)</div> <div>1kg TUB with Handle (ALE200)</div> </div>
	Sample Type	S
VOC MS (S)	<div> <div>All</div> <div>NDPs: 0 Tests: 1</div> </div>	<div> <div>S</div> <div>S</div> <div>X</div> </div>



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Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23910760	BH-PTR-39	0.10	Light Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

<div>Results Legend</div> <div># M ISO17025 accredited. aq mCERTS accredited. diss.filt Aqueous / settled sample. tot.unfilt Dissolved / filtered sample. + Total / unfiltered sample. - Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5@ Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>	<div>BH-PTR-39</div> <div>0.10 Soil/Solid (S) 12/03/2021 . 16/03/2021 210316-101 23910760</div>				
Component		LOD/Units	Method				
Moisture Content Ratio (% of as received sample)		%	PM024	15			
Loss on ignition		<0.7 %	TM018	4.19 M			
Catechol		<0.01 mg/kg	TM062 (S)	<0.01			
Phenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
Cresols		<0.01 mg/kg	TM062 (S)	<0.01 M			
Resorcinol		<0.05 mg/kg	TM062 (S)	<0.05			
Xylenols		<0.015 mg/kg	TM062 (S)	<0.015 M			
1-Naphthol		<0.01 mg/kg	TM062 (S)	<0.01			
2,3,5-Trimethylphenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
2-Isopropylphenol		<0.015 mg/kg	TM062 (S)	<0.015 M			
Phenols, Total Detected 5 speciated		<0.06 mg/kg	TM062 (S)	<0.06 M			
Phenols, Total Detected 8 Speciated		<0.13 mg/kg	TM062 (S)	<0.13			
Organic Carbon, Total		<0.2 %	TM132	0.939 M			
Sulphur, Total		<0.02 %	TM132	0.0367			
Fraction Organic Carbon (FOC)		<0.002	TM132	0.00939 #			
pH		1 pH Units	TM133	8.36 M			
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6 #			
Cyanide, Free		<1 mg/kg	TM153	<1 M			
PCB congener 28		<3 µg/kg	TM168	<3 M			
PCB congener 52		<3 µg/kg	TM168	<3 M			
PCB congener 101		<3 µg/kg	TM168	<3 M			
PCB congener 118		<3 µg/kg	TM168	<3 M			
PCB congener 138		<3 µg/kg	TM168	<3 M			
PCB congener 153		<3 µg/kg	TM168	<3 M			
PCB congener 180		<3 µg/kg	TM168	<3 M			
Sum of detected PCB 7 Congeners		<21 µg/kg	TM168	<21			
Chromium, Trivalent		<0.9 mg/kg	TM181	7.9			
Antimony		<0.6 mg/kg	TM181	<0.6 #			
Arsenic		<0.6 mg/kg	TM181	11 M			
Barium		<0.6 mg/kg	TM181	49.2 #			
Beryllium		<0.01 mg/kg	TM181	0.338 M			
Cadmium		<0.02 mg/kg	TM181	0.0912 M			

[illegible]

CERTIFICATE OF ANALYSIS

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SDG: 210316-101
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Report Number: 636531

Superseded Report: 591773

Location: Cambridge South East Transport - Phase 2

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG: 210316-101
Client Ref.: B025563

Report Number: 636531

Superseded Report: 591773

Location: Cambridge South East Transport - Phase 2

TPH CWG (S)

[illegible]

SDG: 210316-101
Client Ref.: B025563

Report Number: 636531

Superseded Report: 591773

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-39				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 12/03/2021 16/03/2021 210316-101 23910760				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4**@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	114				
Toluene-d8**	%	TM116	101				
4-Bromofluorobenzene**	%	TM116	97.4				
Dichlorodifluoromethane	<6 µg/kg	TM116	<60 M				
Chloromethane	<7 µg/kg	TM116	<70 #				
Vinyl Chloride	<6 µg/kg	TM116	<60 M				
Bromomethane	<10 µg/kg	TM116	<100 M				
Chloroethane	<10 µg/kg	TM116	<100 M				
Trichlorofluorormethane	<6 µg/kg	TM116	<60 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<100 #				
Carbon Disulphide	<7 µg/kg	TM116	<70 M				
Dichloromethane	<10 µg/kg	TM116	<100 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<100 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<100 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<80 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<60 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<100				
Bromochloromethane	<10 µg/kg	TM116	<100 M				
Chloroform	<8 µg/kg	TM116	<80 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<70 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<100 M				
Carbontetrachloride	<10 µg/kg	TM116	<100 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<50 M				
Benzene	<9 µg/kg	TM116	<90 M				
Trichloroethene	<9 µg/kg	TM116	<90 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<100 M				
Dibromomethane	<9 µg/kg	TM116	<90 M				
Bromodichloromethane	<7 µg/kg	TM116	<70 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<100 M				
Toluene	<7 µg/kg	TM116	<70 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<100				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<100 M				



CERTIFICATE OF ANALYSIS

SDG: 210316-101
Client Ref.: B025563

Report Number: 636531

Superseded Report: 591773

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-39				
# M aq diss.flit tot.unflit * ** (F) 1-4-5@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 12/03/2021 16/03/2021 210316-101 23910760				
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<70 M				
Tetrachloroethene	<5 µg/kg	TM116	<50 M				
Dibromochloromethane	<10 µg/kg	TM116	<100 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<100 M				
Chlorobenzene	<5 µg/kg	TM116	<50 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<100 M				
Ethylbenzene	<4 µg/kg	TM116	<40 M				
p/m-Xylene	<10 µg/kg	TM116	<100 #				
o-Xylene	<10 µg/kg	TM116	<100 M				
Styrene	<10 µg/kg	TM116	<100 #				
Bromoform	<10 µg/kg	TM116	<100 M				
Isopropylbenzene	<5 µg/kg	TM116	<50 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<100 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<160 M				
Bromobenzene	<10 µg/kg	TM116	<100 M				
Propylbenzene	<10 µg/kg	TM116	<100 M				
2-Chlorotoluene	<9 µg/kg	TM116	<90 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<80 M				
4-Chlorotoluene	<10 µg/kg	TM116	<100 M				
tert-Butylbenzene	<14 µg/kg	TM116	<140 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<90 #				
sec-Butylbenzene	<10 µg/kg	TM116	<100				
4-Isopropyltoluene	<10 µg/kg	TM116	<100 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<80 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<50 M				
n-Butylbenzene	<11 µg/kg	TM116	<110				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<100 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<140 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<100 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<200				
Hexachlorobutadiene	<20 µg/kg	TM116	<200				
Naphthalene	<13 µg/kg	TM116	<130 M				

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

Client Reference		Site Location	
Mass Sample taken (kg)		Cambridge South East Transport	
Mass of dry sample (kg)		Natural Moisture Content (%)	
Particle Size <4mm		Dry Matter Content (%)	
0.107		19	
0.090		84	
>95%			

REF : BS EN 12457/2

Case	
SDG	210316-101
Lab Sample Number(s)	23910760
Sampled Date	12-Mar-2021
Customer Sample Ref.	BH-PTR-39
Depth (m)	0.10

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.939
Loss on Ignition (%)	4.19
Sum of BTEX (mg/kg)	<0.4
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.36
ANC to pH 6 (mol/kg)	0.0392
ANC to pH 4 (mol/kg)	1.2

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00111	<0.0005	0.0111	<0.005	0.5	2	25
Barium	0.102	<0.0002	1.02	<0.002	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	0.00134	<0.0004	0.0134	<0.004	0.4	10	40
Lead	0.000301	<0.0002	0.00301	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0314	<0.001	0.314	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.653	<0.5	6.53	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	85.6	<5	856	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.25	<3	52.5	<30	500	800	1000

Leach Test Information

Date Prepared	18-Mar-2021
pH (pH Units)	8.54
Conductivity (µS/cm)	107.00
Temperature (°C)	19.40
Volume Leachant (Litres)	0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

08/03/2022 11:48:05

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



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SDG: 210316-101
Client Ref.: B025563

Report Number: 636531
Superseded Report: 591773
Location: Cambridge South East Transport - Phase 2

Test Completion Dates

Lab Sample No(s)	23910760
Customer Sample Ref.	BH-PTR-39
AGS Ref.	
Depth	0.10
Type	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	19-Mar-2021
Anions by Kone (soil)	19-Mar-2021
Anions by Kone (w)	19-Mar-2021
Asbestos ID in Solid Samples	18-Mar-2021
Boron Water Soluble	23-Mar-2021
CEN 10:1 Leachate (1 Stage)	18-Mar-2021
CEN Readings	20-Mar-2021
Chromium III	23-Mar-2021
Coronene	18-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Mar-2021
Dissolved Metals by ICP-MS	23-Mar-2021
Dissolved Organic/Inorganic Carbon	21-Mar-2021
EPH by GCxGC-FID	19-Mar-2021
EPH CWG GC (S)	19-Mar-2021
Fluoride	22-Mar-2021
GRO by GC-FID (S)	18-Mar-2021
Hexavalent Chromium (s)	19-Mar-2021
Loss on Ignition in soils	22-Mar-2021
Mercury Dissolved	22-Mar-2021
Metals in solid samples by OES	23-Mar-2021
Moisture at 105C	18-Mar-2021
PAH 16 & 17 Calc	19-Mar-2021
PAH by GCMS	19-Mar-2021
PCBs by GCMS	23-Mar-2021
pH	19-Mar-2021
Phenols by HPLC (S)	19-Mar-2021
Phenols by HPLC (W)	22-Mar-2021
Sample description	17-Mar-2021
Total Dissolved Solids	23-Mar-2021
Total Organic Carbon	23-Mar-2021
Total Sulphur	22-Mar-2021
TPH CWG GC (S)	19-Mar-2021
VOC MS (S)	19-Mar-2021



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ASSOCIATED AQC DATA

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2335
ANC pH_4 dry soil	TM182	110.56 82.79 : 130.38

Anions by Kone (w)

Component	Method Code	QC 2390
Chloride	TM184	94.9 91.40 : 109.10
Sulphate (soluble)	TM184	99.6 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2340
Water Soluble Boron	TM222	101.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2360
Coronene RAW	TM410	107.0 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2302
Free Cyanide	TM153	100.0 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	102.1 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2308	QC 2367
Aluminium	TM152	108.0 90.78 : 110.89	99.67 90.78 : 110.89
Antimony	TM152	105.33 77.22 : 119.42	99.33 77.22 : 119.42
Arsenic	TM152	109.0 86.77 : 107.67	101.5 86.77 : 107.67



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Report Number: 636531
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591773

Dissolved Metals by ICP-MS

		QC 2308	QC 2367
Barium	TM152	108.33 87.86 : 110.23	100.5 87.86 : 110.23
Beryllium	TM152	109.83 86.19 : 112.98	101.33 86.19 : 112.98
Bismuth	TM152	109.33 84.06 : 106.46	100.17 84.06 : 106.46
Borate	TM152	109.88 88.00 : 112.00	98.15 88.00 : 112.00
Boron	TM152	110.0 83.92 : 114.90	98.33 83.92 : 114.90
Cadmium	TM152	108.5 88.89 : 106.69	100.67 88.89 : 106.69
Calcium	TM152	108.0 80.24 : 117.95	100.67 80.24 : 117.95
Chromium	TM152	108.83 83.22 : 110.16	99.5 83.22 : 110.16
Cobalt	TM152	107.5 82.49 : 112.36	100.0 82.49 : 112.36
Copper	TM152	109.0 83.14 : 113.00	100.0 83.14 : 113.00
Iron	TM152	108.67 88.40 : 109.24	100.0 88.40 : 109.24
Lead	TM152	107.67 83.71 : 109.58	99.33 83.71 : 109.58
Lithium	TM152	109.33 84.50 : 114.28	101.17 84.50 : 114.28
Magnesium	TM152	104.0 87.56 : 114.57	97.33 87.56 : 114.57
Manganese	TM152	109.33 90.01 : 108.72	100.67 90.01 : 108.72
Molybdenum	TM152	107.5 85.53 : 107.42	99.83 85.53 : 107.42
Nickel	TM152	110.17 88.05 : 106.42	100.17 88.05 : 106.42
Phosphorus	TM152	106.83 82.76 : 107.72	101.0 82.76 : 107.72
Potassium	TM152	104.67 88.45 : 106.42	96.0 88.45 : 106.42
Selenium	TM152	108.0 85.61 : 111.03	101.67 85.61 : 111.03
Silver	TM152	107.83 88.48 : 110.48	99.33 88.48 : 110.48
Sodium	TM152	104.67 88.32 : 106.30	96.67 88.32 : 106.30
Strontium	TM152	108.33 83.77 : 107.87	101.0 83.77 : 107.87
Tellurium	TM152	104.0 82.83 : 104.73	99.67 82.83 : 104.73
Thallium	TM152	111.33 77.47 : 113.87	102.83 77.47 : 113.87
Tin	TM152	104.83 87.36 : 109.55	99.17 87.36 : 109.55
Titanium	TM152	108.67 87.29 : 108.31	99.0 87.29 : 108.31



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Dissolved Metals by ICP-MS

		QC 2308	QC 2367
Tungsten	TM152	105.83 68.27 : 122.97	97.33 68.27 : 122.97
Uranium	TM152	110.83 82.46 : 105.16	99.33 82.46 : 105.16
Vanadium	TM152	102.67 88.43 : 114.30	101.0 88.43 : 114.30
Zinc	TM152	109.67 85.57 : 114.31	101.0 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2307
Dissolved Inorganic Carbon	TM090	102.33 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2348
EPH >C10-C40 Raw	TM415	84.01 56.36 : 129.92

EPH CWG GC (S)

Component	Method Code	QC 2310
EPH >C8-C40 Raw	TM414	91.15 69.95 : 114.99
Total Aliphatics Raw	TM414	96.17 68.45 : 114.88
Total Aromatics Raw	TM414	106.68 67.31 : 129.37

Fluoride

Component	Method Code	QC 2330
Fluoride	TM104	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2300
QC	TM089	94.43 70.34 : 111.95



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Location: Cambridge South East Transport - Phase 2

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GRO by GC-FID (S)

Hexavalent Chromium (s)

Component	Method Code	QC 2334
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2379
Loss on Ignition	TM018	96.21 87.10 : 102.39

Mercury Dissolved

Component	Method Code	QC 2355
Mercury Dissolved (CVAf)	TM183	93.8 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2362
Aluminium	TM181	102.65 73.56 : 108.85
Antimony	TM181	82.93 76.89 : 111.24
Arsenic	TM181	108.72 88.53 : 111.01
Barium	TM181	97.25 77.67 : 105.35
Beryllium	TM181	107.84 85.44 : 109.61
Boron	TM181	102.29 73.51 : 104.66
Cadmium	TM181	97.12 77.67 : 104.12
Chromium	TM181	95.33 79.64 : 105.83
Cobalt	TM181	97.8 84.60 : 104.13
Copper	TM181	99.65 82.40 : 105.45
Iron	TM181	103.97 82.95 : 110.58
Lead	TM181	96.62 78.24 : 104.05



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Report Number: 636531
Location: Cambridge South East Transport - Phase 2

Superseded Report: 591773

Metals in solid samples by OES

		QC 2362
Manganese	TM181	118.61 94.29 : 119.51
Mercury	TM181	104.59 83.16 : 107.81
Molybdenum	TM181	102.06 87.11 : 106.87
Nickel	TM181	98.04 80.26 : 102.28
Phosphorus	TM181	115.56 94.56 : 124.28
Selenium	TM181	107.45 82.28 : 110.48
Strontium	TM181	102.0 79.13 : 102.79
Thallium	TM181	105.31 82.94 : 111.86
Tin	TM181	106.84 86.72 : 110.03
Titanium	TM181	91.6 66.23 : 102.06
Vanadium	TM181	106.96 86.19 : 109.45
Zinc	TM181	107.39 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2387
Acenaphthene	TM218	99.0 78.59 : 112.16
Acenaphthylene	TM218	95.0 75.11 : 109.01
Anthracene	TM218	98.0 73.99 : 113.85
Benz(a)anthracene	TM218	98.5 69.31 : 119.18
Benzo(a)pyrene	TM218	88.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	97.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	87.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	91.0 69.98 : 116.49
Chrysene	TM218	96.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	85.0 64.54 : 115.22
Fluoranthene	TM218	104.0 72.56 : 111.70
Fluorene	TM218	95.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	89.5 61.22 : 113.25



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Location: Cambridge South East Transport - Phase 2

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PAH by GCMS

		QC 2387
Naphthalene	TM218	95.5 77.96 : 110.91
Phenanthrene	TM218	102.5 76.83 : 113.25
Pyrene	TM218	102.5 72.45 : 110.77

PCBs by GCMS

Component	Method Code	QC 2382
PCB congener 101	TM168	83.1 65.66 : 110.06
PCB congener 105	TM168	78.1 58.10 : 106.34
PCB congener 114	TM168	79.5 59.38 : 106.48
PCB congener 118	TM168	79.8 60.02 : 106.23
PCB congener 123	TM168	84.3 65.01 : 99.81
PCB congener 126	TM168	78.6 59.31 : 109.23
PCB congener 138	TM168	83.9 63.95 : 107.63
PCB congener 153	TM168	86.2 62.65 : 108.85
PCB congener 156	TM168	79.6 61.69 : 112.27
PCB congener 157	TM168	76.6 55.37 : 104.81
PCB congener 167	TM168	79.2 65.58 : 109.14
PCB congener 169	TM168	80.2 56.84 : 112.10
PCB congener 180	TM168	83.9 66.99 : 111.63
PCB congener 189	TM168	79.2 57.75 : 112.59
PCB congener 28	TM168	84.3 73.68 : 105.96
PCB congener 52	TM168	84.5 67.24 : 107.62
PCB congener 77	TM168	81.5 64.87 : 108.49
PCB congener 81	TM168	83.4 70.78 : 110.80

pH



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Report Number: 636531
Location: Cambridge South East Transport - Phase 2

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pH

Component	Method Code	QC 2361
pH	TM133	100.0 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2305
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.3 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	45.09 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.32 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	49.37 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2356
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	49.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	48.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	47.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	53.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	49.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.33 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2394
Total Dissolved Solids	TM123	100.0 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2374
Total Organic Carbon	TM132	110.55 87.02 : 113.45



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Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

Total Sulphur

Component	Method Code	QC 2357
Total Sulphur %	TM132	111.92 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2379
1,1,1,2-tetrachloroethane	TM116	99.4 86.59 : 118.97
1,1,1-Trichloroethane	TM116	95.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	106.6 75.16 : 112.70
1,1-Dichloroethane	TM116	102.2 83.27 : 122.16
1,2-Dichloroethane	TM116	116.8 89.30 : 133.10
1,4-Dichlorobenzene	TM116	103.8 82.59 : 123.23
2-Chlorotoluene	TM116	92.0 66.81 : 118.43
4-Chlorotoluene	TM116	91.0 65.88 : 114.76
Benzene	TM116	97.4 93.16 : 123.63
Carbon Disulphide	TM116	89.8 75.11 : 124.81
Carbontetrachloride	TM116	99.8 82.35 : 126.46
Chlorobenzene	TM116	97.8 85.07 : 118.13
Chloroform	TM116	103.8 88.13 : 122.71
Chloromethane	TM116	91.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	98.4 78.27 : 128.90
Dibromomethane	TM116	100.8 77.47 : 121.29
Dichloromethane	TM116	105.6 87.89 : 134.72
Ethylbenzene	TM116	88.0 79.92 : 110.05
Hexachlorobutadiene	TM116	45.8 16.78 : 153.29
Isopropylbenzene	TM116	75.2 64.20 : 119.59
Naphthalene	TM116	100.8 79.29 : 125.59
o-Xylene	TM116	84.8 72.86 : 102.10



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SDG: 210316-101

Report Number: 636531

Superseded Report: 591773

Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

		QC 2379
p/m-Xylene	TM116	80.8 74.06 : 106.47
Sec-Butylbenzene	TM116	61.4 44.71 : 117.87
Tetrachloroethene	TM116	91.4 85.86 : 122.95
Toluene	TM116	99.6 87.82 : 116.21
Trichloroethene	TM116	96.4 79.80 : 112.33
Trichlorofluoromethane	TM116	92.4 80.52 : 132.12
Vinyl Chloride	TM116	99.0 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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SDG: 210316-101
Client Ref.: B025563

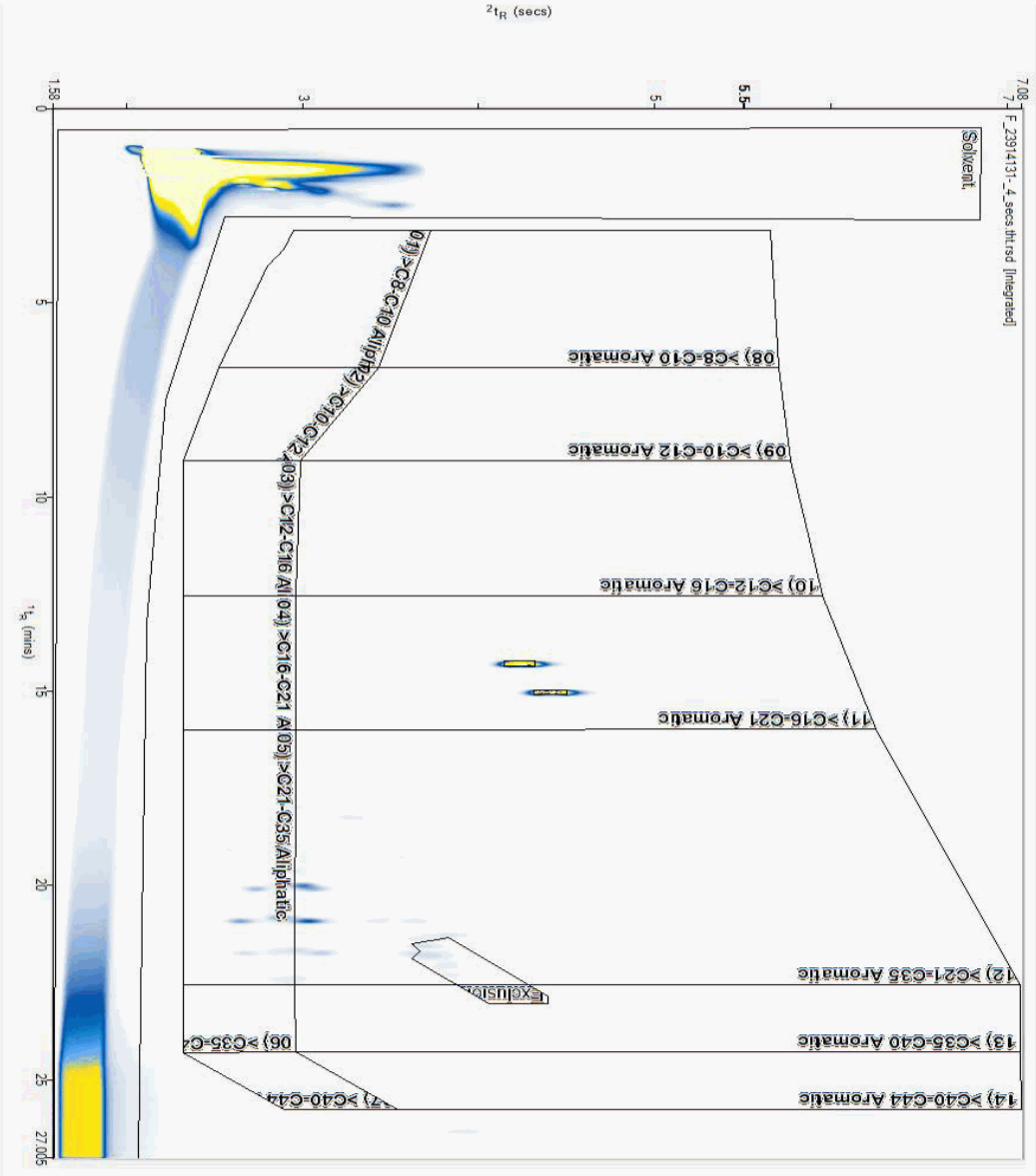
Report Number: 636531
Superseded Report: 591773
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 23914131
Sample ID : BH-PTR-39
Depth : 0.10

ChromSpace LIMS export
Current batch
Sample Identity: F_23914131-4_secs.tht
Date Acquired : 17/03/21 09:30:03
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

Validated

SDG: 210316-101
Client Ref.: B025563

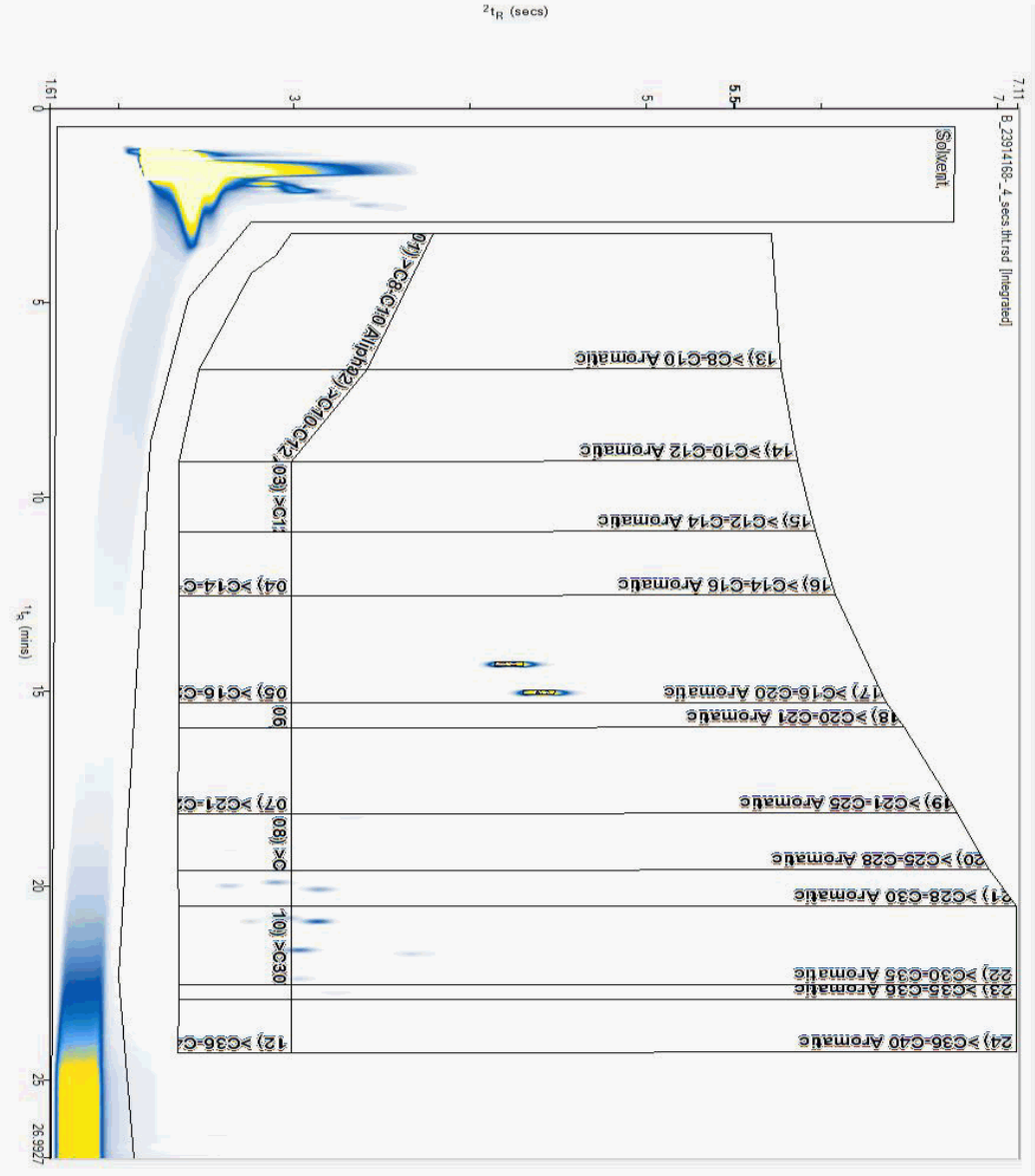
Report Number: 636531
Superseded Report: 591773
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 23914168
Sample ID : BH-PTR-39
Depth : 0.10

ChromSpace LIMS export
Current batch
Sample Identity: B_23914168-4_secs.tht
Date Acquired : 17/03/21 06:57:25
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

SDG:	210316-101	Client Reference:	B025563	Report Number:	636531
Location:	idge South East Transport -	Order Number:	7000964	Superseded Report:	591773

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subject to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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CERTIFICATE OF ANALYSIS

Date of report Generation:

23 March 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210317-130

Your Reference:

784-B025781

Location:

Watford Way, Hendon

Report No:

591623

We received 1 sample on Tuesday March 16, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 23, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 23/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23918226	BH202s	EW1	1.60 - 1.90	15/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:	

Results Legend

- X

Test
- N

No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container						Sample Type
				1000ml glass bottle (ALE220)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	HNO3 Unfiltered (ALE204)	NaOH (ALE245)	
23918226	BH202s	EW1	1.60 - 1.90							GW
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X						
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1							X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1					X			
Mercury Dissolved	All	NDPs: 0 Tests: 1					X			
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1		X						
pH Value	All	NDPs: 0 Tests: 1			X					
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1				X				
Total Metals by ICP-MS	All	NDPs: 0 Tests: 1						X		
TPH by IR Oils and Greases	All	NDPs: 0 Tests: 1		X						



Validated

CERTIFICATE OF ANALYSIS

/validated

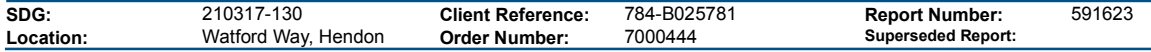
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Table of Results - Appendix

Method No	Reference	Description
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM235	The Determination of Hydrocarbon Oils in Waters by Solvent Extraction, Infra red Absorption and Gravimetry 1983, HMSO, London	Determination of Total Petroleum Hydrocarbons (TPH) in Waters By Infra-Red Spectroscopy
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23918226
Customer Sample Ref.	BH202s
AGS Ref.	EW1
Depth	1.60 - 1.90
Type	Ground Water
Anions by Kone (w)	18-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Mar-2021
Dissolved Metals by ICP-MS	18-Mar-2021
Mercury Dissolved	19-Mar-2021
PAH Spec MS - Aqueous (W)	22-Mar-2021
pH Value	19-Mar-2021
Phenols by HPLC (W)	19-Mar-2021
Total Metals by ICP-MS	20-Mar-2021
TPH by IR Oils and Greases	23-Mar-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (w)

Component	Method Code	QC 2323
Chloride	TM184	104.0 92.93 : 115.43
Sulphate (soluble)	TM184	103.2 90.53 : 113.03

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2362
Free Cyanide (W)	TM227	80.75 91.52 : 123.82
Thiocyanate (W)	TM227	101.25 90.50 : 113.00
Total Cyanide (W)	TM227	104.75 91.75 : 112.75

Dissolved Metals by ICP-MS

Component	Method Code	QC 2327
Aluminium	TM152	103.67 90.98 : 111.82
Antimony	TM152	101.83 90.44 : 113.04
Arsenic	TM152	100.5 88.00 : 112.00
Barium	TM152	100.83 90.20 : 111.19
Beryllium	TM152	105.83 87.77 : 113.97
Bismuth	TM152	101.5 91.90 : 112.20
Borate	TM152	104.32 88.00 : 112.00
Boron	TM152	104.33 96.48 : 114.93
Cadmium	TM152	102.5 96.43 : 110.53
Calcium	TM152	100.67 81.38 : 119.09
Chromium	TM152	98.17 91.84 : 108.67
Cobalt	TM152	96.33 88.00 : 112.00
Copper	TM152	99.33 92.47 : 118.11
Iron	TM152	100.67 92.00 : 113.00
Lead	TM152	98.67 88.00 : 112.00
Lithium	TM152	104.83 91.62 : 113.12
Magnesium	TM152	97.33 93.14 : 107.91



CERTIFICATE OF ANALYSIS

Validated

SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:	

Dissolved Metals by ICP-MS

		QC 2327
Manganese	TM152	99.83 95.03 : 110.58
Molybdenum	TM152	99.17 88.00 : 112.00
Nickel	TM152	99.5 88.00 : 112.00
Phosphorus	TM152	99.5 88.00 : 112.00
Potassium	TM152	100.67 93.90 : 112.36
Selenium	TM152	103.5 91.58 : 115.98
Silver	TM152	101.67 88.80 : 122.30
Sodium	TM152	98.0 94.28 : 110.71
Strontium	TM152	101.0 88.00 : 112.00
Tellurium	TM152	101.17 93.32 : 114.66
Thallium	TM152	96.67 88.00 : 112.00
Tin	TM152	100.67 92.63 : 109.70
Titanium	TM152	103.67 95.58 : 111.68
Tungsten	TM152	98.67 81.32 : 124.72
Uranium	TM152	99.67 88.00 : 112.00
Vanadium	TM152	100.67 88.00 : 112.00
Zinc	TM152	101.0 92.98 : 118.95

Mercury Dissolved

Component	Method Code	QC 2390
Mercury Dissolved (CVAF)	TM183	92.0 69.30 : 128.70

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2307
Acenaphthene by GCMS	TM178	110.8 90.45 : 118.63
Acenaphthylene by GCMS	TM178	110.0 90.13 : 116.27
Anthracene by GCMS	TM178	105.6 92.40 : 114.00
Benz(a)anthracene by GCMS	TM178	106.0 89.51 : 117.69

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623	
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:		
PAH Spec MS - Aqueous (W)						

		QC 2307
Benzo(a)pyrene by GCMS	TM178	110.4 89.43 : 118.57
Benzo(b)fluoranthene by GCMS	TM178	105.2 87.80 : 121.80
Benzo(ghi)perylene by GCMS	TM178	98.0 87.10 : 119.30
Benzo(k)fluoranthene by GCMS	TM178	104.8 93.23 : 123.57
Chrysene by GCMS	TM178	104.0 88.68 : 116.92
Dibenzo(ah)anthracene by GCMS	TM178	110.8 86.24 : 118.56
Fluoranthene by GCMS	TM178	109.2 86.04 : 121.96
Fluorene by GCMS	TM178	110.0 90.76 : 121.24
Indeno(123cd)pyrene by GCMS	TM178	95.6 88.39 : 119.61
Naphthalene by GCMS	TM178	113.6 89.40 : 121.80
Phenanthrene by GCMS	TM178	105.2 90.41 : 119.19
Pyrene by GCMS	TM178	108.0 91.00 : 120.20

pH Value		
Component	Method Code	QC 2342
pH	TM256	101.34 99.33 : 102.54

Phenols by HPLC (W)		
Component	Method Code	QC 2367
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	52.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	51.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.67 76.60 : 126.28
Napthol by HPLC (W)	TM259	60.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	52.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	51.5 79.09 : 131.82
Total Metals by ICP-MS		

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623	
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:		
Total Metals by ICP-MS						

Component	Method Code	QC 2377
Aluminium	TM152	106.67 88.99 : 114.16
Antimony	TM152	104.67 80.45 : 122.65
Arsenic	TM152	106.83 85.20 : 116.13
Barium	TM152	106.17 88.50 : 113.15
Beryllium	TM152	106.17 83.77 : 113.97
Bismuth	TM152	106.67 91.18 : 107.28
Boron	TM152	106.67 86.68 : 117.67
Cadmium	TM152	106.33 87.95 : 113.45
Calcium	TM152	107.33 81.38 : 119.09
Chromium	TM152	106.17 90.87 : 108.50
Cobalt	TM152	105.33 84.39 : 114.26
Copper	TM152	107.67 84.61 : 114.08
Iron	TM152	106.67 90.00 : 111.84
Lead	TM152	105.67 85.65 : 113.58
Lithium	TM152	105.67 87.07 : 115.37
Magnesium	TM152	102.67 86.65 : 109.61
Manganese	TM152	107.17 91.67 : 111.62
Molybdenum	TM152	105.5 87.00 : 108.89
Nickel	TM152	107.33 88.26 : 111.14
Phosphorus	TM152	105.83 84.56 : 112.20
Potassium	TM152	104.0 86.97 : 112.46
Selenium	TM152	105.33 88.44 : 113.86
Silver	TM152	105.83 82.13 : 120.33
Sodium	TM152	103.33 84.47 : 113.44
Strontium	TM152	105.67 90.72 : 114.82
Tellurium	TM152	103.5 86.97 : 108.87
Thallium	TM152	105.83 80.92 : 114.72

	CERTIFICATE OF ANALYSIS					Validated
SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623	
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:		
Total Metals by ICP-MS						

		QC 2377
Tin	TM152	104.67 93.70 : 111.83
Titanium	TM152	106.83 90.30 : 110.00
Uranium	TM152	105.17 84.78 : 111.18
Vanadium	TM152	102.83 88.43 : 114.30
Zinc	TM152	107.33 86.52 : 115.27

TPH by IR Oils and Greases		
		QC 2354
Mineral Oil	TM235	91.67 81.33 : 105.00
TPH	TM235	99.17 89.50 : 103.00

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

	CERTIFICATE OF ANALYSIS				
SDG:	210317-130	Client Reference:	784-B025781	Report Number:	591623
Location:	Watford Way, Hendon	Order Number:	7000444	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210318-111
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592216

We received 4 samples on Thursday March 18, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday March 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-111 Client Reference: B025563 Report Number: 592216
Location: Cambridge South East Transport Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23928717	BHPTR12	ES1	0.10	16/03/2021
23928718	BHPTR12	ES2	0.20	16/03/2021
23928719	BHPTR12	ES3	0.45	16/03/2021
23928720	BHPTR12	ES4	1.00	16/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-111 Client Reference: B025563 Report Number: 592216
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23928718		
	Customer Sample Reference		BHPTRI12		
	AGS Reference		ES2		
	Depth (m)		0.20		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-111 Client Reference: B025563 Report Number: 592216
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23928718		
	Customer Sample Reference		BHPTRI12		
	AGS Reference		ES2		
	Depth (m)		0.20		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes						
very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse
					2mm - 10mm	very coarse
						>10mm
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23928718	BHPTR12	0.20	Dark Brown	Loamy Sand	Vegetation	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BHPTR12				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		16/03/2021				
dis.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		18/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210318-111				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23928718				
(F)	Trigger breach confirmed		ES2				
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	18				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	0.0122	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	0.0122	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0348				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0176	#			
pH	1 pH Units	TM133	8.29	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	8.34				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	7.61	M			
Barium	<0.6 mg/kg	TM181	54.5	#			
Beryllium	<0.01 mg/kg	TM181	0.401	M			
Cadmium	<0.02 mg/kg	TM181	0.137	M			
Chromium	<0.9 mg/kg	TM181	8.34	M			
Copper	<1.4 mg/kg	TM181	16	M			
Iron	<1000 mg/kg	TM181	10700	#			
Lead	<0.7 mg/kg	TM181	14.5	M			
Manganese	<0.13 mg/kg	TM181	418	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.199	#			
Nickel	<0.2 mg/kg	TM181	14.9	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	18.1	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BHPTR12				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	106				
Toluene-d8**	%	TM116	94.6				
4-Bromofluorobenzene**	%	TM116	74.1				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@ Sample deviation (see appendix)											
Cust. Sample Ref.	BHPTR12ES2	24/03/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20										
Sample Type	SOLID										
Date Sampled	16/03/2021 00:00:00										
Date Received	18/03/2021 08:30:00										
SDG	210318-111										
Original Sample	23928718										
Method Number	TM048										

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.113	Natural Moisture Content (%)	25.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	79.7
Particle Size <4mm	>95%		

Case			
SDG	210318-111		
Lab Sample Number(s)	23928718		
Sampled Date	16-Mar-2021		
Customer Sample Ref.	BHPTR12 ES2		
Depth (m)	0.20		

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.18	<3	61.8	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.000946	<0.0005	0.00946	<0.005	-	-	-
Barium	0.23	<0.0002	2.3	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0942	<0.01	0.942	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	27.3	<0.2	273	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00484	<0.0003	0.0484	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.418	<0.036	4.18	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00227	<0.0004	0.0227	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00106	<0.001	0.0106	<0.01	-	-	-
Zinc	0.0426	<0.001	0.426	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information	
Date Prepared	20-Mar-2021
pH (pH Units)	8.18
Conductivity (µS/cm)	134.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.878



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.113	Natural Moisture Content (%)	25.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	79.7
Particle Size <4mm	>95%		

Case

SDG 210318-111

Lab Sample Number(s) 23928718

Sampled Date	16-Mar-2021
---------------------	-------------

Customer Sample Ref.	BHPTR12 ES2
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Depth (m) 0.20

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		
	Result	Limit of Detection	Result	Limit of Detection	
Hardness dissolved	70	<0.65	700	<6.5	- - -
Iron (Dis.Filt) mg/l	0.109	<0.019	1.09	<0.19	- - -

Leach Test Information

Date Prepared	20-Mar-2021
pH (pH Units)	8.18
Conductivity (µS/cm)	134.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.878

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990/BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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Test Completion Dates

Lab Sample No(s)	23928718
Customer Sample Ref.	BHPTR12
AGS Ref.	ES2
Depth	0.20
Type	Soil/Solid (S)
Ammonium Low	24-Mar-2021
Anions by Kone (soil)	25-Mar-2021
Anions by Kone (w)	23-Mar-2021
Asbestos ID in Solid Samples	24-Mar-2021
Boron Water Soluble	25-Mar-2021
CEN 10:1 Leachate (1 Stage)	20-Mar-2021
CEN Readings	25-Mar-2021
Chromium III	25-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	23-Mar-2021
Dissolved Metals by ICP-MS	25-Mar-2021
Dissolved Organic/Inorganic Carbon	25-Mar-2021
EPH CWG GC (S)	25-Mar-2021
Fluoride	24-Mar-2021
GRO by GC-FID (S)	23-Mar-2021
Hexavalent Chromium (s)	24-Mar-2021
Low Level Cyanide (W)	25-Mar-2021
Low Level Hexavalent Chromium (w)	24-Mar-2021
Mercury Dissolved	24-Mar-2021
Metals in solid samples by OES	25-Mar-2021
Moisture at 105C	20-Mar-2021
PAH by GCMS	23-Mar-2021
pH	24-Mar-2021
pH Value of Filtered Water	24-Mar-2021
Phenols by HPLC (S)	23-Mar-2021
Phenols by HPLC (W)	24-Mar-2021
Sample description	19-Mar-2021
Total Organic Carbon	26-Mar-2021
Total Sulphur	26-Mar-2021
TPH CWG GC (S)	25-Mar-2021
VOC MS (S)	24-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2386
Ammoniacal Nitrogen as N	TM099	103.0 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2346
Chloride (soluble)	TM243	135.23 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	156.54 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2389
Chloride	TM184	106.0 92.93 : 115.43
Sulphate (soluble)	TM184	100.0 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2322
Water Soluble Boron	TM222	93.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2379
Free Cyanide	TM153	93.07 79.00 : 115.00
Thiocyanate	TM153	99.36 94.09 : 113.89
Total Cyanide	TM153	97.9 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2380
Aluminium	TM152	103.0 94.21 : 111.52
Antimony	TM152	97.83 88.37 : 130.57
Arsenic	TM152	98.33 92.62 : 113.52



CERTIFICATE OF ANALYSIS

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SDG: 210318-111 Client Reference: B025563 Report Number: 592216
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2380
Barium	TM152	95.17 88.62 : 113.14
Beryllium	TM152	105.33 87.08 : 111.38
Bismuth	TM152	98.83 92.62 : 115.02
Boron	TM152	103.67 86.31 : 120.88
Cadmium	TM152	100.0 93.85 : 111.65
Calcium	TM152	97.33 89.20 : 126.91
Chromium	TM152	99.5 92.50 : 113.03
Cobalt	TM152	99.83 85.01 : 114.87
Copper	TM152	100.17 89.87 : 119.73
Iron	TM152	100.67 93.02 : 113.86
Lead	TM152	98.67 91.11 : 116.98
Lithium	TM152	106.5 87.70 : 115.90
Magnesium	TM152	98.0 89.60 : 116.61
Manganese	TM152	100.67 93.97 : 112.46
Molybdenum	TM152	96.83 89.07 : 110.96
Nickel	TM152	100.33 93.70 : 112.15
Phosphorus	TM152	98.5 89.24 : 114.18
Potassium	TM152	95.33 93.20 : 115.55
Selenium	TM152	97.0 91.69 : 117.12
Silver	TM152	99.5 90.93 : 121.73
Sodium	TM152	100.0 92.42 : 113.24
Strontium	TM152	99.0 92.14 : 116.24
Tellurium	TM152	94.83 89.88 : 111.78
Thallium	TM152	97.17 82.43 : 113.83
Tin	TM152	96.83 94.62 : 107.79
Titanium	TM152	101.33 90.29 : 115.23
Tungsten	TM152	96.83 77.61 : 132.31



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-111 Client Reference: B025563 Report Number: 592216
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2380
Uranium	TM152	96.5 86.97 : 115.76
Vanadium	TM152	101.33 89.61 : 115.48
Zinc	TM152	102.0 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2340
Dissolved Inorganic Carbon	TM090	117.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	101.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2385
Fluoride	TM104	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2334
QC	TM089	84.16 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2358
Hexavalent Chromium	TM151	108.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2356
Free Cyanide - Low Level	TM279	75.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	95.0 81.83 : 110.45

Mercury Dissolved

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210318-111	Client Reference:	B025563	Report Number:	592216	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2340				
Mercury Dissolved (CVAf)	TM183	100.0 69.30 : 128.70				

Metals in solid samples by OES		
Component	Method Code	QC 2349
Aluminium	TM181	105.31 73.56 : 108.85
Antimony	TM181	103.25 76.89 : 111.24
Arsenic	TM181	105.81 88.53 : 111.01
Barium	TM181	100.92 77.67 : 105.35
Beryllium	TM181	104.48 85.44 : 109.61
Boron	TM181	100.57 73.51 : 104.66
Cadmium	TM181	95.06 77.67 : 104.12
Chromium	TM181	95.13 79.64 : 105.83
Cobalt	TM181	94.65 84.60 : 104.13
Copper	TM181	98.42 82.40 : 105.45
Iron	TM181	103.97 82.95 : 110.58
Lead	TM181	93.92 78.24 : 104.05
Manganese	TM181	111.94 94.29 : 119.51
Mercury	TM181	101.93 83.16 : 107.81
Molybdenum	TM181	105.35 87.11 : 106.87
Nickel	TM181	95.84 80.26 : 102.28
Phosphorus	TM181	111.52 94.56 : 124.28
Selenium	TM181	104.71 82.28 : 110.48
Strontium	TM181	100.45 79.13 : 102.79
Thallium	TM181	103.1 82.94 : 111.86
Tin	TM181	104.56 86.72 : 110.03
Titanium	TM181	90.08 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210318-111	Client Reference:	B025563	Report Number:	592216	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2349				
Vanadium	TM181	108.06 86.19 : 109.45				
Zinc	TM181	105.34 84.68 : 113.99				

Component	Method Code	QC 2327
Acenaphthene	TM218	88.5 78.59 : 112.16
Acenaphthylene	TM218	88.0 75.11 : 109.01
Anthracene	TM218	92.0 73.99 : 113.85
Benz(a)anthracene	TM218	88.5 69.31 : 119.18
Benzo(a)pyrene	TM218	81.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	82.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	79.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	87.5 69.98 : 116.49
Chrysene	TM218	88.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	79.5 64.54 : 115.22
Fluoranthene	TM218	86.5 72.56 : 111.70
Fluorene	TM218	90.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	80.0 61.22 : 113.25
Naphthalene	TM218	84.5 77.96 : 110.91
Phenanthrene	TM218	90.5 76.83 : 113.25
Pyrene	TM218	87.5 72.45 : 110.77

pH		
Component	Method Code	QC 2337
pH	TM133	100.66 99.08 : 102.24

pH Value of Filtered Water



CERTIFICATE OF ANALYSIS

Validated

SDG:210318-111

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

592216

pH Value of Filtered Water

Component	Method Code	QC 2331
pH	TM256	<div>101.07</div> <div>99.06 : 101.47</div>

Phenols by HPLC (S)

Component	Method Code	QC 2301
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<div>51.3</div> <div>70.71 : 116.42</div>
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<div>45.61</div> <div>64.54 : 117.79</div>
Cresols by HPLC (S)	TM062 (S)	<div>44.05</div> <div>74.40 : 108.98</div>
Phenol by HPLC (S)	TM062 (S)	<div>51.66</div> <div>69.44 : 122.18</div>
Xylenols by HPLC (S)	TM062 (S)	<div>48.96</div> <div>76.56 : 106.38</div>

Phenols by HPLC (W)

Component	Method Code	QC 2388
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	<div>50.0</div> <div>77.41 : 127.55</div>
2-Isopropyl Phenol by HPLC (W)	TM259	<div>49.0</div> <div>82.77 : 126.51</div>
Cresols by HPLC (W)	TM259	<div>47.67</div> <div>76.60 : 126.28</div>
Napthol by HPLC (W)	TM259	<div>52.0</div> <div>75.40 : 129.40</div>
Phenol by HPLC (W)	TM259	<div>50.0</div> <div>85.77 : 125.91</div>
Xylenols by HPLC (W)	TM259	<div>49.33</div> <div>79.09 : 131.82</div>

Total Organic Carbon

Component	Method Code	QC 2315
Total Organic Carbon	TM132	<div>98.83</div> <div>87.02 : 113.45</div>

Total Sulphur

Component	Method Code	QC 2335
Total Sulphur %	TM132	<div>76.17</div> <div>61.64 : 114.47</div>

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CERTIFICATE OF ANALYSIS

Validated

SDG:210318-111

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

592216

VOC MS (S)

Component	Method Code	QC 2338	QC 2306
1,1,1,2-tetrachloroethane	TM116	<div>106.6</div> <div>84.84 : 116.25</div>	<div>105.2</div> <div>79.10 : 119.66</div>
1,1,1-Trichloroethane	TM116	<div>94.2</div> <div>73.73 : 118.05</div>	<div>102.6</div> <div>84.25 : 112.57</div>
1,1,2-Trichloroethane	TM116	<div>98.8</div> <div>77.12 : 116.04</div>	<div>92.2</div> <div>81.29 : 113.79</div>
1,1-Dichloroethane	TM116	<div>93.2</div> <div>74.46 : 129.15</div>	<div>103.8</div> <div>86.77 : 122.11</div>
1,2-Dichloroethane	TM116	<div>109.2</div> <div>92.38 : 131.65</div>	<div>105.6</div> <div>90.04 : 132.28</div>
1,4-Dichlorobenzene	TM116	<div>99.4</div> <div>83.64 : 126.18</div>	<div>101.4</div> <div>80.81 : 125.07</div>
2-Chlorotoluene	TM116	<div>96.6</div> <div>76.03 : 113.25</div>	<div>88.2</div> <div>73.13 : 114.13</div>
4-Chlorotoluene	TM116	<div>91.6</div> <div>66.90 : 112.46</div>	<div>84.2</div> <div>68.66 : 109.13</div>
Benzene	TM116	<div>95.2</div> <div>88.60 : 113.80</div>	<div>99.0</div> <div>84.29 : 112.22</div>
Carbon Disulphide	TM116	<div>81.0</div> <div>74.91 : 122.14</div>	<div>94.0</div> <div>75.11 : 124.81</div>
Carbontetrachloride	TM116	<div>105.6</div> <div>80.31 : 124.50</div>	<div>101.6</div> <div>82.35 : 126.46</div>
Chlorobenzene	TM116	<div>102.2</div> <div>83.81 : 114.18</div>	<div>103.6</div> <div>82.88 : 122.42</div>
Chloroform	TM116	<div>95.4</div> <div>87.40 : 122.49</div>	<div>103.6</div> <div>90.35 : 120.38</div>
Chloromethane	TM116	<div>85.0</div> <div>65.89 : 136.93</div>	<div>108.6</div> <div>65.80 : 138.88</div>
Cis-1,2-Dichloroethene	TM116	<div>95.2</div> <div>80.67 : 126.72</div>	<div>102.0</div> <div>78.27 : 128.90</div>
Dibromomethane	TM116	<div>113.6</div> <div>73.23 : 118.35</div>	<div>93.2</div> <div>76.00 : 120.73</div>
Dichloromethane	TM116	<div>100.8</div> <div>81.11 : 133.25</div>	<div>107.4</div> <div>92.27 : 134.36</div>
Ethylbenzene	TM116	<div>94.8</div> <div>75.92 : 110.41</div>	<div>90.8</div> <div>70.95 : 113.07</div>
Hexachlorobutadiene	TM116	<div>84.8</div> <div>12.82 : 152.73</div>	<div>65.0</div> <div>14.55 : 147.92</div>
Isopropylbenzene	TM116	<div>88.8</div> <div>55.79 : 97.59</div>	<div>81.2</div> <div>52.00 : 108.19</div>
Naphthalene	TM116	<div>95.8</div> <div>80.86 : 128.81</div>	<div>91.6</div> <div>80.29 : 135.77</div>
o-Xylene	TM116	<div>93.0</div> <div>69.99 : 108.74</div>	<div>89.6</div> <div>64.92 : 98.85</div>
p/m-Xylene	TM116	<div>92.5</div> <div>68.32 : 108.91</div>	<div>85.6</div> <div>69.47 : 97.31</div>
Sec-Butylbenzene	TM116	<div>91.8</div> <div>38.50 : 101.50</div>	<div>72.0</div> <div>27.03 : 135.73</div>
Tetrachloroethene	TM116	<div>106.8</div> <div>76.95 : 121.02</div>	<div>102.2</div> <div>81.43 : 126.65</div>
Toluene	TM116	<div>91.0</div> <div>74.24 : 107.42</div>	<div>90.4</div> <div>82.44 : 103.50</div>
Trichloroethene	TM116	<div>94.2</div> <div>85.28 : 109.36</div>	<div>95.0</div> <div>79.80 : 112.33</div>

12:26:36 26/03/2021

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2338	QC 2306
Trichlorofluoromethane	TM116	86.6	103.2
		84.55 : 133.27	89.67 : 132.09
Vinyl Chloride	TM116	88.2	110.0
		68.02 : 143.37	69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



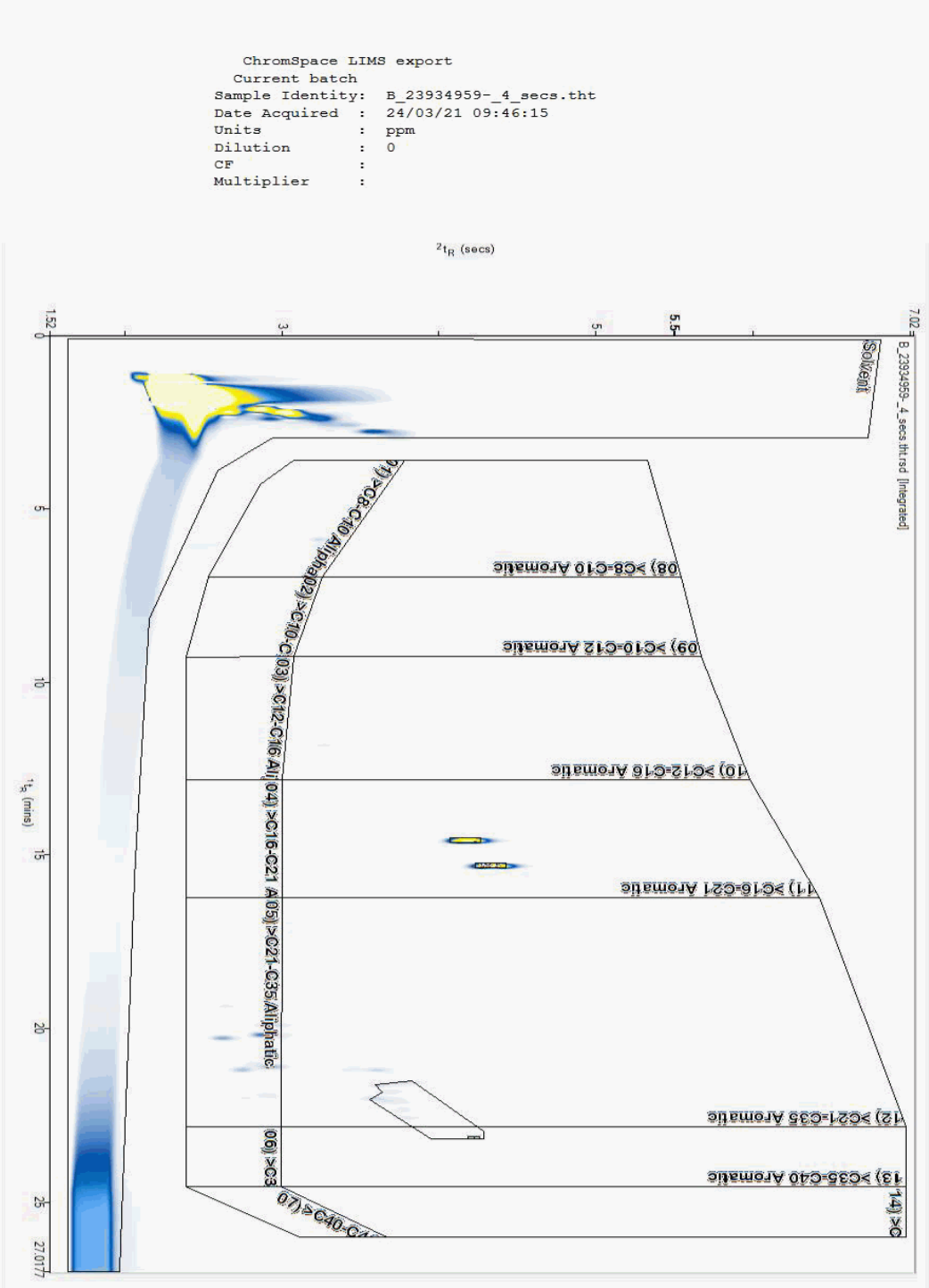
CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23934959	Depth :	0.20
		Sample ID :	BHPTR12		





CERTIFICATE OF ANALYSIS

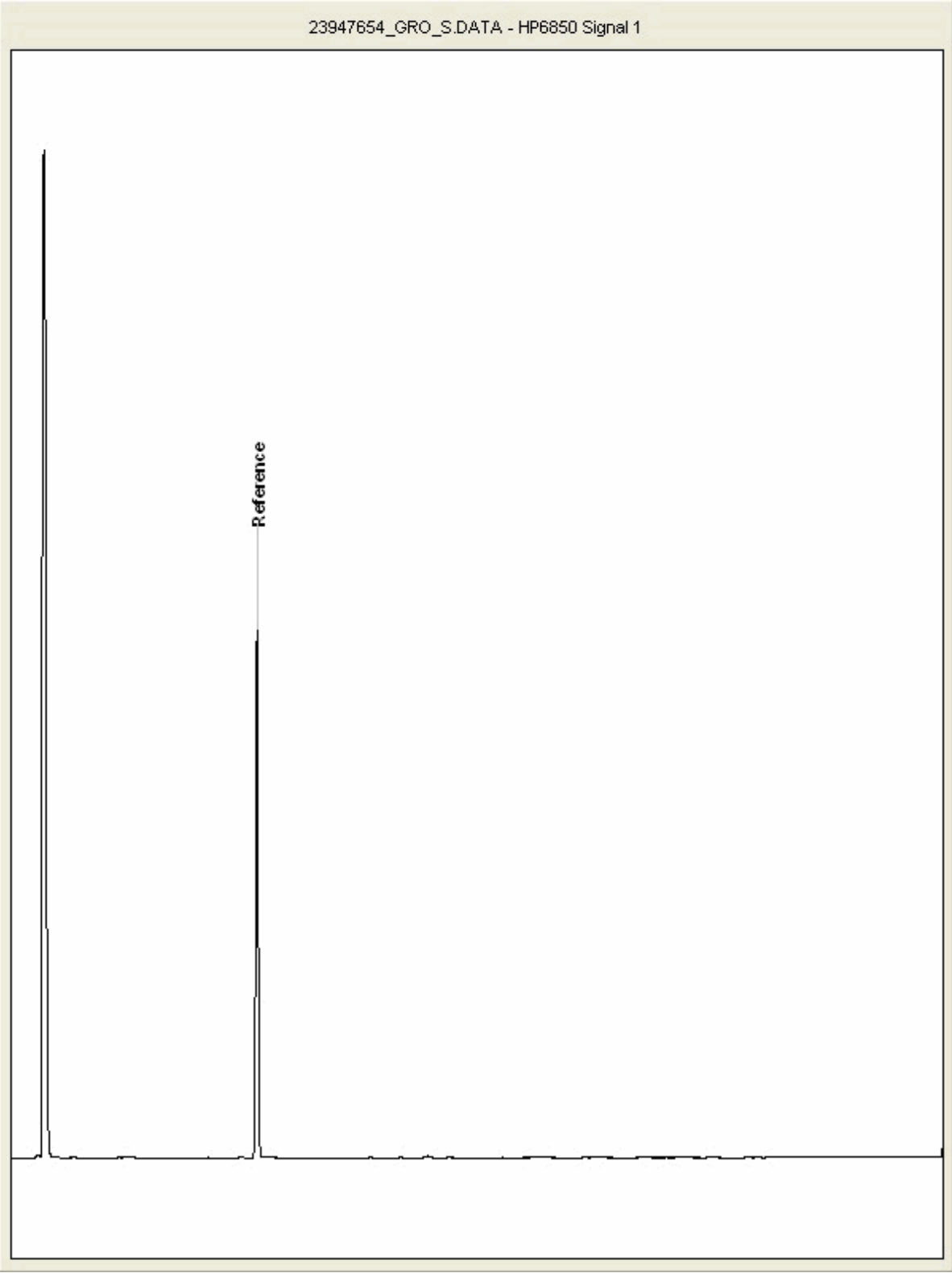
Validated

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23947654
Sample ID : BHPTR12
Depth : 0.20



CERTIFICATE OF ANALYSIS

SDG:	210318-111	Client Reference:	B025563	Report Number:	592216
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210318-114
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592273

We received 10 samples on Thursday March 18, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday March 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-114 Client Reference: B025563 Report Number: 592273
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23929334	OBC - 06 ES		0.10	17/03/2021
23929335	OBC - 06 ES		0.20	17/03/2021
23929336	OBC - 06 ES		0.50	17/03/2021
23929337	OBC - 06 ES		1.00	17/03/2021
23929330	OBC - 08 ES		0.10	16/03/2021
23929331	OBC - 08 ES		0.20	16/03/2021
23929332	OBC - 08 ES		0.50	16/03/2021
23929333	OBC - 08 ES		1.00	16/03/2021
23929338	OBC - 08 (WATER) 1.25		1.25	17/03/2021
23929339	PTR 13		2.70	17/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-114 Client Reference: B025563 Report Number: 592273
Location: Cambridge South East TraOrder Number: 7000964

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23929334		
	Customer Sample Reference		OBC - 06 ES		
	AGS Reference				
	Depth (m)		0.10		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	S	S
	Sample Type			S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 1		X	
Coronene	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-114 Client Reference: B025563 Report Number: 592273
Location: Cambridge South East TraOrder Number: 7000964

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23929334		
	Customer Sample Reference		OBC - 06 ES		
	AGS Reference				
	Depth (m)		0.10		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	S	S
	Sample Type			S	S
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X	
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
PCBs by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG:210318-114Client Reference: B025563Report Number: 592273

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Results Legend

XTest

NNo Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

23929334

Customer Sample Reference

OBC - 06 ES

AGS Reference

Depth (m)

0.10

Container

1kg TUB with Handle (ALE260)

250g Amber Jar (ALE210)

60g VOC (ALE215)

Sample Type

S

S

S

VOC MS (S)

All

NDPs: 0

Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG:210318-114Client Reference: B025563Report Number: 592273

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23929334	OBC - 06 ES	0.10	Dark Brown	Loamy Sand	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>OBC - 06 ES</div> <div>0.10 Soil/Solid (S) 17/03/2021 . 18/03/2021 210318-114 23929334</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	13						
Loss on ignition	<0.7 %	TM018	1.01 M						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M						
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M						
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M						
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M						
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M						
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M						
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Organic Carbon, Total	<0.2 %	TM132	0.794 M						
Sulphur, Total	<0.02 %	TM132	0.0224						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00794 #						
pH	1 pH Units	TM133	8.51 M						
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #						
Cyanide, Free	<1 mg/kg	TM153	<1 M						
PCB congener 28	<3 µg/kg	TM168	<3 M						
PCB congener 52	<3 µg/kg	TM168	<3 M						
PCB congener 101	<3 µg/kg	TM168	<3 M						
PCB congener 118	<3 µg/kg	TM168	<3 M						
PCB congener 138	<3 µg/kg	TM168	<3 M						
PCB congener 153	<3 µg/kg	TM168	<3 M						
PCB congener 180	<3 µg/kg	TM168	<3 M						
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21						
Chromium, Trivalent	<0.9 mg/kg	TM181	14.5						
Antimony	<0.6 mg/kg	TM181	<0.6 #						
Arsenic	<0.6 mg/kg	TM181	15.3 M						
Barium	<0.6 mg/kg	TM181	61.6 #						
Beryllium	<0.01 mg/kg	TM181	0.588 M						
Cadmium	<0.02 mg/kg	TM181	0.116 M						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend			Customer Sample Ref.	OBC - 06 ES				
#	ISO17025 accredited.	mCERTS accredited.						
M	Aqueous / settled sample.		Depth (m)	0.10				
aq	Dissolved / filtered sample.		Sample Type	Soil/Solid (S)				
dis.filt	Total / unfiltered sample.		Date Sampled	17/03/2021				
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.		Sampled Time	.				
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Date Received	18/03/2021				
**	Trigger breach confirmed		SDG Ref	210318-114				
(F)	Sample deviation (see appendix)		Lab Sample No.(s)	23929334				
1-44@			AGS Reference					
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116						
			102					
Toluene-d8**	%	TM116	99.6					
4-Bromofluorobenzene**	%	TM116	84.5					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	M				
Chloromethane	<7 µg/kg	TM116	<7	#				
Vinyl Chloride	<6 µg/kg	TM116	<6	M				
Bromomethane	<10 µg/kg	TM116	<10	M				
Chloroethane	<10 µg/kg	TM116	<10	M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6	M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10	#				
Carbon Disulphide	<7 µg/kg	TM116	<7	M				
Dichloromethane	<10 µg/kg	TM116	<10	#				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8	M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10	M				
Chloroform	<8 µg/kg	TM116	<8	M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10	M				
Carbontetrachloride	<10 µg/kg	TM116	<10	M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5	M				
Benzene	<9 µg/kg	TM116	<9	M				
Trichloroethene	<9 µg/kg	TM116	<9	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10	M				
Dibromomethane	<9 µg/kg	TM116	<9	M				
Bromodichloromethane	<7 µg/kg	TM116	<7	M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	M				
Toluene	<7 µg/kg	TM116	<7	M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	M				

VOC MS (S)

Results Legend			Customer Sample Ref.	OBC - 06 ES				
#	ISO17025 accredited.	mCERTS accredited.						
M	Aqueous / settled sample.		Depth (m)	0.10				
aq	Dissolved / filtered sample.		Sample Type	Soil/Solid (S)				
dis.filt	Total / unfiltered sample.		Date Sampled	17/03/2021				
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.		Sampled Time	.				
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Date Received	18/03/2021				
**	Trigger breach confirmed		SDG Ref	210318-114				
(F)	Sample deviation (see appendix)		Lab Sample No.(s)	23929334				
1-44@			AGS Reference					
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116						
			<7	M				
Tetrachloroethene	<5 µg/kg	TM116	<5	M				
Dibromochloromethane	<10 µg/kg	TM116	<10	M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10	M				
Chlorobenzene	<5 µg/kg	TM116	<5	M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	M				
Ethylbenzene	<4 µg/kg	TM116	<4	M				
p/m-Xylene	<10 µg/kg	TM116	<10	#				
o-Xylene	<10 µg/kg	TM116	<10	M				
Styrene	<10 µg/kg	TM116	<10	#				
Bromoform	<10 µg/kg	TM116	<10	M				
Isopropylbenzene	<5 µg/kg	TM116	<5	#				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	#				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	M				
Bromobenzene	<10 µg/kg	TM116	<10	M				
Propylbenzene	<10 µg/kg	TM116	<10	M				
2-Chlorotoluene	<9 µg/kg	TM116	<9	M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	M				
4-Chlorotoluene	<10 µg/kg	TM116	<10	M				
tert-Butylbenzene	<14 µg/kg	TM116	<14	M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	#				
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10	M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	M				
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	#				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13	M				

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:210318-114

Client Reference: B025563

Report Number: 592273

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Site Location

Cambridge South East Transport - f

Mass Sample taken (kg)

0.105

Natural Moisture Content (%)

16.1

Mass of dry sample (kg)

0.090

Dry Matter Content (%)

86.2

Particle Size <4mm

>95%

Case

SDG

210318-114

Lab Sample Number(s)

23929334

Sampled Date

17-Mar-2021

Customer Sample Ref.

OBC - 06 ES

Depth (m)

0.10

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill

Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill

Hazardous Waste Landfill

3

5

6

-

-

10

6

-

-

1

-

-

500

-

-

100

-

-

-

>6

-

-

-

-

-

-

-

Solid Waste Analysis

Result

Total Organic Carbon (%)

0.794

Loss on Ignition (%)

1.01

Sum of BTEX (mg/kg)

<0.04

Sum of 7 PCBs (mg/kg)

<0.021

Mineral Oil (mg/kg)

<5

PAH Sum of 17 (mg/kg)

<10

pH (pH Units)

8.51

ANC to pH 6 (mol/kg)

0.0516

ANC to pH 4 (mol/kg)

0.173

Eluate Analysis

C2Concⁿ in 10:1 eluate (mg/l)

A210:1 concⁿ leached (mg/kg)

Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Arsenic

0.00162

<0.0005

0.0162

<0.005

0.5

2

25

Barium

0.00422

<0.0002

0.0422

<0.002

20

100

300

Cadmium

0.0000897

<0.00008

0.000897

<0.0008

0.04

1

5

Chromium

<0.001

<0.001

<0.01

<0.01

0.5

10

70

Copper

0.00208

<0.0003

0.0208

<0.003

2

50

100

Mercury Dissolved (CVAf)

0.0000103

<0.00001

0.000103

<0.0001

0.01

0.2

2

Molybdenum

0.0103

<0.003

0.103

<0.03

0.5

10

30

Nickel

0.0015

<0.0004

0.015

<0.004

0.4

10

40

Lead

0.00117

<0.0002

0.0117

<0.002

0.5

10

50

Antimony

<0.001

<0.001

<0.01

<0.01

0.06

0.7

5

Selenium

<0.001

<0.001

<0.01

<0.01

0.1

0.5

7

Zinc

0.00469

<0.001

0.0469

<0.01

4

50

200

Chloride

<2

<2

<20

<20

800

15000

25000

Fluoride

0.608

<0.5

6.08

<5

10

150

500

Sulphate (soluble)

<2

<2

<20

<20

1000

20000

50000

Total Dissolved Solids

76.3

<5

763

<50

4000

60000

100000

Total Monohydric Phenols (W)

<0.016

<0.016

<0.16

<0.16

1

-

-

Dissolved Organic Carbon

5.77

<3

57.7

<30

500

800

1000

Leach Test Information

Date Prepared

21-Mar-2021

pH (pH Units)

8.68

Conductivity (µS/cm)

90.80

Temperature (°C)

19.00

Volume Leachant (Litres)

0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

26/03/2021 15:54:29



CERTIFICATE OF ANALYSIS

Validated

SDG:210318-114

Client Reference:B025563

Report Number:592273

Location:Cambridge South East Tra

Order Number:7000964

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23929334
Customer Sample Ref.	OBC - 06 ES
AGS Ref.	
Depth	0.10
Type	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	25-Mar-2021
Anions by Kone (soil)	25-Mar-2021
Anions by Kone (w)	26-Mar-2021
Asbestos ID in Solid Samples	24-Mar-2021
Boron Water Soluble	25-Mar-2021
CEN 10:1 Leachate (1 Stage)	23-Mar-2021
CEN Readings	26-Mar-2021
Chromium III	25-Mar-2021
Coronene	23-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	23-Mar-2021
Dissolved Metals by ICP-MS	26-Mar-2021
Dissolved Organic/Inorganic Carbon	26-Mar-2021
EPH by GCxGC-FID	23-Mar-2021
EPH CWG GC (S)	25-Mar-2021
Fluoride	26-Mar-2021
GRO by GC-FID (S)	23-Mar-2021
Hexavalent Chromium (s)	24-Mar-2021
Loss on Ignition in soils	25-Mar-2021
Mercury Dissolved	26-Mar-2021
Metals in solid samples by OES	25-Mar-2021
Moisture at 105C	21-Mar-2021
PAH 16 & 17 Calc	23-Mar-2021
PAH by GCMS	23-Mar-2021
PCBs by GCMS	23-Mar-2021
pH	24-Mar-2021
Phenols by HPLC (S)	25-Mar-2021
Phenols by HPLC (W)	26-Mar-2021
Sample description	20-Mar-2021
Total Dissolved Solids	26-Mar-2021
Total Organic Carbon	26-Mar-2021
Total Sulphur	26-Mar-2021
TPH CWG GC (S)	25-Mar-2021
VOC MS (S)	24-Mar-2021

ASSOCIATED AQC DATA

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2395
ANC pH_4 dry soil	TM182	112.02 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2346
Chloride (soluble)	TM243	135.23 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	156.54 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2360
Chloride	TM184	104.0 92.93 : 115.43
Sulphate (soluble)	TM184	100.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2363
Water Soluble Boron	TM222	101.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2342
Coronene RAW	TM410	93.0 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2303
Free Cyanide	TM153	93.17 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	95.1 73.07 : 107.47



CERTIFICATE OF ANALYSIS

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SDG:

210318-114

Client Reference:

B025563

Report Number:

592273

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Dissolved Metals by ICP-MS

Component	Method Code	QC 2386
Aluminium	TM152	105.33 90.78 : 110.89
Antimony	TM152	104.0 77.22 : 119.42
Arsenic	TM152	103.5 86.77 : 107.67
Barium	TM152	103.67 87.86 : 110.23
Beryllium	TM152	107.17 86.19 : 112.98
Bismuth	TM152	104.17 84.06 : 106.46
Borate	TM152	106.79 88.00 : 112.00
Boron	TM152	106.67 83.92 : 114.90
Cadmium	TM152	100.33 88.89 : 106.69
Calcium	TM152	108.0 80.24 : 117.95
Chromium	TM152	103.17 83.22 : 110.16
Cobalt	TM152	102.83 82.49 : 112.36
Copper	TM152	103.17 83.14 : 113.00
Iron	TM152	103.33 88.40 : 109.24
Lead	TM152	104.17 83.71 : 109.58
Lithium	TM152	106.5 84.50 : 114.28
Magnesium	TM152	101.33 87.56 : 114.57
Manganese	TM152	104.17 90.01 : 108.72
Molybdenum	TM152	101.83 85.53 : 107.42
Nickel	TM152	103.0 88.05 : 106.42
Phosphorus	TM152	103.83 82.76 : 107.72
Potassium	TM152	102.67 88.45 : 106.42
Selenium	TM152	102.67 85.61 : 111.03
Silver	TM152	102.17 88.48 : 110.48
Sodium	TM152	102.0 88.32 : 106.30
Strontium	TM152	104.33 83.77 : 107.87
Tellurium	TM152	102.33 82.83 : 104.73



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Superseded Report:

Dissolved Metals by ICP-MS

		QC 2386
Thallium	TM152	100.67 77.47 : 113.87
Tin	TM152	100.33 87.36 : 109.55
Titanium	TM152	106.67 87.29 : 108.31
Tungsten	TM152	102.33 68.27 : 122.97
Uranium	TM152	103.0 82.46 : 105.16
Vanadium	TM152	104.17 88.43 : 114.30
Zinc	TM152	104.67 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2387
Dissolved Inorganic Carbon	TM090	102.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.33 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2329
EPH >C10-C40 Raw	TM415	89.99 59.15 : 115.05

Fluoride

Component	Method Code	QC 2322
Fluoride	TM104	101.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2334
QC	TM089	84.16 70.34 : 111.95

Hexavalent Chromium (s)

Hexavalent Chromium (s)

Component	Method Code	QC 2308
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2380
Loss on Ignition	TM018	101.66 87.10 : 102.39

Mercury Dissolved

Component	Method Code	QC 2352
Mercury Dissolved (CVAF)	TM183	100.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2349
Aluminium	TM181	105.31 73.56 : 108.85
Antimony	TM181	103.25 76.89 : 111.24
Arsenic	TM181	105.81 88.53 : 111.01
Barium	TM181	100.92 77.67 : 105.35
Beryllium	TM181	104.48 85.44 : 109.61
Boron	TM181	100.57 73.51 : 104.66
Cadmium	TM181	95.06 77.67 : 104.12
Chromium	TM181	95.13 79.64 : 105.83
Cobalt	TM181	94.65 84.60 : 104.13
Copper	TM181	98.42 82.40 : 105.45
Iron	TM181	103.97 82.95 : 110.58
Lead	TM181	93.92 78.24 : 104.05
Manganese	TM181	111.94 94.29 : 119.51

Metals in solid samples by OES

		QC 2349
Mercury	TM181	101.93 83.16 : 107.81
Molybdenum	TM181	105.35 87.11 : 106.87
Nickel	TM181	95.84 80.26 : 102.28
Phosphorus	TM181	111.52 94.56 : 124.28
Selenium	TM181	104.71 82.28 : 110.48
Strontium	TM181	100.45 79.13 : 102.79
Thallium	TM181	103.1 82.94 : 111.86
Tin	TM181	104.56 86.72 : 110.03
Titanium	TM181	90.08 66.23 : 102.06
Vanadium	TM181	108.06 86.19 : 109.45
Zinc	TM181	105.34 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2304
Acenaphthene	TM218	92.5 76.79 : 103.90
Acenaphthylene	TM218	89.0 78.40 : 108.66
Anthracene	TM218	90.0 70.90 : 109.22
Benz(a)anthracene	TM218	88.5 73.77 : 119.26
Benzo(a)pyrene	TM218	90.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	85.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	92.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	96.5 75.98 : 116.59
Chrysene	TM218	92.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	92.5 69.17 : 115.30
Fluoranthene	TM218	84.0 75.88 : 112.84
Fluorene	TM218	90.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	90.5 70.26 : 117.95
Naphthalene	TM218	89.0 74.70 : 101.83

PAH by GCMS

		QC 2304
Phenanthrene	TM218	89.5 73.62 : 109.34
Pyrene	TM218	84.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2354
PCB congener 101	TM168	89.7 65.66 : 110.06
PCB congener 105	TM168	85.3 58.10 : 106.34
PCB congener 114	TM168	85.8 59.38 : 106.48
PCB congener 118	TM168	85.9 60.02 : 106.23
PCB congener 123	TM168	93.1 65.01 : 99.81
PCB congener 126	TM168	85.9 59.31 : 109.23
PCB congener 138	TM168	91.5 63.95 : 107.63
PCB congener 153	TM168	90.9 62.65 : 108.85
PCB congener 156	TM168	88.8 61.69 : 112.27
PCB congener 157	TM168	83.7 55.37 : 104.81
PCB congener 167	TM168	87.4 65.58 : 109.14
PCB congener 169	TM168	88.4 56.84 : 112.10
PCB congener 180	TM168	90.0 66.99 : 111.63
PCB congener 189	TM168	88.6 57.75 : 112.59
PCB congener 28	TM168	88.8 73.68 : 105.96
PCB congener 52	TM168	89.6 67.24 : 107.62
PCB congener 77	TM168	91.0 64.87 : 108.49
PCB congener 81	TM168	89.1 70.78 : 110.80

pH

Component	Method Code	QC 2333
pH	TM133	100.53 99.08 : 102.24

Phenols by HPLC (W)

Component	Method Code	QC 2386
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	49.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	47.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	52.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	49.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	49.17 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2374
Total Dissolved Solids	TM123	99.9 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2315
Total Organic Carbon	TM132	98.83 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2335
Total Sulphur %	TM132	76.17 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2338	QC 2352
1,1,1,2-tetrachloroethane	TM116	106.6 84.84 : 116.25	105.4 79.10 : 119.66
1,1,1-Trichloroethane	TM116	94.2 73.73 : 118.05	108.2 84.25 : 112.57
1,1,2-Trichloroethane	TM116	98.8 77.12 : 116.04	95.8 81.29 : 113.79
1,1-Dichloroethane	TM116	93.2 74.46 : 129.15	110.4 86.77 : 122.11
1,2-Dichloroethane	TM116	109.2 92.38 : 131.65	111.0 90.04 : 132.28



CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-114 Client Reference: B025563 Report Number: 592273
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

VOC MS (S)

		QC 2338	QC 2352
1,4-Dichlorobenzene	TM116	99.4 83.64 : 126.18	105.8 80.81 : 125.07
2-Chlorotoluene	TM116	96.6 76.03 : 113.25	86.6 73.13 : 114.13
4-Chlorotoluene	TM116	91.6 66.90 : 112.46	89.4 68.66 : 109.13
Benzene	TM116	95.2 88.60 : 113.80	104.8 84.29 : 112.22
Carbon Disulphide	TM116	81.0 74.91 : 122.14	102.6 75.11 : 124.81
Carbontetrachloride	TM116	105.6 80.31 : 124.50	101.2 82.35 : 126.46
Chlorobenzene	TM116	102.2 83.81 : 114.18	104.0 82.88 : 122.42
Chloroform	TM116	95.4 87.40 : 122.49	110.6 90.35 : 120.38
Chloromethane	TM116	85.0 65.89 : 136.93	120.4 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	95.2 80.67 : 126.72	110.4 78.27 : 128.90
Dibromomethane	TM116	113.6 73.23 : 118.35	97.2 76.00 : 120.73
Dichloromethane	TM116	100.8 81.11 : 133.25	115.8 92.27 : 134.36
Ethylbenzene	TM116	94.8 75.92 : 110.41	89.8 70.95 : 113.07
Hexachlorobutadiene	TM116	84.8 12.82 : 152.73	57.2 14.55 : 147.92
Isopropylbenzene	TM116	88.8 55.79 : 97.59	79.8 52.00 : 108.19
Naphthalene	TM116	95.8 80.86 : 128.81	103.8 80.29 : 135.77
o-Xylene	TM116	93.0 69.99 : 108.74	87.0 64.92 : 98.85
p/m-Xylene	TM116	92.5 68.32 : 108.91	82.0 69.47 : 97.31
Sec-Butylbenzene	TM116	91.8 38.50 : 101.50	62.2 27.03 : 135.73
Tetrachloroethene	TM116	106.8 76.95 : 121.02	99.4 81.43 : 126.65
Toluene	TM116	91.0 74.24 : 107.42	92.4 82.44 : 103.50
Trichloroethene	TM116	94.2 85.28 : 109.36	99.0 79.80 : 112.33
Trichlorofluoromethane	TM116	86.6 84.55 : 133.27	109.0 89.67 : 132.09
Vinyl Chloride	TM116	88.2 68.02 : 143.37	120.6 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



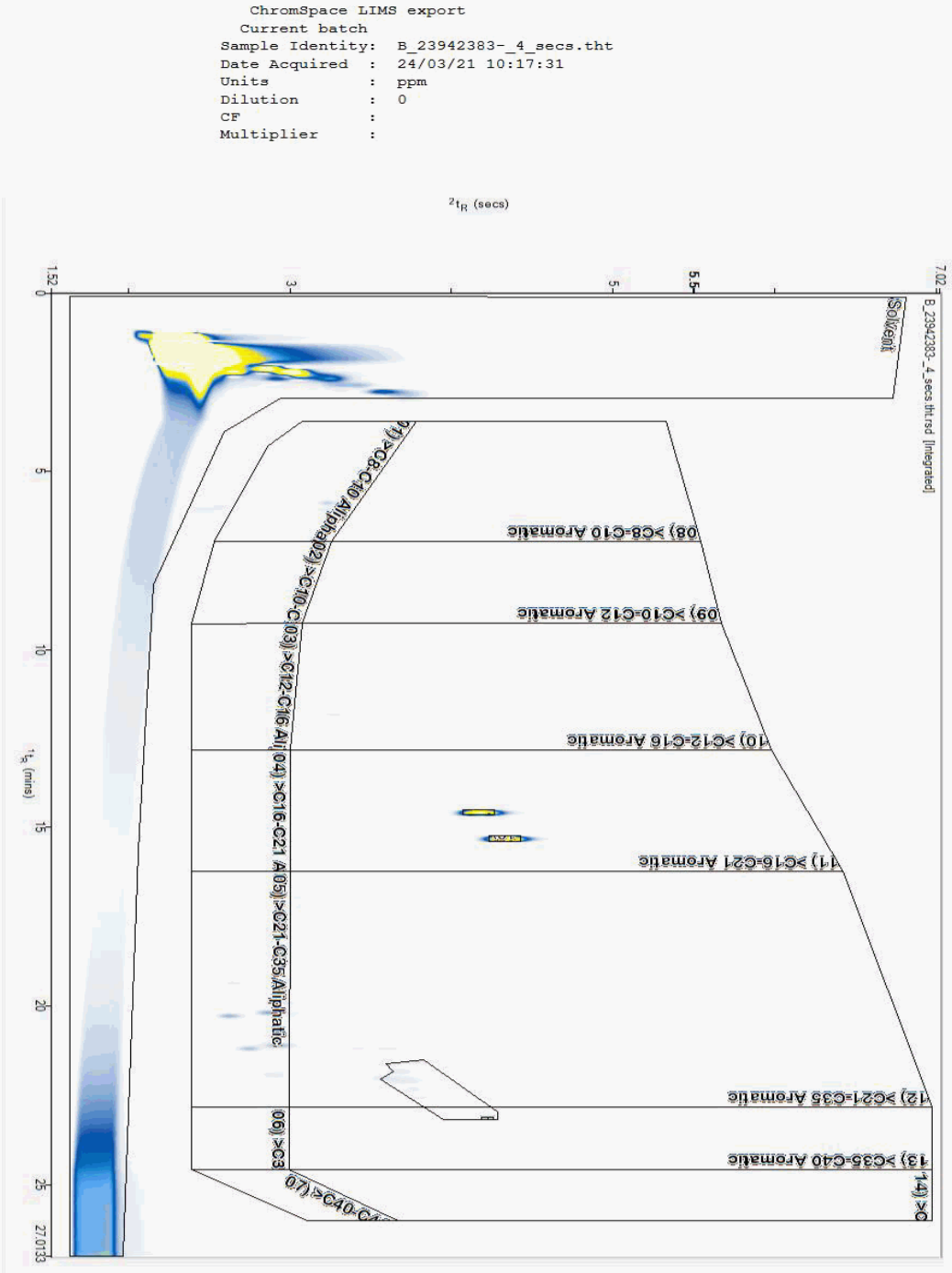
CERTIFICATE OF ANALYSIS

Validated

SDG: 210318-114 Client Reference: B025563 Report Number: 592273
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23942383 Depth : 0.10
Sample ID : OBC - 06 ES





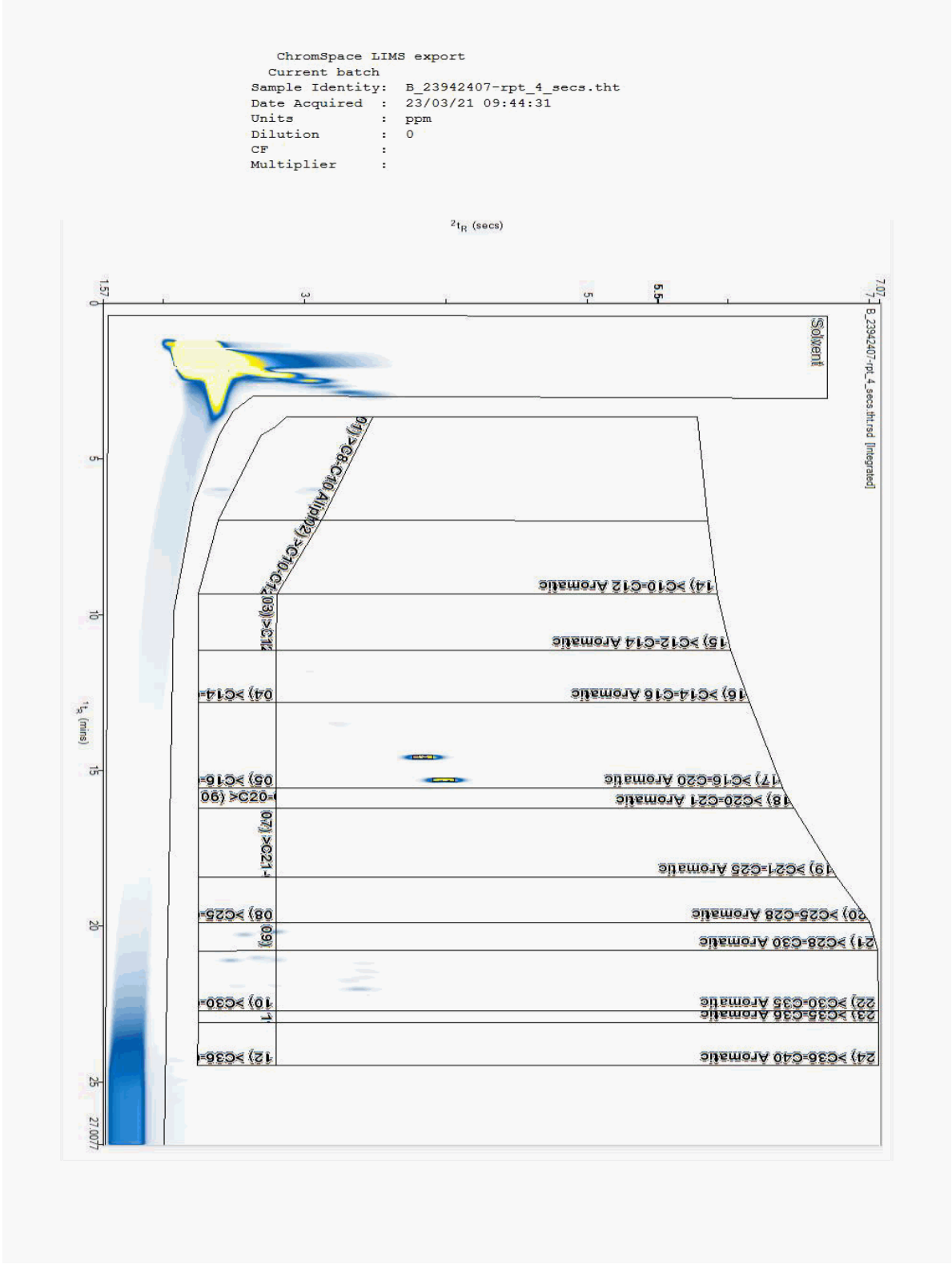
CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH by GCxGC-FID
Sample No : 23942407
Sample ID : OBC - 06 ES
Depth : 0.10



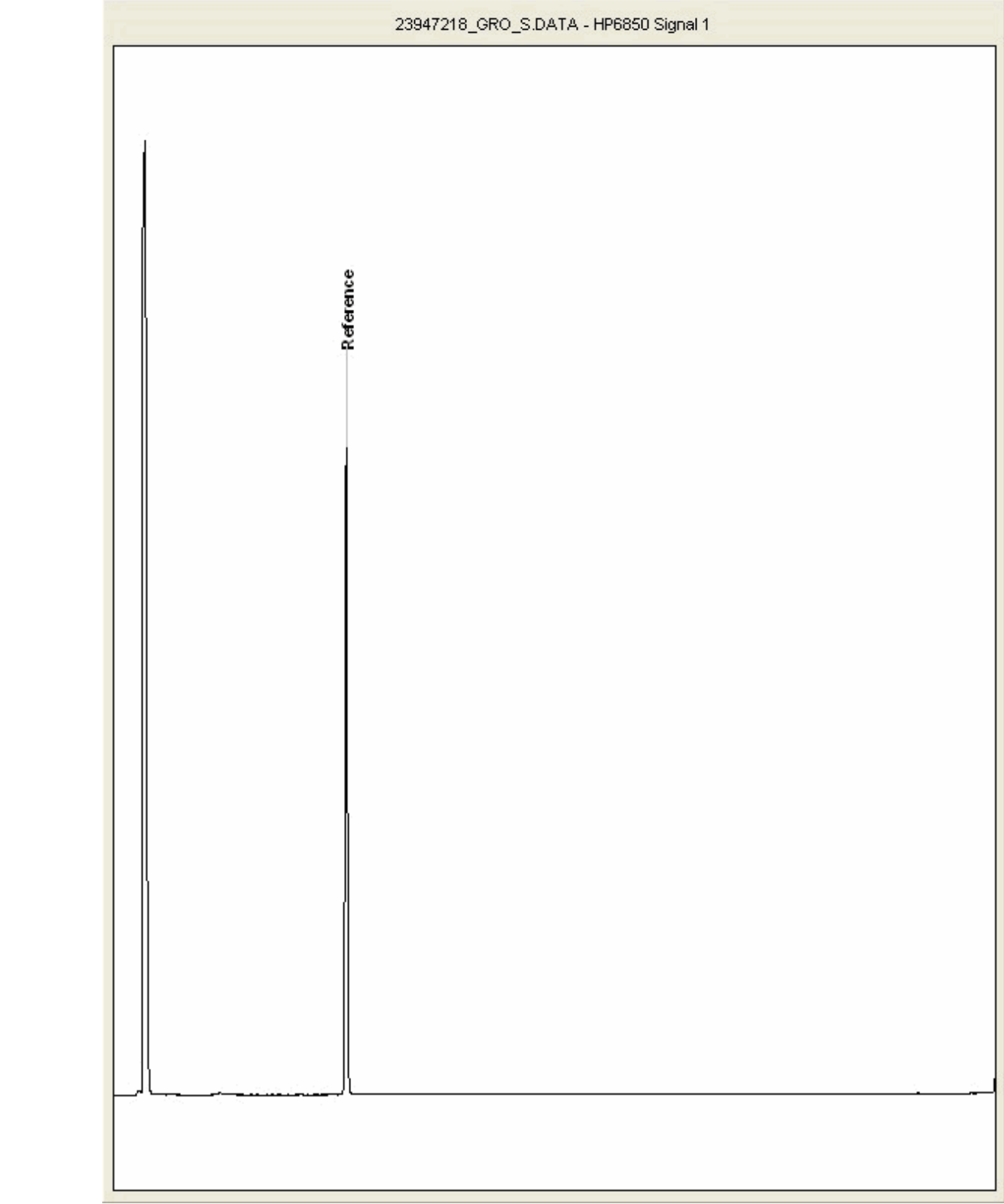
CERTIFICATE OF ANALYSIS

Validated

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)
Sample No : 23947218
Sample ID : OBC - 06 ES
Depth : 0.10





CERTIFICATE OF ANALYSIS

SDG:	210318-114	Client Reference:	B025563	Report Number:	592273
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

29 March 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210319-161

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

592376

We received 5 samples on Friday March 19, 2021 and 1 of these samples were scheduled for analysis which was completed on Monday March 29, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 29/03/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210319-161 Client Reference: B025563 Report Number: 592376
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23938106	OBC-09		0.10	18/03/2021
23938107	OBC-09		0.20	18/03/2021
23938109	OBC-09		0.50	18/03/2021
23938110	OBC-09		1.00	18/03/2021
23938105	OBC-06-WS1		3.10	17/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210319-161 Client Reference: B025563 Report Number: 592376
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23938110		
	Customer Sample Reference		OBC-09		
	AGS Reference				
	Depth (m)		1.00		
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	

CERTIFICATE OF ANALYSIS

Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unflit + " (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>OBC-09</div> <div>1.00 Unspecified Solid (UNS) 18/03/2021 12:00:00 19/03/2021 210319-161 23938110</div>				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	18					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13					
Sulphur, Total	<0.02 %	TM132	0.0245					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0058					
pH	1 pH Units	TM133	8.5					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6					
Cyanide, Free	<1 mg/kg	TM153	<1					
Chromium, Trivalent	<0.9 mg/kg	TM181	20.6					
Antimony	<0.6 mg/kg	TM181	<0.6					
Arsenic	<0.6 mg/kg	TM181	4.22					
Barium	<0.6 mg/kg	TM181	98.3					
Beryllium	<0.01 mg/kg	TM181	0.849					
Cadmium	<0.02 mg/kg	TM181	0.0332					
Chromium	<0.9 mg/kg	TM181	20.6					
Copper	<1.4 mg/kg	TM181	11.1					
Iron	<1000 mg/kg	TM181	19400					
Lead	<0.7 mg/kg	TM181	8.59					
Manganese	<0.13 mg/kg	TM181	194					
Mercury	<0.1 mg/kg	TM181	<0.1					
Molybdenum	<0.1 mg/kg	TM181	<0.1					
Nickel	<0.2 mg/kg	TM181	19.5					
Selenium	<1 mg/kg	TM181	<1					
Vanadium	<0.2 mg/kg	TM181	35.2					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	OBC-09					
#	ISO17025 accredited. mCERTS accredited.							
M	Aqueous / settled sample.	Depth (m) Sample Type	1.00 Unspecified Solid (UNS)					
aq	Disolved / filtered sample.							
dis.filt	Total / unfiltered sample.	Date Sampled Sampled Time	18/03/2021 12:00:00					
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received SDG Ref	19/03/2021 210319-161					
**	Trigger breach confirmed							
(F)	Sample deviation (see appendix)	Lab Sample No.(s) AGS Reference						
1-44@								
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	103					
Toluene-d8**	%	TM116	95.1					
4-Bromofluorobenzene**	%	TM116	87.9					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6					
Chloromethane	<7 µg/kg	TM116	<7					
Vinyl Chloride	<6 µg/kg	TM116	<6					
Bromomethane	<10 µg/kg	TM116	<10					
Chloroethane	<10 µg/kg	TM116	<10					
Trichlorofluorormethane	<6 µg/kg	TM116	<6					
1,1-Dichloroethene	<10 µg/kg	TM116	<10					
Carbon Disulphide	<7 µg/kg	TM116	<7					
Dichloromethane	<10 µg/kg	TM116	27.1					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10					
1,1-Dichloroethane	<8 µg/kg	TM116	<8					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6					
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10					
Chloroform	<8 µg/kg	TM116	<8					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7					
1,1-Dichloropropene	<10 µg/kg	TM116	<10					
Carbontetrachloride	<10 µg/kg	TM116	<10					
1,2-Dichloroethane	<5 µg/kg	TM116	<5					
Benzene	<9 µg/kg	TM116	<9					
Trichloroethene	<9 µg/kg	TM116	<9					
1,2-Dichloropropane	<10 µg/kg	TM116	<10					
Dibromomethane	<9 µg/kg	TM116	<9					
Bromodichloromethane	<7 µg/kg	TM116	<7					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
Toluene	<7 µg/kg	TM116	<7					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10					

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	OBC-09 1.00 Unspecified Solid (UNS) 18/03/2021 12:00:00 19/03/2021 210319-161 23938110					
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7					
Tetrachloroethene	<5 µg/kg	TM116	<5					
Dibromochloromethane	<10 µg/kg	TM116	<10					
1,2-Dibromoethane	<10 µg/kg	TM116	<10					
Chlorobenzene	<5 µg/kg	TM116	<5					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10					
Ethylbenzene	<4 µg/kg	TM116	<4					
p/m-Xylene	<10 µg/kg	TM116	<10					
o-Xylene	<10 µg/kg	TM116	<10					
Styrene	<10 µg/kg	TM116	<10					
Bromoform	<10 µg/kg	TM116	<10					
Isopropylbenzene	<5 µg/kg	TM116	<5					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16					
Bromobenzene	<10 µg/kg	TM116	<10					
Propylbenzene	<10 µg/kg	TM116	<10					
2-Chlorotoluene	<9 µg/kg	TM116	<9					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8					
4-Chlorotoluene	<10 µg/kg	TM116	<10					
tert-Butylbenzene	<14 µg/kg	TM116	<14					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9					
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5					
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13					

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23938110
Customer Sample Ref.	OBC-09
AGS Ref.	
Depth	1.00
Type	Unspecified So
Anions by Kone (soil)	25-Mar-2021
Asbestos ID in Solid Samples	24-Mar-2021
Boron Water Soluble	25-Mar-2021
Chromium III	26-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	29-Mar-2021
EPH CWG GC (S)	24-Mar-2021
GRO by GC-FID (S)	24-Mar-2021
Hexavalent Chromium (s)	26-Mar-2021
Metals in solid samples by OES	26-Mar-2021
PAH by GCMS	26-Mar-2021
pH	25-Mar-2021
Phenols by HPLC (S)	29-Mar-2021
Sample description	22-Mar-2021
Total Organic Carbon	26-Mar-2021
Total Sulphur	26-Mar-2021
TPH CWG GC (S)	24-Mar-2021
VOC MS (S)	25-Mar-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2327
Chloride (soluble)	TM243	135.23 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	155.61 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2335
Water Soluble Boron	TM222	92.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2326
Free Cyanide	TM153	100.99 79.00 : 115.00
Thiocyanate	TM153	102.56 94.09 : 113.89
Total Cyanide	TM153	103.5 73.07 : 107.47

EPH CWG GC (S)

Component	Method Code	QC 2303
EPH >C8-C40 Raw	TM414	104.22 73.48 : 116.68
Total Aliphatics Raw	TM414	113.61 72.61 : 118.71
Total Aromatics Raw	TM414	94.93 63.37 : 122.69

GRO by GC-FID (S)

Component	Method Code	QC 2349
QC	TM089	85.36 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2330
Hexavalent Chromium	TM151	100.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2308
Aluminium	TM181	100.0 73.56 : 108.85
Antimony	TM181	102.44 76.89 : 111.24
Arsenic	TM181	101.45 88.53 : 111.01
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	100.0 85.44 : 109.61
Boron	TM181	96.28 73.51 : 104.66
Cadmium	TM181	90.95 77.67 : 104.12
Chromium	TM181	92.29 79.64 : 105.83
Cobalt	TM181	91.51 84.60 : 104.13
Copper	TM181	93.31 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	94.14 78.24 : 104.05
Manganese	TM181	107.78 94.29 : 119.51
Mercury	TM181	101.45 83.16 : 107.81
Molybdenum	TM181	101.65 87.11 : 106.87
Nickel	TM181	93.4 80.26 : 102.28
Phosphorus	TM181	106.87 94.56 : 124.28
Selenium	TM181	100.39 82.28 : 110.48
Strontium	TM181	96.21 79.13 : 102.79
Thallium	TM181	102.65 82.94 : 111.86
Tin	TM181	102.28 86.72 : 110.03
Titanium	TM181	77.86 66.23 : 102.06
Vanadium	TM181	102.2 86.19 : 109.45
Zinc	TM181	102.46 84.68 : 113.99

PAH by GCMS

PAH by GCMS

Component	Method Code	QC 2358
Acenaphthene	TM218	91.5 78.59 : 112.16
Acenaphthylene	TM218	90.0 75.11 : 109.01
Anthracene	TM218	90.5 73.99 : 113.85
Benz(a)anthracene	TM218	86.0 69.31 : 119.18
Benzo(a)pyrene	TM218	81.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	88.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	89.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	86.0 69.98 : 116.49
Chrysene	TM218	87.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	88.0 64.54 : 115.22
Fluoranthene	TM218	85.5 72.56 : 111.70
Fluorene	TM218	91.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	78.0 61.22 : 113.25
Naphthalene	TM218	90.0 77.96 : 110.91
Phenanthrene	TM218	90.5 76.83 : 113.25
Pyrene	TM218	86.5 72.45 : 110.77

pH

Component	Method Code	QC 2384
pH	TM133	100.79 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2318
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	54.55 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	46.35 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	54.97 69.44 : 122.18

Phenols by HPLC (S)

		QC 2318
Xylenols by HPLC (S)	TM062 (S)	52.4 76.56 : 106.38

Total Organic Carbon

Component	Method Code	QC 2322
Total Organic Carbon	TM132	97.66 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2335
Total Sulphur %	TM132	76.17 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2367	QC 2370
1,1,1,2-tetrachloroethane	TM116	115.6 79.10 : 119.66	100.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	107.8 84.25 : 112.57	102.0 73.73 : 118.05
1,1,2-Trichloroethane	TM116	101.6 81.29 : 113.79	98.8 77.12 : 116.04
1,1-Dichloroethane	TM116	109.8 86.77 : 122.11	109.2 74.46 : 129.15
1,2-Dichloroethane	TM116	113.2 90.04 : 132.28	110.2 92.38 : 131.65
1,4-Dichlorobenzene	TM116	99.6 80.81 : 125.07	112.6 83.64 : 126.18
2-Chlorotoluene	TM116	85.2 73.13 : 114.13	97.6 76.03 : 113.25
4-Chlorotoluene	TM116	86.6 68.66 : 109.13	97.2 66.90 : 112.46
Benzene	TM116	104.6 84.29 : 112.22	102.4 88.60 : 113.80
Carbon Disulphide	TM116	94.6 75.11 : 124.81	96.2 74.91 : 122.14
Carbontetrachloride	TM116	109.6 82.35 : 126.46	99.2 80.31 : 124.50
Chlorobenzene	TM116	105.0 82.88 : 122.42	100.2 83.81 : 114.18
Chloroform	TM116	109.0 90.35 : 120.38	109.4 87.40 : 122.49
Chloromethane	TM116	111.8 65.80 : 138.88	104.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	106.2 78.27 : 128.90	105.6 80.67 : 126.72



CERTIFICATE OF ANALYSIS

Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2367	QC 2370
Dibromomethane	TM116	100.8 76.00 : 120.73	97.4 73.23 : 118.35
Dichloromethane	TM116	114.8 92.27 : 134.36	110.8 81.11 : 133.25
Ethylbenzene	TM116	90.4 70.95 : 113.07	91.6 75.92 : 110.41
Hexachlorobutadiene	TM116	54.4 14.55 : 147.92	80.0 12.82 : 152.73
Isopropylbenzene	TM116	78.8 52.00 : 108.19	84.4 55.79 : 97.59
Naphthalene	TM116	105.4 80.29 : 135.77	104.8 80.86 : 128.81
o-Xylene	TM116	90.8 64.92 : 98.85	89.4 69.99 : 108.74
p/m-Xylene	TM116	81.4 69.47 : 97.31	86.4 68.32 : 108.91
Sec-Butylbenzene	TM116	67.0 27.03 : 135.73	77.0 38.50 : 101.50
Tetrachloroethene	TM116	103.0 81.43 : 126.65	95.0 76.95 : 121.02
Toluene	TM116	92.2 82.44 : 103.50	93.8 74.24 : 107.42
Trichloroethene	TM116	100.2 79.80 : 112.33	97.2 85.28 : 109.36
Trichlorofluoromethane	TM116	108.8 89.67 : 132.09	94.0 84.55 : 133.27
Vinyl Chloride	TM116	111.8 69.66 : 136.55	102.2 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



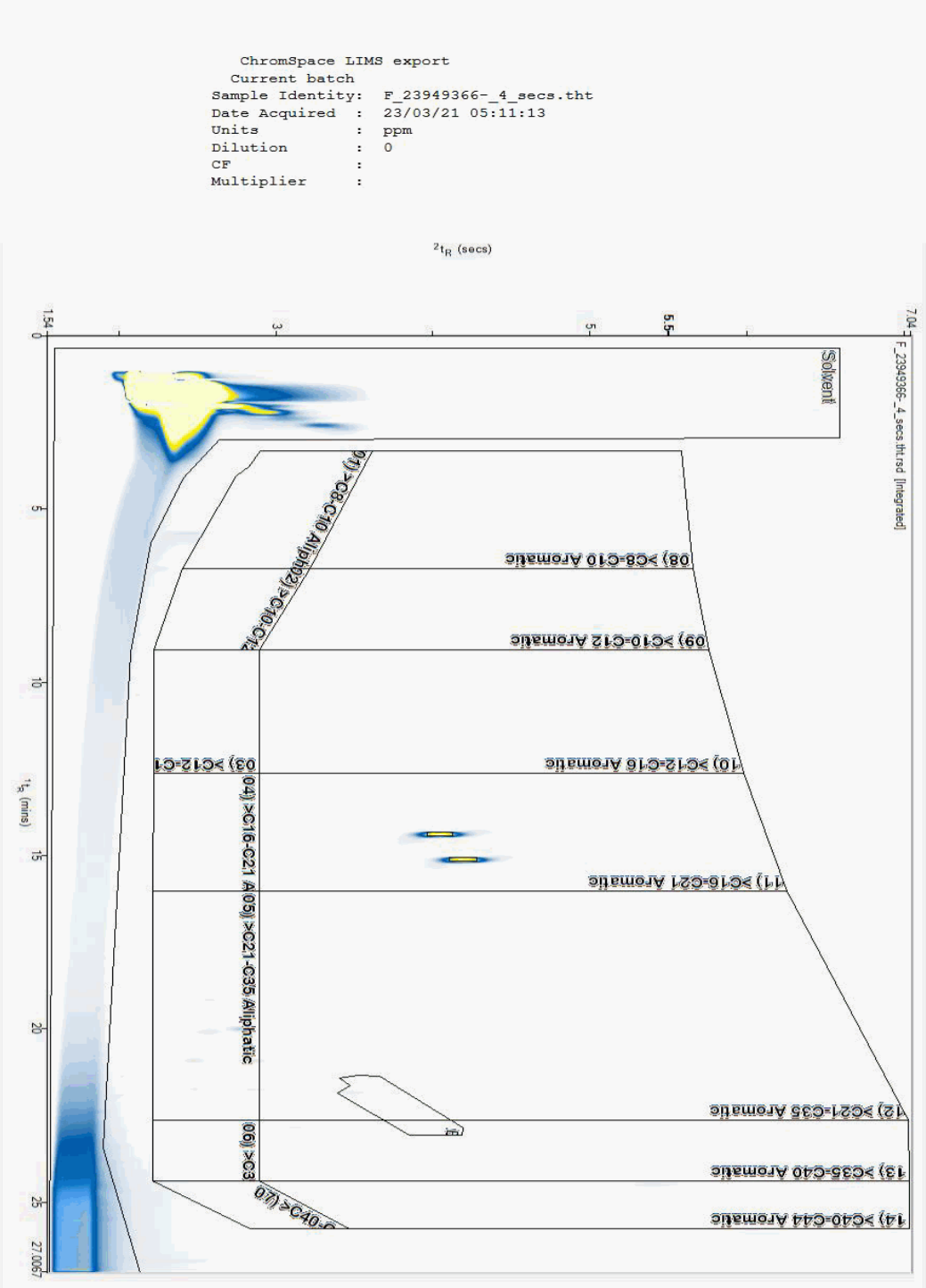
CERTIFICATE OF ANALYSIS

Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23949366	Depth :	1.00
		Sample ID :	OBC-09		





CERTIFICATE OF ANALYSIS

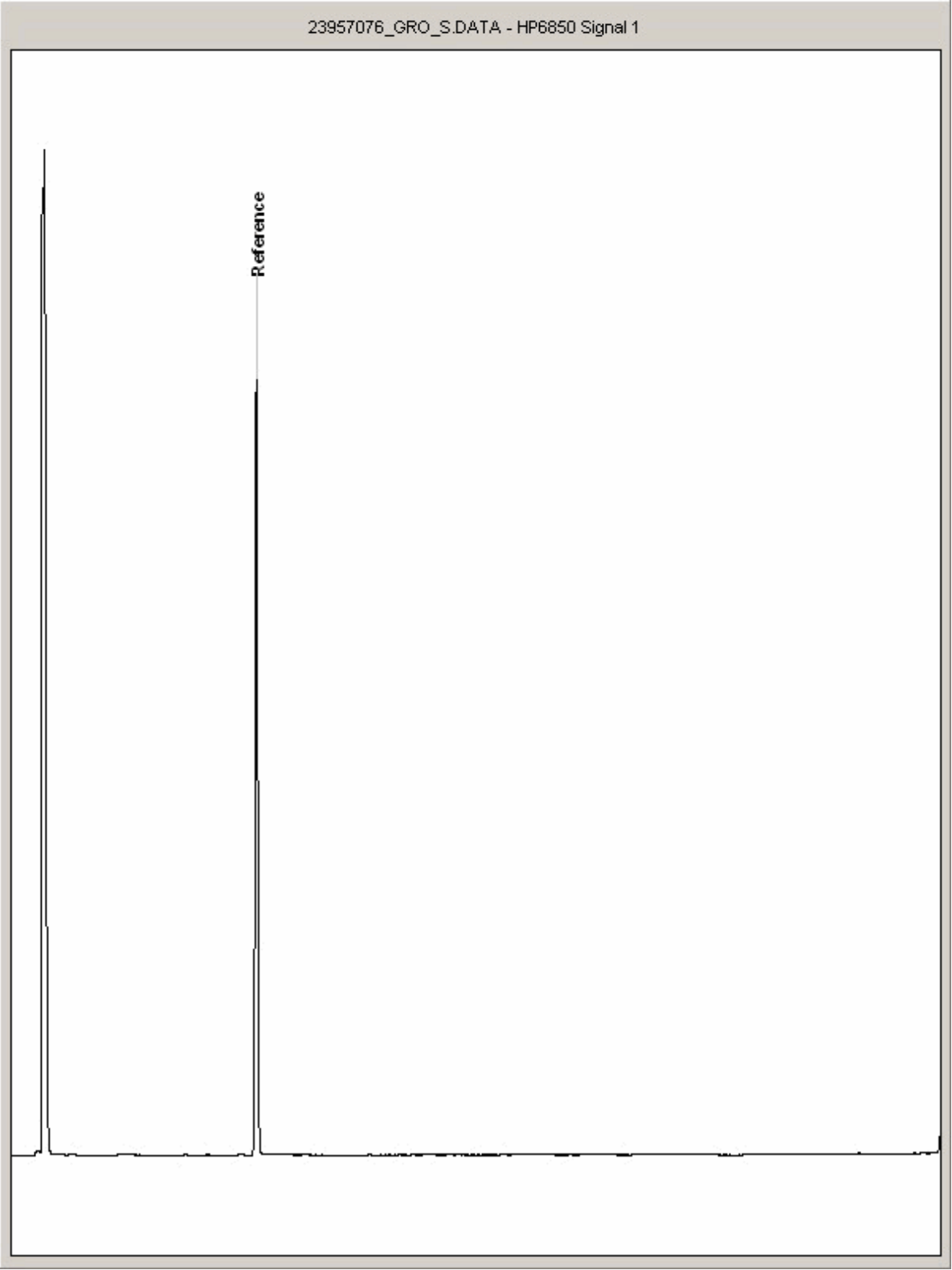
Validated

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23957076
Sample ID : OBC-09
Depth : 1.00



CERTIFICATE OF ANALYSIS

SDG:	210319-161	Client Reference:	B025563	Report Number:	592376
Location:	Cambridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS					Validated
SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23950835	BH-PTR-3A		0.10	17/03/2021
23950836	BH-PTR-3A		0.20	17/03/2021
23950837	BH-PTR-3A		0.50	17/03/2021
23950838	BH-PTR-3A		1.00	17/03/2021
23950839	BH-PTR-3A		1.50	17/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 30 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210323-5
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592561

We received 5 samples on Monday March 22, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 30, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-5 Client Reference: B025563 Report Number: 592561
Location: Cambridge South East TraOrder Number: 7000964

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23950836		
	Customer Sample Reference		BH-PT-R-3A		
	AGS Reference				
	Depth (m)		0.20		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-5 Client Reference: B025563 Report Number: 592561
Location: Cambridge South East TraOrder Number: 7000964

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23950836		
	Customer Sample Reference		BH-PT-R-3A		
	AGS Reference				
	Depth (m)		0.20		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23950836	BH-PTR-3A	0.20	Dark Brown	Silt Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PTR-3A				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		17/03/2021				
dis.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		22/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210323-5				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23950836				
(F)	Trigger breach confirmed						
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	17				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0435				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0444	#			
pH	1 pH Units	TM133	8.53	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	7.09				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	5.04	M			
Barium	<0.6 mg/kg	TM181	66.3	#			
Beryllium	<0.01 mg/kg	TM181	0.317	M			
Cadmium	<0.02 mg/kg	TM181	0.126	M			
Chromium	<0.9 mg/kg	TM181	7.09	M			
Copper	<1.4 mg/kg	TM181	8.94	M			
Iron	<1000 mg/kg	TM181	7790	#			
Lead	<0.7 mg/kg	TM181	14	M			
Manganese	<0.13 mg/kg	TM181	204	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.159	#			
Nickel	<0.2 mg/kg	TM181	12.2	M			
Selenium	<1 mg/kg	TM181	1.29	#			
Vanadium	<0.2 mg/kg	TM181	13.4	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-3A						
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 17/03/2021 . 22/03/2021 210323-5 23950836						
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4\$@	Sample deviation (see appendix)								
Component	LOD/Units			Method					
Dibromofluoromethane**	%	TM116	103						
Toluene-d8**	%	TM116	96						
4-Bromofluorobenzene**	%	TM116	81.2						
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M						
Chloromethane	<7 µg/kg	TM116	<7 #						
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M						
Bromomethane	<10 µg/kg	TM116	<10 M						
Chloroethane	<10 µg/kg	TM116	<10 M						
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M						
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #						
Carbon Disulphide	<7 µg/kg	TM116	<7 M						
Dichloromethane	<10 µg/kg	TM116	<10 #						
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M						
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M						
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M						
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M						
2,2-Dichloropropane	<10 µg/kg	TM116	<10						
Bromochloromethane	<10 µg/kg	TM116	<10 M						
Chloroform	<8 µg/kg	TM116	<8 M						
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M						
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M						
Carbontetrachloride	<10 µg/kg	TM116	<10 M						
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M						
Benzene	<9 µg/kg	TM116	<9 M						
Trichloroethene	<9 µg/kg	TM116	<9 #						
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M						
Dibromomethane	<9 µg/kg	TM116	<9 M						
Bromodichloromethane	<7 µg/kg	TM116	<7 M						
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M						
Toluene	<7 µg/kg	TM116	<7 M						
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M						

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-PTR-3A					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 17/03/2021 . 22/03/2021 210323-5 23950836						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M						
Styrene	<10 µg/kg	TM116	<10 @ #						
Bromoform	<10 µg/kg	TM116	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13 M						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-PTR-3A	26.03.2021	Emily Anderton	/	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20										
Sample Type	SOLID										
Date Sampled	17/03/2021 00:00:00										
Date Received	22/03/2021 08:15:00										
SDG	210323-5										
Original Sample	23950836										
Method Number	TM048										

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F		
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)	22.2		
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	81.8		
Particle Size <4mm	>95%				
Case					
SDG	210323-5				
Lab Sample Number(s)	23950836				
Sampled Date	17-Mar-2021				
Customer Sample Ref.	BH-PTR-3A				
Depth (m)	0.20				

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.22	<3	62.2	<30	-	-	-
Fluoride	1.01	<0.5	10.1	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.000946	<0.0005	0.00946	<0.005	-	-	-
Barium	0.00761	<0.0002	0.0761	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.017	<0.01	0.17	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	20.5	<0.2	205	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00301	<0.0003	0.0301	<0.003	-	-	-
Lead	0.000383	<0.0002	0.00383	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.191	<0.036	1.91	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00291	<0.0004	0.0291	<0.004	-	-	-
Selenium	0.00111	<0.001	0.0111	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	25-Mar-2021
pH (pH Units)	8.55
Conductivity (µS/cm)	91.00
Temperature (°C)	19.20
Volume Leachant (Litres)	0.880



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-5Client Reference: B025563Report Number: 592561

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.110

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site LocationCambridge South East Transport - f

Natural Moisture Content (%)22.2

Dry Matter Content (%)81.8

Case

SDG210323-5

Lab Sample Number(s)23950836

Sampled Date17-Mar-2021

Customer Sample Ref.BH-PTR-3A

Depth (m)0.20

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	52.1	<0.65	521	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.166	<0.019	1.66	<0.19	-	-	-

Leach Test Information

Date Prepared25-Mar-2021

pH (pH Units)8.55

Conductivity (µS/cm)91.00

Temperature (°C)19.20

Volume Leachant (Litres)0.880



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-5Client Reference: B025563Report Number: 592561

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23950836
Customer Sample Ref.	BH-PTR-3A
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
Ammonium Low	29-Mar-2021
Anions by Kone (soil)	29-Mar-2021
Anions by Kone (w)	29-Mar-2021
Asbestos ID in Solid Samples	26-Mar-2021
Boron Water Soluble	30-Mar-2021
CEN 10:1 Leachate (1 Stage)	25-Mar-2021
CEN Readings	27-Mar-2021
Chromium III	30-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	26-Mar-2021
Dissolved Metals by ICP-MS	29-Mar-2021
Dissolved Organic/Inorganic Carbon	29-Mar-2021
EPH CWG GC (S)	26-Mar-2021
Fluoride	29-Mar-2021
GRO by GC-FID (S)	30-Mar-2021
Hexavalent Chromium (s)	29-Mar-2021
Low Level Cyanide (W)	30-Mar-2021
Low Level Hexavalent Chromium (w)	29-Mar-2021
Mercury Dissolved	30-Mar-2021
Metals in solid samples by OES	30-Mar-2021
Moisture at 105C	25-Mar-2021
PAH by GCMS	26-Mar-2021
pH	25-Mar-2021
pH Value of Filtered Water	29-Mar-2021
Phenols by HPLC (S)	30-Mar-2021
Phenols by HPLC (W)	30-Mar-2021
Sample description	24-Mar-2021
Total Organic Carbon	30-Mar-2021
Total Sulphur	29-Mar-2021
TPH CWG GC (S)	30-Mar-2021
VOC MS (S)	29-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2363
Ammoniacal Nitrogen as N	TM099	101.8 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2368
Chloride (soluble)	TM243	151.81 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	165.89 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2321
Chloride	TM184	105.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2371
Water Soluble Boron	TM222	97.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2380
Free Cyanide	TM153	93.47 79.00 : 115.00
Thiocyanate	TM153	96.15 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2377	QC 2326
Aluminium	TM152	103.67 90.98 : 111.82	103.0 94.21 : 111.52
Antimony	TM152	102.5 90.44 : 113.04	103.83 88.37 : 130.57
Arsenic	TM152	103.83 88.00 : 112.00	100.17 92.62 : 113.52



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-5

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

592561

Dissolved Metals by ICP-MS

		QC 2377	QC 2326
Barium	TM152	101.17 90.20 : 111.19	104.83 88.62 : 113.14
Beryllium	TM152	104.17 87.77 : 113.97	103.67 87.08 : 111.38
Bismuth	TM152	100.5 91.90 : 112.20	101.17 92.62 : 115.02
Borate	TM152	105.56 88.00 : 112.00	
Boron	TM152	105.67 96.48 : 114.93	101.33 86.31 : 120.88
Cadmium	TM152	102.67 96.43 : 110.53	102.67 93.85 : 111.65
Calcium	TM152	102.67 81.38 : 119.09	102.0 89.20 : 126.91
Chromium	TM152	102.33 91.84 : 108.67	98.83 92.50 : 113.03
Cobalt	TM152	102.83 88.00 : 112.00	98.83 85.01 : 114.87
Copper	TM152	102.83 92.47 : 118.11	97.5 89.87 : 119.73
Iron	TM152	102.67 92.00 : 113.00	100.0 93.02 : 113.86
Lead	TM152	101.83 88.00 : 112.00	101.5 91.11 : 116.98
Lithium	TM152	104.5 91.62 : 113.12	102.5 87.70 : 115.90
Magnesium	TM152	99.33 93.14 : 107.91	98.0 89.60 : 116.61
Manganese	TM152	103.17 95.03 : 110.58	101.5 93.97 : 112.46
Molybdenum	TM152	99.33 88.00 : 112.00	96.67 89.07 : 110.96
Nickel	TM152	103.5 88.00 : 112.00	99.0 93.70 : 112.15
Phosphorus	TM152	103.0 88.00 : 112.00	103.0 89.24 : 114.18
Potassium	TM152	102.0 93.90 : 112.36	100.67 93.20 : 115.55
Selenium	TM152	101.5 91.58 : 115.98	101.67 91.69 : 117.12
Silver	TM152	95.67 88.80 : 122.30	98.67 90.93 : 121.73
Sodium	TM152	100.67 94.28 : 110.71	98.0 92.42 : 113.24
Strontium	TM152	102.0 88.00 : 112.00	103.67 92.14 : 116.24
Tellurium	TM152	101.5 93.32 : 114.66	102.0 89.88 : 111.78
Thallium	TM152	96.67 88.00 : 112.00	98.17 82.43 : 113.83
Tin	TM152	102.33 92.63 : 109.70	102.83 94.62 : 107.79
Titanium	TM152	105.0 95.58 : 111.68	105.33 90.29 : 115.23



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-5

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

592561

Dissolved Metals by ICP-MS

		QC 2377	QC 2326
Tungsten	TM152	99.0 81.32 : 124.72	99.67 77.61 : 132.31
Uranium	TM152	99.0 88.00 : 112.00	101.33 86.97 : 115.76
Vanadium	TM152	98.0 88.00 : 112.00	100.17 89.61 : 115.48
Zinc	TM152	103.33 92.98 : 118.95	99.67 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2300
Dissolved Inorganic Carbon	TM090	102.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.33 96.13 : 109.53

Fluoride

Component	Method Code	QC 2357
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2308
QC	TM089	97.98 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2312
Hexavalent Chromium	TM151	110.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2309
Free Cyanide - Low Level	TM279	78.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	94.75 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-5	Client Reference:	B025563	Report Number:	592561	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2344				
Mercury Dissolved (CVAf)	TM183	117.0 69.30 : 128.70				

Metals in solid samples by OES		
Component	Method Code	QC 2318
Aluminium	TM181	96.46 73.56 : 108.85
Antimony	TM181	101.22 76.89 : 111.24
Arsenic	TM181	104.07 88.53 : 111.01
Barium	TM181	100.92 77.67 : 105.35
Beryllium	TM181	104.1 85.44 : 109.61
Boron	TM181	92.26 73.51 : 104.66
Cadmium	TM181	100.82 77.67 : 104.12
Chromium	TM181	90.87 79.64 : 105.83
Cobalt	TM181	94.65 84.60 : 104.13
Copper	TM181	96.83 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	92.57 78.24 : 104.05
Manganese	TM181	111.67 94.29 : 119.51
Mercury	TM181	97.83 83.16 : 107.81
Molybdenum	TM181	103.7 87.11 : 106.87
Nickel	TM181	94.87 80.26 : 102.28
Phosphorus	TM181	112.53 94.56 : 124.28
Selenium	TM181	103.92 82.28 : 110.48
Strontium	TM181	97.33 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	103.42 86.72 : 110.03
Titanium	TM181	82.44 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-5	Client Reference:	B025563	Report Number:	592561	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2318				
Vanadium	TM181	100.0 86.19 : 109.45				
Zinc	TM181	101.03 84.68 : 113.99				

Component	Method Code	QC 2361
Acenaphthene	TM218	93.0 76.79 : 103.90
Acenaphthylene	TM218	89.5 78.40 : 108.66
Anthracene	TM218	92.0 70.90 : 109.22
Benz(a)anthracene	TM218	91.0 73.77 : 119.26
Benzo(a)pyrene	TM218	88.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	83.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	88.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	91.0 75.98 : 116.59
Chrysene	TM218	89.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	84.5 69.17 : 115.30
Fluoranthene	TM218	93.5 75.88 : 112.84
Fluorene	TM218	92.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	87.0 70.26 : 117.95
Naphthalene	TM218	94.0 74.70 : 101.83
Phenanthrene	TM218	93.5 73.62 : 109.34
Pyrene	TM218	93.0 71.46 : 117.00

pH		
Component	Method Code	QC 2376
pH	TM133	100.53 99.08 : 102.24

pH Value of Filtered Water



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-5

Client Reference: B025563

Report Number: 592561

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

pH Value of Filtered Water

Component	Method Code	QC 2376
pH	TM256	<div>100.67</div> <div>99.33 : 102.54</div>

Phenols by HPLC (S)

Component	Method Code	QC 2384
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<div>56.49</div> <div>69.38 : 125.27</div>
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<div>50.29</div> <div>69.79 : 122.84</div>
Cresols by HPLC (S)	TM062 (S)	<div>50.52</div> <div>77.98 : 111.41</div>
Phenol by HPLC (S)	TM062 (S)	<div>56.29</div> <div>67.94 : 117.69</div>
Xylenols by HPLC (S)	TM062 (S)	<div>54.27</div> <div>88.23 : 104.42</div>

Phenols by HPLC (W)

Component	Method Code	QC 2375
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	<div>50.0</div> <div>77.41 : 127.55</div>
2-Isopropyl Phenol by HPLC (W)	TM259	<div>49.0</div> <div>82.77 : 126.51</div>
Cresols by HPLC (W)	TM259	<div>47.33</div> <div>76.60 : 126.28</div>
Napthol by HPLC (W)	TM259	<div>52.0</div> <div>75.40 : 129.40</div>
Phenol by HPLC (W)	TM259	<div>49.0</div> <div>85.77 : 125.91</div>
Xylenols by HPLC (W)	TM259	<div>49.67</div> <div>79.09 : 131.82</div>

Total Organic Carbon

Component	Method Code	QC 2339
Total Organic Carbon	TM132	<div>89.45</div> <div>87.02 : 113.45</div>

Total Sulphur

Component	Method Code	QC 2321
Total Sulphur %	TM132	<div>92.23</div> <div>61.64 : 114.47</div>

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CERTIFICATE OF ANALYSIS

Validated

SDG:210323-5

Client Reference: B025563

Report Number: 592561

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

VOC MS (S)

Component	Method Code	QC 2329
1,1,1,2-tetrachloroethane	TM116	<div>98.4</div> <div>86.59 : 118.97</div>
1,1,1-Trichloroethane	TM116	<div>104.4</div> <div>86.26 : 117.53</div>
1,1,2-Trichloroethane	TM116	<div>98.4</div> <div>75.16 : 112.70</div>
1,1-Dichloroethane	TM116	<div>117.8</div> <div>83.27 : 122.16</div>
1,2-Dichloroethane	TM116	<div>107.0</div> <div>89.30 : 133.10</div>
1,4-Dichlorobenzene	TM116	<div>97.8</div> <div>82.59 : 123.23</div>
2-Chlorotoluene	TM116	<div>95.8</div> <div>66.81 : 118.43</div>
4-Chlorotoluene	TM116	<div>89.8</div> <div>65.88 : 114.76</div>
Benzene	TM116	<div>102.0</div> <div>93.16 : 123.63</div>
Carbon Disulphide	TM116	<div>112.4</div> <div>75.11 : 124.81</div>
Carbontetrachloride	TM116	<div>102.6</div> <div>82.35 : 126.46</div>
Chlorobenzene	TM116	<div>100.4</div> <div>85.07 : 118.13</div>
Chloroform	TM116	<div>109.8</div> <div>88.13 : 122.71</div>
Chloromethane	TM116	<div>134.4</div> <div>61.62 : 145.66</div>
Cis-1,2-Dichloroethene	TM116	<div>111.4</div> <div>78.27 : 128.90</div>
Dibromomethane	TM116	<div>93.8</div> <div>77.47 : 121.29</div>
Dichloromethane	TM116	<div>114.8</div> <div>87.89 : 134.72</div>
Ethylbenzene	TM116	<div>89.0</div> <div>79.92 : 110.05</div>
Hexachlorobutadiene	TM116	<div>82.0</div> <div>16.78 : 153.29</div>
Isopropylbenzene	TM116	<div>88.2</div> <div>64.20 : 119.59</div>
Naphthalene	TM116	<div>103.0</div> <div>79.29 : 125.59</div>
o-Xylene	TM116	<div>88.8</div> <div>72.86 : 102.10</div>
p/m-Xylene	TM116	<div>82.8</div> <div>74.06 : 106.47</div>
Sec-Butylbenzene	TM116	<div>85.4</div> <div>44.71 : 117.87</div>
Tetrachloroethene	TM116	<div>102.2</div> <div>85.86 : 122.95</div>
Toluene	TM116	<div>97.0</div> <div>87.82 : 116.21</div>
Trichloroethene	TM116	<div>102.6</div> <div>79.80 : 112.33</div>

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2329
Trichlorofluoromethane	TM116	111.8 80.52 : 132.12
Vinyl Chloride	TM116	131.2 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



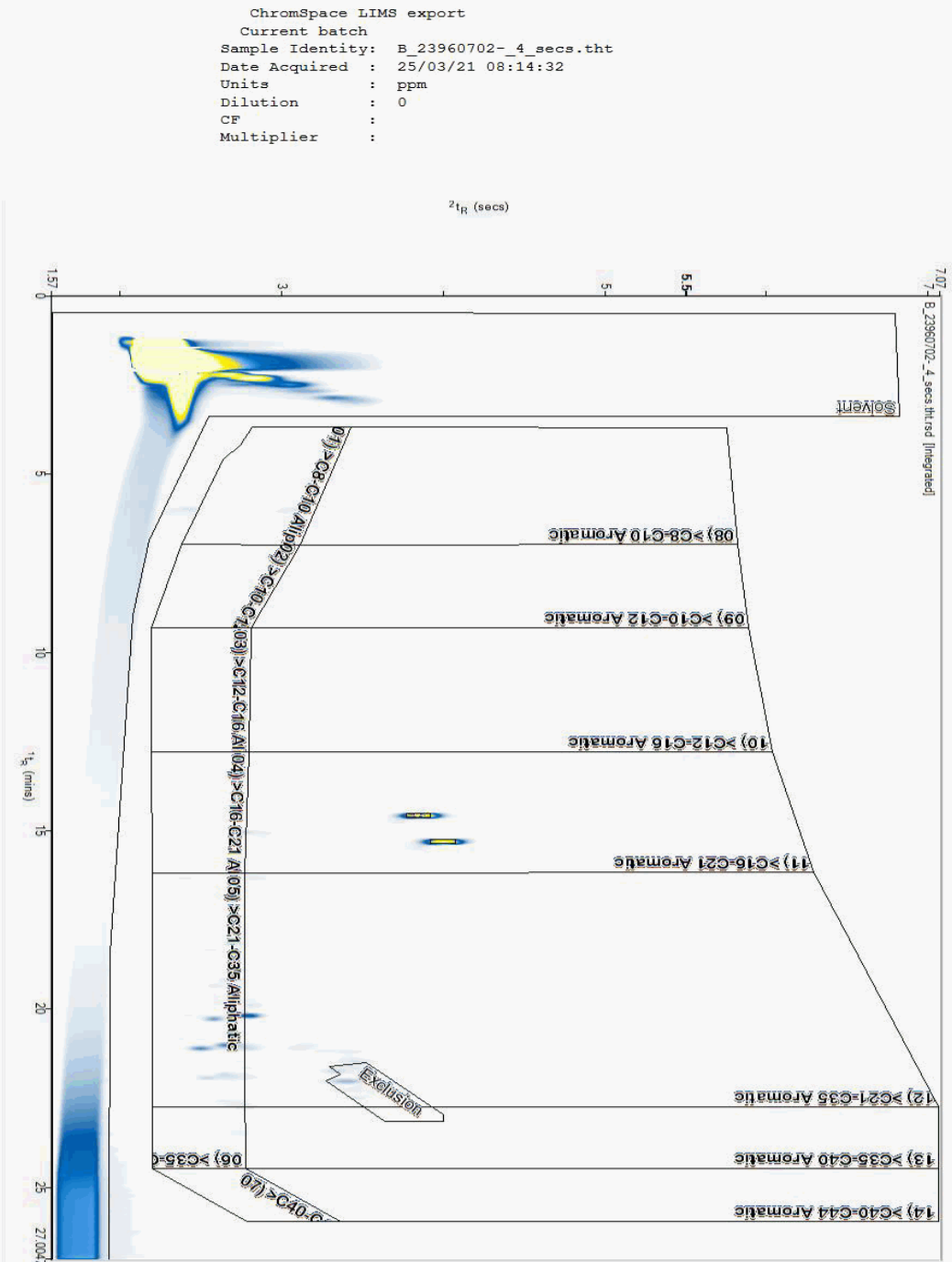
CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-5	Client Reference:	B025563	Report Number:	592561
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23960702	Depth :	0.20
		Sample ID :	BH-PTR-3A		





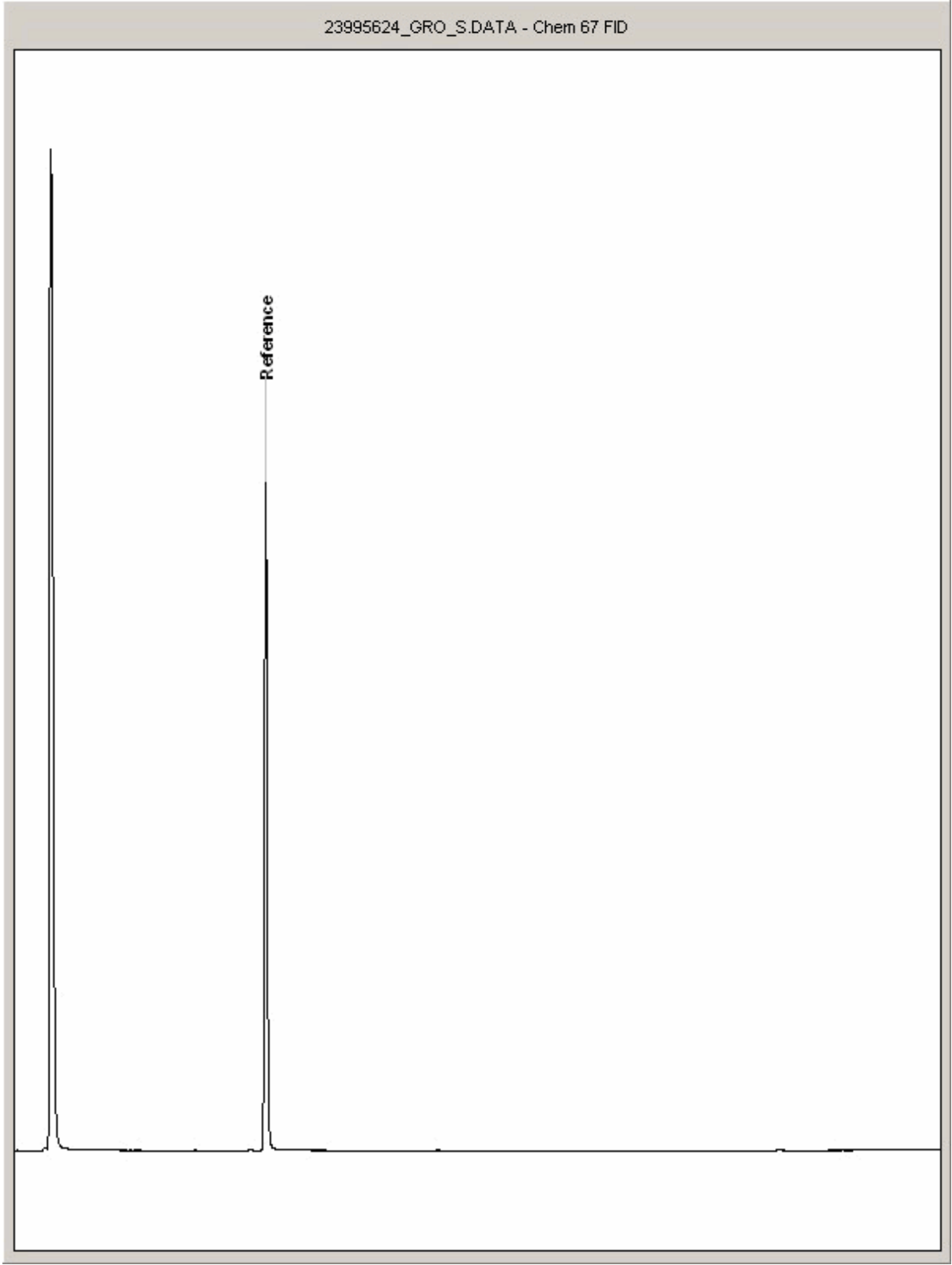
CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-5 Client Reference: B025563 Report Number: 592561
Location: Cambridge South East Tra Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23995624 Depth : 0.20
Sample ID : BH-PTR-3A



CERTIFICATE OF ANALYSIS

SDG: 210323-5 Client Reference: B025563 Report Number: 592561
Location: Cambridge South East Transport - Ph Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
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CERTIFICATE OF ANALYSIS					Validated
SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23950990	OBC- 03	ES1	0.10	18/03/2021
23950991	OBC- 03	ES2	0.20	18/03/2021
23950992	OBC- 03	ES3	0.50	18/03/2021
23950993	OBC- 03	ES4	1.00	18/03/2021
23950995	OBC- 03	GW1	1.30	18/03/2021
23950994	OBC- 09	GW1	1.30	18/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 30 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210323-7
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592550

We received 6 samples on Monday March 22, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 30, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:210323-7Client Reference: B025563Report Number: 592550

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23950992		
	Customer Sample Reference		OBC- 03		
	AGS Reference		ES3		
	Depth (m)		0.50		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Anions by Kone (soil)		NDPs: 0 Tests: 1	X	
	Asbestos ID in Solid Samples		NDPs: 0 Tests: 1	X	
	Boron Water Soluble		NDPs: 0 Tests: 1	X	
	Chromium III		NDPs: 0 Tests: 1	X	
	Cyanide Comp/Free/Total/Thiocyanate		NDPs: 0 Tests: 1	X	
	EPH CWG GC (S)		NDPs: 0 Tests: 1	X	
	GRO by GC-FID (S)		NDPs: 0 Tests: 1		X
	Hexavalent Chromium (s)		NDPs: 0 Tests: 1	X	
	Metals in solid samples by OES		NDPs: 0 Tests: 1	X	
	PAH by GCMS		NDPs: 0 Tests: 1	X	
	pH		NDPs: 0 Tests: 1	X	
	Phenols by HPLC (S)		NDPs: 0 Tests: 1	X	
	Sample description		NDPs: 0 Tests: 1	X	
	Total Organic Carbon		NDPs: 0 Tests: 1	X	
	Total Sulphur		NDPs: 0 Tests: 1	X	
				X	



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-7Client Reference: B025563Report Number: 592550

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23950992		
	Customer Sample Reference		OBC- 03		
	AGS Reference		ES3		
	Depth (m)		0.50		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	TPH CWG GC (S)		NDPs: 0 Tests: 1	X	
	VOC MS (S)		NDPs: 0 Tests: 1		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23950992	OBC- 03	0.50	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	OBC- 03				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		18/03/2021				
disa.filt	Dissolved / filtered sample.		17:00:00				
tot.unfilt	Total / unfiltered sample.		22/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210323-7				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23950992				
(F)	Trigger breach confirmed		ES3				
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	14				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0291				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0162	#			
pH	1 pH Units	TM133	8.57	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	16.4				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	12.6	M			
Barium	<0.6 mg/kg	TM181	84.2	#			
Beryllium	<0.01 mg/kg	TM181	0.701	M			
Cadmium	<0.02 mg/kg	TM181	0.139	M			
Chromium	<0.9 mg/kg	TM181	16.4	M			
Copper	<1.4 mg/kg	TM181	16.5	M			
Iron	<1000 mg/kg	TM181	24600	#			
Lead	<0.7 mg/kg	TM181	32.7	M			
Manganese	<0.13 mg/kg	TM181	377	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.49	#			
Nickel	<0.2 mg/kg	TM181	19.1	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	40.6	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
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[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
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PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	OBC- 03				
# M aq diss.filt tot.unfilt *	(F) 1-4+5@						
ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 Soil/Solid (S) 18/03/2021 17:00:00 22/03/2021 210323-7 23950992 ES3				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	101				
Toluene-d8**	%	TM116	96.7				
4-Bromofluorobenzene**	%	TM116	90.5				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

<div>Results Legend</div> <div># M aq diss.flit tot.unfilt + " (F) 1-4+5@</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>OBC- 03</div> <div>0.50 Soil/Solid (S) 18/03/2021 17:00:00 22/03/2021 210323-7 23950992 ES3</div>					
Component		LOD/Units	Method						
1,3-Dichloropropane		<7 µg/kg	TM116	<7 M					
Tetrachloroethene		<5 µg/kg	TM116	<5 M					
Dibromochloromethane		<10 µg/kg	TM116	<10 M					
1,2-Dibromoethane		<10 µg/kg	TM116	<10 M					
Chlorobenzene		<5 µg/kg	TM116	<5 M					
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10 M					
Ethylbenzene		<4 µg/kg	TM116	<4 M					
p/m-Xylene		<10 µg/kg	TM116	<10 #					
o-Xylene		<10 µg/kg	TM116	<10 M					
Styrene		<10 µg/kg	TM116	<10 @ #					
Bromoform		<10 µg/kg	TM116	<10 M					
Isopropylbenzene		<5 µg/kg	TM116	<5 #					
1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10 #					
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16 M					
Bromobenzene		<10 µg/kg	TM116	<10 M					
Propylbenzene		<10 µg/kg	TM116	<10 M					
2-Chlorotoluene		<9 µg/kg	TM116	<9 M					
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8 M					
4-Chlorotoluene		<10 µg/kg	TM116	<10 M					
tert-Butylbenzene		<14 µg/kg	TM116	<14 M					
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9 #					
sec-Butylbenzene		<10 µg/kg	TM116	<10					
4-Isopropyltoluene		<10 µg/kg	TM116	<10 M					
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8 M					
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5 M					
n-Butylbenzene		<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10 M					
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14 M					
Tert-amyl methyl ether		<10 µg/kg	TM116	<10 #					
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20					
Hexachlorobutadiene		<20 µg/kg	TM116	<20					
Naphthalene		<13 µg/kg	TM116	<13 M					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	OBC- 03E53	26.03.2021	Emily Anderton	/	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	SOLID										
Date Sampled	18/03/2021 00:00:00										
Date Received	22/03/2021 08:15:00										
SDG	210323-7										
Original Sample	23950992										
Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	23950992
Customer Sample Ref.	OBC- 03
AGS Ref.	ES3
Depth	0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	29-Mar-2021
Asbestos ID in Solid Samples	26-Mar-2021
Boron Water Soluble	29-Mar-2021
Chromium III	29-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	26-Mar-2021
EPH CWG GC (S)	29-Mar-2021
GRO by GC-FID (S)	30-Mar-2021
Hexavalent Chromium (s)	29-Mar-2021
Metals in solid samples by OES	29-Mar-2021
PAH by GCMS	26-Mar-2021
pH	25-Mar-2021
Phenols by HPLC (S)	30-Mar-2021
Sample description	24-Mar-2021
Total Organic Carbon	30-Mar-2021
Total Sulphur	26-Mar-2021
TPH CWG GC (S)	30-Mar-2021
VOC MS (S)	29-Mar-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2393
Chloride (soluble)	TM243	145.6 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	163.55 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2310
Water Soluble Boron	TM222	99.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2326
Free Cyanide	TM153	97.72 79.00 : 115.00
Thiocyanate	TM153	97.44 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2308
QC	TM089	97.98 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2305
Hexavalent Chromium	TM151	106.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2369
Aluminium	TM181	99.12 73.56 : 108.85
Antimony	TM181	99.19 76.89 : 111.24
Arsenic	TM181	103.49 88.53 : 111.01

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-7	Client Reference:	B025563	Report Number:	592550	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2369
Barium	TM181	95.41 77.67 : 105.35
Beryllium	TM181	101.87 85.44 : 109.61
Boron	TM181	92.26 73.51 : 104.66
Cadmium	TM181	89.3 77.67 : 104.12
Chromium	TM181	90.67 79.64 : 105.83
Cobalt	TM181	92.77 84.60 : 104.13
Copper	TM181	95.42 82.40 : 105.45
Iron	TM181	99.21 82.95 : 110.58
Lead	TM181	93.24 78.24 : 104.05
Manganese	TM181	113.61 94.29 : 119.51
Mercury	TM181	100.48 83.16 : 107.81
Molybdenum	TM181	101.23 87.11 : 106.87
Nickel	TM181	93.15 80.26 : 102.28
Phosphorus	TM181	112.53 94.56 : 124.28
Selenium	TM181	103.53 82.28 : 110.48
Strontium	TM181	95.99 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	103.8 86.72 : 110.03
Titanium	TM181	84.73 66.23 : 102.06
Vanadium	TM181	100.73 86.19 : 109.45
Zinc	TM181	101.03 84.68 : 113.99

PAH by GCMS		
Component	Method Code	QC 2361
Acenaphthene	TM218	93.0 76.79 : 103.90
Acenaphthylene	TM218	89.5 78.40 : 108.66
Anthracene	TM218	92.0 70.90 : 109.22
Benz(a)anthracene	TM218	91.0 73.77 : 119.26

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-7	Client Reference:	B025563	Report Number:	592550	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
PAH by GCMS						

		QC 2361
Benzo(a)pyrene	TM218	88.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	83.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	88.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	91.0 75.98 : 116.59
Chrysene	TM218	89.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	84.5 69.17 : 115.30
Fluoranthene	TM218	93.5 75.88 : 112.84
Fluorene	TM218	92.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	87.0 70.26 : 117.95
Naphthalene	TM218	94.0 74.70 : 101.83
Phenanthrene	TM218	93.5 73.62 : 109.34
Pyrene	TM218	93.0 71.46 : 117.00

pH		
Component	Method Code	QC 2376
pH	TM133	100.53 99.08 : 102.24

Phenols by HPLC (S)		
Component	Method Code	QC 2388
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	54.55 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.95 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	48.85 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.98 88.23 : 104.42

Total Organic Carbon

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-7	Client Reference:	B025563	Report Number:	592550	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Organic Carbon						
Component	Method Code	QC 2352				
Total Organic Carbon	TM132	105.08 87.02 : 113.45				

Total Sulphur						
Component	Method Code	QC 2343				
Total Sulphur %	TM132	96.37 61.64 : 114.47				

VOC MS (S)						
Component	Method Code	QC 2329				
1,1,1,2-tetrachloroethane	TM116	98.4 86.59 : 118.97				
1,1,1-Trichloroethane	TM116	104.4 86.26 : 117.53				
1,1,2-Trichloroethane	TM116	98.4 75.16 : 112.70				
1,1-Dichloroethane	TM116	117.8 83.27 : 122.16				
1,2-Dichloroethane	TM116	107.0 89.30 : 133.10				
1,4-Dichlorobenzene	TM116	97.8 82.59 : 123.23				
2-Chlorotoluene	TM116	95.8 66.81 : 118.43				
4-Chlorotoluene	TM116	89.8 65.88 : 114.76				
Benzene	TM116	102.0 93.16 : 123.63				
Carbon Disulphide	TM116	112.4 75.11 : 124.81				
Carbontetrachloride	TM116	102.6 82.35 : 126.46				
Chlorobenzene	TM116	100.4 85.07 : 118.13				
Chloroform	TM116	109.8 88.13 : 122.71				
Chloromethane	TM116	134.4 61.62 : 145.66				
Cis-1,2-Dichloroethene	TM116	111.4 78.27 : 128.90				
Dibromomethane	TM116	93.8 77.47 : 121.29				
Dichloromethane	TM116	114.8 87.89 : 134.72				

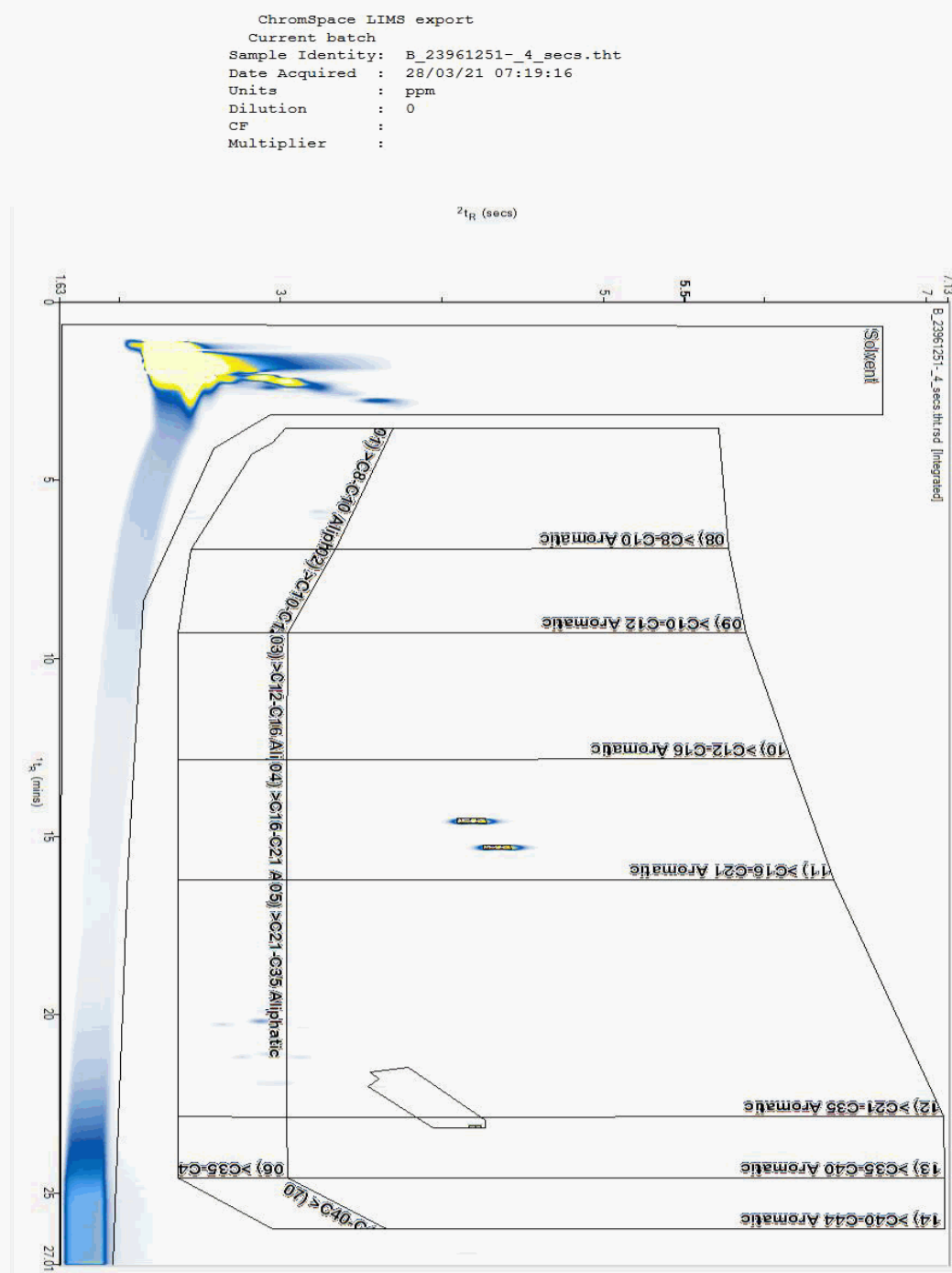
		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-7	Client Reference:	B025563	Report Number:	592550	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2329				
Ethylbenzene	TM116	89.0 79.92 : 110.05				
Hexachlorobutadiene	TM116	82.0 16.78 : 153.29				
Isopropylbenzene	TM116	88.2 64.20 : 119.59				
Naphthalene	TM116	103.0 79.29 : 125.59				
o-Xylene	TM116	88.8 72.86 : 102.10				
p/m-Xylene	TM116	82.8 74.06 : 106.47				
Sec-Butylbenzene	TM116	85.4 44.71 : 117.87				
Tetrachloroethene	TM116	102.2 85.86 : 122.95				
Toluene	TM116	97.0 87.82 : 116.21				
Trichloroethene	TM116	102.6 79.80 : 112.33				
Trichlorofluoromethane	TM116	111.8 80.52 : 132.12				
Vinyl Chloride	TM116	131.2 74.57 : 146.88				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S)	Sample No : 23961251	Depth : 0.50
	Sample ID : OBC- 03	

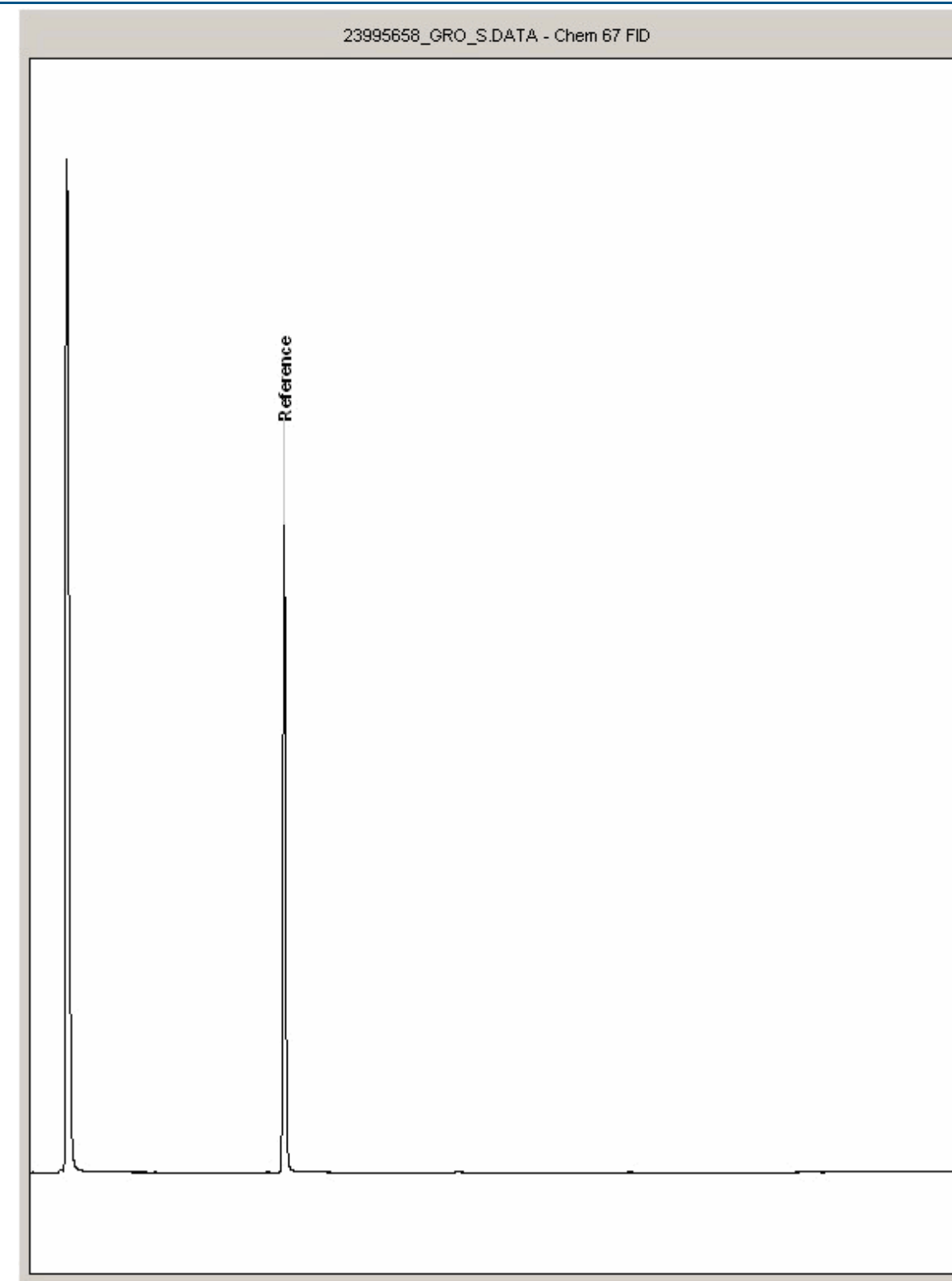


CERTIFICATE OF ANALYSIS

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)	Sample No : 23995658	Depth : 0.50
	Sample ID : OBC- 03	





CERTIFICATE OF ANALYSIS

SDG:	210323-7	Client Reference:	B025563	Report Number:	592550
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

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CH5 3US

Tel: (01244) 528700

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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

30 March 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210323-43

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

592580

We received 6 samples on Tuesday March 23, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday March 30, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:

210323-43

Client Reference:

B025563

Report Number:

592580

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23953433	BH-OBC-07		0.10 - 0.10	22/03/2021
23953434	BH-OBC-07		0.20 - 0.20	22/03/2021
23953436	BH-OBC-07		0.50 - 0.50	22/03/2021
23953437	BH-OBC-07		1.00 - 1.00	22/03/2021
23953439	PTR-09		2.60 - 2.60	19/03/2021
23953440	PTR-12		7.10 - 7.10	19/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:

210323-43

Client Reference:

B025563

Report Number:

592580

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>
--

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-43

Location:Cambridge South East Tra

Client Reference:B025563

Order Number:7000964

Report Number:592580

Superseded Report:

Results Legend

X

Test

N

No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

23953436

BH-OBC-07

0.50 - 0.50

250g Amber Jar (ALE210)

60g VOC (ALE215)

S

S

TPH CWG GC (S)

All

NDPs: 0

Tests: 1

X

VOC MS (S)

All

NDPs: 0

Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG:210323-43

Location:Cambridge South East Tra

Client Reference:B025563

Order Number:7000964

Report Number:592580

Superseded Report:

Sample Descriptions

Grain Sizes

very fine<0.063mmfine0.063mm - 0.1mmmedium0.1mm - 2mmcoarse2mm - 10mmvery coarse>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23953436	BH-OBC-07	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unfit + "" (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-OBC-07</div> <div>0.50 - 0.50 Soil/Solid (S) 22/03/2021 . 23/03/2021 210323-43 23953436</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	12						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Sulphur, Total	<0.02 %	TM132	<0.02						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0259	#					
pH	1 pH Units	TM133	8.62	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
Chromium, Trivalent	<0.9 mg/kg	TM181	17.1						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	18.6	M					
Barium	<0.6 mg/kg	TM181	61.1	#					
Beryllium	<0.01 mg/kg	TM181	0.804	M					
Cadmium	<0.02 mg/kg	TM181	<0.02	M					
Chromium	<0.9 mg/kg	TM181	17.1	M					
Copper	<1.4 mg/kg	TM181	10.1	M					
Iron	<1000 mg/kg	TM181	25100	#					
Lead	<0.7 mg/kg	TM181	12.8	M					
Manganese	<0.13 mg/kg	TM181	438	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	0.474	#					
Nickel	<0.2 mg/kg	TM181	24.1	M					
Selenium	<1 mg/kg	TM181	<1	#					
Vanadium	<0.2 mg/kg	TM181	49.1	#					



CERTIFICATE OF ANALYSIS

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SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBC-07					
#	ISO17025 accredited.	mCERTS accredited.							
M	Aqueous / settled sample.		Depth (m)	0.50 - 0.50					
aq	Dissolved / filtered sample.		Sample Type	Soil/Solid (S)					
dis.filt	Total / unfiltered sample.		Date Sampled	22/03/2021					
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.		Sampled Time	.					
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Date Received	23/03/2021					
**	Trigger breach confirmed		SDG Ref	210323-43					
(F)	Sample deviation (see appendix)		Lab Sample No.(s)	23953436					
1-44@			AGS Reference						
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116							
			106						
Toluene-d8**	%	TM116	99						
4-Bromofluorobenzene**	%	TM116	95.6						
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	M					
Chloromethane	<7 µg/kg	TM116	<7	#					
Vinyl Chloride	<6 µg/kg	TM116	<6	M					
Bromomethane	<10 µg/kg	TM116	<10	M					
Chloroethane	<10 µg/kg	TM116	<10	M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6	M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10	#					
Carbon Disulphide	<7 µg/kg	TM116	<7	M					
Dichloromethane	<10 µg/kg	TM116	<10	#					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8	M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10						
Bromochloromethane	<10 µg/kg	TM116	<10	M					
Chloroform	<8 µg/kg	TM116	<8	M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10	M					
Carbontetrachloride	<10 µg/kg	TM116	<10	M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5	M					
Benzene	<9 µg/kg	TM116	<9	M					
Trichloroethene	<9 µg/kg	TM116	<9	#					
1,2-Dichloropropane	<10 µg/kg	TM116	<10	M					
Dibromomethane	<9 µg/kg	TM116	<9	M					
Bromodichloromethane	<7 µg/kg	TM116	<7	M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	M					
Toluene	<7 µg/kg	TM116	<7	M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	M					

VOC MS (S)

Results Legend			Customer Sample Ref.	BH-OBC-07					
#	ISO17025 accredited.	mCERTS accredited.							
M	Aqueous / settled sample.		Depth (m)	0.50 - 0.50					
aq	Dissolved / filtered sample.		Sample Type	Soil/Solid (S)					
dis.filt	Total / unfiltered sample.		Date Sampled	22/03/2021					
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.		Sampled Time	.					
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Date Received	23/03/2021					
**	Trigger breach confirmed		SDG Ref	210323-43					
(F)	Sample deviation (see appendix)		Lab Sample No.(s)	23953436					
1-44@			AGS Reference						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116							
			<7	M					
Tetrachloroethene	<5 µg/kg	TM116	<5	M					
Dibromochloromethane	<10 µg/kg	TM116	<10	M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10	M					
Chlorobenzene	<5 µg/kg	TM116	<5	M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	M					
Ethylbenzene	<4 µg/kg	TM116	<4	M					
p/m-Xylene	<10 µg/kg	TM116	<10	#					
o-Xylene	<10 µg/kg	TM116	<10	M					
Styrene	<10 µg/kg	TM116	<10	#					
Bromoform	<10 µg/kg	TM116	<10	M					
Isopropylbenzene	<5 µg/kg	TM116	<5	#					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	#					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	M					
Bromobenzene	<10 µg/kg	TM116	<10	M					
Propylbenzene	<10 µg/kg	TM116	<10	M					
2-Chlorotoluene	<9 µg/kg	TM116	<9	M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	M					
4-Chlorotoluene	<10 µg/kg	TM116	<10	M					
tert-Butylbenzene	<14 µg/kg	TM116	<14	M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	#					
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10	M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	M					
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	#					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13	M					

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23953436
Customer Sample Ref.	BH-OBC-07
AGS Ref.	
Depth	0.50 - 0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	29-Mar-2021
Asbestos ID in Solid Samples	26-Mar-2021
Boron Water Soluble	30-Mar-2021
Chromium III	30-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	26-Mar-2021
EPH CWG GC (S)	29-Mar-2021
GRO by GC-FID (S)	29-Mar-2021
Hexavalent Chromium (s)	29-Mar-2021
Metals in solid samples by OES	30-Mar-2021
PAH by GCMS	30-Mar-2021
pH	26-Mar-2021
Phenols by HPLC (S)	30-Mar-2021
Sample description	24-Mar-2021
Total Organic Carbon	30-Mar-2021
Total Sulphur	26-Mar-2021
TPH CWG GC (S)	29-Mar-2021
VOC MS (S)	26-Mar-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2368
Chloride (soluble)	TM243	151.81 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	165.89 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2371
Water Soluble Boron	TM222	97.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2380
Free Cyanide	TM153	93.47 79.00 : 115.00
Thiocyanate	TM153	96.15 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2342
QC	TM089	81.9 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2312
Hexavalent Chromium	TM151	110.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2318
Aluminium	TM181	96.46 73.56 : 108.85
Antimony	TM181	101.22 76.89 : 111.24
Arsenic	TM181	104.07 88.53 : 111.01



CERTIFICATE OF ANALYSIS

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SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Metals in solid samples by OES

		QC 2318
Barium	TM181	100.92 77.67 : 105.35
Beryllium	TM181	104.1 85.44 : 109.61
Boron	TM181	92.26 73.51 : 104.66
Cadmium	TM181	100.82 77.67 : 104.12
Chromium	TM181	90.87 79.64 : 105.83
Cobalt	TM181	94.65 84.60 : 104.13
Copper	TM181	96.83 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	92.57 78.24 : 104.05
Manganese	TM181	111.67 94.29 : 119.51
Mercury	TM181	97.83 83.16 : 107.81
Molybdenum	TM181	103.7 87.11 : 106.87
Nickel	TM181	94.87 80.26 : 102.28
Phosphorus	TM181	112.53 94.56 : 124.28
Selenium	TM181	103.92 82.28 : 110.48
Strontium	TM181	97.33 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	103.42 86.72 : 110.03
Titanium	TM181	82.44 66.23 : 102.06
Vanadium	TM181	100.0 86.19 : 109.45
Zinc	TM181	101.03 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2337
Acenaphthene	TM218	89.0 78.59 : 112.16
Acenaphthylene	TM218	87.0 75.11 : 109.01
Anthracene	TM218	86.5 73.99 : 113.85
Benz(a)anthracene	TM218	88.0 69.31 : 119.18

PAH by GCMS

		QC 2337
Benzo(a)pyrene	TM218	86.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	87.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	86.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	87.5 69.98 : 116.49
Chrysene	TM218	86.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	85.0 64.54 : 115.22
Fluoranthene	TM218	91.5 72.56 : 111.70
Fluorene	TM218	87.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	88.0 61.22 : 113.25
Naphthalene	TM218	88.0 77.96 : 110.91
Phenanthrene	TM218	90.0 76.83 : 113.25
Pyrene	TM218	90.0 72.45 : 110.77

pH

Component	Method Code	QC 2352
pH	TM133	99.87 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2384
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	56.49 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	50.29 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	50.52 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	56.29 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	54.27 88.23 : 104.42

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2352
Total Organic Carbon	TM132	105.08 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2343
Total Sulphur %	TM132	96.37 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2316
1,1,1,2-tetrachloroethane	TM116	104.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	105.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	107.0 77.12 : 116.04
1,1-Dichloroethane	TM116	114.0 74.46 : 129.15
1,2-Dichloroethane	TM116	122.2 92.38 : 131.65
1,4-Dichlorobenzene	TM116	101.0 83.64 : 126.18
2-Chlorotoluene	TM116	94.0 76.03 : 113.25
4-Chlorotoluene	TM116	89.4 66.90 : 112.46
Benzene	TM116	107.8 88.60 : 113.80
Carbon Disulphide	TM116	97.2 74.91 : 122.14
Carbontetrachloride	TM116	105.4 80.31 : 124.50
Chlorobenzene	TM116	102.0 83.81 : 114.18
Chloroform	TM116	112.6 87.40 : 122.49
Chloromethane	TM116	113.8 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	110.2 80.67 : 126.72
Dibromomethane	TM116	114.0 73.23 : 118.35
Dichloromethane	TM116	124.2 81.11 : 133.25



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2316
Ethylbenzene	TM116	91.6 75.92 : 110.41
Hexachlorobutadiene	TM116	43.2 12.82 : 152.73
Isopropylbenzene	TM116	81.6 55.79 : 97.59
Naphthalene	TM116	101.6 80.86 : 128.81
o-Xylene	TM116	88.6 69.99 : 108.74
p/m-Xylene	TM116	84.9 68.32 : 108.91
Sec-Butylbenzene	TM116	66.4 38.50 : 101.50
Tetrachloroethene	TM116	100.8 76.95 : 121.02
Toluene	TM116	95.6 74.24 : 107.42
Trichloroethene	TM116	101.8 85.28 : 109.36
Trichlorofluoromethane	TM116	100.6 84.55 : 133.27
Vinyl Chloride	TM116	104.8 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



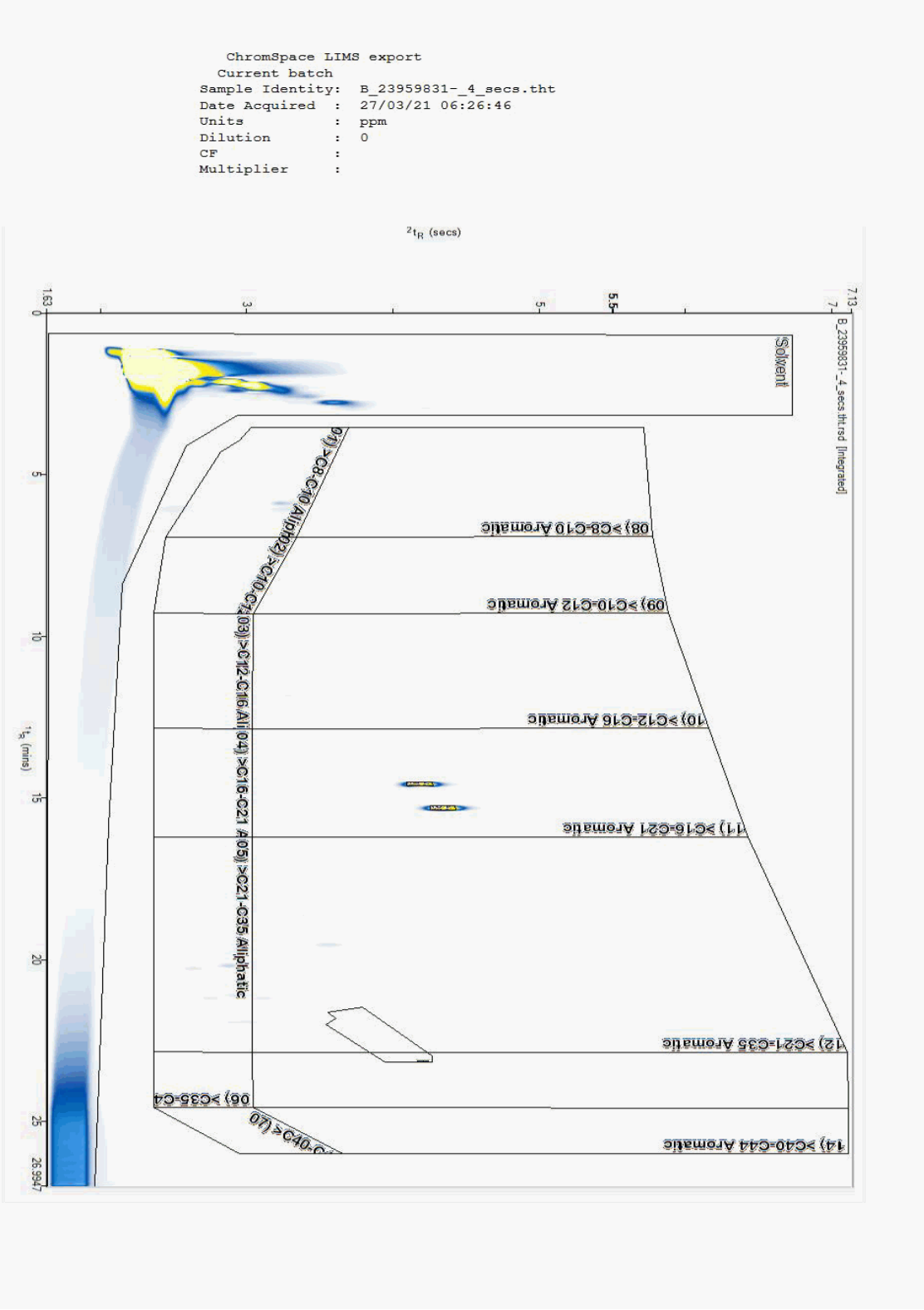
CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-43	Client Reference:	B025563	Report Number:	592580
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23959831	Depth :	0.50 - 0.50
		Sample ID :	BH-OBC-07		





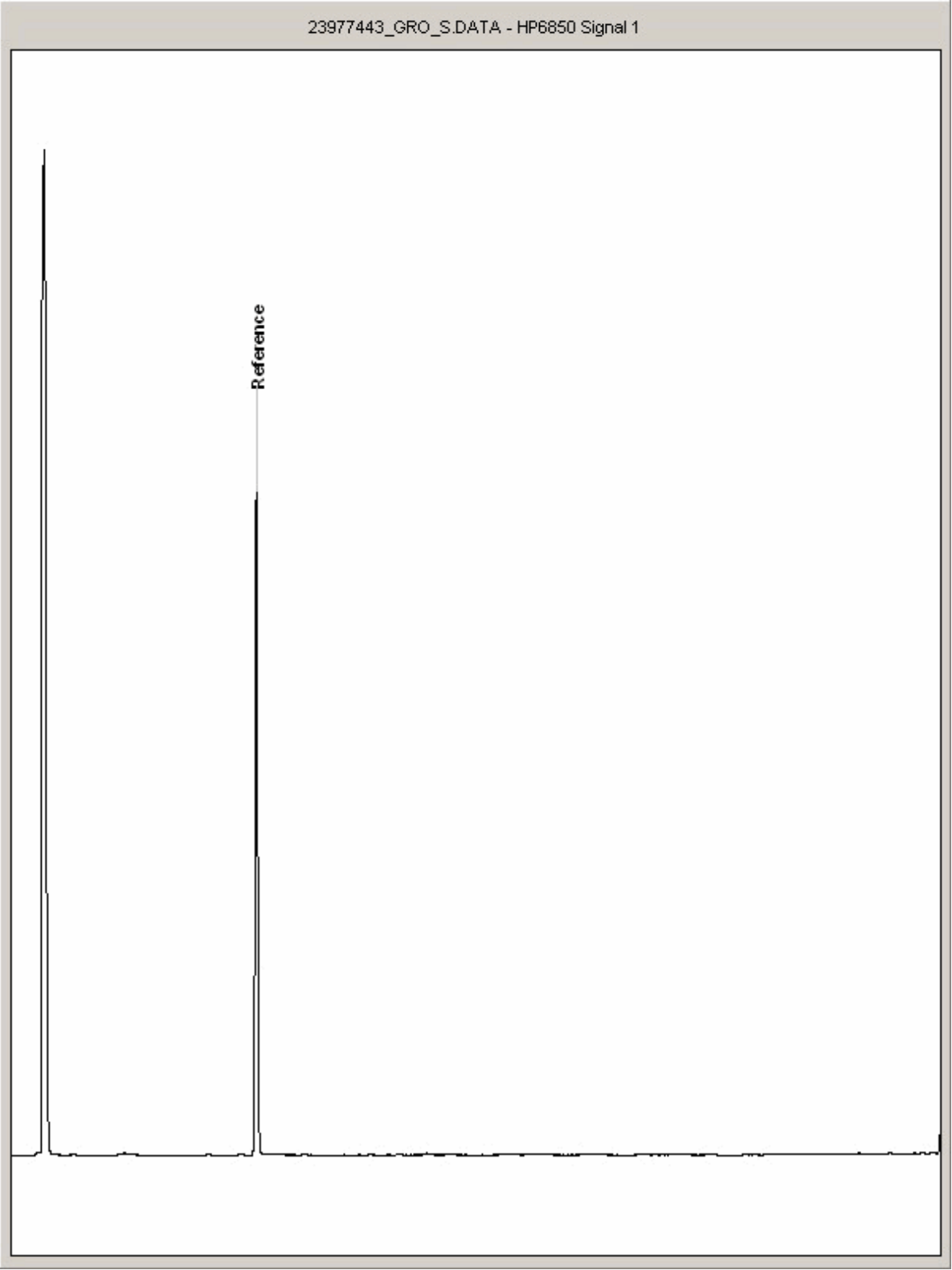
CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-43 Client Reference: B025563 Report Number: 592580
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23977443 Depth : 0.50 - 0.50
Sample ID : BH-OBC-07



CERTIFICATE OF ANALYSIS

SDG: 210323-43 Client Reference: B025563 Report Number: 592580
Location: idge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 30 March 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210323-45
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592560

We received 4 samples on Tuesday March 23, 2021 and 2 of these samples were scheduled for analysis which was completed on Tuesday March 30, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: Cambridge South East Transport Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23953575	PTR-06		0.10	19/03/2021
23953577	PTR-06		0.20	19/03/2021
23953578	PTR-06		0.50	19/03/2021
23953579	PTR-06		1.00	19/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23953575		PTR-06		PTR-06	
	Customer Sample Reference							
	AGS Reference							
	Depth (m)		0.10				1.00	
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)
	Sample Type		S	S	S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X					
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X			X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X					
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X			X		
Boron Water Soluble	All	NDPs: 0 Tests: 2		X			X	
CEN Readings	All	NDPs: 0 Tests: 1	X					
Chromium III	All	NDPs: 0 Tests: 3	X	X			X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X					
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X					
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X			X	
Fluoride	All	NDPs: 0 Tests: 1	X					
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X			X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X					



CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23953575		PTR-06		PTR-06	
	Customer Sample Reference							
	AGS Reference							
	Depth (m)		0.10				1.00	
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)
	Sample Type		S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X					
Mercury Dissolved	All	NDPs: 0 Tests: 1	X					
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X			X	
PAH by GCMS	All	NDPs: 0 Tests: 2		X			X	
pH	All	NDPs: 0 Tests: 2		X			X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X					
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X			X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X					
Sample description	All	NDPs: 0 Tests: 2		X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 2		X			X	
Total Sulphur	All	NDPs: 0 Tests: 2		X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X			X	
VOC MS (S)	All	NDPs: 0 Tests: 2			X			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23953575	PTR-06	0.10	Dark Brown	Sandy Loam	Stones	Vegetation
23953579	PTR-06	1.00	Light Brown	Sandy Clay	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	PTR-06	PTR-06				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	PTR-06	PTR-06				
M	mCERTS accredited.		0.10	1.00				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		19/03/2021	19/03/2021				
tot.unfilt	Total / unfiltered sample.		.	.				
*	Subcontracted - refer to subcontractor report for accreditation status.		23/03/2021	23/03/2021				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210323-45	210323-45				
(F)	Trigger breach confirmed		23953575	23953579				
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	19	11				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	0.0124	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0518	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0125	0.0509				
pH	1 pH Units	TM133	8.31	8.54				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	6.12	5.36				
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6				
Arsenic	<0.6 mg/kg	TM181	5.32	5.1				
Barium	<0.6 mg/kg	TM181	69.9	22.1				
Beryllium	<0.01 mg/kg	TM181	0.361	0.255				
Cadmium	<0.02 mg/kg	TM181	0.115	0.0475				
Chromium	<0.9 mg/kg	TM181	6.12	5.36				
Copper	<1.4 mg/kg	TM181	18.1	4.65				
Iron	<1000 mg/kg	TM181	8110	5780				
Lead	<0.7 mg/kg	TM181	14.1	2.09				
Manganese	<0.13 mg/kg	TM181	233	346				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.317	0.227				
Nickel	<0.2 mg/kg	TM181	11.7	8.48				
Selenium	<1 mg/kg	TM181	1.25	<1				
Vanadium	<0.2 mg/kg	TM181	12.3	10.7				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

<div><div>Results Legend</div><div><div># M aq diss.flit totUnflit *</div><div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44\$@ Sample deviation (see appendix)</div></div></div>	<div><div>Customer Sample Ref.</div><div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div></div>	<div><div>PTR-06</div><div>0.10 Soil/Solid (S) 19/03/2021 . 23/03/2021 210323-45 23953575</div></div>	<div><div>PTR-06</div><div>1.00 Soil/Solid (S) 19/03/2021 . 23/03/2021 210323-45 23953579</div></div>				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	107	105			
Toluene-d8**	%	TM116	95.4	99.7			
4-Bromofluorobenzene**	%	TM116	77.3	101			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M			
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #			
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M			
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M			
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M			
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M			
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #			
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M			
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M			
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M			
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10			
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M			
Chloroform	<8 µg/kg	TM116	<8 M	<8 M			
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M			
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M			
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M			
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M			
Benzene	<9 µg/kg	TM116	<9 M	<9 M			
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #			
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M			
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M			
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M			
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M			
Toluene	<7 µg/kg	TM116	<7 M	<7 M			
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10			
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M			

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - I
Mass Sample taken (kg)	0.117	Natural Moisture Content (%)		29.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		77.5
Particle Size <4mm	>95%			

Case

SDG 210323-45

Lab Sample Number(s)	23953575
----------------------	----------

Sampled Date	19-Mar-2021
---------------------	-------------

Customer Sample Ref. PTR-06

Depth (m) 0.10

[illegible]

Leach Test Information

Date Prepared	25-Mar-2021
pH (pH Units)	8.63
Conductivity (µS/cm)	96.40
Temperature (°C)	18.40
Volume Leachant (Litres)	0.873



SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990/BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23953575	23953579
Customer Sample Ref.	PTR-06	PTR-06
AGS Ref.		
Depth	0.10	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	29-Mar-2021	
Anions by Kone (soil)	29-Mar-2021	29-Mar-2021
Anions by Kone (w)	29-Mar-2021	
Asbestos ID in Solid Samples	29-Mar-2021	26-Mar-2021
Boron Water Soluble	29-Mar-2021	29-Mar-2021
CEN 10:1 Leachate (1 Stage)	25-Mar-2021	
CEN Readings	26-Mar-2021	
Chromium III	30-Mar-2021	30-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	26-Mar-2021	26-Mar-2021
Dissolved Metals by ICP-MS	29-Mar-2021	
Dissolved Organic/Inorganic Carbon	29-Mar-2021	
EPH CWG GC (S)	29-Mar-2021	30-Mar-2021
Fluoride	29-Mar-2021	
GRO by GC-FID (S)	29-Mar-2021	29-Mar-2021
Hexavalent Chromium (s)	29-Mar-2021	29-Mar-2021
Low Level Cyanide (W)	30-Mar-2021	
Low Level Hexavalent Chromium (w)	29-Mar-2021	
Mercury Dissolved	30-Mar-2021	
Metals in solid samples by OES	30-Mar-2021	30-Mar-2021
Moisture at 105C	25-Mar-2021	
PAH by GCMS	25-Mar-2021	25-Mar-2021
pH	26-Mar-2021	26-Mar-2021
pH Value of Filtered Water	29-Mar-2021	
Phenols by HPLC (S)	30-Mar-2021	30-Mar-2021
Phenols by HPLC (W)	30-Mar-2021	
Sample description	24-Mar-2021	24-Mar-2021
Total Organic Carbon	30-Mar-2021	30-Mar-2021
Total Sulphur	26-Mar-2021	26-Mar-2021
TPH CWG GC (S)	29-Mar-2021	30-Mar-2021
VOC MS (S)	26-Mar-2021	26-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2363
Ammoniacal Nitrogen as N	TM099	101.8 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2368	QC 2393
Chloride (soluble)	TM243	151.81 86.68 : 115.67	145.6 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	165.89 70.00 : 130.00	163.55 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2321
Chloride	TM184	105.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2310
Water Soluble Boron	TM222	99.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2324
Free Cyanide	TM153	98.81 79.00 : 115.00
Thiocyanate	TM153	100.64 94.09 : 113.89
Total Cyanide	TM153	101.4 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2377	QC 2326
Aluminium	TM152	103.67 90.98 : 111.82	103.0 94.21 : 111.52
Antimony	TM152	102.5 90.44 : 113.04	103.83 88.37 : 130.57
Arsenic	TM152	103.83 88.00 : 112.00	100.17 92.62 : 113.52

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-45	Client Reference:	B025563	Report Number:	592560	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Dissolved Metals by ICP-MS						

		QC 2377	QC 2326
Barium	TM152	101.17 90.20 : 111.19	104.83 88.62 : 113.14
Beryllium	TM152	104.17 87.77 : 113.97	103.67 87.08 : 111.38
Bismuth	TM152	100.5 91.90 : 112.20	101.17 92.62 : 115.02
Borate	TM152	105.56 88.00 : 112.00	
Boron	TM152	105.67 96.48 : 114.93	101.33 86.31 : 120.88
Cadmium	TM152	102.67 96.43 : 110.53	102.67 93.85 : 111.65
Calcium	TM152	102.67 81.38 : 119.09	102.0 89.20 : 126.91
Chromium	TM152	102.33 91.84 : 108.67	98.83 92.50 : 113.03
Cobalt	TM152	102.83 88.00 : 112.00	98.83 85.01 : 114.87
Copper	TM152	102.83 92.47 : 118.11	97.5 89.87 : 119.73
Iron	TM152	102.67 92.00 : 113.00	100.0 93.02 : 113.86
Lead	TM152	101.83 88.00 : 112.00	101.5 91.11 : 116.98
Lithium	TM152	104.5 91.62 : 113.12	102.5 87.70 : 115.90
Magnesium	TM152	99.33 93.14 : 107.91	98.0 89.60 : 116.61
Manganese	TM152	103.17 95.03 : 110.58	101.5 93.97 : 112.46
Molybdenum	TM152	99.33 88.00 : 112.00	96.67 89.07 : 110.96
Nickel	TM152	103.5 88.00 : 112.00	99.0 93.70 : 112.15
Phosphorus	TM152	103.0 88.00 : 112.00	103.0 89.24 : 114.18
Potassium	TM152	102.0 93.90 : 112.36	100.67 93.20 : 115.55
Selenium	TM152	101.5 91.58 : 115.98	101.67 91.69 : 117.12
Silver	TM152	95.67 88.80 : 122.30	98.67 90.93 : 121.73
Sodium	TM152	100.67 94.28 : 110.71	98.0 92.42 : 113.24
Strontium	TM152	102.0 88.00 : 112.00	103.67 92.14 : 116.24
Tellurium	TM152	101.5 93.32 : 114.66	102.0 89.88 : 111.78
Thallium	TM152	96.67 88.00 : 112.00	98.17 82.43 : 113.83
Tin	TM152	102.33 92.63 : 109.70	102.83 94.62 : 107.79
Titanium	TM152	105.0 95.58 : 111.68	105.33 90.29 : 115.23

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-45	Client Reference:	B025563	Report Number:	592560	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Dissolved Metals by ICP-MS						

		QC 2377	QC 2326
Tungsten	TM152	99.0 81.32 : 124.72	99.67 77.61 : 132.31
Uranium	TM152	99.0 88.00 : 112.00	101.33 86.97 : 115.76
Vanadium	TM152	98.0 88.00 : 112.00	100.17 89.61 : 115.48
Zinc	TM152	103.33 92.98 : 118.95	99.67 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2300
Dissolved Inorganic Carbon	TM090	102.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.33 96.13 : 109.53

Fluoride

Component	Method Code	QC 2369
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2342
QC	TM089	81.9 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2305
Hexavalent Chromium	TM151	106.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2309
Free Cyanide - Low Level	TM279	78.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	94.75 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-45	Client Reference:	B025563	Report Number:	592560	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2344				
Mercury Dissolved (CVAf)	TM183	117.0 69.30 : 128.70				

Metals in solid samples by OES		
Component	Method Code	QC 2318
Aluminium	TM181	96.46 73.56 : 108.85
Antimony	TM181	101.22 76.89 : 111.24
Arsenic	TM181	104.07 88.53 : 111.01
Barium	TM181	100.92 77.67 : 105.35
Beryllium	TM181	104.1 85.44 : 109.61
Boron	TM181	92.26 73.51 : 104.66
Cadmium	TM181	100.82 77.67 : 104.12
Chromium	TM181	90.87 79.64 : 105.83
Cobalt	TM181	94.65 84.60 : 104.13
Copper	TM181	96.83 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	92.57 78.24 : 104.05
Manganese	TM181	111.67 94.29 : 119.51
Mercury	TM181	97.83 83.16 : 107.81
Molybdenum	TM181	103.7 87.11 : 106.87
Nickel	TM181	94.87 80.26 : 102.28
Phosphorus	TM181	112.53 94.56 : 124.28
Selenium	TM181	103.92 82.28 : 110.48
Strontium	TM181	97.33 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	103.42 86.72 : 110.03
Titanium	TM181	82.44 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210323-45	Client Reference:	B025563	Report Number:	592560	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2318				
Vanadium	TM181	100.0 86.19 : 109.45				
Zinc	TM181	101.03 84.68 : 113.99				

Component	Method Code	QC 2379
Acenaphthene	TM218	93.5 78.59 : 112.16
Acenaphthylene	TM218	91.0 75.11 : 109.01
Anthracene	TM218	90.5 73.99 : 113.85
Benz(a)anthracene	TM218	83.5 69.31 : 119.18
Benzo(a)pyrene	TM218	76.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	75.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	75.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	79.5 69.98 : 116.49
Chrysene	TM218	80.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	75.5 64.54 : 115.22
Fluoranthene	TM218	83.0 72.56 : 111.70
Fluorene	TM218	93.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	82.0 61.22 : 113.25
Naphthalene	TM218	93.0 77.96 : 110.91
Phenanthrene	TM218	89.5 76.83 : 113.25
Pyrene	TM218	83.0 72.45 : 110.77

pH		
Component	Method Code	QC 2352
pH	TM133	99.87 99.08 : 102.24

pH Value of Filtered Water

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH Value of Filtered Water						

Component	Method Code	QC 2376
pH	TM256	100.67 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2374
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	54.55 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	48.85 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	53.64 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	52.19 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2358
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	49.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	48.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	53.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	50.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.0 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2339
Total Organic Carbon	TM132	89.45 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2343
Total Sulphur %	TM132	96.37 61.64 : 114.47

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
VOC MS (S)						

Component	Method Code	QC 2316
1,1,1,2-tetrachloroethane	TM116	104.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	105.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	107.0 77.12 : 116.04
1,1-Dichloroethane	TM116	114.0 74.46 : 129.15
1,2-Dichloroethane	TM116	122.2 92.38 : 131.65
1,4-Dichlorobenzene	TM116	101.0 83.64 : 126.18
2-Chlorotoluene	TM116	94.0 76.03 : 113.25
4-Chlorotoluene	TM116	89.4 66.90 : 112.46
Benzene	TM116	107.8 88.60 : 113.80
Carbon Disulphide	TM116	97.2 74.91 : 122.14
Carbontetrachloride	TM116	105.4 80.31 : 124.50
Chlorobenzene	TM116	102.0 83.81 : 114.18
Chloroform	TM116	112.6 87.40 : 122.49
Chloromethane	TM116	113.8 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	110.2 80.67 : 126.72
Dibromomethane	TM116	114.0 73.23 : 118.35
Dichloromethane	TM116	124.2 81.11 : 133.25
Ethylbenzene	TM116	91.6 75.92 : 110.41
Hexachlorobutadiene	TM116	43.2 12.82 : 152.73
Isopropylbenzene	TM116	81.6 55.79 : 97.59
Naphthalene	TM116	101.6 80.86 : 128.81
o-Xylene	TM116	88.6 69.99 : 108.74
p/m-Xylene	TM116	84.9 68.32 : 108.91
Sec-Butylbenzene	TM116	66.4 38.50 : 101.50
Tetrachloroethene	TM116	100.8 76.95 : 121.02
Toluene	TM116	95.6 74.24 : 107.42
Trichloroethene	TM116	101.8 85.28 : 109.36



CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2316
Trichlorofluoromethane	TM116	100.6 84.55 : 133.27
Vinyl Chloride	TM116	104.8 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



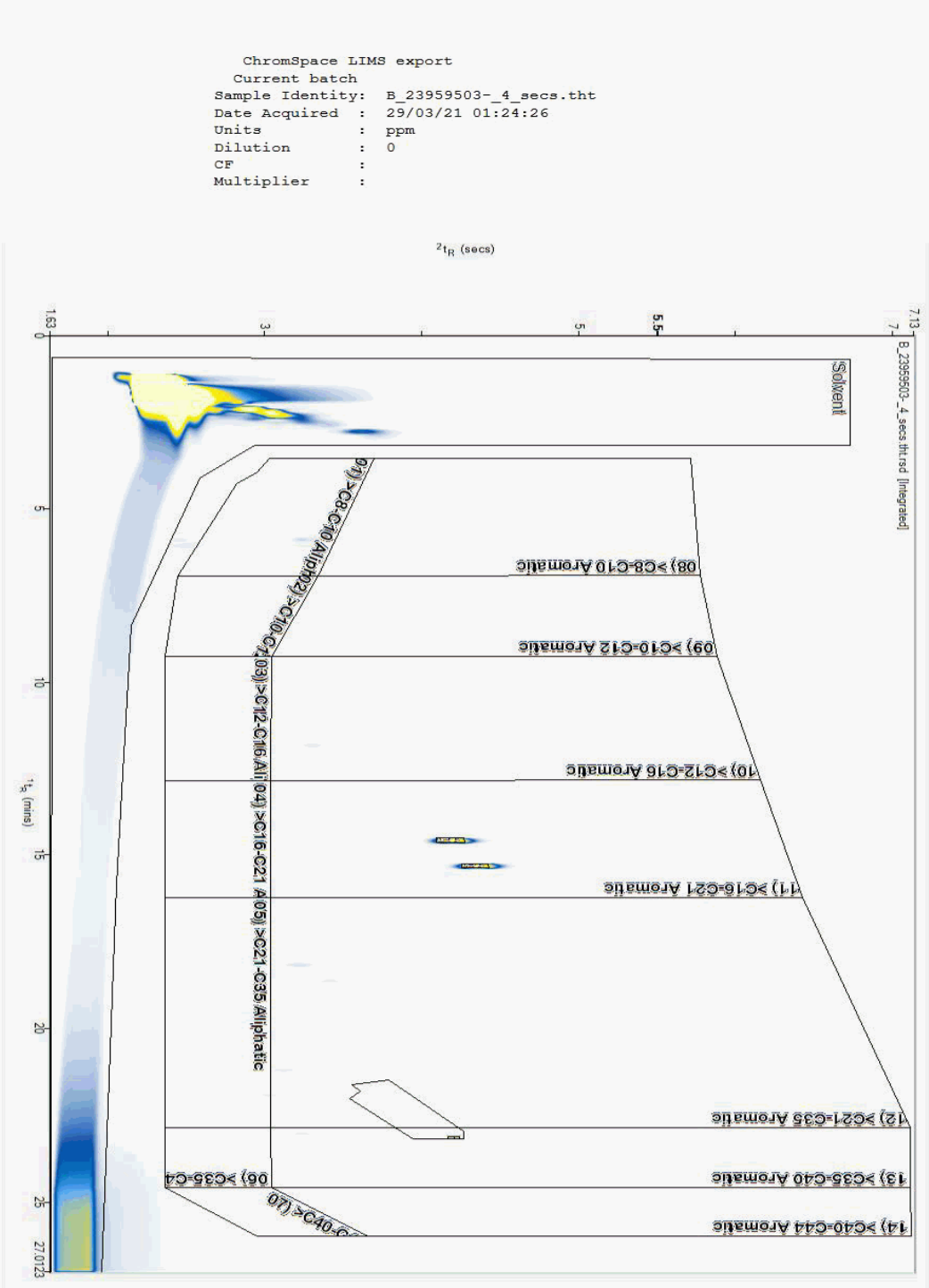
CERTIFICATE OF ANALYSIS

Validated

SDG:	210323-45	Client Reference:	B025563	Report Number:	592560
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23959503	Depth :	1.00
		Sample ID :	PTR-06		





CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23959574 Depth : 0.10
Sample ID : PTR-06



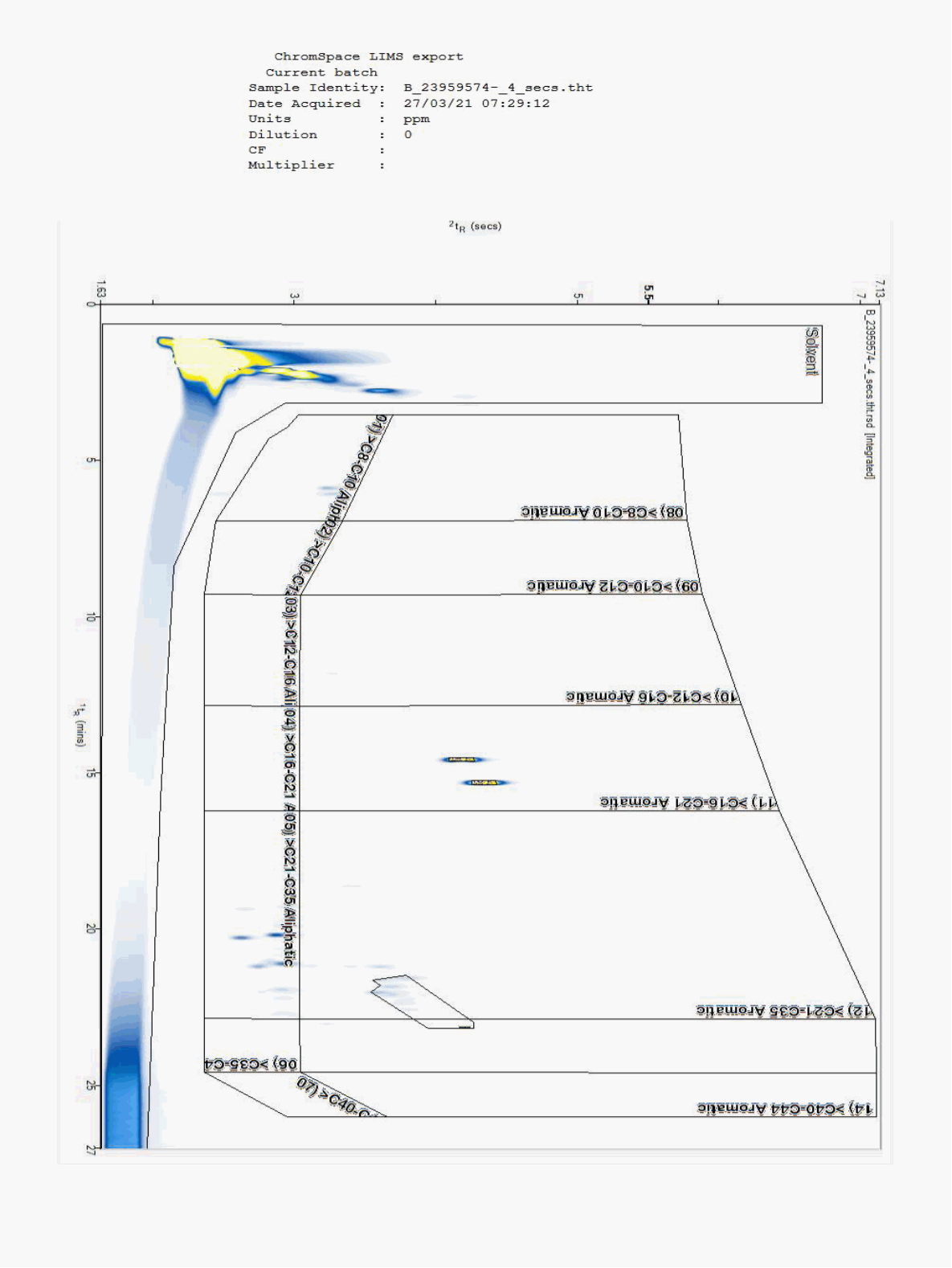
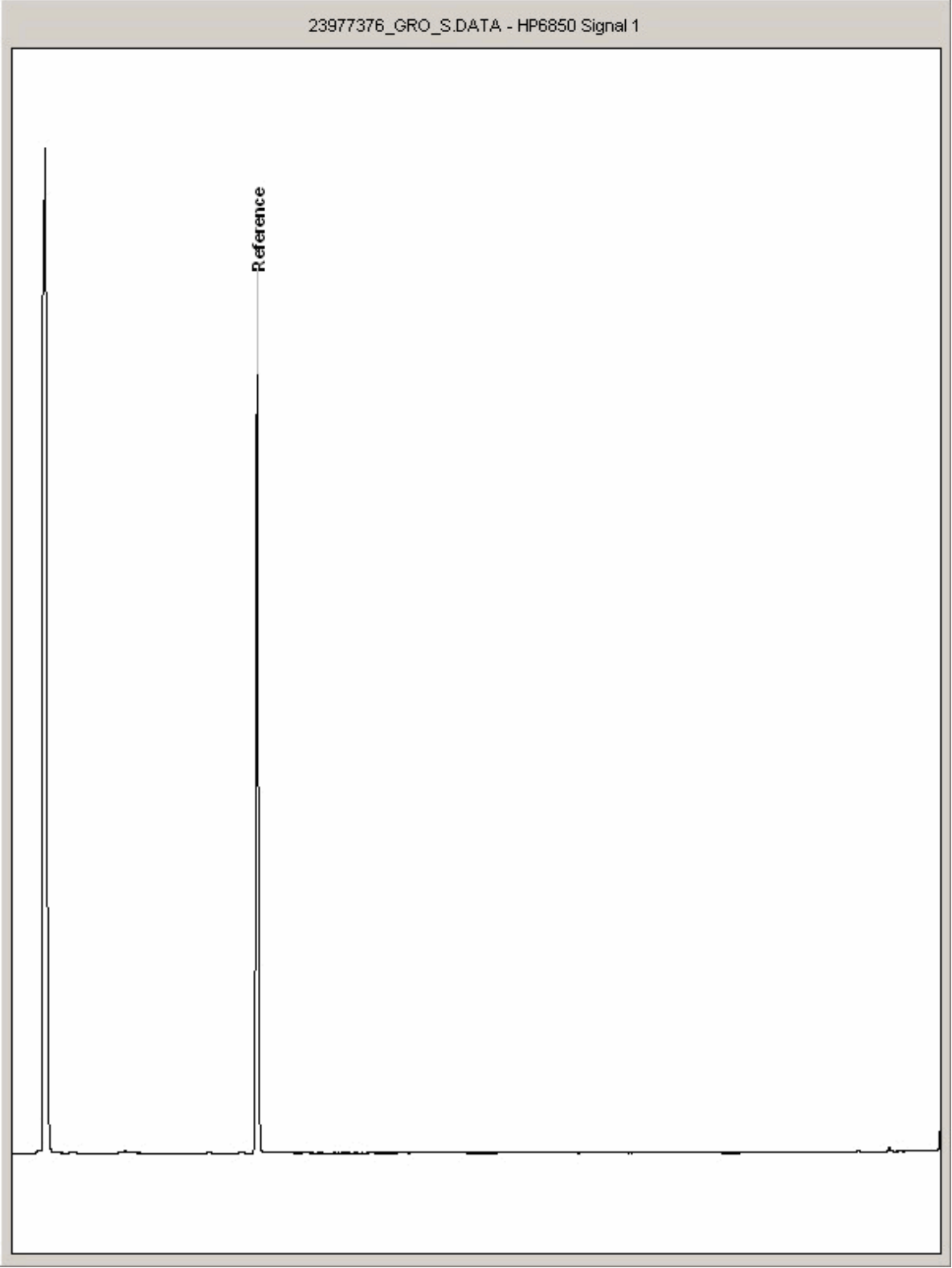
CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23977376 Depth : 1.00
Sample ID : PTR-06





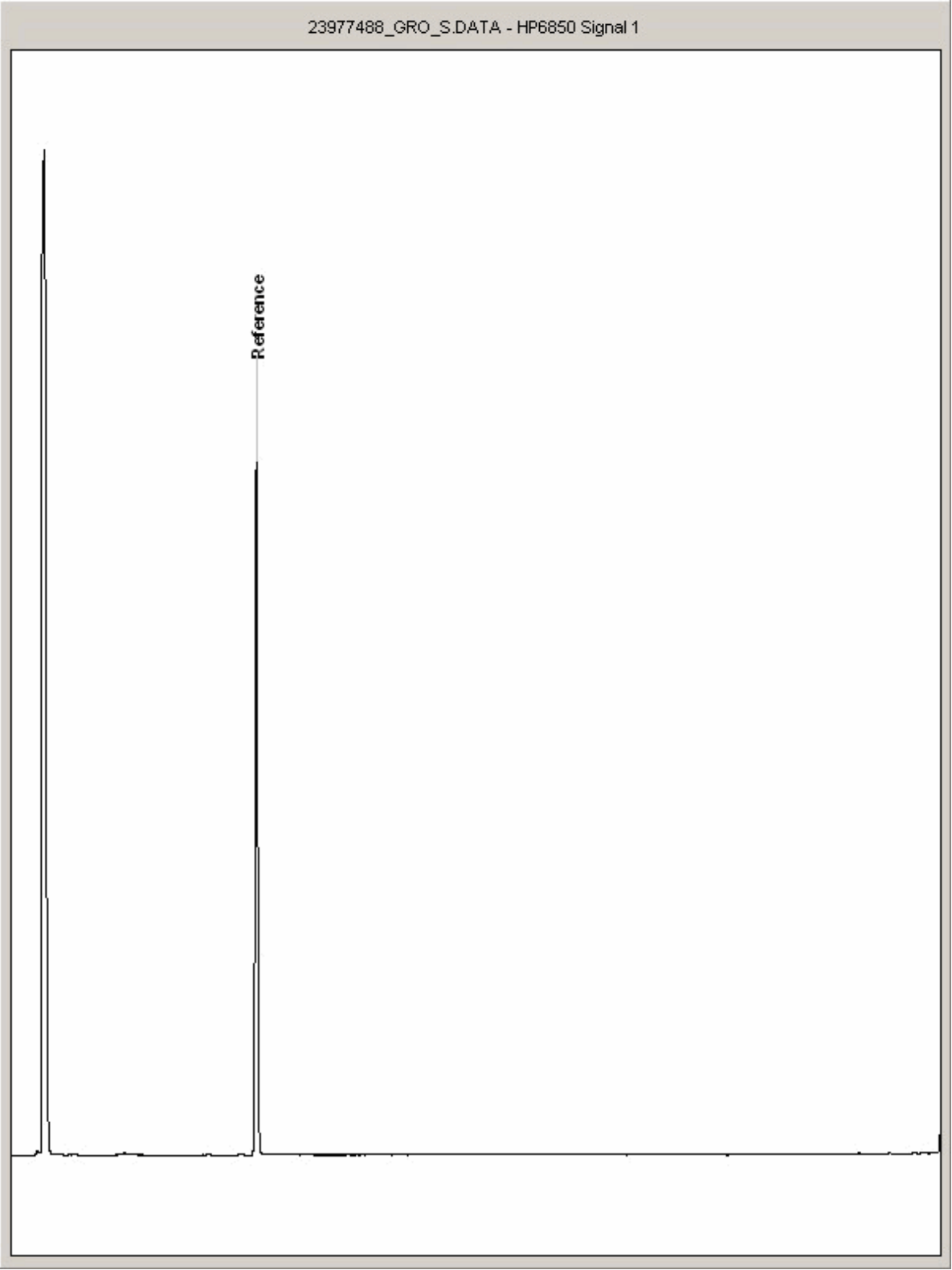
CERTIFICATE OF ANALYSIS

Validated

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23977488 Depth : 0.10
Sample ID : PTR-06



CERTIFICATE OF ANALYSIS

SDG: 210323-45 Client Reference: B025563 Report Number: 592560
Location: idge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

Attention: Richard Tonge

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CERTIFICATE OF ANALYSIS					Validated
SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23964660	BH-PTR-08		0.10	22/03/2021
23964661	BH-PTR-08		0.20	22/03/2021
23964662	BH-PTR-08		0.50	22/03/2021
23964663	BH-PTR-08		1.00	22/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 03 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210324-149
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592874

We received 4 samples on Wednesday March 24, 2021 and 1 of these samples were scheduled for analysis which was completed on Saturday April 03, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-149 Client Reference: B025563 Report Number: 592874
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23964661		
	Customer Sample Reference		BH-PT-R-08		
	AGS Reference				
	Depth (m)		0.20		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Coronene	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-149 Client Reference: B025563 Report Number: 592874
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23964661		
	Customer Sample Reference		BH-PT-R-08		
	AGS Reference				
	Depth (m)		0.20		
	Container		60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)		
	Sample Type		S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
PCBs by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-PTR-08</div> <div>0.20 Soil/Solid (S) 22/03/2021 . 24/03/2021 210324-149 23964661</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	19						
Loss on ignition	<0.7 %	TM018	4.66	M					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Organic Carbon, Total	<0.2 %	TM132	1.55	M					
Sulphur, Total	<0.02 %	TM132	0.0503						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0155	#					
pH	1 pH Units	TM133	8.27	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
PCB congener 28	<3 µg/kg	TM168	<3	M					
PCB congener 52	<3 µg/kg	TM168	<3	M					
PCB congener 101	<3 µg/kg	TM168	<3	M					
PCB congener 118	<3 µg/kg	TM168	<3	M					
PCB congener 138	<3 µg/kg	TM168	<3	M					
PCB congener 153	<3 µg/kg	TM168	<3	M					
PCB congener 180	<3 µg/kg	TM168	<3	M					
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21						
Chromium, Trivalent	<0.9 mg/kg	TM181	6.01						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	7.05	M					
Barium	<0.6 mg/kg	TM181	66.1	#					
Beryllium	<0.01 mg/kg	TM181	0.33	M					
Cadmium	<0.02 mg/kg	TM181	0.113	M					



CERTIFICATE OF ANALYSIS

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-08				
# M aq diss.filt tot.unfilt + ** (F) 1-4&6	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 22/03/2021 . 24/03/2021 210324-149 23964661				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	112				
Toluene-d8**	%	TM116	84.2				
4-Bromofluorobenzene**	%	TM116	85				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-08					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 22/03/2021 . 24/03/2021 210324-149 23964661					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4\$@	Sample deviation (see appendix)							
Component	LOD/Units			Method				
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M					
Tetrachloroethene	<5 µg/kg	TM116	<5 M					
Dibromochloromethane	<10 µg/kg	TM116	<10 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M					
Chlorobenzene	<5 µg/kg	TM116	<5 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M					
Ethylbenzene	<4 µg/kg	TM116	<4 M					
p/m-Xylene	<10 µg/kg	TM116	<10 #					
o-Xylene	<10 µg/kg	TM116	<10 M					
Styrene	<10 µg/kg	TM116	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 M					
Isopropylbenzene	<5 µg/kg	TM116	<5 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M					
Bromobenzene	<10 µg/kg	TM116	<10 M					
Propylbenzene	<10 µg/kg	TM116	<10 M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #					
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M					
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13 M					

SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.120	Natural Moisture Content (%)	34
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	74.6
Particle Size <4mm	>95%		

Case		<div>Landfill Waste Acceptance Criteria Limits</div>		
SDG	210324-149			
Lab Sample Number(s)	23964661			
Sampled Date	22-Mar-2021			
Customer Sample Ref.	BH-PTR-08			
Depth (m)	0.20			

Solid Waste Analysis		Result			
Total Organic Carbon (%)	1.55		3	5	6
Loss on Ignition (%)	4.66		-	-	10
Sum of BTEX (mg/kg)	<0.04		6	-	-
Sum of 7 PCBs (mg/kg)	<0.021		1	-	-
Mineral Oil (mg/kg)	<5		500	-	-
PAH Sum of 17 (mg/kg)	<10		100	-	-
pH (pH Units)	8.27		-	>6	-
ANC to pH 6 (mol/kg)	0.123		-	-	-
ANC to pH 4 (mol/kg)	5.97		-	-	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	-	-	-	-	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	-	-	-	-	0.5	10	70
Copper	-	-	-	-	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	-	-	-	-	0.4	10	40
Lead	-	-	-	-	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	-	-	-	-	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	89.9	<5	899	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	5.83	<3	58.3	<30	500	800	1000

Leach Test Information

Date Prepared	26-Mar-2021
pH (pH Units)	8.38
Conductivity (µS/cm)	122.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.870

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

03/04/2021 09:12:32



SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.120	Natural Moisture Content (%)	34
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	74.6
Particle Size <4mm	>95%		

Case			
SDG	210324-149		
Lab Sample Number(s)	23964661		
Sampled Date	22-Mar-2021		
Customer Sample Ref.	BH-PTR-08		
Depth (m)	0.20		

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.014	<0.01	0.14	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	0.0021	<0.0005	0.021	<0.005	-	-	-
Barium	0.0127	<0.0002	0.127	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0167	<0.01	0.167	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	26.1	<0.2	261	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00358	<0.0003	0.0358	<0.003	-	-	-
Hardness dissolved	67	<0.65	670	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.786	<0.019	7.86	<0.19	-	-	-
Lead	0.000239	<0.0002	0.00239	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.404	<0.036	4.04	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00288	<0.0004	0.0288	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00289	<0.001	0.0289	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	26-Mar-2021
pH (pH Units)	8.38
Conductivity (µS/cm)	122.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.870

03/04/2021 09:12:50

09:12:16 03/04/2021

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325 2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23964661
Customer Sample Ref.	BH-PTR-08
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
Ammonium Low	30-Mar-2021
ANC at pH4 and ANC at pH 6	29-Mar-2021
Anions by Kone (soil)	30-Mar-2021
Anions by Kone (w)	29-Mar-2021
Asbestos ID in Solid Samples	31-Mar-2021
Boron Water Soluble	31-Mar-2021
CEN 10:1 Leachate (1 Stage)	26-Mar-2021
CEN Readings	27-Mar-2021
Chromium III	01-Apr-2021
Coronene	29-Mar-2021
Cyanide Comp/Free/Total/Thiocyanate	31-Mar-2021
Dissolved Metals by ICP-MS	29-Mar-2021
Dissolved Organic/Inorganic Carbon	03-Apr-2021
EPH by GCxGC-FID	29-Mar-2021
EPH CWG GC (S)	31-Mar-2021
Fluoride	29-Mar-2021
GRO by GC-FID (S)	31-Mar-2021
Hexavalent Chromium (s)	31-Mar-2021
Loss on Ignition in soils	30-Mar-2021
Low Level Cyanide (W)	30-Mar-2021
Low Level Hexavalent Chromium (w)	29-Mar-2021
Mercury Dissolved	30-Mar-2021
Metals in solid samples by OES	01-Apr-2021
Moisture at 105C	26-Mar-2021
PAH 16 & 17 Calc	29-Mar-2021
PAH by GCMS	26-Mar-2021
PCBs by GCMS	31-Mar-2021
pH	31-Mar-2021
pH Value of Filtered Water	29-Mar-2021
Phenols by HPLC (S)	30-Mar-2021
Phenols by HPLC (W)	30-Mar-2021
Sample description	25-Mar-2021
Total Dissolved Solids	31-Mar-2021
Total Organic Carbon	31-Mar-2021
Total Sulphur	29-Mar-2021
TPH CWG GC (S)	31-Mar-2021
VOC MS (S)	30-Mar-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2415
Ammoniacal Nitrogen as N	TM099	103.2 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2376
ANC pH_4 dry soil	TM182	115.84 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2388
Chloride (soluble)	TM243	148.7 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	163.55 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2370
Chloride	TM184	106.0 92.93 : 115.43
Sulphate (soluble)	TM184	104.8 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2315
Water Soluble Boron	TM222	96.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2334
Coronene RAW	TM410	89.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2339
Free Cyanide	TM153	95.15 79.00 : 115.00
Thiocyanate	TM153	94.23 94.09 : 113.89
Total Cyanide	TM153	109.09 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2393
Aluminium	TM152	102.67 94.21 : 111.52
Antimony	TM152	105.0 88.37 : 130.57
Arsenic	TM152	101.5 92.62 : 113.52
Barium	TM152	106.17 88.62 : 113.14
Beryllium	TM152	105.0 87.08 : 111.38
Bismuth	TM152	104.5 92.62 : 115.02
Boron	TM152	100.33 86.31 : 120.88
Cadmium	TM152	104.0 93.85 : 111.65
Calcium	TM152	102.67 89.20 : 126.91
Chromium	TM152	102.0 92.50 : 113.03
Cobalt	TM152	101.17 85.01 : 114.87
Copper	TM152	100.33 89.87 : 119.73
Iron	TM152	101.33 93.02 : 113.86
Lead	TM152	102.0 91.11 : 116.98
Lithium	TM152	103.67 87.70 : 115.90
Magnesium	TM152	97.33 89.60 : 116.61
Manganese	TM152	101.67 93.97 : 112.46
Molybdenum	TM152	100.17 89.07 : 110.96
Nickel	TM152	101.67 93.70 : 112.15
Phosphorus	TM152	103.17 89.24 : 114.18
Potassium	TM152	101.33 93.20 : 115.55
Selenium	TM152	100.33 91.69 : 117.12

Dissolved Metals by ICP-MS

		QC 2393
Silver	TM152	100.67 90.93 : 121.73
Sodium	TM152	98.0 92.42 : 113.24
Strontium	TM152	104.33 92.14 : 116.24
Tellurium	TM152	101.67 89.88 : 111.78
Thallium	TM152	100.0 82.43 : 113.83
Tin	TM152	104.33 94.62 : 107.79
Titanium	TM152	107.0 90.29 : 115.23
Tungsten	TM152	100.83 77.61 : 132.31
Uranium	TM152	101.67 86.97 : 115.76
Vanadium	TM152	101.83 89.61 : 115.48
Zinc	TM152	102.0 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2470
Dissolved Inorganic Carbon	TM090	118.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2380
Fluoride	TM104	101.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2386
QC	TM089	97.13 70.34 : 111.95

Hexavalent Chromium (s)

Hexavalent Chromium (s)

Component	Method Code	QC 2300
Hexavalent Chromium	TM151	110.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2364
Loss on Ignition	TM018	96.68 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2309
Free Cyanide - Low Level	TM279	78.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	94.75 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2359
Mercury Dissolved (CVAf)	TM183	100.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2397
Aluminium	TM181	93.81 73.56 : 108.85
Antimony	TM181	95.93 76.89 : 111.24
Arsenic	TM181	99.13 88.53 : 111.01
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	96.27 85.44 : 109.61
Boron	TM181	92.55 73.51 : 104.66
Cadmium	TM181	89.3 77.67 : 104.12
Chromium	TM181	87.63 79.64 : 105.83



CERTIFICATE OF ANALYSIS

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SDG:210324-149

Client Reference: B025563

Report Number: 592874

Location:Cambridge South East Tra

Order Number: 7000964

Superseded Report:

Metals in solid samples by OES

		QC 2397
Cobalt	TM181	88.99 84.60 : 104.13
Copper	TM181	91.2 82.40 : 105.45
Iron	TM181	92.86 82.95 : 110.58
Lead	TM181	89.86 78.24 : 104.05
Manganese	TM181	108.33 94.29 : 119.51
Mercury	TM181	95.41 83.16 : 107.81
Molybdenum	TM181	96.71 87.11 : 106.87
Nickel	TM181	89.24 80.26 : 102.28
Phosphorus	TM181	107.07 94.56 : 124.28
Selenium	TM181	99.61 82.28 : 110.48
Strontium	TM181	91.76 79.13 : 102.79
Thallium	TM181	97.79 82.94 : 111.86
Tin	TM181	100.0 86.72 : 110.03
Titanium	TM181	87.79 66.23 : 102.06
Vanadium	TM181	97.44 86.19 : 109.45
Zinc	TM181	97.54 84.68 : 113.99

Component	Method Code	QC 2329
Acenaphthene	TM218	87.0 78.59 : 112.16
Acenaphthylene	TM218	86.0 75.11 : 109.01
Anthracene	TM218	87.0 73.99 : 113.85
Benz(a)anthracene	TM218	80.5 69.31 : 119.18
Benzo(a)pyrene	TM218	78.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	80.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	81.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	77.5 69.98 : 116.49
Chrysene	TM218	85.0 69.86 : 114.50



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Order Number: 7000964

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PAH by GCMS

		QC 2329
Dibenzo(ah)anthracene	TM218	79.0 64.54 : 115.22
Fluoranthene	TM218	85.5 72.56 : 111.70
Fluorene	TM218	87.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	81.5 61.22 : 113.25
Naphthalene	TM218	84.5 77.96 : 110.91
Phenanthrene	TM218	87.5 76.83 : 113.25
Pyrene	TM218	83.5 72.45 : 110.77

Component	Method Code	QC 2340
PCB congener 101	TM168	82.9 65.66 : 110.06
PCB congener 105	TM168	79.3 58.10 : 106.34
PCB congener 114	TM168	81.2 59.38 : 106.48
PCB congener 118	TM168	81.5 60.02 : 106.23
PCB congener 123	TM168	84.6 65.01 : 99.81
PCB congener 126	TM168	80.9 59.31 : 109.23
PCB congener 138	TM168	81.7 63.95 : 107.63
PCB congener 153	TM168	85.6 62.65 : 108.85
PCB congener 156	TM168	79.4 61.69 : 112.27
PCB congener 157	TM168	77.4 55.37 : 104.81
PCB congener 167	TM168	77.2 65.58 : 109.14
PCB congener 169	TM168	81.7 56.84 : 112.10
PCB congener 180	TM168	83.0 66.99 : 111.63
PCB congener 189	TM168	77.3 57.75 : 112.59
PCB congener 28	TM168	86.6 73.68 : 105.96
PCB congener 52	TM168	84.9 67.24 : 107.62
PCB congener 77	TM168	85.4 64.87 : 108.49
PCB congener 81	TM168	84.5 70.78 : 110.80

pH		
Component	Method Code	QC 2357
pH	TM133	100.0 99.08 : 102.24

pH Value of Filtered Water		
Component	Method Code	QC 2378
pH	TM256	100.94 99.33 : 102.54

Phenols by HPLC (S)		
Component	Method Code	QC 2393
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.25 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.78 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	44.47 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.04 76.56 : 106.38

Total Dissolved Solids		
Component	Method Code	QC 2428
Total Dissolved Solids	TM123	99.9 97.30 : 100.92

Total Organic Carbon		
Component	Method Code	QC 2383
Total Organic Carbon	TM132	107.42 87.02 : 113.45

Total Sulphur		
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Total Sulphur		
Component	Method Code	QC 2311
Total Sulphur %	TM132	71.5 61.64 : 114.47

VOC MS (S)		
Component	Method Code	QC 2307
1,1,1,2-tetrachloroethane	TM116	105.4 79.10 : 119.66
1,1,1-Trichloroethane	TM116	108.2 84.25 : 112.57
1,1,2-Trichloroethane	TM116	104.8 81.29 : 113.79
1,1-Dichloroethane	TM116	113.0 86.77 : 122.11
1,2-Dichloroethane	TM116	114.6 90.04 : 132.28
1,4-Dichlorobenzene	TM116	109.6 80.81 : 125.07
2-Chlorotoluene	TM116	95.2 73.13 : 114.13
4-Chlorotoluene	TM116	93.2 68.66 : 109.13
Benzene	TM116	107.2 84.29 : 112.22
Carbon Disulphide	TM116	101.6 75.11 : 124.81
Carbontetrachloride	TM116	106.2 82.35 : 126.46
Chlorobenzene	TM116	103.2 82.88 : 122.42
Chloroform	TM116	112.4 90.35 : 120.38
Chloromethane	TM116	131.0 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	108.2 78.27 : 128.90
Dibromomethane	TM116	99.6 76.00 : 120.73
Dichloromethane	TM116	122.6 92.27 : 134.36
Ethylbenzene	TM116	95.6 70.95 : 113.07
Hexachlorobutadiene	TM116	85.2 14.55 : 147.92
Isopropylbenzene	TM116	96.4 52.00 : 108.19
Naphthalene	TM116	104.0 80.29 : 135.77
o-Xylene	TM116	91.6 64.92 : 98.85



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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2307
p/m-Xylene	TM116	89.0 69.47 : 97.31
Sec-Butylbenzene	TM116	102.0 27.03 : 135.73
Tetrachloroethene	TM116	103.8 81.43 : 126.65
Toluene	TM116	95.4 82.44 : 103.50
Trichloroethene	TM116	101.4 79.80 : 112.33
Trichlorofluoromethane	TM116	108.0 89.67 : 132.09
Vinyl Chloride	TM116	121.2 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



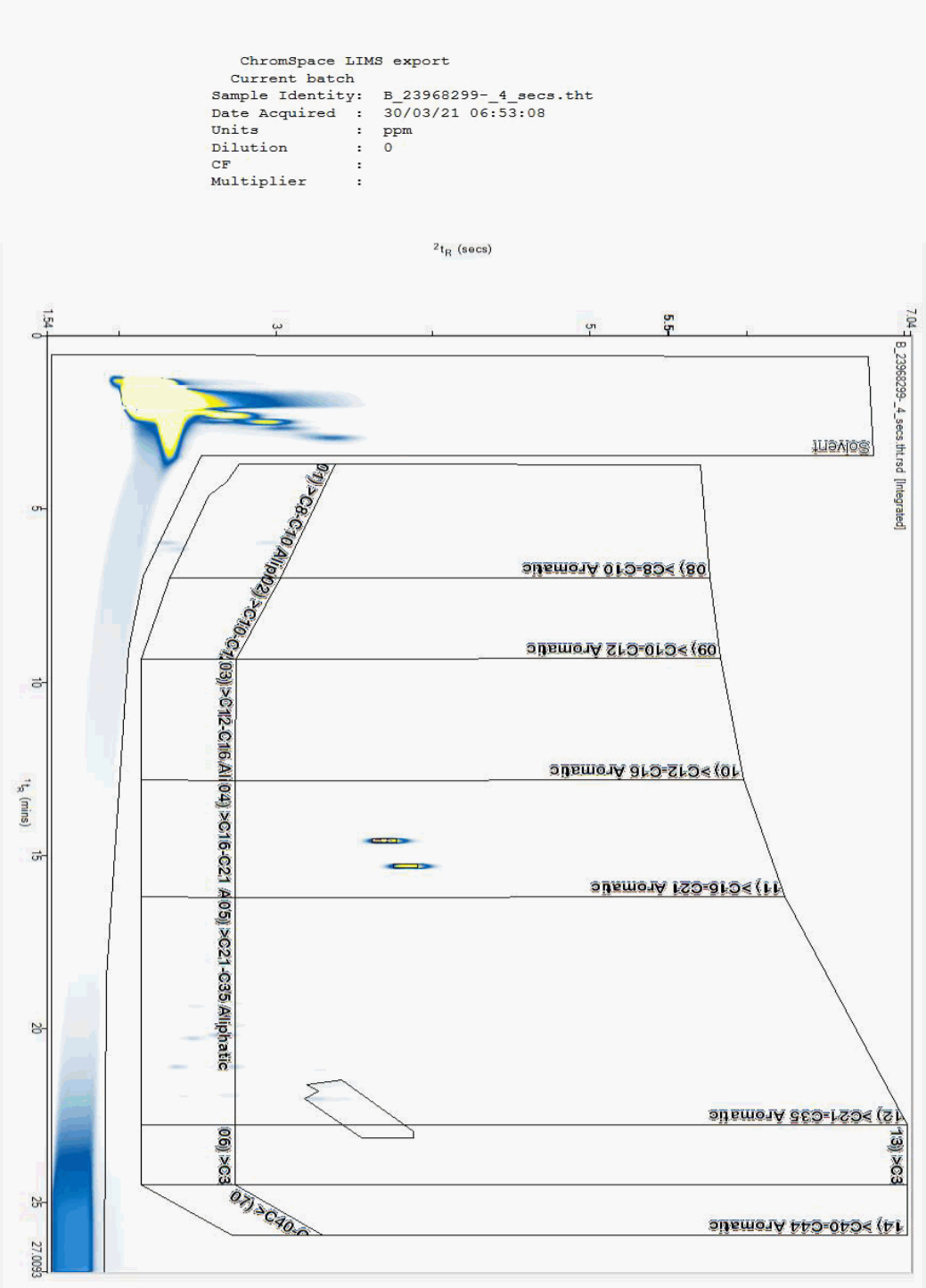
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SDG:	210324-149	Client Reference:	B025563	Report Number:	592874
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23968299	Depth :	0.20
		Sample ID :	BH-PTR-08		





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SDG: 210324-149 Client Reference: B025563 Report Number: 592874
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Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 23968385 Depth : 0.20
Sample ID : BH-PTR-08



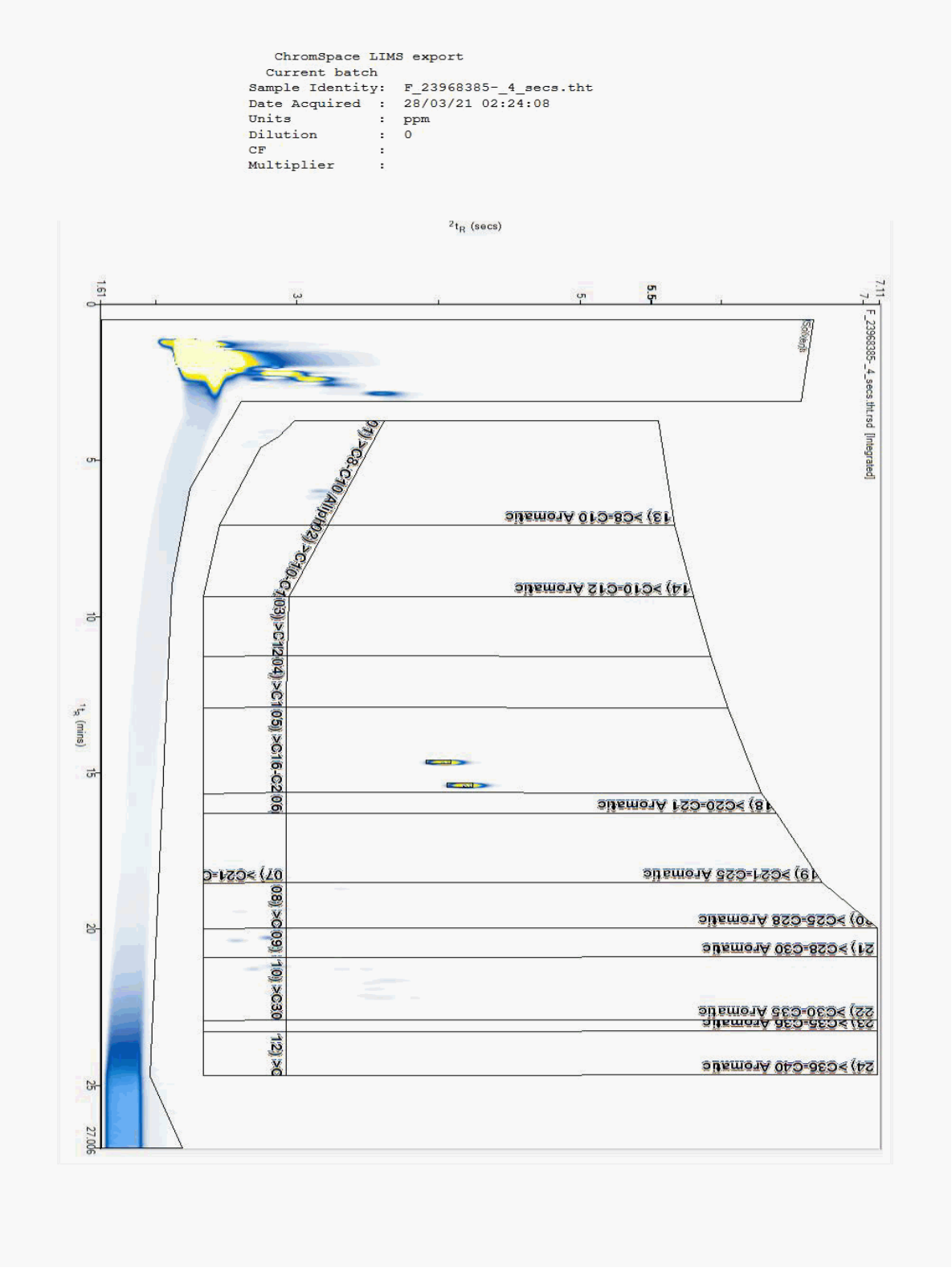
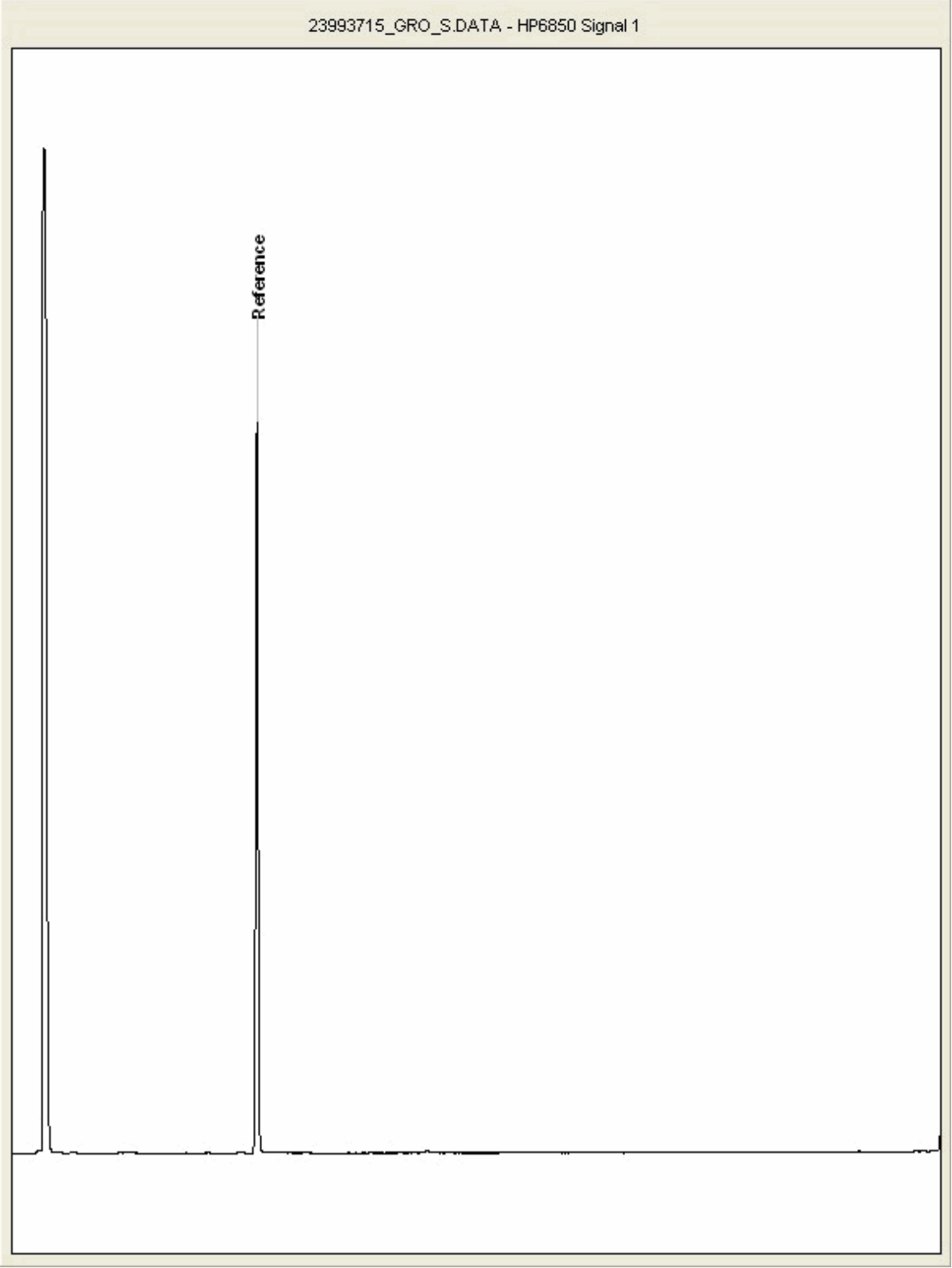
CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-149 Client Reference: B025563 Report Number: 592874
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23993715 Depth : 0.20
Sample ID : BH-PTR-08





CERTIFICATE OF ANALYSIS

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Location: idge South East Transport - Ph: **Order Number:** 7000964 **Superseded Report:**

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Attention: Richard Tonge

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Hawarden

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CH5 3US

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CERTIFICATE OF ANALYSIS

Date of report Generation:

01 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210324-150

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

592774

We received 7 samples on Wednesday March 24, 2021 and 2 of these samples were scheduled for analysis which was completed on Thursday April 01, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 01/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-150 Client Reference: B025563 Report Number: 592774
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23964704	BH-OBC-07	ES1	2.75	22/03/2021
23964706	BH-OBC-21	ES1		22/03/2021
23964700	BH-PTR-29	ES1	0.10	22/03/2021
23964701	BH-PTR-29	ES2	0.20	22/03/2021
23964702	BH-PTR-29	ES3	0.50	22/03/2021
23964703	BH-PTR-29	ES4	1.00	22/03/2021
23964705	BH-PTR-29	ES1	1.20	22/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-150 Client Reference: B025563 Report Number: 592774
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	23964700	23964703
						BH-PTR-29	BH-PTR-29
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	0.10	1.00	60g VOC (ALE215) 250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2					
Boron Water Soluble	All	NDPs: 0 Tests: 2					
Chromium III	All	NDPs: 0 Tests: 2					
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2					
EPH CWG GC (S)	All	NDPs: 0 Tests: 2					
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2					
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2					
Metals in solid samples by OES	All	NDPs: 0 Tests: 2					
PAH by GCMS	All	NDPs: 0 Tests: 2					
pH	All	NDPs: 0 Tests: 2					
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2					
Sample description	All	NDPs: 0 Tests: 2					
Total Organic Carbon	All	NDPs: 0 Tests: 2					
Total Sulphur	All	NDPs: 0 Tests: 2					



CERTIFICATE OF ANALYSIS

Validated

SDG:

210324-150

Client Reference:

B025563

Report Number:

592774

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Results Legend

X

Test

N

No Determination Possible

Sample Types -

S - Soil/Solid

UNS - Unspecified Solid

GW - Ground Water

SW - Surface Water

LE - Land Leachate

PL - Prepared Leachate

PR - Process Water

SA - Saline Water

TE - Trade Effluent

TS - Treated Sewage

US - Untreated Sewage

RE - Recreational Water

DW - Drinking Water Non-regulatory

UNL - Unspecified Liquid

SL - Sludge

G - Gas

OTH - Other

Lab Sample No(s)

23964700

23964703

Customer Sample Reference

BH-PTR-29

BH-PTR-29

AGS Reference

ES1

ES4

Depth (m)

0.10

1.00

Container

1kg TUB with Handle (ALE260)

250g Amber Jar (ALE210)

60g VOC (ALE215)

250g Amber Jar (ALE210)

60g VOC (ALE215)

Sample Type

S

S

S

S

S

TPH CWG GC (S)

All

NDPs: 0
Tests: 2

X

X

VOC MS (S)

All

NDPs: 0
Tests: 2

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG:

210324-150

Location:

Cambridge South East Tra

Client Reference:

B025563

Order Number:

7000964

Report Number:

592774

Superseded Report:

Sample Descriptions

Grain Sizes

very fine

<0.063mm

fine

0.063mm - 0.1mm

medium

0.1mm - 2mm

coarse

2mm - 10mm

very coarse

>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23964700	BH-PTR-29	0.10	Light Brown	Silty Clay Loam	Stones	Vegetation
23964703	BH-PTR-29	1.00	Light Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

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SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unfit + " (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		Customer Sample Ref.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-PTR-29 0.10 Soil/Solid (S) 22/03/2021 . 24/03/2021 210324-150 23964700 ES1	BH-PTR-29 1.00 Soil/Solid (S) 22/03/2021 . 24/03/2021 210324-150 23964703 ES4				
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	23	13					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13					
Sulphur, Total	<0.02 %	TM132	0.0277	<0.02					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0283 #	0.00294 #					
pH	1 pH Units	TM133	8.22 M	8.56 M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #					
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M					
Chromium, Trivalent	<0.9 mg/kg	TM181	21.3	6.73					
Antimony	<0.6 mg/kg	TM181	<0.6 #	<0.6 #					
Arsenic	<0.6 mg/kg	TM181	15.3 M	4.13 M					
Barium	<0.6 mg/kg	TM181	98.6 #	31 #					
Beryllium	<0.01 mg/kg	TM181	1 M	0.282 M					
Cadmium	<0.02 mg/kg	TM181	0.134 M	0.0526 M					
Chromium	<0.9 mg/kg	TM181	21.3 M	6.73 M					
Copper	<1.4 mg/kg	TM181	15.1 M	5.16 M					
Iron	<1000 mg/kg	TM181	26100 #	5060 #					
Lead	<0.7 mg/kg	TM181	23.2 M	3.42 M					
Manganese	<0.13 mg/kg	TM181	358 M	50.7 M					
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M					
Molybdenum	<0.1 mg/kg	TM181	0.24 #	0.141 #					
Nickel	<0.2 mg/kg	TM181	23.7 M	9.4 M					
Selenium	<1 mg/kg	TM181	<1 #	<1 #					
Vanadium	<0.2 mg/kg	TM181	48.4 #	15.2 #					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

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SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

Table of Results - Appendix		
Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates		
Lab Sample No(s) Customer Sample Ref. AGS Ref. Depth Type	23964700	23964703
	BH-PTR-29	BH-PTR-29
	ES1	ES4
	0.10	1.00
	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	30-Mar-2021	30-Mar-2021
Asbestos ID in Solid Samples	31-Mar-2021	31-Mar-2021
Boron Water Soluble	31-Mar-2021	31-Mar-2021
Chromium III	01-Apr-2021	01-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	29-Mar-2021	29-Mar-2021
EPH CWG GC (S)	31-Mar-2021	31-Mar-2021
GRO by GC-FID (S)	31-Mar-2021	31-Mar-2021
Hexavalent Chromium (s)	31-Mar-2021	31-Mar-2021
Metals in solid samples by OES	01-Apr-2021	01-Apr-2021
Moisture at 105C	26-Mar-2021	
PAH by GCMS	29-Mar-2021	29-Mar-2021
pH	31-Mar-2021	31-Mar-2021
Phenols by HPLC (S)	30-Mar-2021	30-Mar-2021
Sample description	25-Mar-2021	25-Mar-2021
Total Organic Carbon	31-Mar-2021	31-Mar-2021
Total Sulphur	29-Mar-2021	29-Mar-2021
TPH CWG GC (S)	31-Mar-2021	31-Mar-2021
VOC MS (S)	30-Mar-2021	30-Mar-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2388	QC 2385
Chloride (soluble)	TM243	148.7 86.68 : 115.67	143.01 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	163.55 70.00 : 130.00	163.08 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2315
Water Soluble Boron	TM222	96.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2303	QC 2326
Free Cyanide	TM153	99.01 79.00 : 115.00	100.99 79.00 : 115.00
Thiocyanate	TM153	100.64 94.09 : 113.89	102.56 94.09 : 113.89
Total Cyanide	TM153	97.9 73.07 : 107.47	103.5 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2386
QC	TM089	97.13 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2300
Hexavalent Chromium	TM151	110.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2397
Aluminium	TM181	93.81 73.56 : 108.85
Antimony	TM181	95.93 76.89 : 111.24
Arsenic	TM181	99.13 88.53 : 111.01



CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-150Client Reference: B025563Report Number: 592774

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Metals in solid samples by OES

		QC 2397
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	96.27 85.44 : 109.61
Boron	TM181	92.55 73.51 : 104.66
Cadmium	TM181	89.3 77.67 : 104.12
Chromium	TM181	87.63 79.64 : 105.83
Cobalt	TM181	88.99 84.60 : 104.13
Copper	TM181	91.2 82.40 : 105.45
Iron	TM181	92.86 82.95 : 110.58
Lead	TM181	89.86 78.24 : 104.05
Manganese	TM181	108.33 94.29 : 119.51
Mercury	TM181	95.41 83.16 : 107.81
Molybdenum	TM181	96.71 87.11 : 106.87
Nickel	TM181	89.24 80.26 : 102.28
Phosphorus	TM181	107.07 94.56 : 124.28
Selenium	TM181	99.61 82.28 : 110.48
Strontium	TM181	91.76 79.13 : 102.79
Thallium	TM181	97.79 82.94 : 111.86
Tin	TM181	100.0 86.72 : 110.03
Titanium	TM181	87.79 66.23 : 102.06
Vanadium	TM181	97.44 86.19 : 109.45
Zinc	TM181	97.54 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2328
Acenaphthene	TM218	92.5 73.47 : 109.80
Acenaphthylene	TM218	89.5 70.00 : 130.00
Anthracene	TM218	101.0 68.68 : 111.89
Benz(a)anthracene	TM218	87.0 68.12 : 118.39

13:14:19 01/04/2021

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PAH by GCMS

		QC 2328
Benzo(a)pyrene	TM218	98.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	93.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	105.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	102.5 73.10 : 117.03
Chrysene	TM218	85.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	102.5 67.32 : 121.35
Fluoranthene	TM218	95.5 75.16 : 117.28
Fluorene	TM218	89.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	97.5 68.91 : 117.62
Naphthalene	TM218	92.0 72.12 : 106.18
Phenanthrene	TM218	105.0 69.01 : 113.72
Pyrene	TM218	101.0 64.28 : 115.75

pH

Component	Method Code	QC 2357
pH	TM133	100.0 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2337
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	54.55 68.54 : 123.77
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 68.54 : 123.77
Cresols by HPLC (S)	TM062 (S)	37.16 64.51 : 98.72
Phenol by HPLC (S)	TM062 (S)	52.98 68.24 : 117.99
Xylenols by HPLC (S)	TM062 (S)	52.19 88.23 : 104.42

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2383
Total Organic Carbon	TM132	107.42 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2311
Total Sulphur %	TM132	71.5 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2307
1,1,1,2-tetrachloroethane	TM116	105.4 79.10 : 119.66
1,1,1-Trichloroethane	TM116	108.2 84.25 : 112.57
1,1,2-Trichloroethane	TM116	104.8 81.29 : 113.79
1,1-Dichloroethane	TM116	113.0 86.77 : 122.11
1,2-Dichloroethane	TM116	114.6 90.04 : 132.28
1,4-Dichlorobenzene	TM116	109.6 80.81 : 125.07
2-Chlorotoluene	TM116	95.2 73.13 : 114.13
4-Chlorotoluene	TM116	93.2 68.66 : 109.13
Benzene	TM116	107.2 84.29 : 112.22
Carbon Disulphide	TM116	101.6 75.11 : 124.81
Carbontetrachloride	TM116	106.2 82.35 : 126.46
Chlorobenzene	TM116	103.2 82.88 : 122.42
Chloroform	TM116	112.4 90.35 : 120.38
Chloromethane	TM116	131.0 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	108.2 78.27 : 128.90
Dibromomethane	TM116	99.6 76.00 : 120.73
Dichloromethane	TM116	122.6 92.27 : 134.36



CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2307
Ethylbenzene	TM116	95.6 70.95 : 113.07
Hexachlorobutadiene	TM116	85.2 14.55 : 147.92
Isopropylbenzene	TM116	96.4 52.00 : 108.19
Naphthalene	TM116	104.0 80.29 : 135.77
o-Xylene	TM116	91.6 64.92 : 98.85
p/m-Xylene	TM116	89.0 69.47 : 97.31
Sec-Butylbenzene	TM116	102.0 27.03 : 135.73
Tetrachloroethene	TM116	103.8 81.43 : 126.65
Toluene	TM116	95.4 82.44 : 103.50
Trichloroethene	TM116	101.4 79.80 : 112.33
Trichlorofluoromethane	TM116	108.0 89.67 : 132.09
Vinyl Chloride	TM116	121.2 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



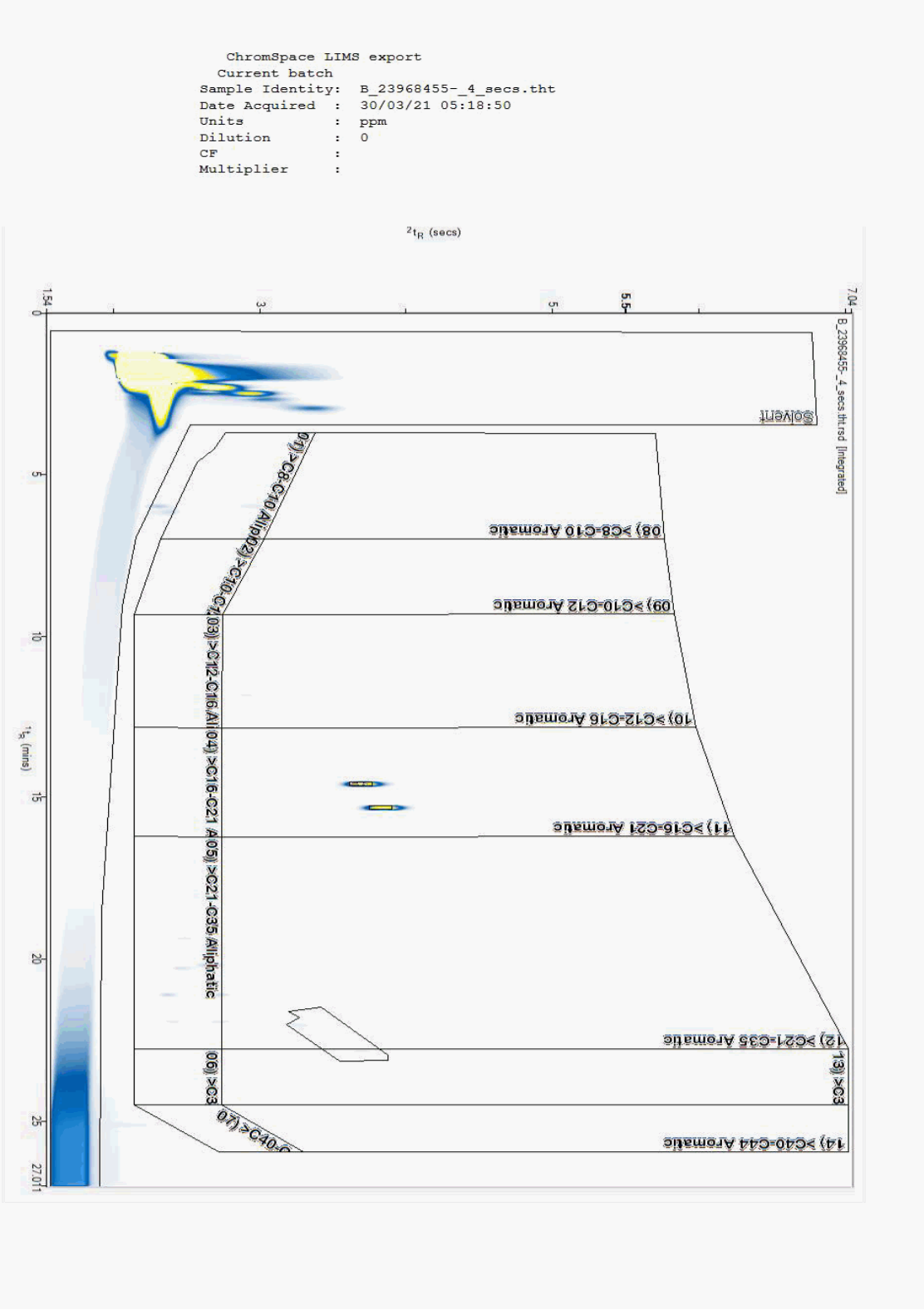
CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23968455	Depth :	1.00
		Sample ID :	BH-PTR-29		





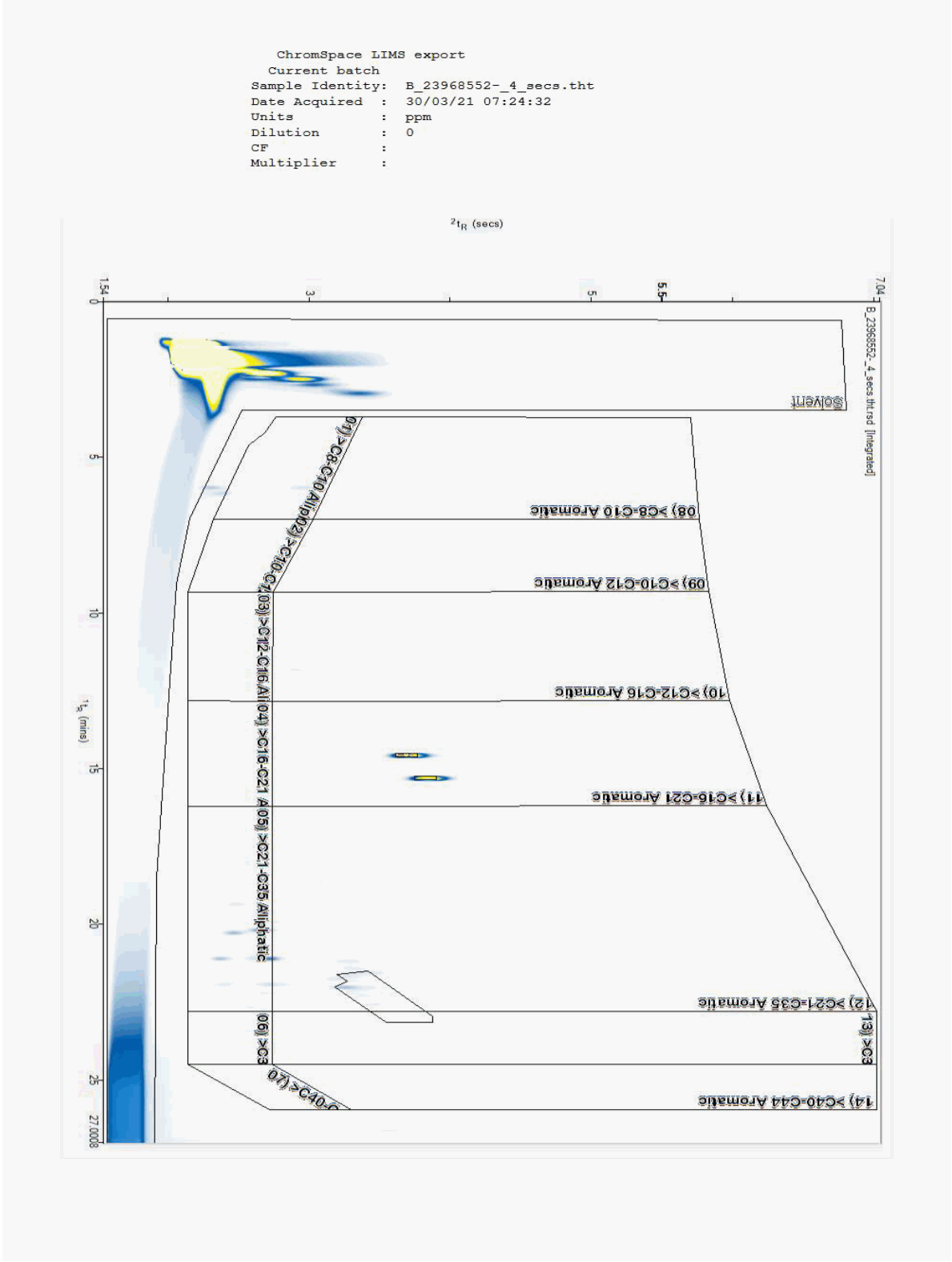
CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23968552 Depth : 0.10
Sample ID : BH-PTR-29



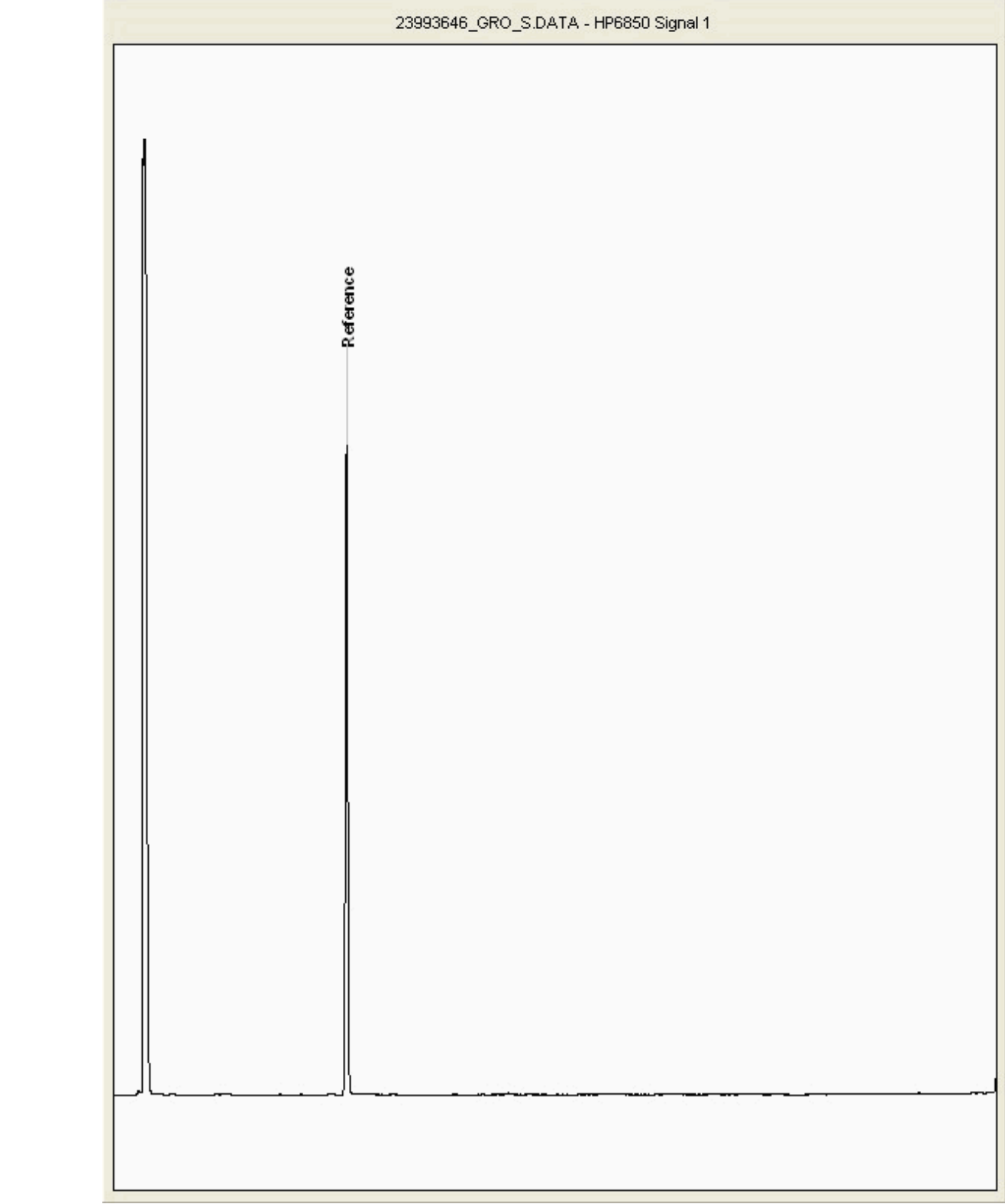
CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23993646 Depth : 0.10
Sample ID : BH-PTR-29





CERTIFICATE OF ANALYSIS

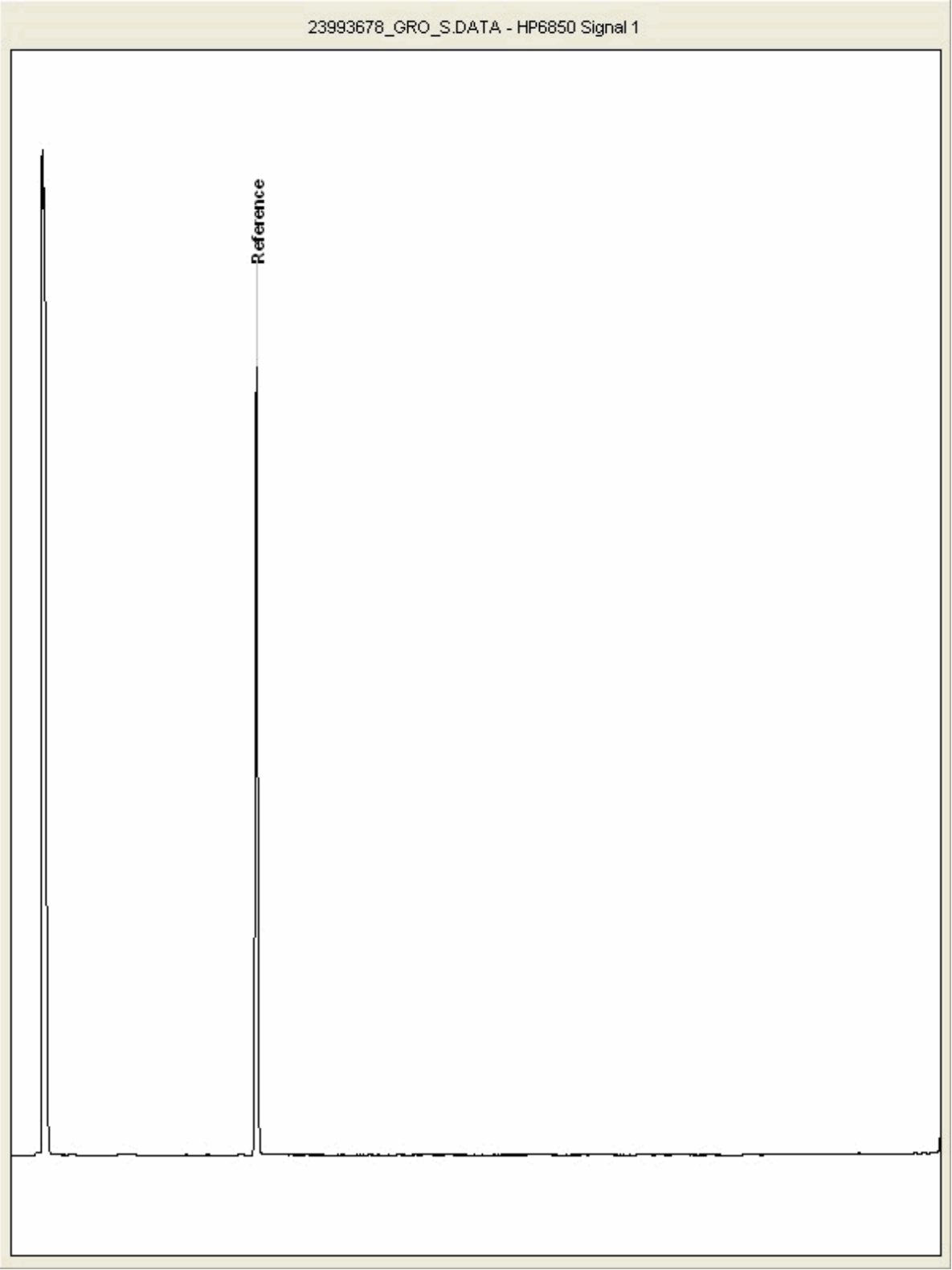
Validated

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 23993678
Sample ID : BH-PTR-29
Depth : 1.00



CERTIFICATE OF ANALYSIS

SDG:	210324-150	Client Reference:	B025563	Report Number:	592774
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 01 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210324-152
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 592722

We received 4 samples on Wednesday March 24, 2021 and 1 of these samples were scheduled for analysis which was completed on Thursday April 01, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-152 Client Reference: B025563 Report Number: 592722
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23964741	BHPTR09	ES1	0.10	19/03/2021
23964742	BHPTR09	ES2	0.20	19/03/2021
23964743	BHPTR09	ES3	0.50	19/03/2021
23964744	BHPTR09	ES4	1.00	19/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:210324-152Client Reference: B025563Report Number: 592722

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23964743		
	Customer Sample Reference		BHPTRO9		
	AGS Reference		ES3		
	Depth (m)		0.50		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG:210324-152Client Reference: B025563Report Number: 592722

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23964743		
	Customer Sample Reference		BHPTRO9		
	AGS Reference		ES3		
	Depth (m)		0.50		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23964743	BHPTR09	0.50	Light Brown	Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BHPTR09				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		19/03/2021				
disa.fit	Dissolved / filtered sample.		.				
tot.unfit	Total / unfiltered sample.		24/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210324-152				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23964743				
(F)	Trigger breach confirmed		ES3				
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	13				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	0.069	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	0.069	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	#			
pH	1 pH Units	TM133	8.72	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	7.2				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	3.38	M			
Barium	<0.6 mg/kg	TM181	49.9	#			
Beryllium	<0.01 mg/kg	TM181	0.355	M			
Cadmium	<0.02 mg/kg	TM181	0.0293	M			
Chromium	<0.9 mg/kg	TM181	7.2	M			
Copper	<1.4 mg/kg	TM181	7.99	M			
Iron	<1000 mg/kg	TM181	12400	#			
Lead	<0.7 mg/kg	TM181	3.87	M			
Manganese	<0.13 mg/kg	TM181	442	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	<0.1	#			
Nickel	<0.2 mg/kg	TM181	13.9	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	14.9	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		BHPTR09					
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.			Depth (m)	0.50				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			Sample Type	Soil/Solid (S)				
(F)	Trigger breach confirmed			Date Sampled	19/03/2021				
1-4&6	Sample deviation (see appendix)			Sampled Time	.				
				Date Received	24/03/2021				
				SDG Ref	210324-152				
				Lab Sample No.(s)	23964743				
				AGS Reference	ES3				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	118						
Toluene-d8**	%	TM116	87						
4-Bromofluorobenzene**	%	TM116	100						
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M						
Chloromethane	<7 µg/kg	TM116	<7 #						
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M						
Bromomethane	<10 µg/kg	TM116	<10 M						
Chloroethane	<10 µg/kg	TM116	<10 M						
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M						
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #						
Carbon Disulphide	<7 µg/kg	TM116	<7 M						
Dichloromethane	<10 µg/kg	TM116	<10 #						
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M						
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M						
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M						
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M						
2,2-Dichloropropane	<10 µg/kg	TM116	<10						
Bromochloromethane	<10 µg/kg	TM116	<10 M						
Chloroform	<8 µg/kg	TM116	<8 M						
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M						
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M						
Carbontetrachloride	<10 µg/kg	TM116	<10 M						
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M						
Benzene	<9 µg/kg	TM116	<9 M						
Trichloroethene	<9 µg/kg	TM116	<9 #						
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M						
Dibromomethane	<9 µg/kg	TM116	<9 M						
Bromodichloromethane	<7 µg/kg	TM116	<7 M						
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M						
Toluene	<7 µg/kg	TM116	<7 M						
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M						

VOC MS (S)

Results Legend			Customer Sample Ref.		BHPTR09					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 Soil/Solid (S) 19/03/2021 . 24/03/2021 210324-152 23964743 ES3							
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
dis.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted - refer to subcontractor report for accreditation status.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-4-6@	Sample deviation (see appendix)									
Component	LOD/Units									Method
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M							
Tetrachloroethene	<5 µg/kg	TM116	<5 M							
Dibromochloromethane	<10 µg/kg	TM116	<10 M							
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M							
Chlorobenzene	<5 µg/kg	TM116	<5 M							
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M							
Ethylbenzene	<4 µg/kg	TM116	<4 M							
p/m-Xylene	<10 µg/kg	TM116	<10 #							
o-Xylene	<10 µg/kg	TM116	<10 M							
Styrene	<10 µg/kg	TM116	<10 @ #							
Bromoform	<10 µg/kg	TM116	<10 M							
Isopropylbenzene	<5 µg/kg	TM116	<5 #							
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #							
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M							
Bromobenzene	<10 µg/kg	TM116	<10 M							
Propylbenzene	<10 µg/kg	TM116	<10 M							
2-Chlorotoluene	<9 µg/kg	TM116	<9 M							
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M							
4-Chlorotoluene	<10 µg/kg	TM116	<10 M							
tert-Butylbenzene	<14 µg/kg	TM116	<14 M							
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #							
sec-Butylbenzene	<10 µg/kg	TM116	<10							
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M							
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M							
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M							
n-Butylbenzene	<11 µg/kg	TM116	<11							
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M							
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M							
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #							
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20							
Hexachlorobutadiene	<20 µg/kg	TM116	<20							
Naphthalene	<13 µg/kg	TM116	<13 M							

VOC MS (S)

Results Legend		Customer Sample Ref.		BHPTR09					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 Soil/Solid (S) 19/03/2021 . 24/03/2021 210324-152 23964743 ES3						
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4-6@	Sample deviation (see appendix)								
Component	LOD/Units			Method					
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20 #						
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20						
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02						
Sum of BTEX	<40 µg/kg	TM116	<40						

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BHPTR09ES3	31/03/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	SOLID										
Date Sampled	19/03/2021 00:00:00										
Date Received	24/03/2021 13:20:00										
SDG	210324-152										
Original Sample Method Number	23964743 TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	23964743
Customer Sample Ref.	BHPTRO9
AGS Ref.	ES3
Depth	0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	30-Mar-2021
Asbestos ID in Solid Samples	31-Mar-2021
Boron Water Soluble	31-Mar-2021
Chromium III	01-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	31-Mar-2021
EPH CWG GC (S)	31-Mar-2021
GRO by GC-FID (S)	31-Mar-2021
Hexavalent Chromium (s)	31-Mar-2021
Metals in solid samples by OES	01-Apr-2021
PAH by GCMS	31-Mar-2021
pH	31-Mar-2021
Phenols by HPLC (S)	31-Mar-2021
Sample description	26-Mar-2021
Total Organic Carbon	31-Mar-2021
Total Sulphur	29-Mar-2021
TPH CWG GC (S)	31-Mar-2021
VOC MS (S)	30-Mar-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2388
Chloride (soluble)	TM243	148.7 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	163.55 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2315
Water Soluble Boron	TM222	96.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2339
Free Cyanide	TM153	95.15 79.00 : 115.00
Thiocyanate	TM153	94.23 94.09 : 113.89
Total Cyanide	TM153	109.09 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2386
QC	TM089	97.13 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2300
Hexavalent Chromium	TM151	110.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2397
Aluminium	TM181	93.81 73.56 : 108.85
Antimony	TM181	95.93 76.89 : 111.24
Arsenic	TM181	99.13 88.53 : 111.01



CERTIFICATE OF ANALYSIS

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SDG: 210324-152 Client Reference: B025563 Report Number: 592722
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Metals in solid samples by OES

		QC 2397
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	96.27 85.44 : 109.61
Boron	TM181	92.55 73.51 : 104.66
Cadmium	TM181	89.3 77.67 : 104.12
Chromium	TM181	87.63 79.64 : 105.83
Cobalt	TM181	88.99 84.60 : 104.13
Copper	TM181	91.2 82.40 : 105.45
Iron	TM181	92.86 82.95 : 110.58
Lead	TM181	89.86 78.24 : 104.05
Manganese	TM181	108.33 94.29 : 119.51
Mercury	TM181	95.41 83.16 : 107.81
Molybdenum	TM181	96.71 87.11 : 106.87
Nickel	TM181	89.24 80.26 : 102.28
Phosphorus	TM181	107.07 94.56 : 124.28
Selenium	TM181	99.61 82.28 : 110.48
Strontium	TM181	91.76 79.13 : 102.79
Thallium	TM181	97.79 82.94 : 111.86
Tin	TM181	100.0 86.72 : 110.03
Titanium	TM181	87.79 66.23 : 102.06
Vanadium	TM181	97.44 86.19 : 109.45
Zinc	TM181	97.54 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2329
Acenaphthene	TM218	95.0 78.59 : 112.16
Acenaphthylene	TM218	93.5 75.11 : 109.01
Anthracene	TM218	92.5 73.99 : 113.85
Benz(a)anthracene	TM218	93.5 69.31 : 119.18



CERTIFICATE OF ANALYSIS

Validated

SDG: 210324-152 Client Reference: B025563 Report Number: 592722
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

PAH by GCMS

		QC 2329
Benzo(a)pyrene	TM218	89.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	94.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	88.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	89.0 69.98 : 116.49
Chrysene	TM218	90.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	89.0 64.54 : 115.22
Fluoranthene	TM218	90.5 72.56 : 111.70
Fluorene	TM218	93.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	94.0 61.22 : 113.25
Naphthalene	TM218	94.0 77.96 : 110.91
Phenanthrene	TM218	93.5 76.83 : 113.25
Pyrene	TM218	91.0 72.45 : 110.77

pH

Component	Method Code	QC 2357
pH	TM133	100.0 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2337
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	54.55 68.54 : 123.77
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 68.54 : 123.77
Cresols by HPLC (S)	TM062 (S)	37.16 64.51 : 98.72
Phenol by HPLC (S)	TM062 (S)	52.98 68.24 : 117.99
Xylenols by HPLC (S)	TM062 (S)	52.19 88.23 : 104.42

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2383
Total Organic Carbon	TM132	107.42 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2321
Total Sulphur %	TM132	92.23 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2307
1,1,1,2-tetrachloroethane	TM116	105.4 79.10 : 119.66
1,1,1-Trichloroethane	TM116	108.2 84.25 : 112.57
1,1,2-Trichloroethane	TM116	104.8 81.29 : 113.79
1,1-Dichloroethane	TM116	113.0 86.77 : 122.11
1,2-Dichloroethane	TM116	114.6 90.04 : 132.28
1,4-Dichlorobenzene	TM116	109.6 80.81 : 125.07
2-Chlorotoluene	TM116	95.2 73.13 : 114.13
4-Chlorotoluene	TM116	93.2 68.66 : 109.13
Benzene	TM116	107.2 84.29 : 112.22
Carbon Disulphide	TM116	101.6 75.11 : 124.81
Carbontetrachloride	TM116	106.2 82.35 : 126.46
Chlorobenzene	TM116	103.2 82.88 : 122.42
Chloroform	TM116	112.4 90.35 : 120.38
Chloromethane	TM116	131.0 65.80 : 138.88
Cis-1,2-Dichloroethene	TM116	108.2 78.27 : 128.90
Dibromomethane	TM116	99.6 76.00 : 120.73
Dichloromethane	TM116	122.6 92.27 : 134.36

VOC MS (S)

		QC 2307
Ethylbenzene	TM116	95.6 70.95 : 113.07
Hexachlorobutadiene	TM116	85.2 14.55 : 147.92
Isopropylbenzene	TM116	96.4 52.00 : 108.19
Naphthalene	TM116	104.0 80.29 : 135.77
o-Xylene	TM116	91.6 64.92 : 98.85
p/m-Xylene	TM116	89.0 69.47 : 97.31
Sec-Butylbenzene	TM116	102.0 27.03 : 135.73
Tetrachloroethene	TM116	103.8 81.43 : 126.65
Toluene	TM116	95.4 82.44 : 103.50
Trichloroethene	TM116	101.4 79.80 : 112.33
Trichlorofluoromethane	TM116	108.0 89.67 : 132.09
Vinyl Chloride	TM116	121.2 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



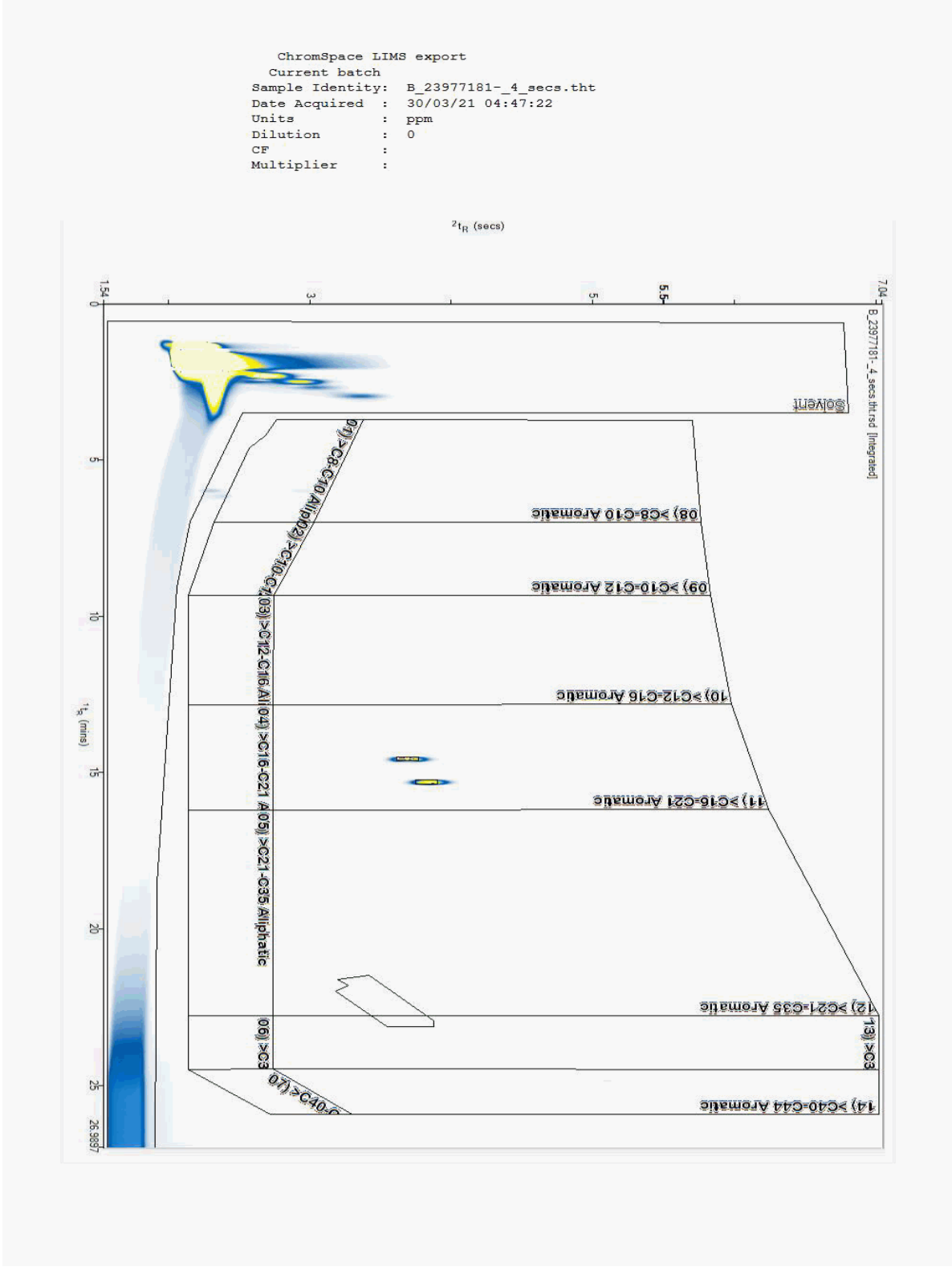
CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23977181 Depth : 0.50
Sample ID : BHPTR09



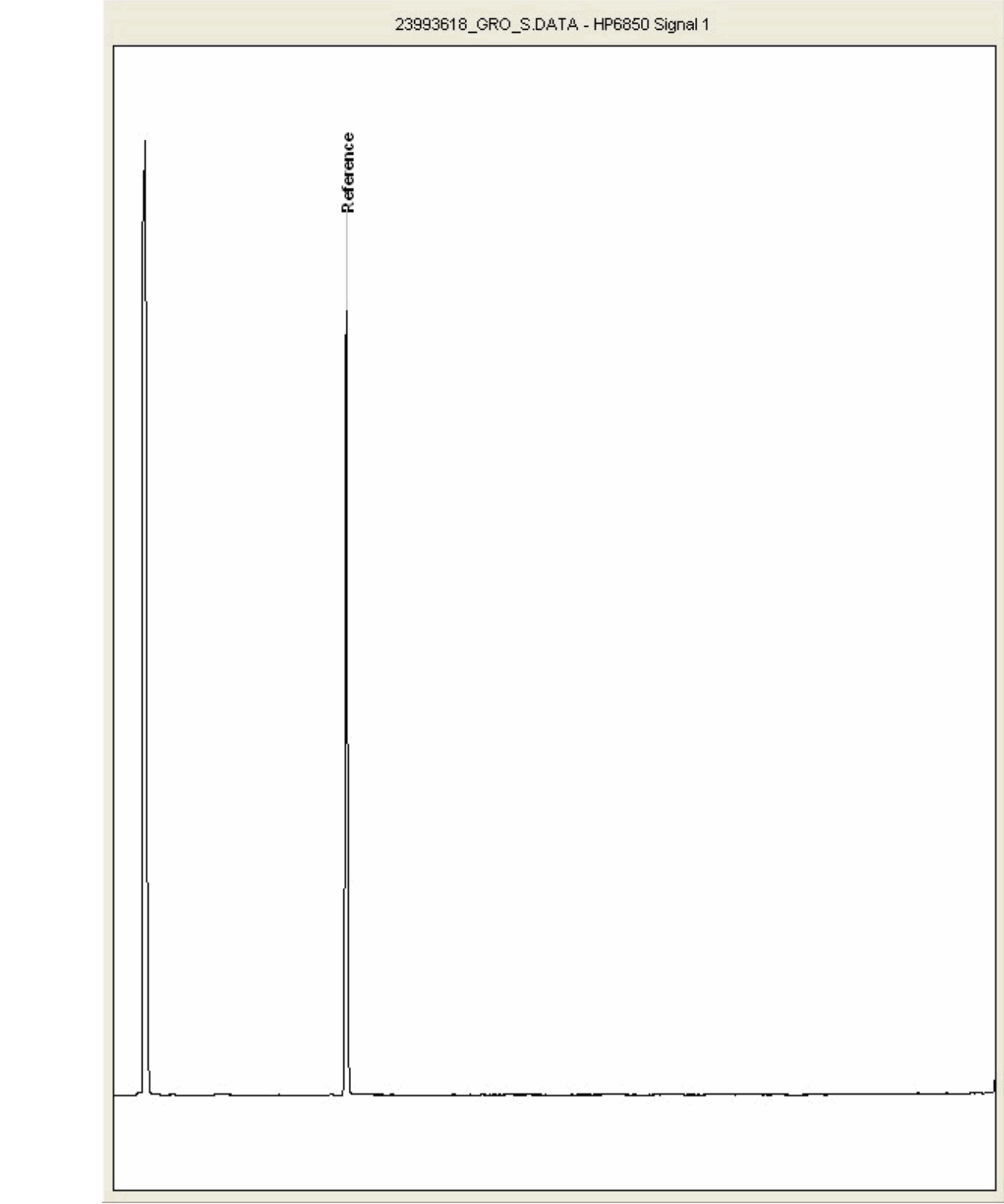
CERTIFICATE OF ANALYSIS

Validated

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 23993618 Depth : 0.50
Sample ID : BHPTR09





CERTIFICATE OF ANALYSIS

SDG:	210324-152	Client Reference:	B025563	Report Number:	592722
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Attention: Richard Tonge

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Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

07 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210325-141

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

593168

We received 5 samples on Thursday March 25, 2021 and 1 of these samples were scheduled for analysis which was completed on Wednesday April 07, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 07/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:

210325-141

Client Reference:

B025563

Report Number:

593168

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23972294	TP-OBC-12	ESES1	0.10	23/03/2021
23972296	TP-OBC-12	ESES3	0.20	23/03/2021
23972297	TP-OBC-12	ESES6	0.60	23/03/2021
23972298	TP-OBC-12	ESES10	1.40	23/03/2021
23972299	TP-OBC-12	ESES16	3.10	23/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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SDG:

210325-141

Client Reference:

B025563

Report Number:

593168

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>
--

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other



CERTIFICATE OF ANALYSIS

Validated

SDG: 210325-141		Client Reference: B025563		Report Number: 593168	
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:	

X

Test

N

No Determination Possible

Sample Types -

S - Soil/Solid

UNS - Unspecified Solid

GW - Ground Water

SW - Surface Water

LE - Land Leachate

PL - Prepared Leachate

PR - Process Water

SA - Saline Water

TE - Trade Effluent

TS - Treated Sewage

US - Untreated Sewage

RE - Recreational Water

DW - Drinking Water Non-regulatory

UNL - Unspecified Liquid

SL - Sludge

G - Gas

OTH - Other

<div>Results Legend</div>	Lab Sample No(s)		23972298		
	Customer Sample Reference		TP-OBC-12		
	AGS Reference		ESES10		
	Depth (m)		1.40		
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

Validated

SDG:

210325-141

Location:

Cambridge South East Tra

Client Reference:

B025563

Order Number:

7000964

Report Number:

593168

Superseded Report:

Sample Descriptions

Grain Sizes

very fine

<0.063mm

fine

0.063mm - 0.1mm

medium

0.1mm - 2mm

coarse

2mm - 10mm

very coarse

>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23972298	TP-OBC-12	1.40	Light Brown	Sandy Silt Loam	N/A	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>TP-OBC-12</div> <div>1.40 Soil/Solid (S) 23/03/2021 . 25/03/2021 210325-141 23972298 ESES10</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	14						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01 @						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M						
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 @ M						
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05 @						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 @ M						
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01 @						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M						
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 @ M						
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 @ M						
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13 @						
Sulphur, Total	<0.02 %	TM132	<0.02						
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002 #						
pH	1 pH Units	TM133	8.49 M						
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #						
Cyanide, Free	<1 mg/kg	TM153	<1 M						
Chromium, Trivalent	<0.9 mg/kg	TM181	21.9						
Antimony	<0.6 mg/kg	TM181	<0.6 #						
Arsenic	<0.6 mg/kg	TM181	17.6 M						
Barium	<0.6 mg/kg	TM181	75.6 #						
Beryllium	<0.01 mg/kg	TM181	0.985 M						
Cadmium	<0.02 mg/kg	TM181	0.106 M						
Chromium	<0.9 mg/kg	TM181	21.9 M						
Copper	<1.4 mg/kg	TM181	26.1 M						
Iron	<1000 mg/kg	TM181	29800 #						
Lead	<0.7 mg/kg	TM181	16.6 M						
Manganese	<0.13 mg/kg	TM181	684 M						
Mercury	<0.1 mg/kg	TM181	<0.1 M						
Molybdenum	<0.1 mg/kg	TM181	0.5 #						
Nickel	<0.2 mg/kg	TM181	32 M						
Selenium	<1 mg/kg	TM181	<1 #						
Vanadium	<0.2 mg/kg	TM181	51.8 #						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

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SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-OBC-12					
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.40 Soil/Solid (S) 23/03/2021 . 25/03/2021 210325-141 23972298 ESES10					
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units							
Dibromofluoromethane**	%	TM116	107					
Toluene-d8**	%	TM116	98.1					
4-Bromofluorobenzene**	%	TM116	100					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M					
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M					
Benzene	<9 µg/kg	TM116	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M					
Toluene	<7 µg/kg	TM116	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M					

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-OBC-12					
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.40 Soil/Solid (S) 23/03/2021 . 25/03/2021 210325-141 23972298 ESES10					
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M					
Tetrachloroethene	<5 µg/kg	TM116	<5 M					
Dibromochloromethane	<10 µg/kg	TM116	<10 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M					
Chlorobenzene	<5 µg/kg	TM116	<5 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M					
Ethylbenzene	<4 µg/kg	TM116	<4 M					
p/m-Xylene	<10 µg/kg	TM116	<10 #					
o-Xylene	<10 µg/kg	TM116	<10 M					
Styrene	<10 µg/kg	TM116	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 M					
Isopropylbenzene	<5 µg/kg	TM116	<5 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M					
Bromobenzene	<10 µg/kg	TM116	<10 M					
Propylbenzene	<10 µg/kg	TM116	<10 M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #					
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M					
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13 M					

SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23972298
Customer Sample Ref.	TP-OBC-12
AGS Ref.	ESES10
Depth	1.40
Type	Soil/Solid (S)
Anions by Kone (soil)	06-Apr-2021
Asbestos ID in Solid Samples	06-Apr-2021
Boron Water Soluble	06-Apr-2021
Chromium III	06-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	01-Apr-2021
EPH CWG GC (S)	01-Apr-2021
GRO by GC-FID (S)	01-Apr-2021
Hexavalent Chromium (s)	06-Apr-2021
Metals in solid samples by OES	06-Apr-2021
PAH by GCMS	01-Apr-2021
pH	31-Mar-2021
Phenols by HPLC (S)	07-Apr-2021
Sample description	30-Mar-2021
Total Organic Carbon	07-Apr-2021
Total Sulphur	07-Apr-2021
TPH CWG GC (S)	01-Apr-2021
VOC MS (S)	31-Mar-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210325-141 Client Reference: B025563 Report Number: 593168
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2485
Chloride (soluble)	TM243	133.16 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	157.94 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2426
Water Soluble Boron	TM222	95.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2423
Free Cyanide	TM153	97.82 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	102.1 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2488
QC	TM089	103.64 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2484
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2432
Aluminium	TM181	87.88 73.56 : 108.85
Antimony	TM181	92.68 76.89 : 111.24
Arsenic	TM181	101.16 88.53 : 111.01



CERTIFICATE OF ANALYSIS

Validated

SDG: 210325-141 Client Reference: B025563 Report Number: 593168
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Metals in solid samples by OES

		QC 2432
Barium	TM181	93.58 77.67 : 105.35
Beryllium	TM181	100.0 85.44 : 109.61
Boron	TM181	90.54 73.51 : 104.66
Cadmium	TM181	90.95 77.67 : 104.12
Chromium	TM181	87.83 79.64 : 105.83
Cobalt	TM181	90.57 84.60 : 104.13
Copper	TM181	92.96 82.40 : 105.45
Iron	TM181	95.24 82.95 : 110.58
Lead	TM181	90.09 78.24 : 104.05
Manganese	TM181	108.61 94.29 : 119.51
Mercury	TM181	97.1 83.16 : 107.81
Molybdenum	TM181	95.47 87.11 : 106.87
Nickel	TM181	90.71 80.26 : 102.28
Phosphorus	TM181	109.49 94.56 : 124.28
Selenium	TM181	100.78 82.28 : 110.48
Strontium	TM181	93.99 79.13 : 102.79
Thallium	TM181	59.29 82.94 : 111.86
Tin	TM181	98.48 86.72 : 110.03
Titanium	TM181	78.63 66.23 : 102.06
Vanadium	TM181	93.77 86.19 : 109.45
Zinc	TM181	99.79 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2416
Acenaphthene	TM218	88.0 78.59 : 112.16
Acenaphthylene	TM218	88.5 75.11 : 109.01
Anthracene	TM218	87.5 73.99 : 113.85
Benz(a)anthracene	TM218	89.5 69.31 : 119.18

PAH by GCMS

		QC 2416
Benzo(a)pyrene	TM218	88.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	88.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	82.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	89.5 69.98 : 116.49
Chrysene	TM218	87.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	86.0 64.54 : 115.22
Fluoranthene	TM218	89.0 72.56 : 111.70
Fluorene	TM218	88.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	89.5 61.22 : 113.25
Naphthalene	TM218	86.5 77.96 : 110.91
Phenanthrene	TM218	88.5 76.83 : 113.25
Pyrene	TM218	88.5 72.45 : 110.77

pH

Component	Method Code	QC 2439
pH	TM133	100.13 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2400
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.3 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	43.86 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	49.27 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	50.33 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	49.17 88.23 : 104.42

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2419
Total Organic Carbon	TM132	100.39 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2424
Total Sulphur %	TM132	84.46 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2442
1,1,1,2-tetrachloroethane	TM116	105.8 79.10 : 119.66
1,1,1-Trichloroethane	TM116	104.0 84.25 : 112.57
1,1,2-Trichloroethane	TM116	96.4 81.29 : 113.79
1,1-Dichloroethane	TM116	112.4 86.77 : 122.11
1,2-Dichloroethane	TM116	110.8 90.04 : 132.28
1,4-Dichlorobenzene	TM116	103.6 80.81 : 125.07
2-Chlorotoluene	TM116	93.6 73.13 : 114.13
4-Chlorotoluene	TM116	91.0 68.66 : 109.13
Benzene	TM116	105.0 84.29 : 112.22
Carbon Disulphide	TM116	104.6 75.11 : 124.81
Carbontetrachloride	TM116	105.8 82.35 : 126.46
Chlorobenzene	TM116	104.0 82.88 : 122.42
Chloroform	TM116	109.0 90.35 : 120.38
Chloromethane	TM116	121.2 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	106.8 78.27 : 128.90
Dibromomethane	TM116	98.0 76.00 : 120.73
Dichloromethane	TM116	119.2 92.27 : 134.36

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210325-141	Client Reference:	B025563	Report Number:	593168	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						

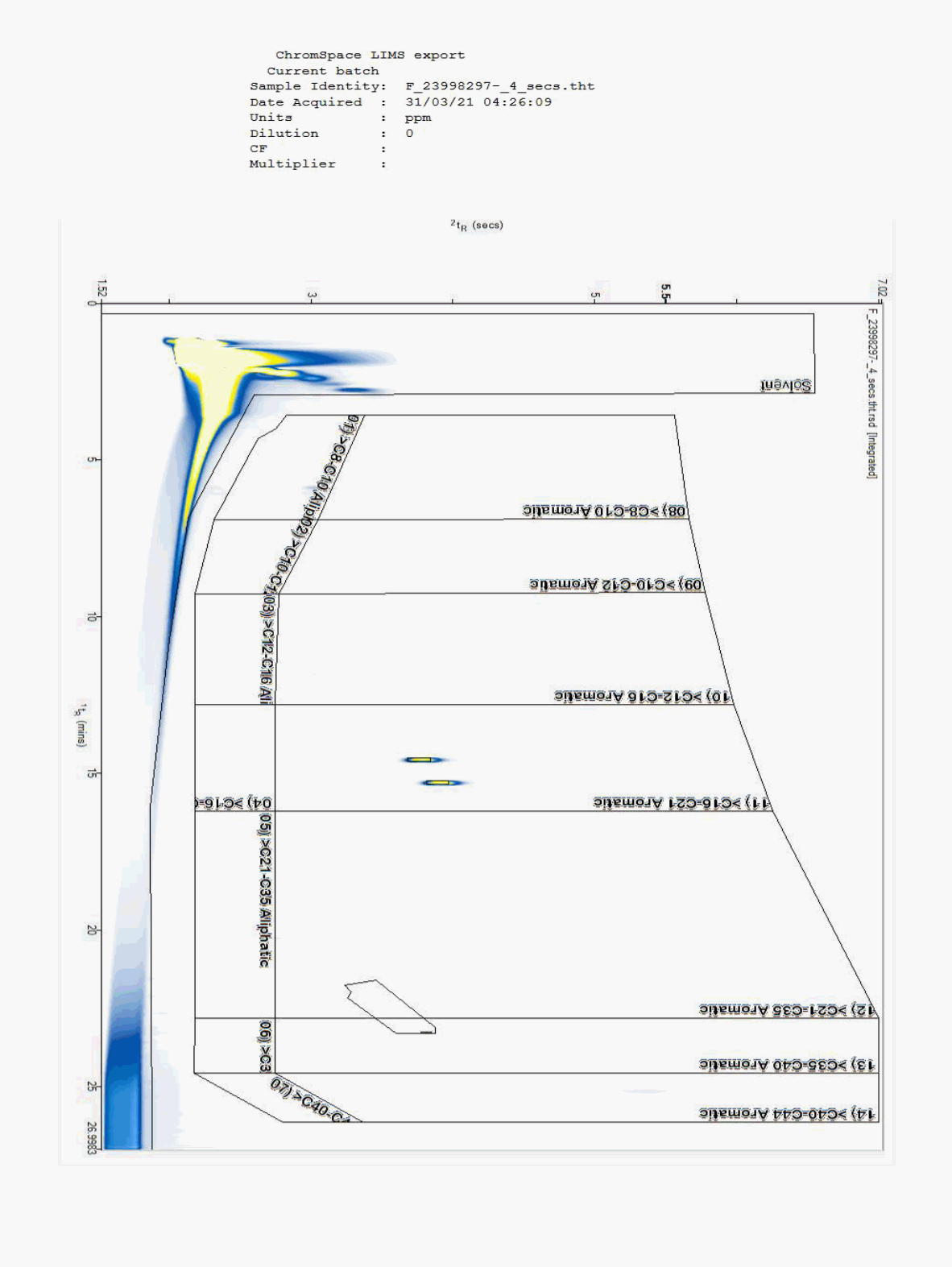
		QC 2442
Ethylbenzene	TM116	98.0 70.95 : 113.07
Hexachlorobutadiene	TM116	61.6 14.55 : 147.92
Isopropylbenzene	TM116	93.8 52.00 : 108.19
Naphthalene	TM116	96.0 80.29 : 135.77
o-Xylene	TM116	93.0 64.92 : 98.85
p/m-Xylene	TM116	89.3 69.47 : 97.31
Sec-Butylbenzene	TM116	83.4 27.03 : 135.73
Tetrachloroethene	TM116	108.6 81.43 : 126.65
Toluene	TM116	94.4 82.44 : 103.50
Trichloroethene	TM116	98.8 79.80 : 112.33
Trichlorofluoromethane	TM116	105.0 89.67 : 132.09
Vinyl Chloride	TM116	118.8 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210325-141	Client Reference:	B025563	Report Number:	593168	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Chromatogram						
Analysis:	EPH CWG GC (S)	Sample No :	23998297	Depth :	1.40	
		Sample ID :	TP-OBC-12			





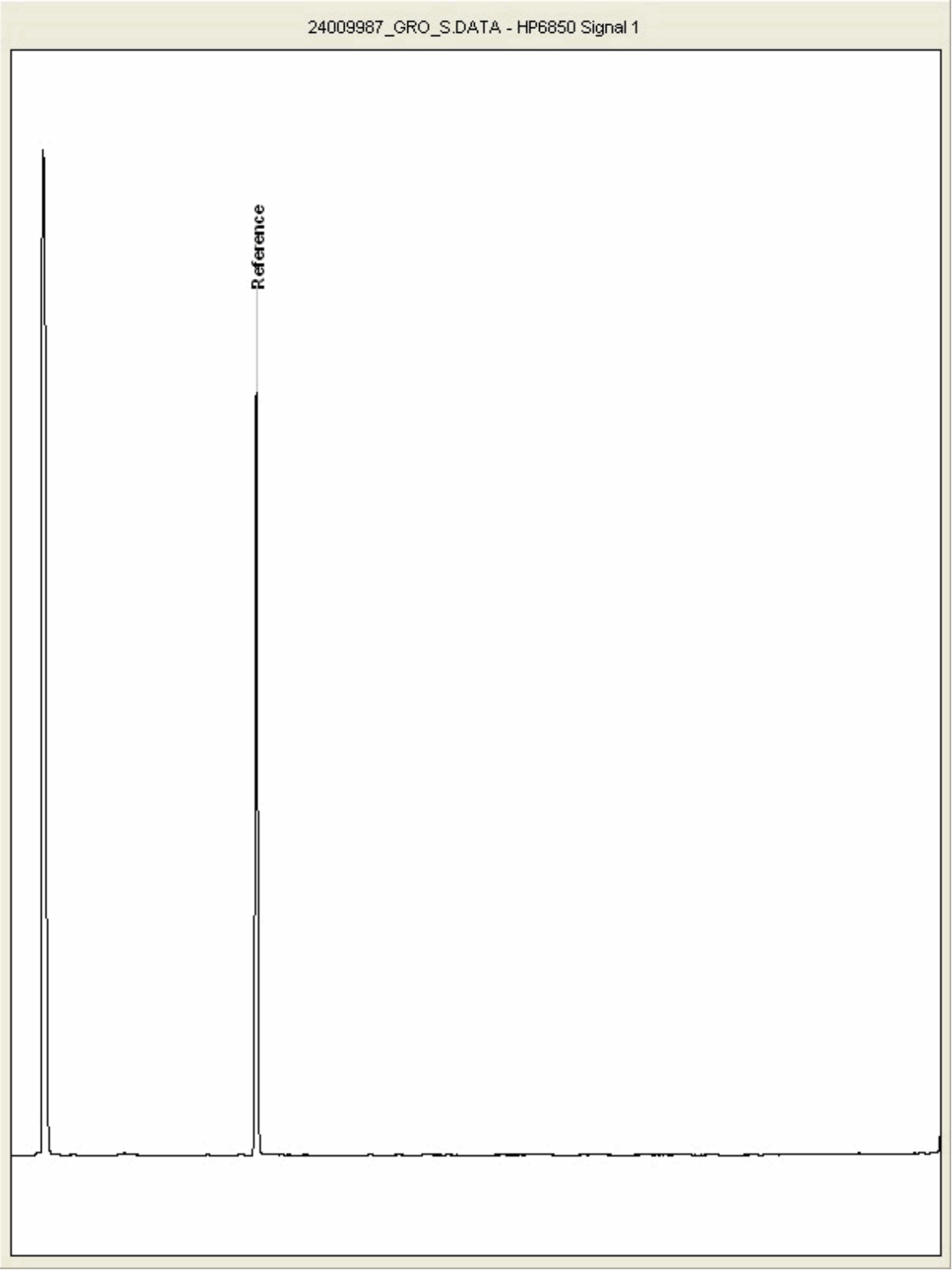
CERTIFICATE OF ANALYSIS

Validated

SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	GRO by GC-FID (S)	Sample No :	24009987	Depth :	1.40
		Sample ID :	TP-OBC-12		



CERTIFICATE OF ANALYSIS

SDG:	210325-141	Client Reference:	B025563	Report Number:	593168
Location:	Cambridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 07 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210326-141
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 593204

We received 7 samples on Friday March 26, 2021 and 2 of these samples were scheduled for analysis which was completed on Wednesday April 07, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210326-141 Client Reference: B025563 Report Number: 593204
Location: Cambridge South East Transport Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23980779	PTR11		2.00	
23980787	TP-OBC-01		0.10	24/03/2021
23980789	TP-OBC-01		0.20	24/03/2021
23980790	TP-OBC-01		1.00	24/03/2021
23980782	TP-OBC-07		0.10	24/03/2021
23980784	TP-OBC-07		0.20	24/03/2021
23980785	TP-OBC-07		0.80	24/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23980789	23980785						
	Customer Sample Reference		TP-OBC-01	TP-OBC-07						
	AGS Reference									
	Depth (m)		0.20	0.80						
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Hande (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	S
	Sample Type		S	S	S	S	S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X							
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X				X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X							
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X				X			
Boron Water Soluble	All	NDPs: 0 Tests: 2		X				X		
CEN Readings	All	NDPs: 0 Tests: 1	X							
Chromium III	All	NDPs: 0 Tests: 3	X	X				X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X				X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X							
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X							
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X				X		
Fluoride	All	NDPs: 0 Tests: 1	X							
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X				X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X				X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X							



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Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		23980789	23980785						
	Customer Sample Reference		TP-OBC-01	TP-OBC-07						
	AGS Reference									
	Depth (m)		0.20	0.80						
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Hande (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	S
	Sample Type		S	S	S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X							
Mercury Dissolved	All	NDPs: 0 Tests: 1	X							
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X				X		
PAH by GCMS	All	NDPs: 0 Tests: 2		X				X		
pH	All	NDPs: 0 Tests: 2		X				X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X							
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X				X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X							
Sample description	All	NDPs: 0 Tests: 2		X				X		
Total Organic Carbon	All	NDPs: 0 Tests: 2		X				X		
Total Sulphur	All	NDPs: 0 Tests: 2		X				X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X				X		
VOC MS (S)	All	NDPs: 0 Tests: 2			X				X	

Sample Descriptions

Grain Sizes

very fine<0.063mmfine0.063mm - 0.1mmmedium0.1mm - 2mmcoarse2mm - 10mmvery coarse>10mm						
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23980789	TP-OBC-01	0.20	Dark Brown	Sandy Loam	Stones	Vegetation
23980785	TP-OBC-07	0.80	White	Chalk	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-OBC-01	TP-OBC-07				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20	0.80				
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		24/03/2021	24/03/2021				
disa.fit	Dissolved / filtered sample.		.	.				
totunfit	Total / unfiltered sample.		26/03/2021	26/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210326-141	210326-141				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		23980789	23980785				
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	7	13				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0285	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0102	<0.002				
pH	1 pH Units	TM133	8.54	8.95				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	10.6	1.78				
Antimony	<0.6 mg/kg	TM181	<0.6	0.993				
Arsenic	<0.6 mg/kg	TM181	9.66	2.26				
Barium	<0.6 mg/kg	TM181	52.1	10.8				
Beryllium	<0.01 mg/kg	TM181	0.446	0.0875				
Cadmium	<0.02 mg/kg	TM181	0.224	0.148				
Chromium	<0.9 mg/kg	TM181	10.6	1.78				
Copper	<1.4 mg/kg	TM181	11.9	2.02				
Iron	<1000 mg/kg	TM181	15600	3790				
Lead	<0.7 mg/kg	TM181	17.9	<0.7				
Manganese	<0.13 mg/kg	TM181	418	201				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.279	0.185				
Nickel	<0.2 mg/kg	TM181	12.7	3.87				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	24.5	4.88				

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SDG:	210326-141	Client Reference:	B025563	Report Number:	593204
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TPH CWG (S)

[illegible]

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SDG:	210326-141	Client Reference:	B025563	Report Number:	593204
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		TP-OBC-01	TP-OBC-07				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*\$@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 24/03/2021 . 26/03/2021 210326-141 23980789	0.80 Soil/Solid (S) 24/03/2021 . 26/03/2021 210326-141 23980785					
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	109	107					
Toluene-d8**	%	TM116	99.2	99.4					
4-Bromofluorobenzene**	%	TM116	101	101					
Dichlorodifluoromethane	<6 µg/kg	TM116	<60 M	<120 #					
Chloromethane	<7 µg/kg	TM116	<70 #	<140 #					
Vinyl Chloride	<6 µg/kg	TM116	<60 @ M	<120 @ #					
Bromomethane	<10 µg/kg	TM116	<100 M	<200 #					
Chloroethane	<10 µg/kg	TM116	<100 M	<200 #					
Trichlorofluorormethane	<6 µg/kg	TM116	<60 M	<120 #					
1,1-Dichloroethene	<10 µg/kg	TM116	<100 #	<200 #					
Carbon Disulphide	<7 µg/kg	TM116	<70 M	<140 #					
Dichloromethane	<10 µg/kg	TM116	160 #	<200 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<100 M	<200 #					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<100 M	<200 #					
1,1-Dichloroethane	<8 µg/kg	TM116	<80 M	<160 #					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<60 M	<120 #					
2,2-Dichloropropane	<10 µg/kg	TM116	<100	<200					
Bromochloromethane	<10 µg/kg	TM116	<100 M	<200 #					
Chloroform	<8 µg/kg	TM116	<80 M	<160 #					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<70 M	<140 #					
1,1-Dichloropropene	<10 µg/kg	TM116	<100 M	<200 #					
Carbontetrachloride	<10 µg/kg	TM116	<100 M	<200 #					
1,2-Dichloroethane	<5 µg/kg	TM116	<50 M	<100 #					
Benzene	<9 µg/kg	TM116	<90 M	<180 #					
Trichloroethene	<9 µg/kg	TM116	<90 #	<180 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<100 M	<200 #					
Dibromomethane	<9 µg/kg	TM116	<90 M	<180 #					
Bromodichloromethane	<7 µg/kg	TM116	<70 M	<140 #					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<100 M	<200 #					
Toluene	<7 µg/kg	TM116	<70 M	<140 #					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<100	<200					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<100 M	<200 #					



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Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.101

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site LocationCambridge South East Transport - f

Natural Moisture Content (%)11.8

Dry Matter Content (%)89.4

Case

SDG210326-141

Lab Sample Number(s)23980789

Sampled Date24-Mar-2021

Customer Sample Ref.TP-OBC-01

Depth (m)0.20

Eluate Analysis	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	48.7	<0.65	487	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.197	<0.019	1.97	<0.19	-	-	-

Leach Test Information

Date Prepared30-Mar-2021

pH (pH Units)10.31

Conductivity (µS/cm)150.00

Temperature (°C)19.50

Volume Leachant (Litres)0.889



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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



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Test Completion Dates

Lab Sample No(s)	23980789	23980785
Customer Sample Ref.	TP-OBC-01	TP-OBC-07
AGS Ref.		
Depth	0.20	0.80
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	07-Apr-2021	
Anions by Kone (soil)	06-Apr-2021	06-Apr-2021
Anions by Kone (w)	06-Apr-2021	
Asbestos ID in Solid Samples	06-Apr-2021	06-Apr-2021
Boron Water Soluble	01-Apr-2021	01-Apr-2021
CEN 10:1 Leachate (1 Stage)	30-Mar-2021	
CEN Readings	03-Apr-2021	
Chromium III	07-Apr-2021	06-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	01-Apr-2021	01-Apr-2021
Dissolved Metals by ICP-MS	07-Apr-2021	
Dissolved Organic/Inorganic Carbon	07-Apr-2021	
EPH CWG GC (S)	01-Apr-2021	01-Apr-2021
Fluoride	07-Apr-2021	
GRO by GC-FID (S)	01-Apr-2021	01-Apr-2021
Hexavalent Chromium (s)	06-Apr-2021	06-Apr-2021
Low Level Cyanide (W)	07-Apr-2021	
Low Level Hexavalent Chromium (w)	06-Apr-2021	
Mercury Dissolved	06-Apr-2021	
Metals in solid samples by OES	06-Apr-2021	06-Apr-2021
Moisture at 105C	30-Mar-2021	
PAH by GCMS	06-Apr-2021	01-Apr-2021
pH	31-Mar-2021	31-Mar-2021
pH Value of Filtered Water	06-Apr-2021	
Phenols by HPLC (S)	07-Apr-2021	07-Apr-2021
Phenols by HPLC (W)	07-Apr-2021	
Sample description	29-Mar-2021	29-Mar-2021
Total Organic Carbon	06-Apr-2021	06-Apr-2021
Total Sulphur	01-Apr-2021	01-Apr-2021
TPH CWG GC (S)	01-Apr-2021	01-Apr-2021
VOC MS (S)	07-Apr-2021	07-Apr-2021



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ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2424
Ammoniacal Nitrogen as N	TM099	100.6 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2485
Chloride (soluble)	TM243	133.16 86.68 : 115.67
Water Soluble Sulphate as SO4 2:1 Extract	TM243	157.94 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2482
Chloride	TM184	102.0 92.93 : 115.43
Sulphate (soluble)	TM184	100.0 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2480
Water Soluble Boron	TM222	93.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2497
Free Cyanide	TM153	98.02 79.00 : 115.00
Thiocyanate	TM153	100.0 94.09 : 113.89
Total Cyanide	TM153	104.9 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2494
Aluminium	TM152	107.0 90.98 : 111.82
Antimony	TM152	102.67 90.44 : 113.04
Arsenic	TM152	104.33 88.00 : 112.00



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Dissolved Metals by ICP-MS

		QC 2494
Barium	TM152	105.17 90.20 : 111.19
Beryllium	TM152	109.67 87.77 : 113.97
Bismuth	TM152	104.0 91.90 : 112.20
Borate	TM152	109.88 88.00 : 112.00
Boron	TM152	110.0 96.48 : 114.93
Cadmium	TM152	104.33 96.43 : 110.53
Calcium	TM152	105.33 81.38 : 119.09
Chromium	TM152	104.5 91.84 : 108.67
Cobalt	TM152	101.67 88.00 : 112.00
Copper	TM152	104.67 92.47 : 118.11
Iron	TM152	104.67 92.00 : 113.00
Lead	TM152	103.17 88.00 : 112.00
Lithium	TM152	110.67 91.62 : 113.12
Magnesium	TM152	105.33 93.14 : 107.91
Manganese	TM152	104.83 95.03 : 110.58
Molybdenum	TM152	102.67 88.00 : 112.00
Nickel	TM152	105.0 88.00 : 112.00
Phosphorus	TM152	105.17 88.00 : 112.00
Potassium	TM152	104.67 93.90 : 112.36
Selenium	TM152	105.67 91.58 : 115.98
Silver	TM152	104.5 88.80 : 122.30
Sodium	TM152	106.67 94.28 : 110.71
Strontium	TM152	103.67 88.00 : 112.00
Tellurium	TM152	104.0 93.32 : 114.66
Thallium	TM152	99.0 88.00 : 112.00
Tin	TM152	102.33 92.63 : 109.70
Titanium	TM152	106.67 95.58 : 111.68



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Dissolved Metals by ICP-MS

		QC 2494
Tungsten	TM152	102.67 81.32 : 124.72
Uranium	TM152	102.33 88.00 : 112.00
Vanadium	TM152	105.33 88.00 : 112.00
Zinc	TM152	106.0 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2470
Dissolved Inorganic Carbon	TM090	109.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2498
Fluoride	TM104	95.33 93.20 : 104.48

GRO by GC-FID (S)

Component	Method Code	QC 2419
QC	TM089	86.31 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2484	QC 2435
Hexavalent Chromium	TM151	104.0 92.00 : 111.20	106.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2450
Free Cyanide - Low Level	TM279	82.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	95.75 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2470
Mercury Dissolved (CVAF)	TM183	95.8 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2483
Aluminium	TM181	77.08 73.56 : 108.85
Antimony	TM181	89.43 76.89 : 111.24
Arsenic	TM181	92.44 88.53 : 111.01
Barium	TM181	87.43 77.67 : 105.35
Beryllium	TM181	91.04 85.44 : 109.61
Boron	TM181	85.1 73.51 : 104.66
Cadmium	TM181	81.89 77.67 : 104.12
Chromium	TM181	83.77 79.64 : 105.83
Cobalt	TM181	83.02 84.60 : 104.13
Copper	TM181	86.62 82.40 : 105.45
Iron	TM181	93.65 82.95 : 110.58
Lead	TM181	85.14 78.24 : 104.05
Manganese	TM181	101.67 94.29 : 119.51
Mercury	TM181	88.65 83.16 : 107.81
Molybdenum	TM181	91.36 87.11 : 106.87
Nickel	TM181	88.75 80.26 : 102.28
Phosphorus	TM181	100.81 94.56 : 124.28
Selenium	TM181	91.37 82.28 : 110.48
Strontium	TM181	86.86 79.13 : 102.79
Thallium	TM181	91.59 82.94 : 111.86
Tin	TM181	93.92 86.72 : 110.03
Titanium	TM181	82.44 66.23 : 102.06

Metals in solid samples by OES

		QC 2483
Vanadium	TM181	92.31 86.19 : 109.45
Zinc	TM181	91.38 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2428	QC 2479
Acenaphthene	TM218	84.5 73.47 : 109.80	91.0 78.59 : 112.16
Acenaphthylene	TM218	89.0 70.00 : 130.00	89.5 75.11 : 109.01
Anthracene	TM218	91.0 68.68 : 111.89	92.0 73.99 : 113.85
Benz(a)anthracene	TM218	105.5 68.12 : 118.39	93.0 69.31 : 119.18
Benzo(a)pyrene	TM218	99.0 71.72 : 115.31	90.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	95.0 66.89 : 120.40	87.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	79.5 67.82 : 118.49	81.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	100.0 73.10 : 117.03	92.5 69.98 : 116.49
Chrysene	TM218	100.0 69.58 : 115.47	94.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	72.0 67.32 : 121.35	83.0 64.54 : 115.22
Fluoranthene	TM218	89.5 75.16 : 117.28	83.5 72.56 : 111.70
Fluorene	TM218	90.5 73.81 : 108.66	92.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	69.5 68.91 : 117.62	89.0 61.22 : 113.25
Naphthalene	TM218	84.0 72.12 : 106.18	85.5 77.96 : 110.91
Phenanthrene	TM218	87.5 69.01 : 113.72	90.5 76.83 : 113.25
Pyrene	TM218	98.5 64.28 : 115.75	87.0 72.45 : 110.77

pH

Component	Method Code	QC 2439
pH	TM133	100.13 99.08 : 102.24

pH Value of Filtered Water



CERTIFICATE OF ANALYSIS

Validated

SDG:210326-141

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

593204

pH Value of Filtered Water

Component	Method Code	QC 2483
pH	TM256	<div>100.94</div> <div>99.33 : 102.54</div>

Phenols by HPLC (S)

Component	Method Code	QC 2400
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<div>51.3</div> <div>69.38 : 125.27</div>
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<div>43.86</div> <div>69.79 : 122.84</div>
Cresols by HPLC (S)	TM062 (S)	<div>49.27</div> <div>77.98 : 111.41</div>
Phenol by HPLC (S)	TM062 (S)	<div>50.33</div> <div>67.94 : 117.69</div>
Xylenols by HPLC (S)	TM062 (S)	<div>49.17</div> <div>88.23 : 104.42</div>

Phenols by HPLC (W)

Component	Method Code	QC 2487
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	<div>49.0</div> <div>77.41 : 127.55</div>
2-Isopropyl Phenol by HPLC (W)	TM259	<div>46.0</div> <div>82.77 : 126.51</div>
Cresols by HPLC (W)	TM259	<div>48.0</div> <div>76.60 : 126.28</div>
Napthol by HPLC (W)	TM259	<div>46.0</div> <div>75.40 : 129.40</div>
Phenol by HPLC (W)	TM259	<div>48.0</div> <div>85.77 : 125.91</div>
Xylenols by HPLC (W)	TM259	<div>48.67</div> <div>79.09 : 131.82</div>

Total Organic Carbon

Component	Method Code	QC 2408
Total Organic Carbon	TM132	<div>106.25</div> <div>87.02 : 113.45</div>

Total Sulphur

Component	Method Code	QC 2427
Total Sulphur %	TM132	<div>96.89</div> <div>61.64 : 114.47</div>

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CERTIFICATE OF ANALYSIS

Validated

SDG:210326-141

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

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593204

VOC MS (S)

Component	Method Code	QC 2484	QC 2449
1,1,1,2-tetrachloroethane	TM116	<div>103.2</div> <div>79.10 : 119.66</div>	<div>102.0</div> <div>79.10 : 119.66</div>
1,1,1-Trichloroethane	TM116	<div>105.0</div> <div>84.25 : 112.57</div>	<div>101.0</div> <div>84.25 : 112.57</div>
1,1,2-Trichloroethane	TM116	<div>104.2</div> <div>81.29 : 113.79</div>	<div>95.2</div> <div>81.29 : 113.79</div>
1,1-Dichloroethane	TM116	<div>109.0</div> <div>86.77 : 122.11</div>	<div>107.0</div> <div>86.77 : 122.11</div>
1,2-Dichloroethane	TM116	<div>120.0</div> <div>90.04 : 132.28</div>	<div>103.2</div> <div>90.04 : 132.28</div>
1,4-Dichlorobenzene	TM116	<div>105.0</div> <div>80.81 : 125.07</div>	<div>98.0</div> <div>80.81 : 125.07</div>
2-Chlorotoluene	TM116	<div>88.6</div> <div>73.13 : 114.13</div>	<div>90.8</div> <div>73.13 : 114.13</div>
4-Chlorotoluene	TM116	<div>86.4</div> <div>68.66 : 109.13</div>	<div>88.4</div> <div>68.66 : 109.13</div>
Benzene	TM116	<div>105.8</div> <div>84.29 : 112.22</div>	<div>101.4</div> <div>84.29 : 112.22</div>
Carbon Disulphide	TM116	<div>111.8</div> <div>75.11 : 124.81</div>	<div>100.4</div> <div>75.11 : 124.81</div>
Carbontetrachloride	TM116	<div>103.6</div> <div>82.35 : 126.46</div>	<div>98.8</div> <div>82.35 : 126.46</div>
Chlorobenzene	TM116	<div>103.2</div> <div>82.88 : 122.42</div>	<div>101.2</div> <div>82.88 : 122.42</div>
Chloroform	TM116	<div>113.4</div> <div>90.35 : 120.38</div>	<div>105.0</div> <div>90.35 : 120.38</div>
Chloromethane	TM116	<div>133.4</div> <div>67.89 : 143.51</div>	<div>110.8</div> <div>67.89 : 143.51</div>
Cis-1,2-Dichloroethene	TM116	<div>111.0</div> <div>78.27 : 128.90</div>	<div>103.0</div> <div>78.27 : 128.90</div>
Dibromomethane	TM116	<div>108.0</div> <div>76.00 : 120.73</div>	<div>91.2</div> <div>76.00 : 120.73</div>
Dichloromethane	TM116	<div>123.0</div> <div>92.27 : 134.36</div>	<div>112.4</div> <div>92.27 : 134.36</div>
Ethylbenzene	TM116	<div>90.8</div> <div>70.95 : 113.07</div>	<div>90.4</div> <div>70.95 : 113.07</div>
Hexachlorobutadiene	TM116	<div>45.6</div> <div>14.55 : 147.92</div>	<div>61.2</div> <div>14.55 : 147.92</div>
Isopropylbenzene	TM116	<div>77.2</div> <div>52.00 : 108.19</div>	<div>86.4</div> <div>52.00 : 108.19</div>
Naphthalene	TM116	<div>107.6</div> <div>80.29 : 135.77</div>	<div>100.0</div> <div>80.29 : 135.77</div>
o-Xylene	TM116	<div>91.0</div> <div>64.92 : 98.85</div>	<div>86.8</div> <div>64.92 : 98.85</div>
p/m-Xylene	TM116	<div>83.7</div> <div>69.47 : 97.31</div>	<div>83.7</div> <div>69.47 : 97.31</div>
Sec-Butylbenzene	TM116	<div>61.4</div> <div>27.03 : 135.73</div>	<div>80.4</div> <div>27.03 : 135.73</div>
Tetrachloroethene	TM116	<div>101.2</div> <div>81.43 : 126.65</div>	<div>99.2</div> <div>81.43 : 126.65</div>
Toluene	TM116	<div>95.8</div> <div>82.44 : 103.50</div>	<div>90.8</div> <div>82.44 : 103.50</div>
Trichloroethene	TM116	<div>102.2</div> <div>79.80 : 112.33</div>	<div>94.8</div> <div>79.80 : 112.33</div>

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210326-141	Client Reference:	B025563	Report Number:	593204
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2484	QC 2449
Trichlorofluoromethane	TM116	106.6	98.8
		89.67 : 132.09	89.67 : 132.09
Vinyl Chloride	TM116	123.8	114.2
		69.66 : 136.55	69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



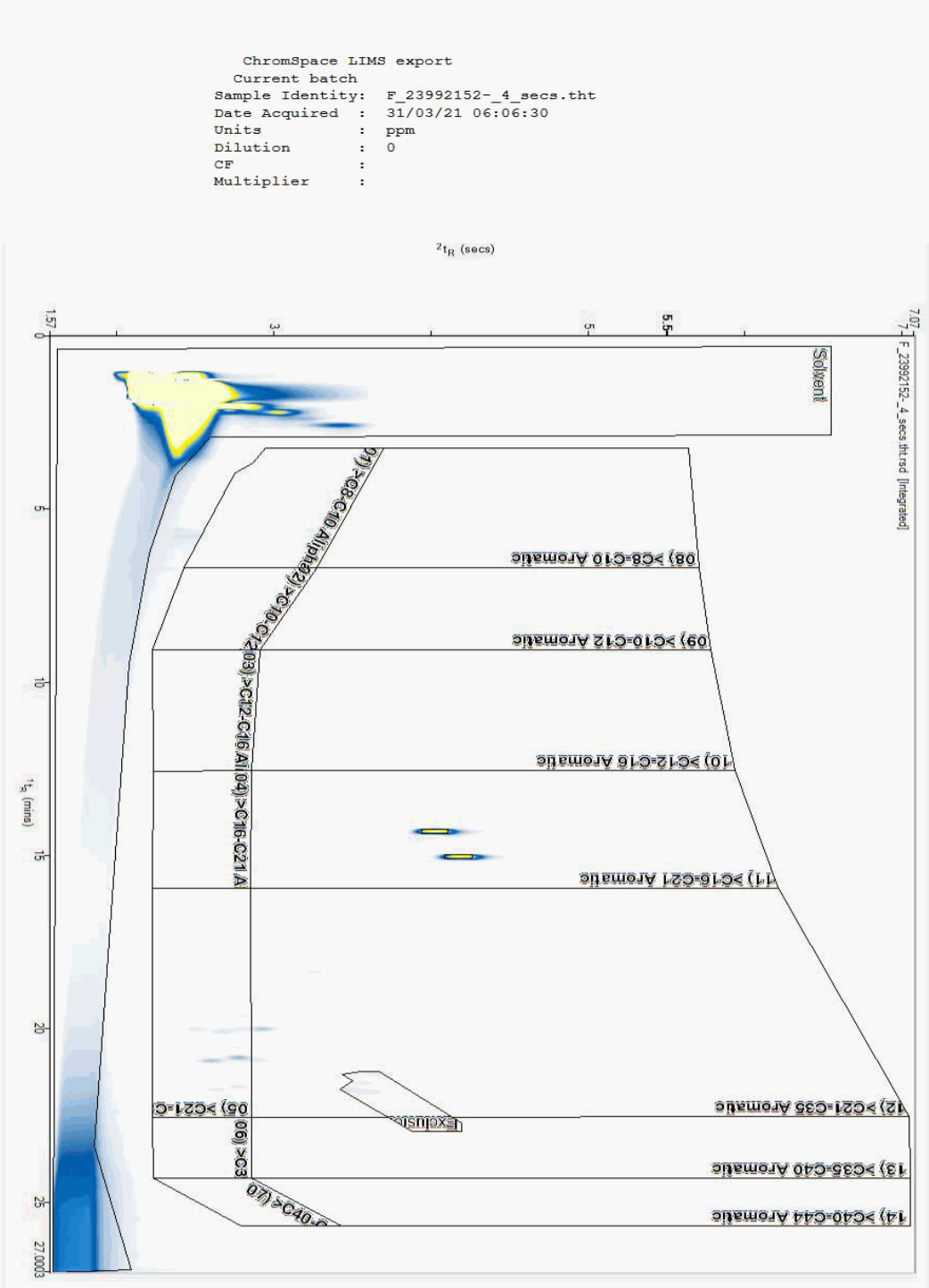
CERTIFICATE OF ANALYSIS

Validated

SDG:	210326-141	Client Reference:	B025563	Report Number:	593204
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	23992152	Depth :	0.20
		Sample ID :	TP-OBC-01		





CERTIFICATE OF ANALYSIS

Validated

SDG:	210326-141	Client Reference:	B025563	Report Number:	593204
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 23992187 Depth : 0.80
Sample ID : TP-OBC-07



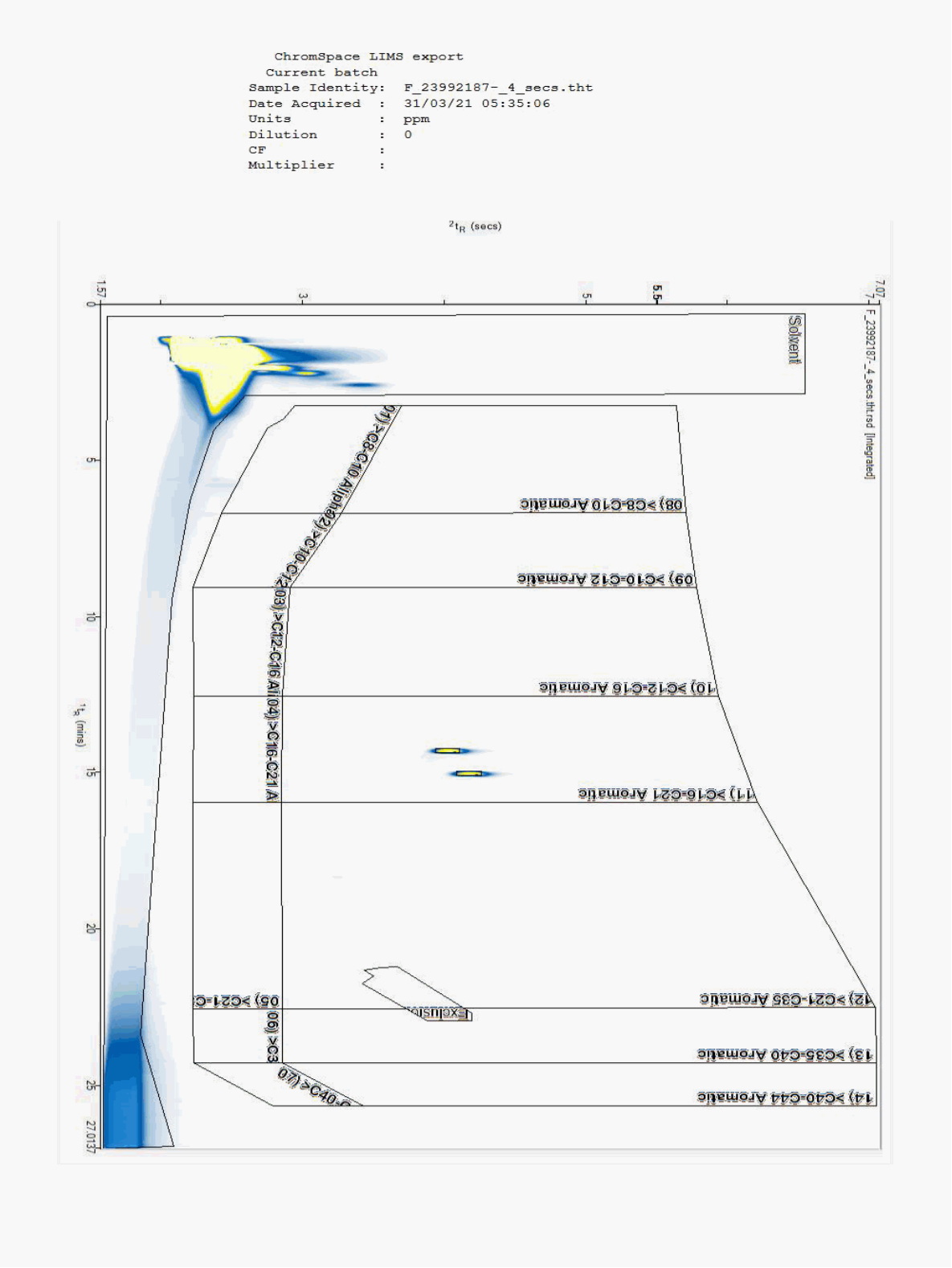
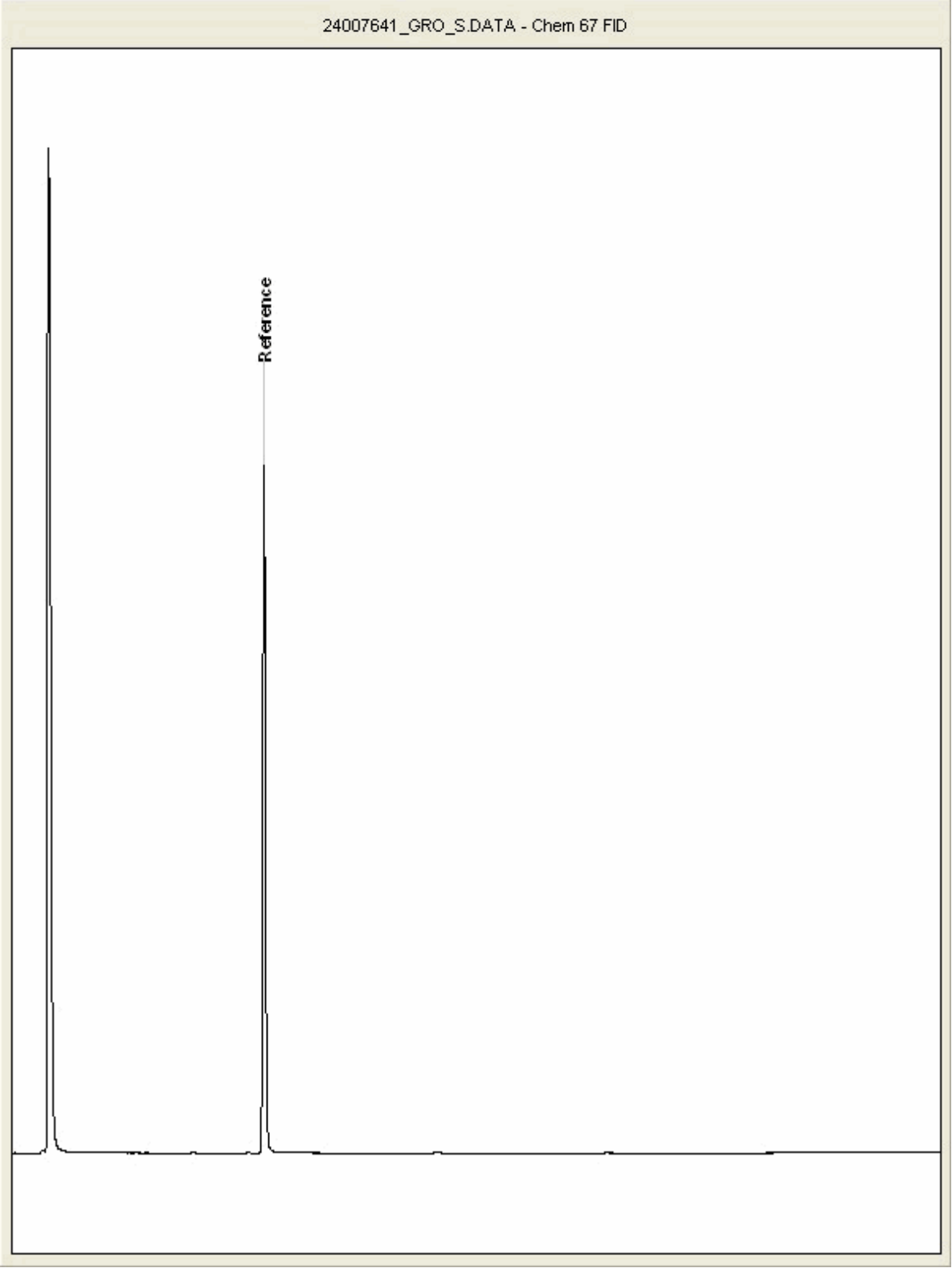
CERTIFICATE OF ANALYSIS

Validated

SDG:	210326-141	Client Reference:	B025563	Report Number:	593204
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24007641 Depth : 0.20
Sample ID : TP-OBC-01





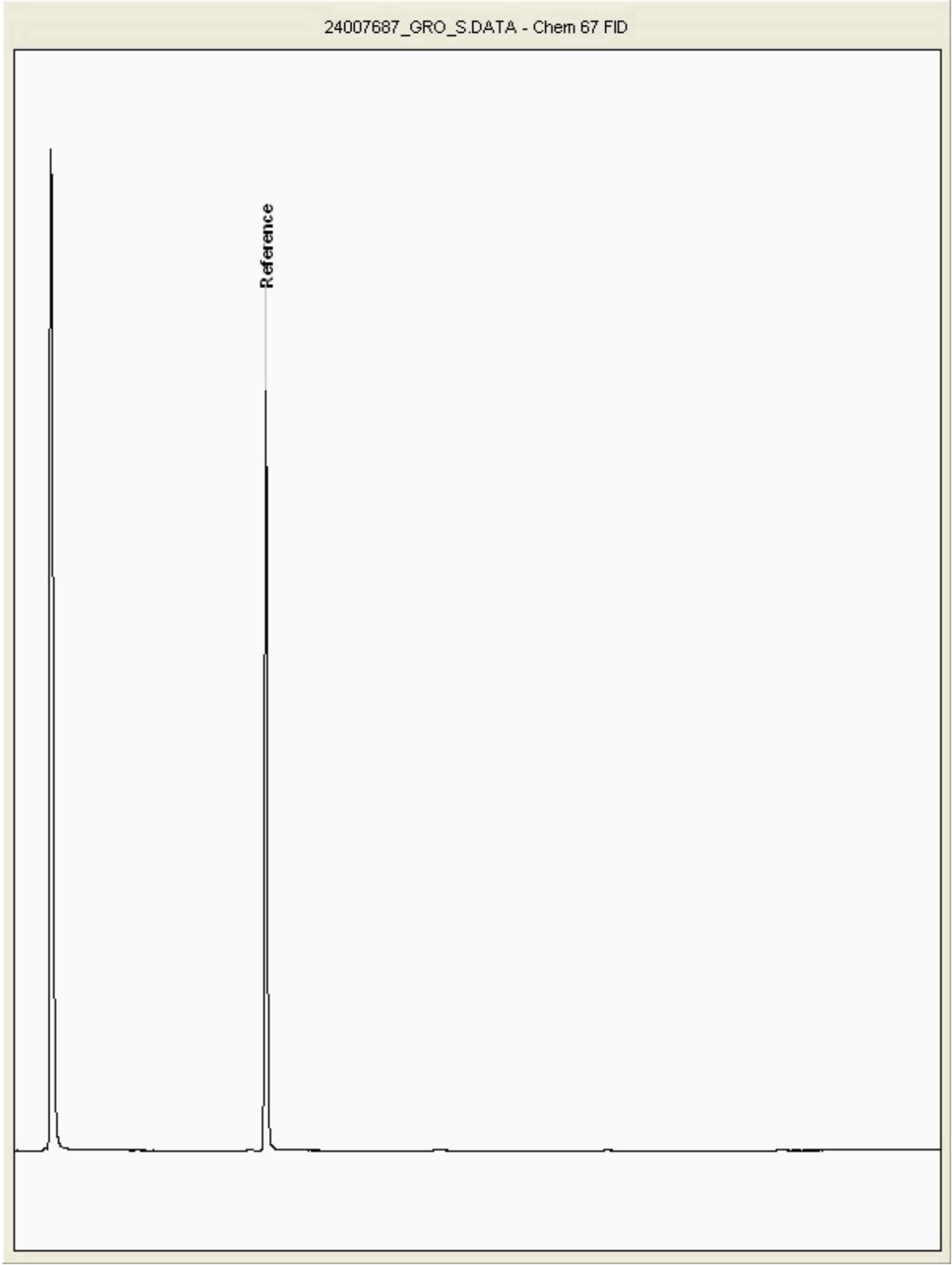
CERTIFICATE OF ANALYSIS

Validated

SDG: 210326-141 Client Reference: B025563 Report Number: 593204
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24007687 Depth : 0.80
Sample ID : TP-OBC-07



CERTIFICATE OF ANALYSIS

SDG: 210326-141 Client Reference: B025563 Report Number: 593204
Location: idge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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CERTIFICATE OF ANALYSIS					Validated
SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23993079	PTR 45		0.10	25/03/2021
23993080	PTR 45		0.20	25/03/2021
23993081	PTR 45		0.50	25/03/2021
23993082	PTR 45		0.52	25/03/2021
23993083	PTR 45		1.00	25/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 13 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210329-69
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 593938

This report has been revised and directly supersedes 593036 in its entirety.

We received 5 samples on Monday March 29, 2021 and 2 of these samples were scheduled for analysis which was completed on Tuesday April 13, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-69 Client Reference: B025563 Report Number: 593938
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593036

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23993081	23993083
	Customer Sample Reference		PTR 45	PTR 45
	AGS Reference			
	Depth (m)		0.50	1.00
	Container		Hande (ALE260) 1kg TUB with (ALE210) 250g Amber Jar (ALE215) 60g VOC (ALE215) 1kg TUB with Hande (ALE260) 250g Amber Jar (ALE210) 60g VOC (ALE215)	Hande (ALE260) 1kg TUB with (ALE210) 250g Amber Jar (ALE215) 60g VOC (ALE215)
	Sample Type		S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1	X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2	X	X
CEN Readings	All	NDPs: 0 Tests: 2	X	X
Chromium III	All	NDPs: 0 Tests: 4	X	X
Coronene	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X	X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
Fluoride	All	NDPs: 0 Tests: 2	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-69 Client Reference: B025563 Report Number: 593938
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593036

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		23993081	23993083
	Customer Sample Reference		PTR 45	PTR 45
	AGS Reference			
	Depth (m)		0.50	1.00
	Container		Hande (ALE260) 1kg TUB with (ALE210) 250g Amber Jar (ALE215) 60g VOC (ALE215) 1kg TUB with Hande (ALE260) 250g Amber Jar (ALE210) 60g VOC (ALE215)	Hande (ALE260) 1kg TUB with (ALE210) 250g Amber Jar (ALE215) 60g VOC (ALE215)
	Sample Type		S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X	X
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 2	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1	X	
PAH by GCMS	All	NDPs: 0 Tests: 2	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 1	X	
pH	All	NDPs: 0 Tests: 2	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X	X
Sample description	All	NDPs: 0 Tests: 1	X	

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		23993081		23993083	
	Customer Sample Reference		PTR 45		PTR 45	
	AGS Reference					
	Depth (m)		0.50		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X			
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23993081	PTR 45	0.50	Grey	Sandy Loam	Stones	Vegetation
23993083	PTR 45	1.00	Dark Brown	Sand	Brick	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + " (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		Customer Sample Ref.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	PTR 45 0.50 Soil/Solid (S) 25/03/2021 . 29/03/2021 210329-69 23993081	PTR 45 1.00 Soil/Solid (S) 25/03/2021 . 29/03/2021 210329-69 23993083				
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	0	0					
Loss on ignition	<0.7 %	TM018	3.4						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13					
Organic Carbon, Total	<0.2 %	TM132	0.224						
Sulphur, Total	<0.02 %	TM132	<0.02	0.081					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00224	0.00809					
pH	1 pH Units	TM133	8.83	8.98					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6					
Cyanide, Free	<1 mg/kg	TM153	<1	<1					
PCB congener 28	<3 µg/kg	TM168	<3						
PCB congener 52	<3 µg/kg	TM168	<3						
PCB congener 101	<3 µg/kg	TM168	<3						
PCB congener 118	<3 µg/kg	TM168	<3						
PCB congener 138	<3 µg/kg	TM168	<3						
PCB congener 153	<3 µg/kg	TM168	<3						
PCB congener 180	<3 µg/kg	TM168	<3						
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21						
Chromium, Trivalent	<0.9 mg/kg	TM181	5.42	16.9					
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6					
Arsenic	<0.6 mg/kg	TM181	2.77	14.7					
Barium	<0.6 mg/kg	TM181	31.9	80.2					
Beryllium	<0.01 mg/kg	TM181	0.338	0.585					
Cadmium	<0.02 mg/kg	TM181	0.045	0.392					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	PTR 45		PTR 45				
# M aq diss.filt tot.unfilt + ** (F) 1-45@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)		0.50 Soil/Solid (S) 25/03/2021 . 29/03/2021 210329-69 23993081	1.00 Soil/Solid (S) 25/03/2021 . 29/03/2021 210329-69 23993083					
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	106	113					
			@	@					
Toluene-d8**	%	TM116	99.9	91.3					
			@	@					
4-Bromofluorobenzene**	%	TM116	97.6	77.4					
			@	@					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 @ M	<6 @ M					
Chloromethane	<7 µg/kg	TM116	<7 @ #	<7 @ #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Chloroethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6 @ M	<6 @ M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 @ #	<10 @ #					
Carbon Disulphide	<7 µg/kg	TM116	<7 @ M	<7 @ M					
Dichloromethane	<10 µg/kg	TM116	<10 @ #	48.2 @ #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 @ M	<10 @ M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 @ M	<8 @ M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 @ M	<6 @ M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10 @	<10 @					
Bromochloromethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Chloroform	<8 µg/kg	TM116	<8 @ M	<8 @ M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 @ M	<7 @ M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Carbontetrachloride	<10 µg/kg	TM116	<10 @ M	<10 @ M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 @ M	<5 @ M					
Benzene	<9 µg/kg	TM116	<9 @ M	<9 @ M					
Trichloroethene	<9 µg/kg	TM116	<9 @ #	<9 @ #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Dibromomethane	<9 µg/kg	TM116	<9 @ M	<9 @ M					
Bromodichloromethane	<7 µg/kg	TM116	<7 @ M	<7 @ M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Toluene	<7 µg/kg	TM116	<7 @ M	<7 @ M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10 @	<10 @					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					

VOC MS (S)

Results Legend			Customer Sample Ref.	PTR 45 0.50 Soil/Solid (S) 25/03/2021 . 29/03/2021 210329-69 23993081	PTR 45 1.00 Soil/Solid (S) 25/03/2021 . 29/03/2021 210329-69 23993083				
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-44@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 @ M	<7 @ M					
Tetrachloroethene	<5 µg/kg	TM116	<5 @ M	<5 @ M					
Dibromochloromethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Chlorobenzene	<5 µg/kg	TM116	<5 @ M	<5 @ M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Ethylbenzene	<4 µg/kg	TM116	<4 @ M	<4 @ M					
p/m-Xylene	<10 µg/kg	TM116	<10 @ #	<10 @ #					
o-Xylene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Isopropylbenzene	<5 µg/kg	TM116	<5 @ #	<5 @ #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 @ #	<10 @ #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 @ M	<16 @ M					
Bromobenzene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
Propylbenzene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 @ M	<9 @ M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 @ M	<8 @ M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 @ M	<14 @ M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 @ #	<9 @ #					
sec-Butylbenzene	<10 µg/kg	TM116	<10 @	<10 @					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 @ M	<8 @ M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 @ M	<5 @ M					
n-Butylbenzene	<11 µg/kg	TM116	<11 @	<11 @					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 @ M	<10 @ M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 @ M	<14 @ M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 @ #	<10 @ #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20 @	<20 @					
Hexachlorobutadiene	<20 µg/kg	TM116	<20 @	<20 @					
Naphthalene	<13 µg/kg	TM116	<13 @ M	<13 @ M					

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.1
Particle Size <4mm	>95%		

Case		Landfill Waste Acceptance Criteria Limits		
SDG	210329-69			
Lab Sample Number(s)	23993081			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	PTR 45			
Depth (m)	0.50			
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous	Hazardous Waste Landfill

Solid Waste Analysis		Result			
Total Organic Carbon (%)	0.224		3	5	6
Loss on Ignition (%)	3.4		-	-	10
Sum of BTEX (mg/kg)	<0.04		6	-	-
Sum of 7 PCBs (mg/kg)	<0.021		1	-	-
Mineral Oil (mg/kg)	<5		500	-	-
PAH Sum of 17 (mg/kg)	<10		100	-	-
pH (pH Units)	8.83		-	>6	-
ANC to pH 6 (mol/kg)	0.329		-	-	-
ANC to pH 4 (mol/kg)	7.92		-	-	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	-	-	-	-	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	-	-	-	-	0.5	10	70
Copper	-	-	-	-	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	-	-	-	-	0.4	10	40
Lead	-	-	-	-	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	-	-	-	-	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.511	<0.5	5.11	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	74.3	<5	743	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	3.75	<3	37.5	<30	500	800	1000

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	8.65
Conductivity (µS/cm)	70.40
Temperature (°C)	19.90
Volume Leachant (Litres)	0.888

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

13/04/2021 16:52:08



SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.1
Particle Size <4mm	>95%		

Case				
SDG	210329-69			
Lab Sample Number(s)	23993081			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	PTR 45			
Depth (m)	0.50			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.012	<0.01	0.12	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	0.000564	<0.0005	0.00564	<0.005	-	-	-
Barium	0.00402	<0.0002	0.0402	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0402	<0.01	0.402	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	12.3	<0.2	123	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Hardness dissolved	32.5	<0.65	325	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.241	<0.019	2.41	<0.19	-	-	-
Lead	0.000239	<0.0002	0.00239	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.441	<0.036	4.41	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000592	<0.0004	0.00592	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00147	<0.001	0.0147	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	8.65
Conductivity (µS/cm)	70.40
Temperature (°C)	19.90
Volume Leachant (Litres)	0.888

13/04/2021 16:52:24

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.098	Natural Moisture Content (%)	8.86
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	91.9
Particle Size <4mm	>95%		

Case

SDG	210329-69			
Lab Sample Number(s)	23993083			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	PTR 45			
Depth (m)	1.00			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Low Level Hexavalent Chromium	0.00501	<0.003	0.0501	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	5.28	<3	52.8	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	0.0000139	<0.00001	0.000139	<0.0001	-	-	-
Arsenic	0.0047	<0.0005	0.047	<0.005	-	-	-
Barium	0.00682	<0.0002	0.0682	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0231	<0.01	0.231	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.00008	<0.00008	-	-	-
Calcium (Dis.Filt) mg/l	19.1	<0.2	191	<2	-	-	-
Chromium	0.00524	<0.001	0.0524	<0.01	-	-	-
Copper	0.00814	<0.0003	0.0814	<0.003	-	-	-
Iron (Dis.Filt) mg/l	0.867	<0.019	8.67	<0.19	-	-	-
Lead	0.000784	<0.0002	0.00784	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.438	<0.036	4.38	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00349	<0.003	0.0349	<0.03	-	-	-
Nickel	0.000609	<0.0004	0.00609	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0134	<0.001	0.134	<0.01	-	-	-
Zinc	0.13	<0.001	1.3	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	10.7	<2	107	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	9.31
Conductivity (µS/cm)	106.00
Temperature (°C)	14.40
Volume Leachant (Litres)	0.892



SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.098	Natural Moisture Content (%)	8.86
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	91.9
Particle Size <4mm	>95%		

Case

SDG	210329-69			
Lab Sample Number(s)	23993083			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	PTR 45			
Depth (m)	1.00			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		
	Result	Limit of Detection	Result	Limit of Detection	
Hardness dissolved	49.5	<0.65	495	<6.5	- - -

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	9.31
Conductivity (µS/cm)	106.00
Temperature (°C)	14.40
Volume Leachant (Litres)	0.892

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23993081	23993083
Customer Sample Ref.	PTR 45	PTR 45
AGS Ref.		
Depth	0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	12-Apr-2021	
ANC at pH4 and ANC at pH 6	12-Apr-2021	
Anions by Kone (soil)	13-Apr-2021	13-Apr-2021
Anions by Kone (w)	09-Apr-2021	09-Apr-2021
Asbestos ID in Solid Samples	12-Apr-2021	12-Apr-2021
Boron Water Soluble	12-Apr-2021	12-Apr-2021
CEN 10:1 Leachate (1 Stage)	07-Apr-2021	07-Apr-2021
CEN Readings	09-Apr-2021	08-Apr-2021
Chromium III	13-Apr-2021	13-Apr-2021
Coronene	09-Apr-2021	
Cyanide Comp/Free/Total/Thiocyanate	13-Apr-2021	13-Apr-2021
Dissolved Metals by ICP-MS	09-Apr-2021	09-Apr-2021
Dissolved Organic/Inorganic Carbon	13-Apr-2021	13-Apr-2021
EPH by GCxGC-FID	13-Apr-2021	
EPH CWG GC (S)	13-Apr-2021	13-Apr-2021
Fluoride	09-Apr-2021	09-Apr-2021
GRO by GC-FID (S)	09-Apr-2021	12-Apr-2021
Hexavalent Chromium (s)	13-Apr-2021	13-Apr-2021
Loss on Ignition in soils	12-Apr-2021	
Low Level Cyanide (W)	13-Apr-2021	13-Apr-2021
Low Level Hexavalent Chromium (w)	09-Apr-2021	09-Apr-2021
Mercury Dissolved	09-Apr-2021	09-Apr-2021
Metals in solid samples by OES	13-Apr-2021	12-Apr-2021
Moisture at 105C	06-Apr-2021	06-Apr-2021
PAH 16 & 17 Calc	13-Apr-2021	
PAH by GCMS	13-Apr-2021	13-Apr-2021
PCBs by GCMS	09-Apr-2021	
pH	08-Apr-2021	09-Apr-2021
pH Value of Filtered Water	12-Apr-2021	12-Apr-2021
Phenols by HPLC (S)	13-Apr-2021	12-Apr-2021
Phenols by HPLC (W)	12-Apr-2021	12-Apr-2021
Sample description	03-Apr-2021	03-Apr-2021
Total Dissolved Solids	12-Apr-2021	
Total Organic Carbon	13-Apr-2021	13-Apr-2021
Total Sulphur	09-Apr-2021	09-Apr-2021
TPH CWG GC (S)	13-Apr-2021	13-Apr-2021
VOC MS (S)	12-Apr-2021	12-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2454
Ammoniacal Nitrogen as N	TM099	100.6 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2409
ANC pH_4 dry soil	TM182	110.85 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2485
Chloride (soluble)	TM243	148.19 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	168.69 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2495
Chloride	TM184	101.0 91.40 : 109.10
Sulphate (soluble)	TM184	98.4 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2444
Water Soluble Boron	TM222	104.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2487
Coronene RAW	TM410	110.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2439	QC 2489
Free Cyanide	TM153	101.98 86.90 : 108.50	102.97 86.90 : 108.50
Thiocyanate	TM153	109.62 94.53 : 113.33	110.9 94.53 : 113.33
Total Cyanide	TM153	104.2 86.13 : 102.13	104.2 86.13 : 102.13

Dissolved Metals by ICP-MS

Component	Method Code	QC 2402
Aluminium	TM152	97.33 90.78 : 110.89
Antimony	TM152	95.17 77.22 : 119.42
Arsenic	TM152	96.17 86.77 : 107.67
Barium	TM152	97.67 87.86 : 110.23
Beryllium	TM152	99.67 86.19 : 112.98
Bismuth	TM152	97.83 84.06 : 106.46
Borate	TM152	98.15 88.00 : 112.00
Boron	TM152	98.0 83.92 : 114.90
Cadmium	TM152	97.0 88.89 : 106.69
Calcium	TM152	99.33 80.24 : 117.95
Chromium	TM152	96.83 83.22 : 110.16
Cobalt	TM152	95.17 82.49 : 112.36
Copper	TM152	97.67 83.14 : 113.00
Iron	TM152	96.67 88.40 : 109.24
Lead	TM152	96.0 83.71 : 109.58
Lithium	TM152	99.5 84.50 : 114.28
Magnesium	TM152	95.33 87.56 : 114.57
Manganese	TM152	96.5 90.01 : 108.72
Molybdenum	TM152	95.0 85.53 : 107.42
Nickel	TM152	98.17 88.05 : 106.42
Phosphorus	TM152	96.83 82.76 : 107.72
Potassium	TM152	95.33 88.45 : 106.42

Dissolved Metals by ICP-MS

		QC 2402
Selenium	TM152	96.33 85.61 : 111.03
Silver	TM152	95.33 88.48 : 110.48
Sodium	TM152	94.67 88.32 : 106.30
Strontium	TM152	96.67 83.77 : 107.87
Tellurium	TM152	95.33 82.83 : 104.73
Thallium	TM152	97.17 77.47 : 113.87
Tin	TM152	95.33 87.36 : 109.55
Titanium	TM152	98.17 87.29 : 108.31
Tungsten	TM152	99.33 68.27 : 122.97
Uranium	TM152	96.67 82.46 : 105.16
Vanadium	TM152	96.67 88.43 : 114.30
Zinc	TM152	98.0 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2496
Dissolved Inorganic Carbon	TM090	102.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2474
Fluoride	TM104	105.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2410	QC 2471
QC	TM089	78.4 70.34 : 111.95	101.26 70.75 : 114.19

Hexavalent Chromium (s)

Hexavalent Chromium (s)

Component	Method Code	QC 2438
Hexavalent Chromium	TM151	108.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2442
Loss on Ignition	TM018	98.34 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2411
Free Cyanide - Low Level	TM279	79.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	95.25 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2475
Mercury Dissolved (CVAf)	TM183	101.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2406
Aluminium	TM181	95.58 73.56 : 108.85
Antimony	TM181	101.63 76.89 : 111.24
Arsenic	TM181	106.4 88.53 : 111.01
Barium	TM181	99.08 77.67 : 105.35
Beryllium	TM181	101.49 85.44 : 109.61
Boron	TM181	89.4 73.51 : 104.66
Cadmium	TM181	90.53 77.67 : 104.12
Chromium	TM181	91.68 79.64 : 105.83

Metals in solid samples by OES

		QC 2406
Cobalt	TM181	91.82 84.60 : 104.13
Copper	TM181	94.89 82.40 : 105.45
Iron	TM181	96.03 82.95 : 110.58
Lead	TM181	94.59 78.24 : 104.05
Manganese	TM181	110.28 94.29 : 119.51
Mercury	TM181	103.38 83.16 : 107.81
Molybdenum	TM181	99.59 87.11 : 106.87
Nickel	TM181	95.35 80.26 : 102.28
Phosphorus	TM181	110.71 94.56 : 124.28
Selenium	TM181	101.57 82.28 : 110.48
Strontium	TM181	95.1 79.13 : 102.79
Thallium	TM181	105.75 82.94 : 111.86
Tin	TM181	103.04 86.72 : 110.03
Titanium	TM181	74.73 66.23 : 102.06
Vanadium	TM181	97.44 86.19 : 109.45
Zinc	TM181	102.67 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2436	QC 2443
Acenaphthene	TM218	90.5 73.47 : 109.80	85.0 76.79 : 103.90
Acenaphthylene	TM218	91.0 70.00 : 130.00	82.0 78.40 : 108.66
Anthracene	TM218	88.5 68.68 : 111.89	84.5 70.90 : 109.22
Benz(a)anthracene	TM218	108.0 68.12 : 118.39	84.5 73.77 : 119.26
Benzo(a)pyrene	TM218	107.5 71.72 : 115.31	85.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	103.5 66.89 : 120.40	78.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	98.0 67.82 : 118.49	86.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	102.0 73.10 : 117.03	86.0 75.98 : 116.59
Chrysene	TM218	104.5 69.58 : 115.47	88.5 74.82 : 114.18

PAH by GCMS

		QC 2436	QC 2443
Dibenzo(ah)anthracene	TM218	93.0 67.32 : 121.35	86.0 69.17 : 115.30
Fluoranthene	TM218	114.5 75.16 : 117.28	84.0 75.88 : 112.84
Fluorene	TM218	88.5 73.81 : 108.66	84.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	99.5 68.91 : 117.62	82.5 70.26 : 117.95
Naphthalene	TM218	88.5 72.12 : 106.18	79.0 74.70 : 101.83
Phenanthrene	TM218	97.5 69.01 : 113.72	85.0 73.62 : 109.34
Pyrene	TM218	107.5 64.28 : 115.75	84.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2490
PCB congener 101	TM168	89.0 65.66 : 110.06
PCB congener 105	TM168	82.6 58.10 : 106.34
PCB congener 114	TM168	84.7 59.38 : 106.48
PCB congener 118	TM168	84.3 60.02 : 106.23
PCB congener 123	TM168	90.9 65.01 : 99.81
PCB congener 126	TM168	83.4 59.31 : 109.23
PCB congener 138	TM168	87.6 63.95 : 107.63
PCB congener 153	TM168	91.3 62.65 : 108.85
PCB congener 156	TM168	85.1 61.69 : 112.27
PCB congener 157	TM168	81.4 55.37 : 104.81
PCB congener 167	TM168	84.8 65.58 : 109.14
PCB congener 169	TM168	87.5 56.84 : 112.10
PCB congener 180	TM168	89.9 66.99 : 111.63
PCB congener 189	TM168	85.2 57.75 : 112.59
PCB congener 28	TM168	91.0 73.68 : 105.96
PCB congener 52	TM168	88.1 67.24 : 107.62
PCB congener 77	TM168	87.0 64.87 : 108.49
PCB congener 81	TM168	88.7 70.78 : 110.80

pH			
Component	Method Code	QC 2445	QC 2485
pH	TM133	100.53 99.08 : 102.24	100.53 99.08 : 102.24

pH Value of Filtered Water			
Component	Method Code	QC 2407	
pH	TM256	100.8 99.33 : 102.54	

Component	Method Code	QC 2433	QC 2416
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 70.71 : 116.42	51.3 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79	43.86 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	51.15 74.40 : 108.98	49.06 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18	50.99 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	50.73 76.56 : 106.38	48.65 88.23 : 104.42

Component	Method Code	QC 2492	
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	49.0 77.41 : 127.55	
2-Isopropyl Phenol by HPLC (W)	TM259	47.0 82.77 : 126.51	
Cresols by HPLC (W)	TM259	48.67 76.60 : 126.28	
Napthol by HPLC (W)	TM259	47.0 75.40 : 129.40	
Phenol by HPLC (W)	TM259	49.0 85.77 : 125.91	
Xylenols by HPLC (W)	TM259	49.33 79.09 : 131.82	

Total Dissolved Solids			
Component	Method Code	QC 2474	
Total Dissolved Solids	TM123	99.6 97.30 : 100.92	

Total Organic Carbon		
Component	Method Code	QC 2461
Total Organic Carbon	TM132	101.56 87.02 : 113.45

Total Sulphur		
Component	Method Code	QC 2449
Total Sulphur %	TM132	99.48 61.64 : 114.47

Component	Method Code	QC 2426
1,1,1,2-tetrachloroethane	TM116	97.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	100.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	91.2 75.16 : 112.70
1,1-Dichloroethane	TM116	103.8 83.27 : 122.16
1,2-Dichloroethane	TM116	102.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	104.6 82.59 : 123.23
2-Chlorotoluene	TM116	96.4 66.81 : 118.43
4-Chlorotoluene	TM116	98.6 65.88 : 114.76
Benzene	TM116	94.4 93.16 : 123.63
Carbon Disulphide	TM116	96.4 75.11 : 124.81
Carbontetrachloride	TM116	105.8 82.35 : 126.46
Chlorobenzene	TM116	98.8 85.07 : 118.13
Chloroform	TM116	102.6 88.13 : 122.71
Chloromethane	TM116	104.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	99.0 78.27 : 128.90
Dibromomethane	TM116	93.0 77.47 : 121.29
Dichloromethane	TM116	108.0 87.89 : 134.72

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210329-69	Client Reference:	B025563	Report Number:	593938	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036	
VOC MS (S)						

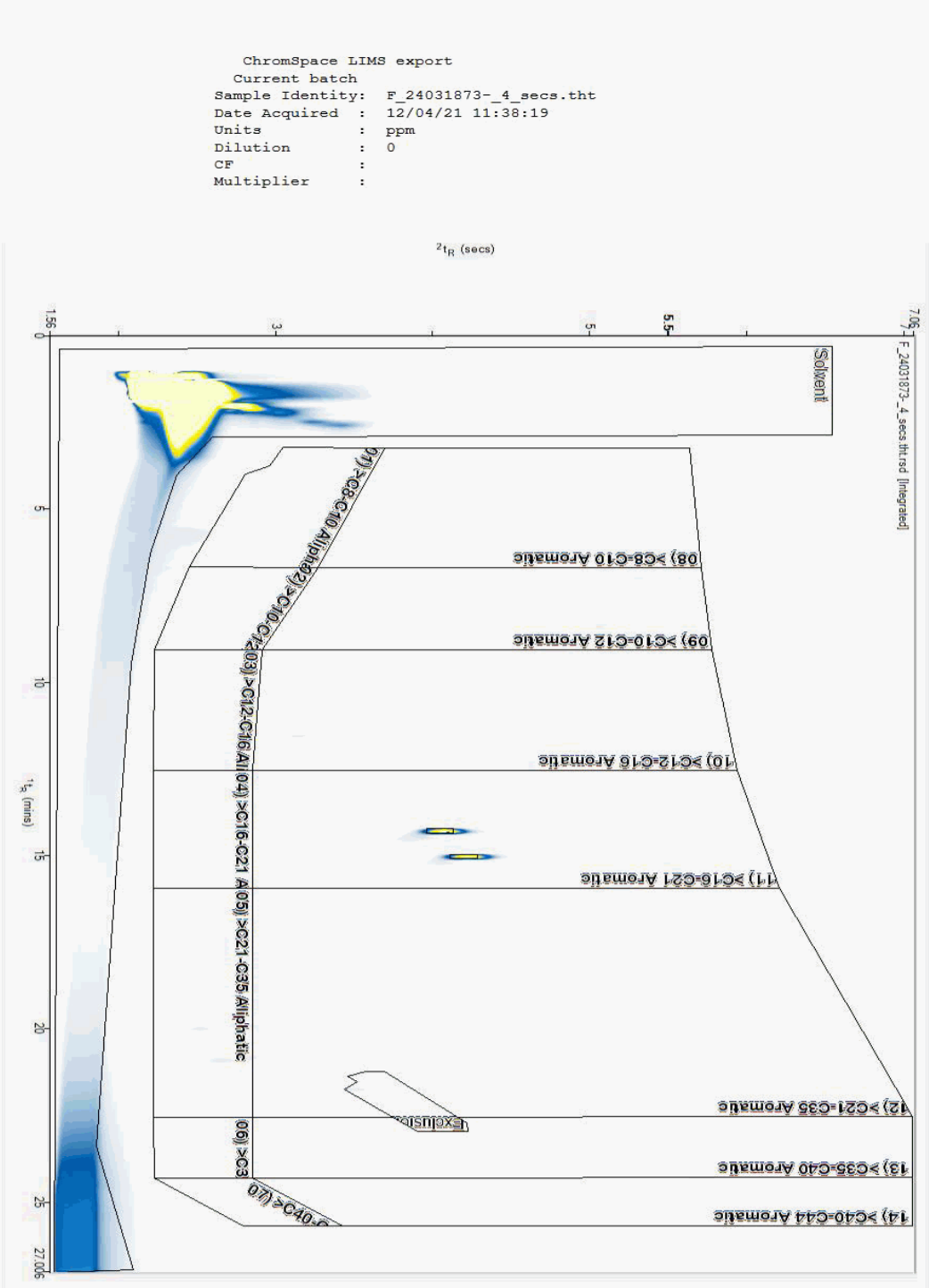
		QC 2426
Ethylbenzene	TM116	87.0 79.92 : 110.05
Hexachlorobutadiene	TM116	58.2 16.78 : 153.29
Isopropylbenzene	TM116	77.0 64.20 : 119.59
Naphthalene	TM116	93.8 79.29 : 125.59
o-Xylene	TM116	82.0 72.86 : 102.10
p/m-Xylene	TM116	85.5 74.06 : 106.47
Sec-Butylbenzene	TM116	76.8 44.71 : 117.87
Tetrachloroethene	TM116	91.4 77.82 : 125.00
Toluene	TM116	88.4 87.82 : 116.21
Trichloroethene	TM116	95.8 79.80 : 112.33
Trichlorofluoromethane	TM116	99.8 80.52 : 132.12
Vinyl Chloride	TM116	113.2 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210329-69	Client Reference:	B025563	Report Number:	593938	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036	
Chromatogram						
Analysis:	EPH CWG GC (S)	Sample No :	24031873	Depth :	0.50	
		Sample ID :	PTR 45			





CERTIFICATE OF ANALYSIS

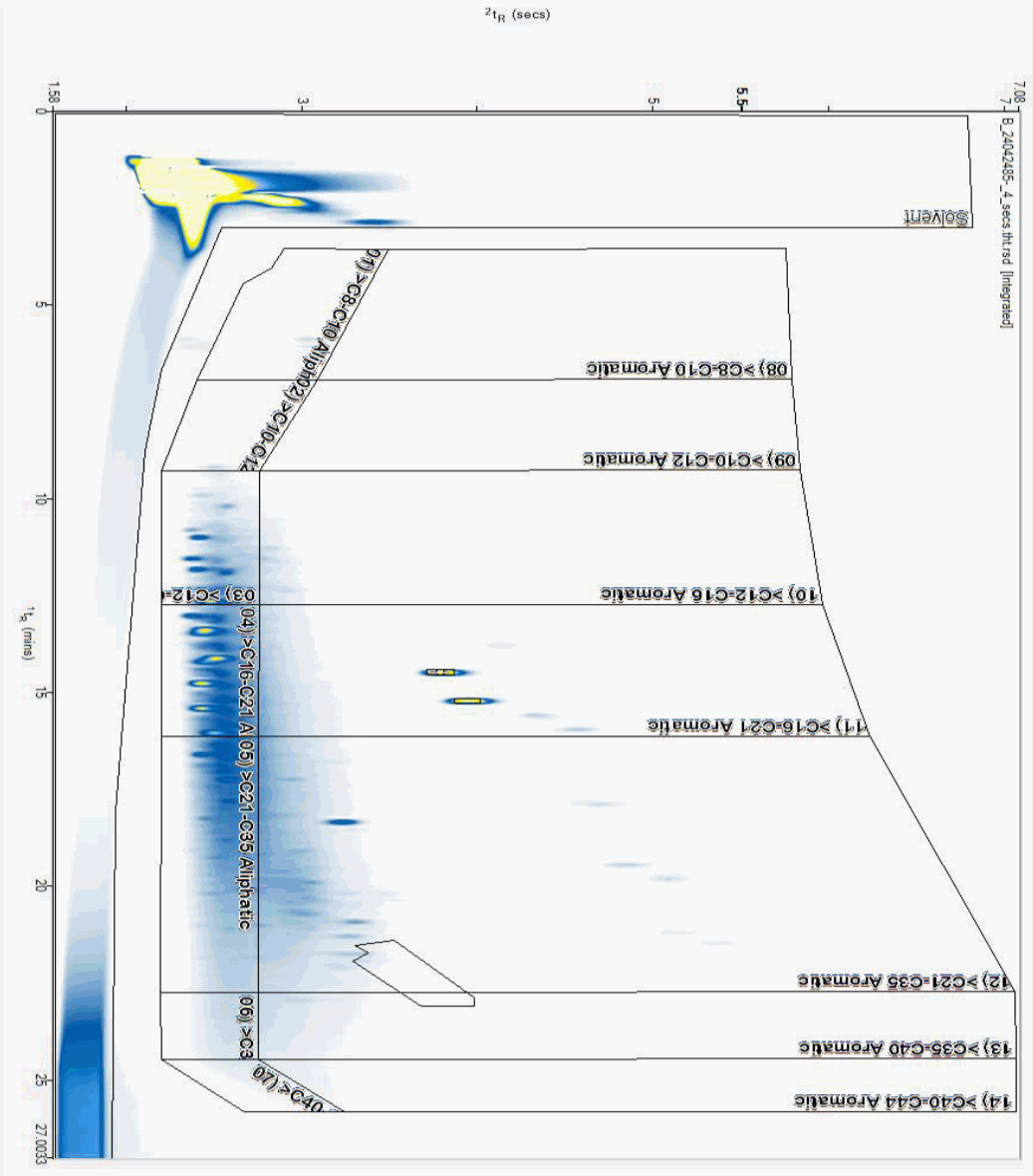
Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24042485 Depth : 1.00
Sample ID : PTR 45

ChromSpace LIMS export
Current batch
Sample Identity: B_24042485-4_secs.tht
Date Acquired : 13/04/21 12:41:08
Units : ppm
Dilution : 0
CF :
Multiplier :





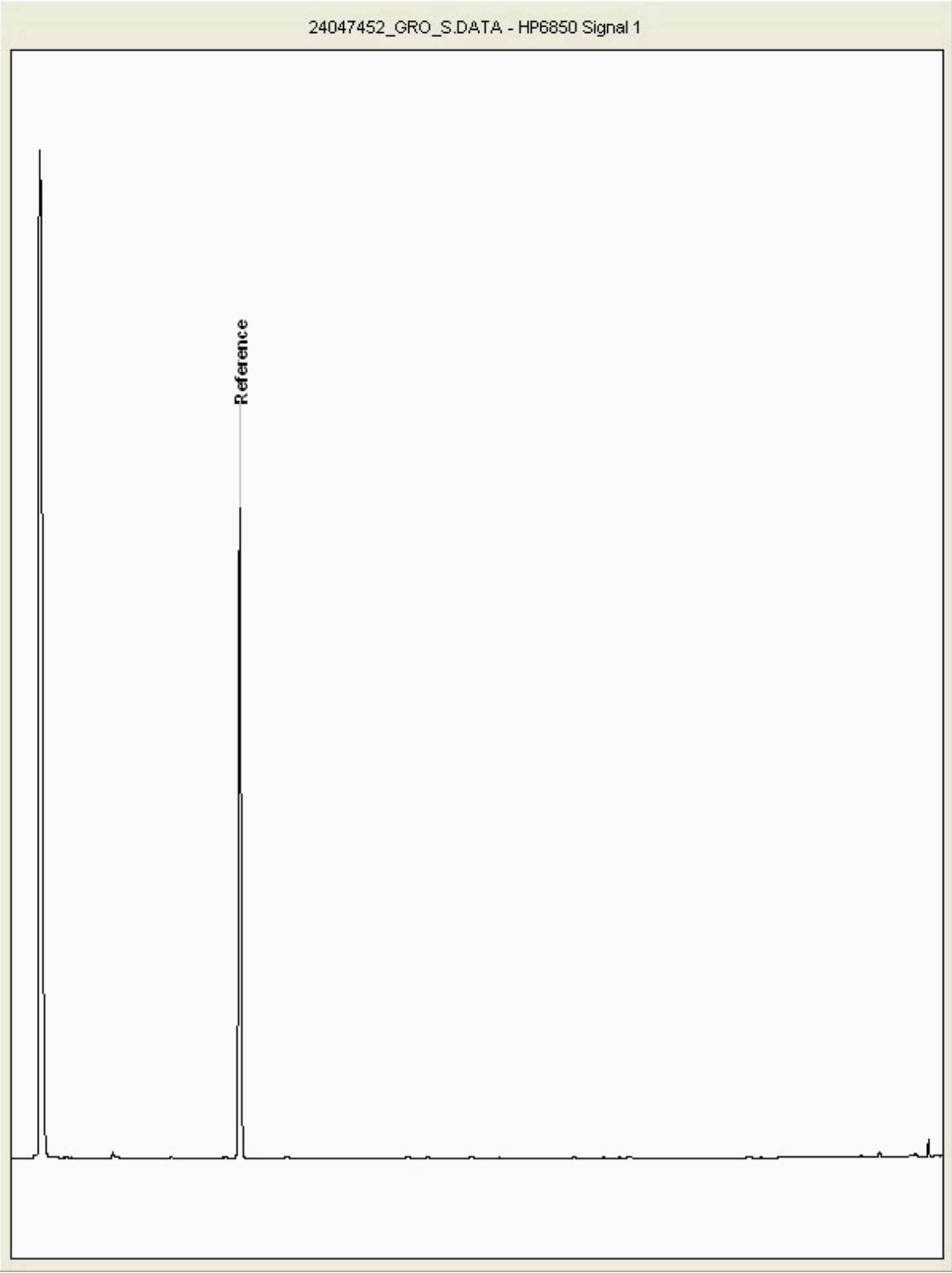
CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24047452 Depth : 0.50
Sample ID : PTR 45



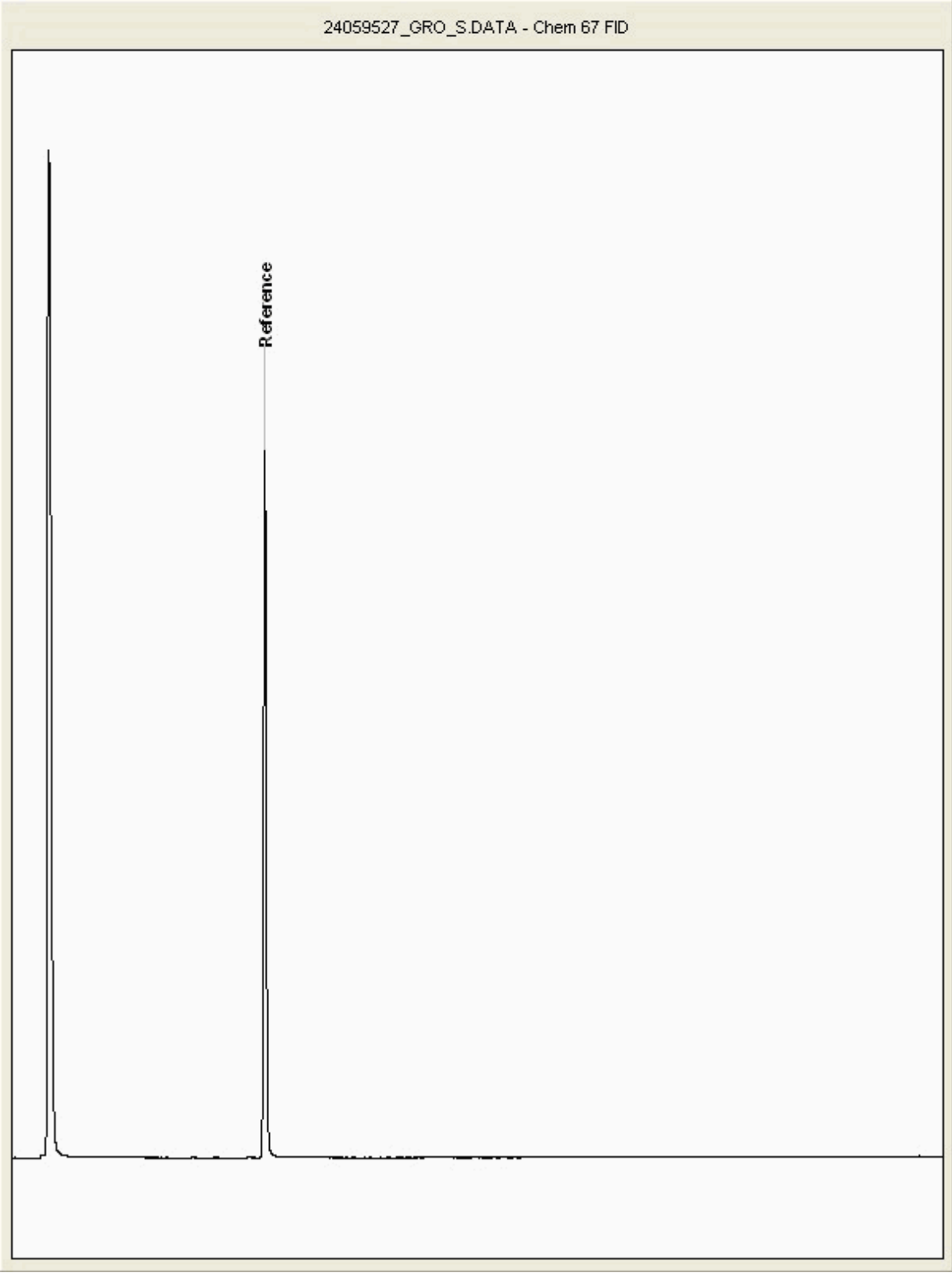
CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593036

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24059527 Depth : 1.00
Sample ID : PTR 45





CERTIFICATE OF ANALYSIS

SDG:	210329-69	Client Reference:	B025563	Report Number:	593938
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	593036

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

Attention: Richard Tonge

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CERTIFICATE OF ANALYSIS

Date of report Generation:

20 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210329-72

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

594746

We received 7 samples on Monday March 29, 2021 and 5 of these samples were scheduled for analysis which was completed on Thursday April 15, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct. Incorrect sampling dates and/or sample information will affect the validity of results. The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7 Version Issued: 20/04/2021

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23993300	TP-SRS-01		0.10	25/03/2021
23993301	TP-SRS-01		0.20	25/03/2021
23993302	TP-SRS-01		0.50	25/03/2021
23993303	TP-SRS-01		1.50	25/03/2021
23993304	TP-SRS-02		1.10	25/03/2021
23993305	TP-SRS-02		1.60	25/03/2021
23993306	TP-SRS-02		2.50	25/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG:	210329-72	Client Reference:	8025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	23993306		TP-SRS-02				2.50		60g VOC (ALE215)		S	
	23993305		TP-SRS-02				1.60		250g Amber Jar (ALE210)		S	
	23993304		TP-SRS-02				1.10		1kg TUB with Handle		S	
	23993303		TP-SRS-01				1.50		250g Amber Jar (ALE210)		S	
	23993302		TP-SRS-01				0.50		1kg TUB with Handle		S	
									250g Amber Jar (ALE215)		S	
Ammonium Low	All	NDPs: 0 Tests: 4	X					X				
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 2		X					X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 5		X			X		X		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X					X		X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 5	X		X			X		X		
Boron Water Soluble	All	NDPs: 0 Tests: 5		X		X		X		X		X
CEN Readings	All	NDPs: 0 Tests: 4	X					X		X		
Chromium III	All	NDPs: 0 Tests: 9	X	X		X		X	X	X	X	X
Coronene	All	NDPs: 0 Tests: 2		X					X			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5		X		X		X		X		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	X					X		X		X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4	X					X		X		X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 2		X				X				
EPH CWG GC (S)	All	NDPs: 0 Tests: 5		X		X		X		X		X
Fluoride	All	NDPs: 0 Tests: 4	X					X		X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Results Legend	Lab Sample No(s)		23993302	23993303	23993304	23993305	23993306
	Customer Sample Reference		TP-SRS-01	TP-SRS-01	TP-SRS-02	TP-SRS-02	TP-SRS-02
	AGS Reference						
	Depth (m)		0.50	1.50	1.10	1.60	2.50
	Container		1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S
	Sample Type		S	S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 5		X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 2	X		X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 4	X		X	X	X
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 4	X		X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 4	X		X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 5	X	X	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 2	X		X		
PAH by GCMS	All	NDPs: 0 Tests: 5	X	X	X	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 2	X		X		
pH	All	NDPs: 0 Tests: 5	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 4	X		X	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4	X		X	X	X
Sample description	All	NDPs: 0 Tests: 5	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Results Legend	Lab Sample No(s)		23993302	23993303	23993304	23993305	23993306
	Customer Sample Reference		TP-SRS-01	TP-SRS-01	TP-SRS-02	TP-SRS-02	TP-SRS-02
	AGS Reference						
	Depth (m)		0.50	1.50	1.10	1.60	2.50
	Container		1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S	1kg TUB with Handle 250g Amber Jar (ALE210) 60g VOC (ALE215) S
	Sample Type		S	S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 2	X	X			
Total Organic Carbon	All	NDPs: 0 Tests: 5	X	X	X	X	X
Total Sulphur	All	NDPs: 0 Tests: 5	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 5		X	X	X	X



CERTIFICATE OF ANALYSIS

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SDG: 210329-72

Client Reference: B025563

Report Number: 594746

Location: Cambridge South East

Order Number: 7000964

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
23993302	TP-SRS-01	0.50	Cream	Sand	None	Stones
23993303	TP-SRS-01	1.50	White	N/A	None	Stones
23993304	TP-SRS-02	1.10	Dark Brown	Loamy Sand	None	Stones
23993305	TP-SRS-02	1.60	Dark Brown	Sand	Coal fragments	Stones
23993306	TP-SRS-02	2.50	White	Sand	None	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

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SDG: 210329-72

Client Reference: B025563

Report Number: 594746

Location: Cambridge South East

Order Number: 7000964

Superseded Report:

Results Legend			Customer Sample Ref.		TP-SRS-01	TP-SRS-01	TP-SRS-02	TP-SRS-02	TP-SRS-02	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.50	1.50	1.10	1.60	2.50	
M	MCERTS accredited.				Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
aq	Aqueous / settled sample.				25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021	
diss.filt	Dissolved / filtered sample.				29/03/2021	29/03/2021	29/03/2021	29/03/2021	29/03/2021	
tot.unfilt	Total / unfiltered sample.				210329-72	210329-72	210329-72	210329-72	210329-72	
*	Subcontracted - refer to subcontractor report for accreditation status.				23993302	23993303	23993304	23993305	23993306	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-44\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Moisture Content Ratio (% of as received sample)	%	PM024	15	18	12	18	16			
Loss on ignition	<0.7 %	TM018	23.8	M	3.01	M				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	@	<0.01	@	<0.01	@	<0.01	@
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	@ M	<0.01	@ #	<0.01	@ M	<0.01	@ M
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	@ M	<0.01	@ #	<0.01	@ M	<0.01	@ M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	@	<0.05	@	<0.05	@	<0.05	@
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	@ M	<0.015	@ #	<0.015	@ M	<0.015	@ M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	@	<0.01	@	<0.01	@	<0.01	@
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	@ M	<0.01	@ #	<0.01	@ M	<0.01	@ M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	@ M	<0.015	@ #	<0.015	@ M	<0.015	@ M
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	@ M	<0.06	@ #	<0.06	@ M	<0.06	@ M
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	@	<0.13	@	<0.13	@	<0.13	@
Organic Carbon, Total	<0.2 %	TM132	<0.2	M	0.596	M				
Sulphur, Total	<0.02 %	TM132	<0.02		0.0268		0.061		<0.02	
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	#	0.00596	#	0.0319	#	<0.002	#
pH	1 pH Units	TM133	9.06	M	9.09	#	8.64	M	8.46	M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#	<0.6	#	<0.6	#	<0.6	#
Cyanide, Free	<1 mg/kg	TM153	<1	@ M	<1	@ #	<1	@ M	<1	@ M
PCB congener 28	<3 µg/kg	TM168	<3	M	<30	M				
PCB congener 52	<3 µg/kg	TM168	<3	M	<30	M				
PCB congener 101	<3 µg/kg	TM168	<3	M	<30	M				
PCB congener 118	<3 µg/kg	TM168	<3	M	<30	M				
PCB congener 138	<3 µg/kg	TM168	<3	M	<30	M				
PCB congener 153	<3 µg/kg	TM168	<3	M	<30	M				
PCB congener 180	<3 µg/kg	TM168	<3	M	<30	M				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21		<210					
Chromium, Trivalent	<0.9 mg/kg	TM181	2.66		<0.9		10.4		12.1	
Antimony	<0.6 mg/kg	TM181	<0.6	#	1.38	#	<0.6	#	<0.6	#
Arsenic	<0.6 mg/kg	TM181	2.94	M	<0.6	#	8.43	M	10.3	M
Barium	<0.6 mg/kg	TM181	11.8	#	6.56	#	51.5	#	69	#
Beryllium	<0.01 mg/kg	TM181	0.135	M	0.0556	#	0.288	M	0.549	M
Cadmium	<0.02 mg/kg	TM181	0.0751	M	0.114	#	0.104	M	0.181	M

CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-72	Client Reference:	8025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210329-72	Client Reference:	8025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-SRS-01	TP-SRS-01	TP-SRS-02	TP-SRS-02	TP-SRS-02	
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		0.50 Soil/Solid (S) 25/03/2021	1.50 Soil/Solid (S) 25/03/2021	1.10 Soil/Solid (S) 25/03/2021	1.60 Soil/Solid (S) 25/03/2021	2.50 Soil/Solid (S) 25/03/2021	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		29/03/2021 210329-72 23993302	29/03/2021 210329-72 23993303	29/03/2021 210329-72 23993304	29/03/2021 210329-72 23993305	29/03/2021 210329-72 23993306	
(F) 1-4+5@	Trigger breach confirmed Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	113	143	108	124	113	
			@	@	@	@	@	
Toluene-d8**	%	TM116	99.9	97.7	97	98.4	98.8	
			@	@	@	@	@	
4-Bromofluorobenzene**	%	TM116	99.9	102	83.4	73.5	97.7	
			@	@	@	@	@	
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 @ M	<6 @ #	<6 @ M	<6 @ M	<6 @ M	
Chloromethane	<7 µg/kg	TM116	<7 @ #	<7 @ #	<7 @ #	<7 @ #	<7 @ #	
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ #	<6 @ M	<6 @ M	<6 @ M	
Bromomethane	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Chloroethane	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Trichlorofluoromethane	<6 µg/kg	TM116	<6 @ M	<6 @ #	<6 @ M	<6 @ M	<6 @ M	
1,1-Dichloroethene	<10 µg/kg	TM116	<10 @ #	<10 @ #	<10 @ #	<10 @ #	<10 @ #	
Carbon Disulphide	<7 µg/kg	TM116	<7 @ M	<7 @ #	<7 @ M	<7 @ M	<7 @ M	
Dichloromethane	<10 µg/kg	TM116	21.5 @ #	14.7 @ #	25.3 @ #	102 @ #	18.7 @ #	
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
1,1-Dichloroethane	<8 µg/kg	TM116	<8 @ M	<8 @ #	<8 @ M	<8 @ M	<8 @ M	
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 @ M	<6 @ #	<6 @ M	<6 @ M	<6 @ M	
2,2-Dichloropropane	<10 µg/kg	TM116	<10 @	<10 @	<10 @	<10 @	<10 @	
Bromochloromethane	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Chloroform	<8 µg/kg	TM116	<8 @ M	<8 @ #	<8 @ M	<8 @ M	<8 @ M	
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 @ M	<7 @ #	<7 @ M	<7 @ M	<7 @ M	
1,1-Dichloropropene	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Carbontetrachloride	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
1,2-Dichloroethane	<5 µg/kg	TM116	<5 @ M	<5 @ #	<5 @ M	<5 @ M	<5 @ M	
Benzene	<9 µg/kg	TM116	<9 @ M	<9 @ #	<9 @ M	<9 @ M	<9 @ M	
Trichloroethene	<9 µg/kg	TM116	<9 @ #	<9 @ #	<9 @ #	<9 @ #	<9 @ #	
1,2-Dichloropropane	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Dibromomethane	<9 µg/kg	TM116	<9 @ M	<9 @ #	<9 @ M	<9 @ M	<9 @ M	
Bromodichloromethane	<7 µg/kg	TM116	<7 @ M	<7 @ #	<7 @ M	<7 @ M	<7 @ M	
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Toluene	<7 µg/kg	TM116	<7 @ M	<7 @ #	<7 @ M	18.3 @ M	<7 @ M	
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10 @	<10 @	<10 @	<10 @	<10 @	
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

VOC MS (S)

# M aq diss.flit tot.unfit * ** (F) 1-44\$@	Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP-SRS-01	TP-SRS-01	TP-SRS-02	TP-SRS-02	TP-SRS-02	
	ISO17025 accredited.			0.50	1.50	1.10	1.60	2.50	
	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
	Aqueous / settled sample.			25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021	
	Dissolved / filtered sample.								
	Total / unfiltered sample.								
	Subcontracted - refer to subcontractor report for accreditation status.								
	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			29/03/2021	29/03/2021	29/03/2021	29/03/2021	29/03/2021	
	Trigger breach confirmed			210329-72	210329-72	210329-72	210329-72	210329-72	
	Sample deviation (see appendix)			23993302	23993303	23993304	23993305	23993306	
Component		LOD/Units	Method						
1,3-Dichloropropane		<7 µg/kg	TM116	<7 @ M	<7 @ #	<7 @ M	<7 @ M	<7 @ M	
Tetrachloroethene		<5 µg/kg	TM116	<5 @ M	<5 @ #	<5 @ M	<5 @ M	<5 @ M	
Dibromochloromethane		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
1,2-Dibromoethane		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Chlorobenzene		<5 µg/kg	TM116	<5 @ M	<5 @ #	<5 @ M	<5 @ M	<5 @ M	
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Ethylbenzene		<4 µg/kg	TM116	<4 @ M	<4 @ #	<4 @ M	<4 @ M	<4 @ M	
p/m-Xylene		<10 µg/kg	TM116	<10 @ #	<10 @ #	<10 @ #	<10 @ #	<10 @ #	
o-Xylene		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Styrene		<10 µg/kg	TM116	<10 @ #	<10 @ #	<10 @ #	<10 @ #	<10 @ #	
Bromoform		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Isopropylbenzene		<5 µg/kg	TM116	<5 @ #	<5 @ #	<5 @ #	<5 @ #	<5 @ #	
1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10 @ #	<10 @ #	<10 @ #	<10 @ #	<10 @ #	
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16 @ M	<16 @ #	<16 @ M	<16 @ M	<16 @ M	
Bromobenzene		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
Propylbenzene		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
2-Chlorotoluene		<9 µg/kg	TM116	<9 @ M	<9 @ #	<9 @ M	<9 @ M	<9 @ M	
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8 @ M	<8 @ #	<8 @ M	<8 @ M	<8 @ M	
4-Chlorotoluene		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
tert-Butylbenzene		<14 µg/kg	TM116	<14 @ M	<14 @ #	<14 @ M	<14 @ M	<14 @ M	
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9 @ #	<9 @ #	<9 @ #	<9 @ #	<9 @ #	
sec-Butylbenzene		<10 µg/kg	TM116	<10 @	<10 @	<10 @	<10 @	<10 @	
4-Isopropyltoluene		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8 @ M	<8 @ #	<8 @ M	<8 @ M	<8 @ M	
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5 @ M	<5 @ #	<5 @ M	<5 @ M	<5 @ M	
n-Butylbenzene		<11 µg/kg	TM116	<11 @	<11 @	<11 @	<11 @	<11 @	
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10 @ M	<10 @ #	<10 @ M	<10 @ M	<10 @ M	
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14 @ M	<14 @ #	<14 @ M	<14 @ M	<14 @ M	
Tert-amyl methyl ether		<10 µg/kg	TM116	<10 @ #	<10 @ #	<10 @ #	<10 @ #	<10 @ #	
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20 @	<20 @	<20 @	<20 @	<20 @	
Hexachlorobutadiene		<20 µg/kg	TM116	<20 @	<20 @	<20 @	<20 @	<20 @	
Naphthalene		<13 µg/kg	TM116	<13 @ M	<13 @ #	23.1 @ M	<13 @ M	<13 @ M	



CERTIFICATE OF ANALYSIS

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

SDG:	210329-72	Client Reference:	8025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transpo
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)		17
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		85.5
Particle Size <4mm	>95%			

Case

SDG	210329-72
Lab Sample Number(s)	23993302
Sampled Date	25-Mar-2021
Customer Sample Ref.	TP-SRS-01
Depth (m)	0.50

Landfill Waste Acceptance Criteria Limits

Solid Waste Analysis		Result
Total Organic Carbon (%)	<0.2	
Loss on Ignition (%)	23.8	
Sum of BTEx (mg/kg)	<0.04	
Sum of 7 PCBs (mg/kg)	<0.021	
Mineral Oil (mg/kg)	<5	
PAH Sum of 17 (mg/kg)	<10	
pH (pH Units)	9.06	
ANC to pH 6 (mol/kg)	0.558	
ANC to pH 4 (mol/kg)	5.87	

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	-	-	-	-	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	-	-	-	-	0.5	10	70
Copper	-	-	-	-	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	-	-	-	-	0.4	10	40
Lead	-	-	-	-	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	-	-	-	-	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	2	<2	20	<20	1000	20000	50000
Total Dissolved Solids	42.9	<5	429	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	4.6	<3	46	<30	500	800	1000

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	8.84
Conductivity (µS/cm)	57.30
Temperature (°C)	20.10
Volume Leachant (Litres)	0.884

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

		CERTIFICATE OF ANALYSIS		Validated	
SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	
CEN 10:1 SINGLE STAGE LEACHATE TEST					
CEN ANALYTICAL RESULTS				REF : BS EN 12457/2	
Client Reference		Site Location		Cambridge South East Transport	
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)		13.9	
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		87.8	
Particle Size <4mm	>95%				
Case				Landfill Waste Acceptance Criteria Limits	
SDG	210329-72				
Lab Sample Number(s)	23993304				
Sampled Date	25-Mar-2021				
Customer Sample Ref.	TP-SRS-02				
Depth (m)	1.10				
Solid Waste Analysis		Result			
Total Organic Carbon (%)		0.596			
Loss on Ignition (%)		3.01			
Sum of BTEX (mg/kg)		<0.04			
Sum of 7 PCBs (mg/kg)		<0.21			
Mineral Oil (mg/kg)		13.8			
PAH Sum of 17 (mg/kg)		36.8			
pH (pH Units)		8.64			
ANC to pH 6 (mol/kg)		0.0653			
ANC to pH 4 (mol/kg)		1.15			
Eluate Analysis		C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)	
		Result		Limit of Detection	
Arsenic		-		-	
Barium		-		-	
Cadmium		-		-	
Chromium		-		-	
Copper		-		-	
Mercury Dissolved (CVAF)		<0.00001		<0.0001	
Molybdenum		-		-	
Nickel		-		-	
Lead		-		-	
Antimony		-		-	
Selenium		-		-	
Zinc		-		-	
Chloride		<2		<20	
Fluoride		0.52		<5	
Sulphate (soluble)		4.2		<20	
Total Dissolved Solids		81.1		<50	
Total Monohydric Phenols (W)		-		-	
Dissolved Organic Carbon		6.21		<30	
Leach Test Information					
Date Prepared		09-Apr-2021			
pH (pH Units)		8.28			
Conductivity (µS/cm)		109.00			
Temperature (°C)		19.60			
Volume Leachant (Litres)		0.888			
Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable					
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation					
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		CERTIFICATE OF ANALYSIS		Validated	
SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	
CEN 10:1 SINGLE STAGE LEACHATE TEST					
CEN ANALYTICAL RESULTS			REF : BS EN 12457/2		
Client Reference			Site Location		
Mass Sample taken (kg)			Cambridge South East Transport		
Mass of dry sample (kg)			Natural Moisture Content (%)		
Particle Size <4mm			Dry Matter Content (%)		
Case					
SDG					
Lab Sample Number(s)					
Sampled Date					
Customer Sample Ref.					
Depth (m)					
Eluate Analysis					
C2 Conc ⁿ in 10:1 eluate (mg/l)			A2 10:1 conc ⁿ leached (mg/kg)		
Result			Limit of Detection		
Limit of Detection			Result		
Limit of Detection			Limit of Detection		
Ammoniacal Nitrogen as N			0.012		
Low Level Hexavalent Chromium			<0.003		
Chromium III (Low)			<0.003		
Complex Cyanide - Low Level			<0.005		
Free Cyanide - Low Level			<0.0025		
Antimony			<0.001		
Arsenic			0.000582		
Barium			0.00165		
Beryllium			<0.0001		
Boron			0.0179		
Cadmium			<0.00008		
Calcium (Dis.Filt) mg/l			11.4		
Chromium			<0.001		
Copper			0.00135		
Hardness dissolved			29.9		
Iron (Dis.Filt) mg/l			<0.019		
Lead			<0.0002		
Magnesium (Dis.Filt) mg/l			0.312		
Manganese			<0.003		
Molybdenum			<0.003		
Nickel			<0.0004		
Selenium			<0.001		
Vanadium			0.00128		
Zinc			0.00211		
2,3,5 Trimethyl-Phenol by HPLC (W)			<0.003		
2-Isopropyl Phenol by HPLC (W)			<0.006		
Catechol by HPLC (W)			<0.01		
Cresols by HPLC (W)			<0.006		
Naphthol by HPLC (W)			<0.01		
NG Total Speciated Phenols by HPLC (W)			<0.045		
Phenol by HPLC (W)			<0.002		
Resorcinol HPLC (W)			<0.01		
Total Monohydric Phenols (W)			<0.016		
Xylenols by HPLC (W)			<0.008		
Leach Test Information					
Date Prepared			09-Apr-2021		
pH (pH Units)			8.84		
Conductivity (µS/cm)			57.30		
Temperature (°C)			20.10		
Volume Leachant (Litres)			0.884		
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CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)	13.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87.8
Particle Size <4mm	>95%		

Case

SDG	210329-72			
Lab Sample Number(s)	23993304			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	TP-SRS-02			
Depth (m)	1.10			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.019	<0.01	0.19	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	0.00103	<0.0005	0.0103	<0.005	-	-	-
Barium	0.00836	<0.0002	0.0836	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0287	<0.01	0.287	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	20.3	<0.2	203	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.0043	<0.0003	0.043	<0.003	-	-	-
Hardness dissolved	55	<0.65	550	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.785	<0.019	7.85	<0.19	-	-	-
Lead	0.000356	<0.0002	0.00356	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	1.03	<0.036	10.3	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00122	<0.0004	0.0122	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00189	<0.001	0.0189	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	8.28
Conductivity (µS/cm)	109.00
Temperature (°C)	19.60
Volume Leachant (Litres)	0.888

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CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport
Mass Sample taken (kg)	0.110	Natural Moisture Content (%)	21.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	82.3
Particle Size <4mm	>95%		

Case

SDG	210329-72			
Lab Sample Number(s)	23993305			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	TP-SRS-02			
Depth (m)	1.60			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.027	<0.01	0.27	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	12.7	<3	127	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	0.0000151	<0.00001	0.000151	<0.0001	-	-	-
Arsenic	0.00108	<0.0005	0.0108	<0.005	-	-	-
Barium	0.0954	<0.0002	0.954	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.127	<0.01	1.27	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	25.7	<0.2	257	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00388	<0.0003	0.0388	<0.003	-	-	-
Lead	0.00058	<0.0002	0.0058	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	1.28	<0.036	12.8	<0.36	-	-	-
Manganese	0.00625	<0.003	0.0625	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00222	<0.0004	0.0222	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00118	<0.001	0.0118	<0.01	-	-	-
Zinc	0.0428	<0.001	0.428	<0.01	-	-	-
Chloride	4.1	<2	41	<20	-	-	-
Sulphate (soluble)	10.4	<2	104	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	7.66
Conductivity (µS/cm)	146.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.880

20/04/2021 12:38:47

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72

Client Reference: B025563

Report Number: 594746

Location: Cambridge South East

Order Number: 7000964

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.110

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site Location

Natural Moisture Content (%)21.5

Dry Matter Content (%)82.3

Cambridge South East Transport

Case

SDG210329-72

Lab Sample Number(s)23993305

Sampled Date25-Mar-2021

Customer Sample Ref.TP-SRS-02

Depth (m)1.60

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Hardness dissolved

69.6

<0.65

696

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.205

<0.019

2.05

<0.19

-

-

-

Leach Test Information

Date Prepared09-Apr-2021

pH (pH Units)7.66

Conductivity (µS/cm)146.00

Temperature (°C)20.00

Volume Leachant (Litres)0.880

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12:38:04 20/04/2021

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ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72

Client Reference: B025563

Report Number: 594746

Location: Cambridge South East

Order Number: 7000964

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.107

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site Location

Natural Moisture Content (%)19.7

Dry Matter Content (%)83.5

Cambridge South East Transport

Case

SDG210329-72

Lab Sample Number(s)23993306

Sampled Date25-Mar-2021

Customer Sample Ref.TP-SRS-02

Depth (m)2.50

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Ammoniacal Nitrogen as N

0.016

<0.01

0.16

<0.1

-

-

-

Low Level Hexavalent Chromium

<0.003

<0.003

<0.03

<0.03

-

-

-

Chromium III (Low)

<0.003

<0.003

<0.03

<0.03

-

-

-

Complex Cyanide - Low Level

<0.005

<0.005

<0.05

<0.05

-

-

-

Free Cyanide - Low Level

<0.0025

<0.0025

<0.025

<0.025

-

-

-

Dissolved Organic Carbon

<3

<3

<30

<30

-

-

-

Fluoride

<0.5

<0.5

<5

<5

-

-

-

Mercury Dissolved (CVAF)

<0.00001

<0.00001

<0.0001

<0.0001

-

-

-

Arsenic

0.000573

<0.0005

0.00573

<0.005

-

-

-

Barium

0.0035

<0.0002

0.035

<0.002

-

-

-

Beryllium

<0.0001

<0.0001

<0.001

<0.001

-

-

-

Boron

0.0168

<0.01

0.168

<0.1

-

-

-

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

-

-

-

Calcium (Dis.Filt) mg/l

12.6

<0.2

126

<2

-

-

-

Chromium

<0.001

<0.001

<0.01

<0.01

-

-

-

Copper

0.00151

<0.0003

0.0151

<0.003

-

-

-

Lead

<0.0002

<0.0002

<0.002

<0.002

-

-

-

Magnesium (Dis.Filt) mg/l

0.626

<0.036

6.26

<0.36

-

-

-

Manganese

<0.003

<0.003

<0.03

<0.03

-

-

-

Molybdenum

<0.003

<0.003

<0.03

<0.03

-

-

-

Nickel

<0.0004

<0.0004

<0.004

<0.004

-

-

-

Selenium

<0.001

<0.001

<0.01

<0.01

-

-

-

Vanadium

0.00108

<0.001

0.0108

<0.01

-

-

-

Zinc

<0.001

<0.001

<0.01

<0.01

-

-

-

Chloride

<2

<2

<20

<20

-

-

-

Sulphate (soluble)

5.9

<2

59

<20

-

-

-

2,3,5 Trimethyl-Phenol by HPLC (W)

<0.003

<0.003

<0.03

<0.03

-

-

-

2-Isopropyl Phenol by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Catechol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Cresols by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Napthol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

NG Total Speciated Phenols by HPLC (W)

<0.045

<0.045

<0.45

<0.45

-

-

-

Phenol by HPLC (W)

<0.002

<0.002

<0.02

<0.02

-

-

-

Resorcinol HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Xylenols by HPLC (W)

<0.008

<0.008

<0.08

<0.08

-

-

-

Leach Test Information

Date Prepared09-Apr-2021

pH (pH Units)9.00

Conductivity (µS/cm)72.50

Temperature (°C)17.00

Volume Leachant (Litres)0.883

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19.7	
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	83.5	
Particle Size <4mm	>95%			

Case

SDG	210329-72			
Lab Sample Number(s)	23993306			
Sampled Date	25-Mar-2021			
Customer Sample Ref.	TP-SRS-02			
Depth (m)	2.50			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	34	<0.65	340	<6.5	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	9.00
Conductivity (µS/cm)	72.50
Temperature (°C)	17.00
Volume Leachant (Litres)	0.883

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CERTIFICATE OF ANALYSIS

/validated

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	Cambridge South East	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	23993302	23993303	23993304	23993305	23993306
	TP-SRS-01	TP-SRS-01	TP-SRS-02	TP-SRS-02	TP-SRS-02
	0.50	1.50	1.10	1.60	2.50
AGS Ref. Depth Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	12-Apr-2021		12-Apr-2021	12-Apr-2021	12-Apr-2021
ANC at pH4 and ANC at pH 6	09-Apr-2021		09-Apr-2021		
Anions by Kone (soil)	12-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
Anions by Kone (w)	12-Apr-2021		12-Apr-2021	12-Apr-2021	12-Apr-2021
Asbestos ID in Solid Samples	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021
Boron Water Soluble	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021
CEN 10:1 Leachate (1 Stage)	09-Apr-2021		09-Apr-2021	09-Apr-2021	09-Apr-2021
CEN Readings	13-Apr-2021		13-Apr-2021	13-Apr-2021	10-Apr-2021
Chromium III	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
Coronene	09-Apr-2021		09-Apr-2021		
Cyanide Comp/Free/Total/Thiocyanate	13-Apr-2021	15-Apr-2021	15-Apr-2021	15-Apr-2021	15-Apr-2021
Dissolved Metals by ICP-MS	12-Apr-2021		12-Apr-2021	12-Apr-2021	12-Apr-2021
Dissolved Organic/Inorganic Carbon	13-Apr-2021		13-Apr-2021	13-Apr-2021	13-Apr-2021
EPH by GCxGC-FID	12-Apr-2021		12-Apr-2021		
EPH CWG GC (S)	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
Fluoride	12-Apr-2021		12-Apr-2021	12-Apr-2021	12-Apr-2021
GRO by GC-FID (S)	09-Apr-2021	12-Apr-2021	09-Apr-2021	09-Apr-2021	09-Apr-2021
Hexavalent Chromium (s)	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
Loss on Ignition in soils	12-Apr-2021		09-Apr-2021		
Low Level Cyanide (W)	13-Apr-2021		13-Apr-2021	13-Apr-2021	13-Apr-2021
Low Level Hexavalent Chromium (w)	12-Apr-2021		12-Apr-2021	12-Apr-2021	12-Apr-2021
Mercury Dissolved	13-Apr-2021		13-Apr-2021	13-Apr-2021	13-Apr-2021
Metals in solid samples by OES	13-Apr-2021	09-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
Moisture at 105C	09-Apr-2021		20-Apr-2021	09-Apr-2021	09-Apr-2021
PAH 16 & 17 Calc	13-Apr-2021		09-Apr-2021		
PAH by GCMS	13-Apr-2021	13-Apr-2021	09-Apr-2021	13-Apr-2021	13-Apr-2021
PCBs by GCMS	09-Apr-2021		09-Apr-2021		
pH	08-Apr-2021	08-Apr-2021	08-Apr-2021	08-Apr-2021	08-Apr-2021
pH Value of Filtered Water	12-Apr-2021		12-Apr-2021	12-Apr-2021	12-Apr-2021
Phenols by HPLC (S)	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021
Phenols by HPLC (W)	13-Apr-2021		13-Apr-2021	13-Apr-2021	13-Apr-2021
Sample description	07-Apr-2021	07-Apr-2021	07-Apr-2021	07-Apr-2021	07-Apr-2021
Total Dissolved Solids	12-Apr-2021		12-Apr-2021		
Total Organic Carbon	12-Apr-2021	13-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021
Total Sulphur	09-Apr-2021	09-Apr-2021	09-Apr-2021	09-Apr-2021	09-Apr-2021
TPH CWG GC (S)	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
VOC MS (S)	09-Apr-2021	09-Apr-2021	09-Apr-2021	09-Apr-2021	09-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2454
Ammoniacal Nitrogen as N	TM099	100.6 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2450
ANC pH_4 dry soil	TM182	97.65 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2481	QC 2485
Chloride (soluble)	TM243	156.99 83.05 : 116.28	148.19 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	169.16 70.00 : 130.00	168.69 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2440
Chloride	TM184	98.6 92.93 : 115.43
Sulphate (soluble)	TM184	102.8 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2459
Water Soluble Boron	TM222	108.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2487
Coronene RAW	TM410	110.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2439	QC 2453	QC 2495
Free Cyanide	TM153	101.98 86.90 : 108.50	94.36 79.00 : 115.00	97.03 79.00 : 115.00
Thiocyanate	TM153	109.62 94.53 : 113.33	100.64 94.09 : 113.89	100.64 94.09 : 113.89
Total Cyanide	TM153	104.2 86.13 : 102.13	99.3 73.07 : 107.47	98.6 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2446	QC 2448
Aluminium	TM152	103.67 90.98 : 111.82	103.0 90.98 : 111.82
Antimony	TM152	104.5 90.44 : 113.04	103.83 90.44 : 113.04
Arsenic	TM152	104.17 88.00 : 112.00	104.17 88.00 : 112.00
Barium	TM152	100.5 90.20 : 111.19	102.0 90.20 : 111.19
Beryllium	TM152	105.67 87.77 : 113.97	106.0 87.77 : 113.97
Bismuth	TM152	101.67 91.90 : 112.20	102.33 91.90 : 112.20
Borate	TM152	105.56 88.00 : 112.00	105.56 88.00 : 112.00
Boron	TM152	105.33 96.48 : 114.93	105.33 96.48 : 114.93
Cadmium	TM152	103.17 96.43 : 110.53	103.33 96.43 : 110.53
Calcium	TM152	103.33 81.38 : 119.09	102.67 81.38 : 119.09
Chromium	TM152	101.83 91.84 : 108.67	102.0 91.84 : 108.67
Cobalt	TM152	103.33 88.00 : 112.00	102.0 88.00 : 112.00
Copper	TM152	105.33 92.47 : 118.11	104.67 92.47 : 118.11
Iron	TM152	100.67 92.00 : 113.00	99.33 92.00 : 113.00
Lead	TM152	101.67 88.00 : 112.00	102.0 88.00 : 112.00
Lithium	TM152	101.33 91.62 : 113.12	102.5 91.62 : 113.12
Magnesium	TM152	100.67 93.14 : 107.91	99.33 93.14 : 107.91
Manganese	TM152	103.17 95.03 : 110.58	103.67 95.03 : 110.58
Molybdenum	TM152	97.83 88.00 : 112.00	98.17 88.00 : 112.00
Nickel	TM152	104.0 88.00 : 112.00	103.5 88.00 : 112.00
Phosphorus	TM152	104.33 88.00 : 112.00	103.33 88.00 : 112.00
Potassium	TM152	102.67 93.90 : 112.36	102.67 93.90 : 112.36

Dissolved Metals by ICP-MS

		QC 2446	QC 2448
Selenium	TM152	104.83 91.58 : 115.98	105.0 91.58 : 115.98
Silver	TM152	98.33 88.80 : 122.30	98.67 88.80 : 122.30
Sodium	TM152	100.67 94.28 : 110.71	100.0 94.28 : 110.71
Strontium	TM152	100.67 88.00 : 112.00	101.33 88.00 : 112.00
Tellurium	TM152	102.83 93.32 : 114.66	101.83 93.32 : 114.66
Thallium	TM152	94.67 88.00 : 112.00	87.5 88.00 : 112.00
Tin	TM152	99.17 92.63 : 109.70	99.17 92.63 : 109.70
Titanium	TM152	103.0 95.58 : 111.68	101.17 95.58 : 111.68
Tungsten	TM152	100.0 81.32 : 124.72	100.5 81.32 : 124.72
Uranium	TM152	100.5 88.00 : 112.00	101.67 88.00 : 112.00
Vanadium	TM152	106.5 88.00 : 112.00	102.83 88.00 : 112.00
Zinc	TM152	107.0 92.98 : 118.95	105.67 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2496
Dissolved Inorganic Carbon	TM090	102.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2498
Fluoride	TM104	106.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2464	QC 2471
QC	TM089	97.54 70.75 : 114.19	101.26 70.75 : 114.19

Hexavalent Chromium (s)

Hexavalent Chromium (s)

Component	Method Code	QC 2436	QC 2454	QC 2477
Hexavalent Chromium	TM151	104.0 92.00 : 111.20	104.0 92.00 : 111.20	106.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2417	QC 2442
Loss on Ignition	TM018	102.13 87.10 : 102.39	98.34 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2429
Free Cyanide - Low Level	TM279	78.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2493	QC 2412
Mercury Dissolved (CVAF)	TM183	90.3 69.30 : 128.70	91.6 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2484	QC 2430	QC 2432	QC 2409
Aluminium	TM181	90.27 73.56 : 108.85	100.88 77.46 : 123.98	100.88 73.56 : 108.85	95.58 77.46 : 123.98
Antimony	TM181	86.99 76.89 : 111.24	99.19 87.04 : 111.16	85.77 76.89 : 111.24	95.12 87.04 : 111.16
Arsenic	TM181	100.29 88.53 : 111.01	104.94 87.34 : 110.87	104.94 88.53 : 111.01	104.65 87.34 : 110.87
Barium	TM181	89.17 77.67 : 105.35	100.0 80.73 : 115.16	104.59 77.67 : 105.35	101.83 80.73 : 115.16
Beryllium	TM181	103.73 85.44 : 109.61	101.49 89.47 : 112.97	98.13 85.44 : 109.61	105.6 89.47 : 112.97
Boron	TM181	90.26 73.51 : 104.66	93.41 76.57 : 104.15	93.41 73.51 : 104.66	90.54 76.57 : 104.15
Cadmium	TM181	94.65 77.67 : 104.12	97.12 78.94 : 102.43	102.06 77.67 : 104.12	98.35 78.94 : 102.43
Chromium	TM181	88.64 79.64 : 105.83	95.13 77.55 : 104.47	86.21 79.64 : 105.83	84.38 77.55 : 104.47

Metals in solid samples by OES

		QC 2484	QC 2430	QC 2432	QC 2409
Cobalt	TM181	93.08 84.60 : 104.13	91.82 82.95 : 107.41	90.25 84.60 : 104.13	93.4 82.95 : 107.41
Copper	TM181	93.84 82.40 : 105.45	103.35 84.36 : 106.14	97.54 82.40 : 105.45	99.12 84.36 : 106.14
Iron	TM181	90.48 82.95 : 110.58	99.21 81.43 : 115.79	96.83 82.95 : 110.58	100.0 81.43 : 115.79
Lead	TM181	96.17 78.24 : 104.05	94.37 81.95 : 107.63	92.79 78.24 : 104.05	95.95 81.95 : 107.63
Manganese	TM181	106.11 94.29 : 119.51	110.0 94.29 : 119.51	108.06 94.29 : 119.51	104.72 94.29 : 119.51
Mercury	TM181	97.34 83.16 : 107.81	100.0 82.73 : 106.36	99.03 83.16 : 107.81	90.58 82.73 : 106.36
Molybdenum	TM181	96.3 87.11 : 106.87	100.82 86.61 : 111.07	100.0 87.11 : 106.87	99.59 86.61 : 111.07
Nickel	TM181	91.2 80.26 : 102.28	92.91 79.72 : 103.80	89.24 80.26 : 102.28	88.02 79.72 : 103.80
Phosphorus	TM181	107.27 94.56 : 124.28	114.55 92.65 : 125.47	115.56 94.56 : 124.28	110.51 92.65 : 125.47
Selenium	TM181	98.82 82.28 : 110.48	105.88 88.36 : 111.25	104.71 82.28 : 110.48	102.75 88.36 : 111.25
Strontium	TM181	91.54 79.13 : 102.79	96.88 78.06 : 99.91	93.1 79.13 : 102.79	91.09 78.06 : 99.91
Thallium	TM181	97.79 82.94 : 111.86	102.65 88.60 : 116.73	100.0 82.94 : 111.86	105.31 88.60 : 116.73
Tin	TM181	100.38 86.72 : 110.03	101.14 89.77 : 112.62	98.86 86.72 : 110.03	97.34 89.77 : 112.62
Titanium	TM181	81.68 66.23 : 102.06	83.21 66.29 : 105.96	84.73 66.23 : 102.06	85.5 66.29 : 105.96
Vanadium	TM181	94.87 86.19 : 109.45	98.9 75.51 : 108.87	97.07 86.19 : 109.45	98.9 75.51 : 108.87
Zinc	TM181	100.21 84.68 : 113.99	103.49 84.02 : 111.24	103.08 84.68 : 113.99	99.18 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2443	QC 2436	QC 2443
Acenaphthene	TM218	85.5 80.97 : 105.99	90.5 73.47 : 109.80	85.0 76.79 : 103.90
Acenaphthylene	TM218	82.5 74.76 : 107.36	91.0 70.00 : 130.00	82.0 78.40 : 108.66
Anthracene	TM218	84.5 73.04 : 106.97	88.5 68.68 : 111.89	84.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.5 68.79 : 119.64	108.0 68.12 : 118.39	84.5 73.77 : 119.26
Benzo(a)pyrene	TM218	81.0 66.17 : 117.52	107.5 71.72 : 115.31	85.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	79.0 66.40 : 118.34	103.5 66.89 : 120.40	78.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	88.0 67.68 : 112.07	98.0 67.82 : 118.49	86.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	92.0 72.84 : 114.66	102.0 73.10 : 117.03	86.0 75.98 : 116.59
Chrysene	TM218	88.5 68.39 : 115.56	104.5 69.58 : 115.47	88.5 74.82 : 114.18

PAH by GCMS

		QC 2443	QC 2436	QC 2443
Dibenzo(ah)anthracene	TM218	86.0 69.03 : 110.45	93.0 67.32 : 121.35	86.0 69.17 : 115.30
Fluoranthene	TM218	84.0 69.37 : 117.19	114.5 75.16 : 117.28	84.0 75.88 : 112.84
Fluorene	TM218	85.0 75.38 : 105.98	88.5 73.81 : 108.66	84.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	74.0 65.91 : 113.61	99.5 68.91 : 117.62	82.5 70.26 : 117.95
Naphthalene	TM218	84.0 71.40 : 105.87	88.5 72.12 : 106.18	79.0 74.70 : 101.83
Phenanthrene	TM218	87.0 74.04 : 109.30	97.5 69.01 : 113.72	85.0 73.62 : 109.34
Pyrene	TM218	86.5 69.68 : 115.27	107.5 64.28 : 115.75	84.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2490
PCB congener 101	TM168	89.0 65.66 : 110.06
PCB congener 105	TM168	82.6 58.10 : 106.34
PCB congener 114	TM168	84.7 59.38 : 106.48
PCB congener 118	TM168	84.3 60.02 : 106.23
PCB congener 123	TM168	90.9 65.01 : 99.81
PCB congener 126	TM168	83.4 59.31 : 109.23
PCB congener 138	TM168	87.6 63.95 : 107.63
PCB congener 153	TM168	91.3 62.65 : 108.85
PCB congener 156	TM168	85.1 61.69 : 112.27
PCB congener 157	TM168	81.4 55.37 : 104.81
PCB congener 167	TM168	84.8 65.58 : 109.14
PCB congener 169	TM168	87.5 56.84 : 112.10
PCB congener 180	TM168	89.9 66.99 : 111.63
PCB congener 189	TM168	85.2 57.75 : 112.59
PCB congener 28	TM168	91.0 73.68 : 105.96
PCB congener 52	TM168	88.1 67.24 : 107.62
PCB congener 77	TM168	87.0 64.87 : 108.49
PCB congener 81	TM168	88.7 70.78 : 110.80

pH

Component	Method Code	QC 2445	QC 2459
pH	TM133	100.53 99.08 : 102.24	100.92 98.71 : 102.32

pH Value of Filtered Water

Component	Method Code	QC 2463	QC 2465
pH	TM256	100.13 99.33 : 102.54	100.4 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2464	QC 2416
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	48.7 70.71 : 116.42	51.3 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.11 64.54 : 117.79	43.86 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	45.93 74.40 : 108.98	49.06 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	48.34 69.44 : 122.18	50.99 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	46.67 76.56 : 106.38	48.65 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2495
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	47.0 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.33 76.60 : 126.28
Napthol by HPLC (W)	TM259	49.0 75.40 : 129.40
Phenol by HPLC (W)	TM259	49.0 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.17 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2474	QC 2480
Total Dissolved Solids	TM123	99.6 97.30 : 100.92	99.6 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2458	QC 2461
Total Organic Carbon	TM132	103.91 87.02 : 113.45	101.56 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2494
Total Sulphur %	TM132	87.05 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2495
1,1,1,2-tetrachloroethane	TM116	100.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	100.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	96.6 77.12 : 116.04
1,1-Dichloroethane	TM116	104.0 74.46 : 129.15
1,2-Dichloroethane	TM116	109.2 92.38 : 131.65
1,4-Dichlorobenzene	TM116	98.4 83.64 : 126.18
2-Chlorotoluene	TM116	94.0 76.03 : 113.25
4-Chlorotoluene	TM116	85.8 66.90 : 112.46
Benzene	TM116	101.4 88.60 : 113.80
Carbon Disulphide	TM116	94.6 74.91 : 122.14
Carbontetrachloride	TM116	102.8 80.31 : 124.50
Chlorobenzene	TM116	97.6 83.81 : 114.18
Chloroform	TM116	105.0 87.40 : 122.49
Chloromethane	TM116	102.6 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	101.8 80.67 : 126.72
Dibromomethane	TM116	95.8 73.23 : 118.35
Dichloromethane	TM116	106.2 81.11 : 133.25

VOC MS (S)

		QC 2495
Ethylbenzene	TM116	93.6 75.92 : 110.41
Hexachlorobutadiene	TM116	77.4 12.82 : 152.73
Isopropylbenzene	TM116	87.6 55.79 : 97.59
Naphthalene	TM116	98.0 80.86 : 128.81
o-Xylene	TM116	90.0 69.99 : 108.74
p/m-Xylene	TM116	87.5 68.32 : 108.91
Sec-Butylbenzene	TM116	78.6 38.50 : 101.50
Tetrachloroethene	TM116	101.6 76.95 : 121.02
Toluene	TM116	91.6 74.24 : 107.42
Trichloroethene	TM116	97.0 85.28 : 109.36
Trichlorofluoromethane	TM116	97.6 84.55 : 133.27
Vinyl Chloride	TM116	106.0 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

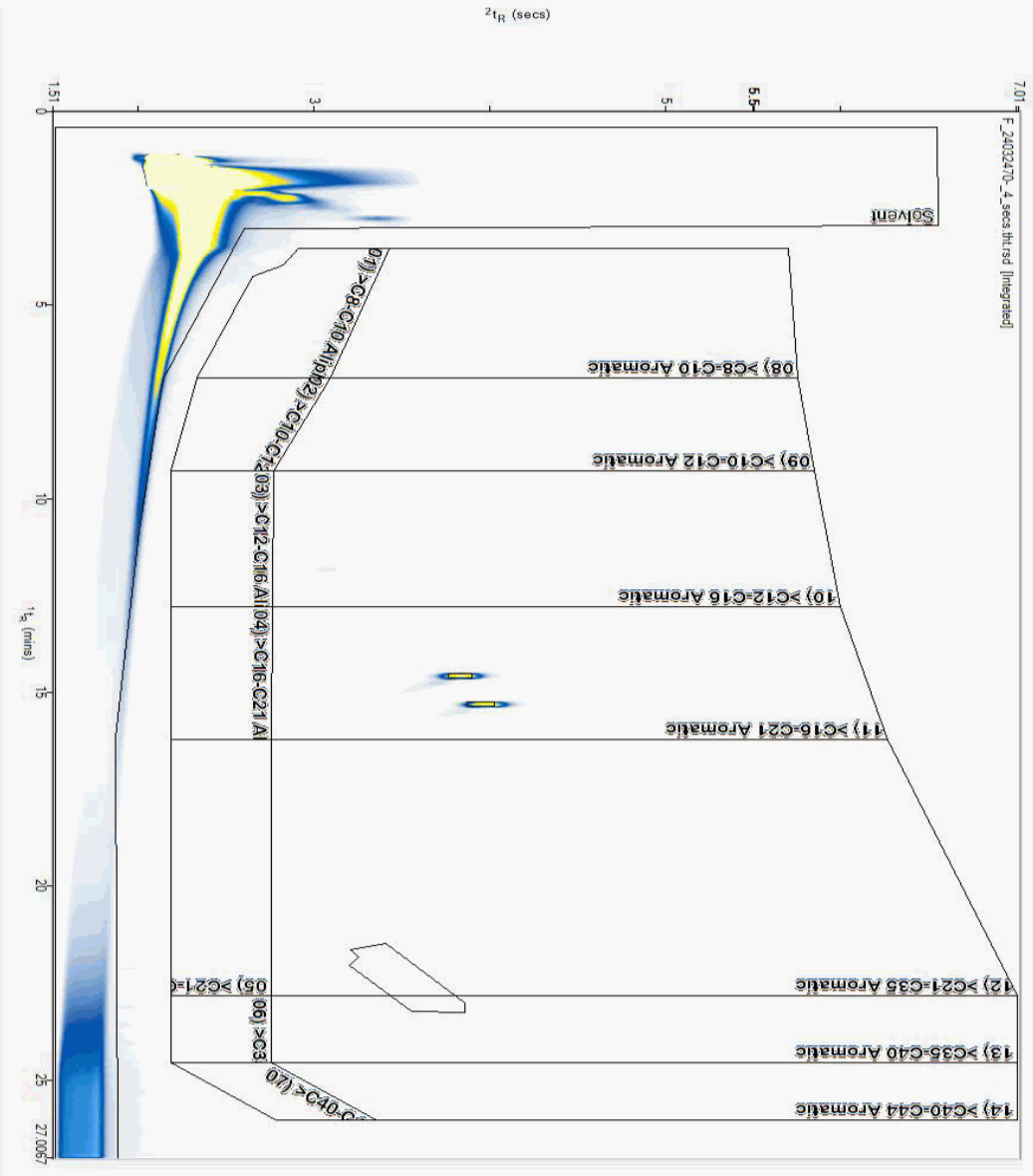
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SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24032470 Depth : 0.50
Sample ID : TP-SRS-01

ChromSpace LIMS export
Current batch
Sample Identity: F_24032470-4_secs.tht
Date Acquired : 12/04/21 06:00:47
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

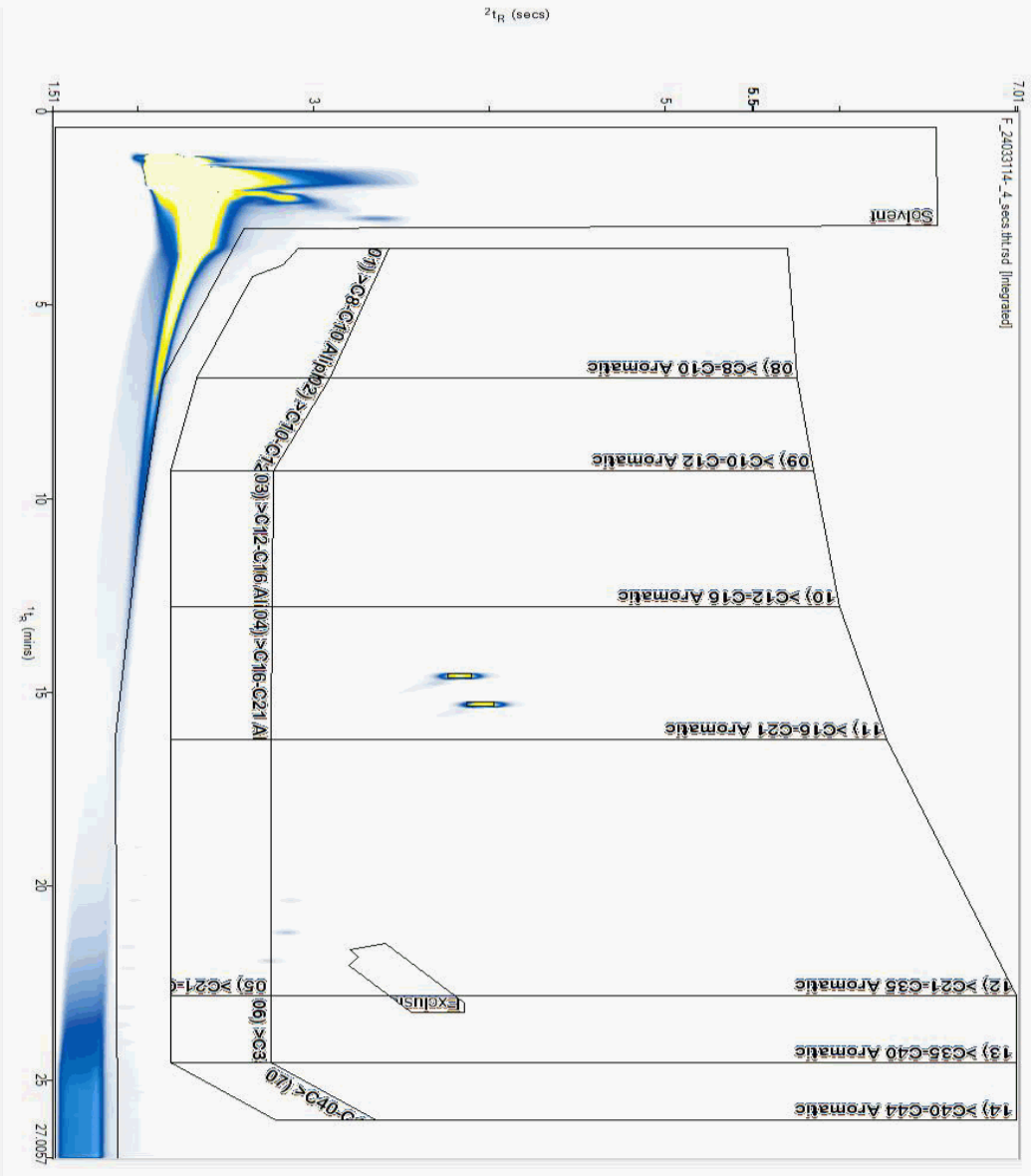
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SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24033114 Depth : 1.50
Sample ID : TP-SRS-01

ChromSpace LIMS export
Current batch
Sample Identity: F_24033114-4_secs.tht
Date Acquired : 12/04/21 08:05:40
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

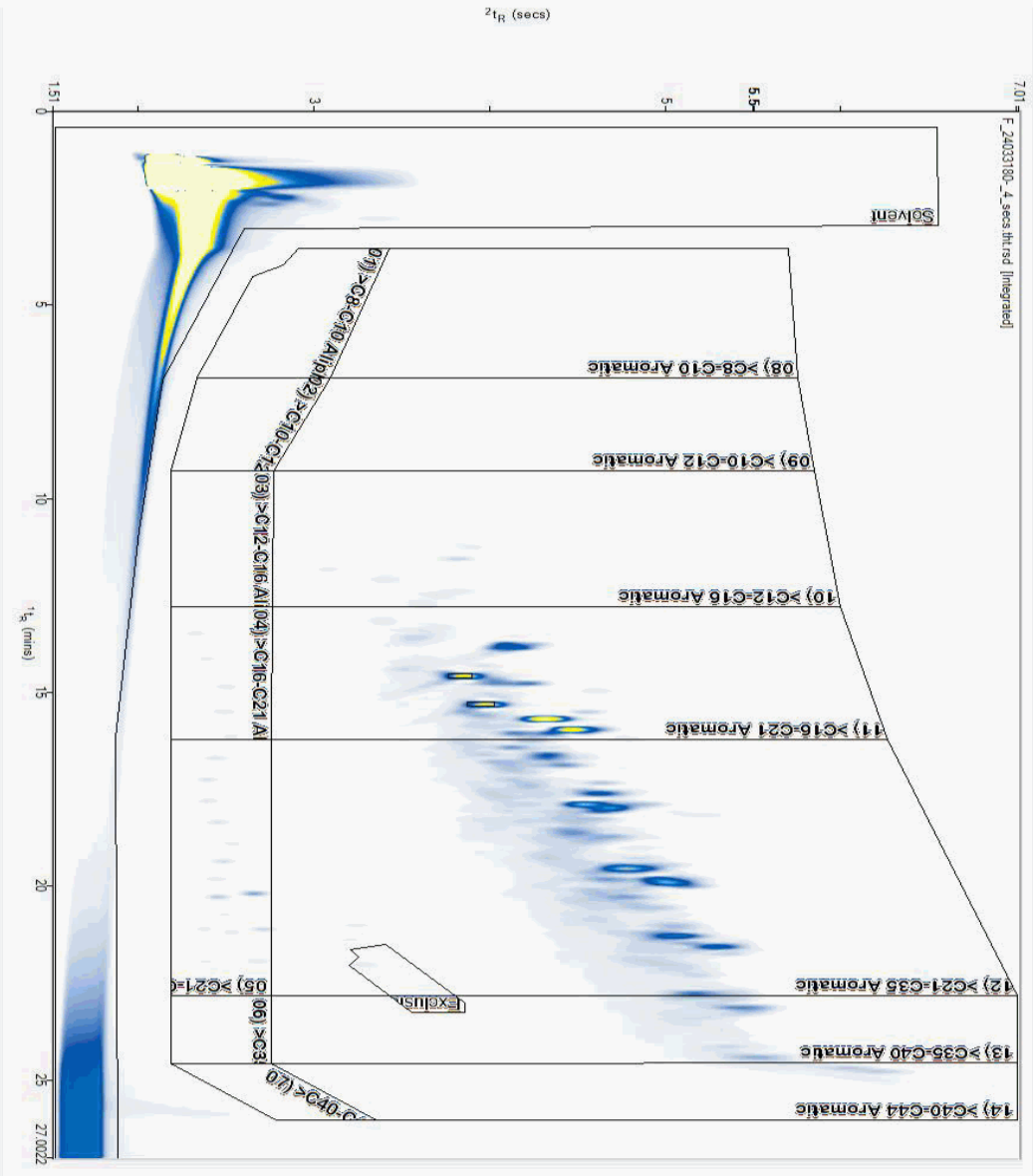
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SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24033180 Depth : 1.10
Sample ID : TP-SRS-02

ChromSpace LIMS export
Current batch
Sample Identity: F_24033180-4_secs.tht
Date Acquired : 13/04/21 02:37:16
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

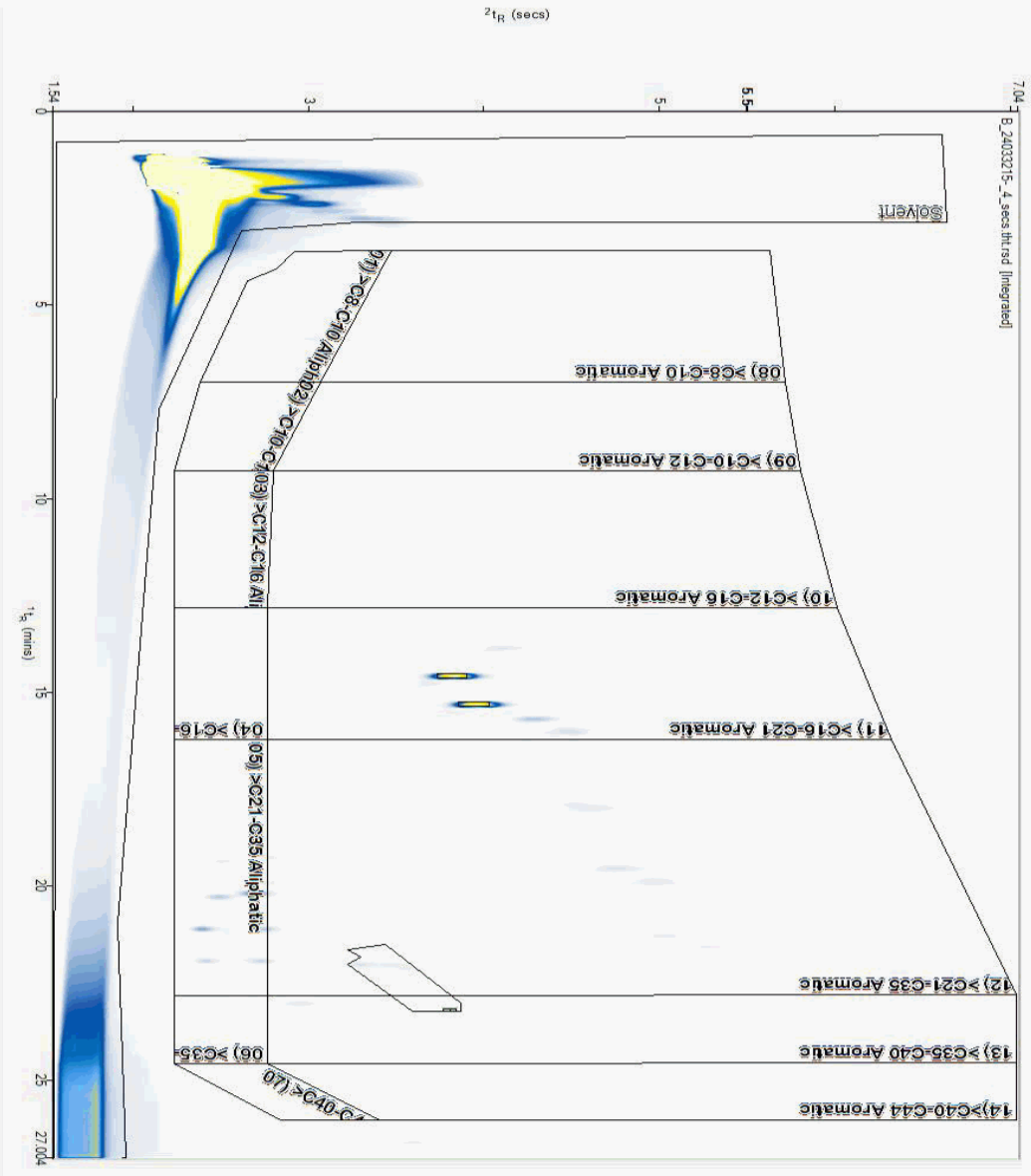
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SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24033215 Depth : 1.60
Sample ID : TP-SRS-02

ChromSpace LIMS export
Current batch
Sample Identity: B_24033215-4_secs.tht
Date Acquired : 12/04/21 10:10:36
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

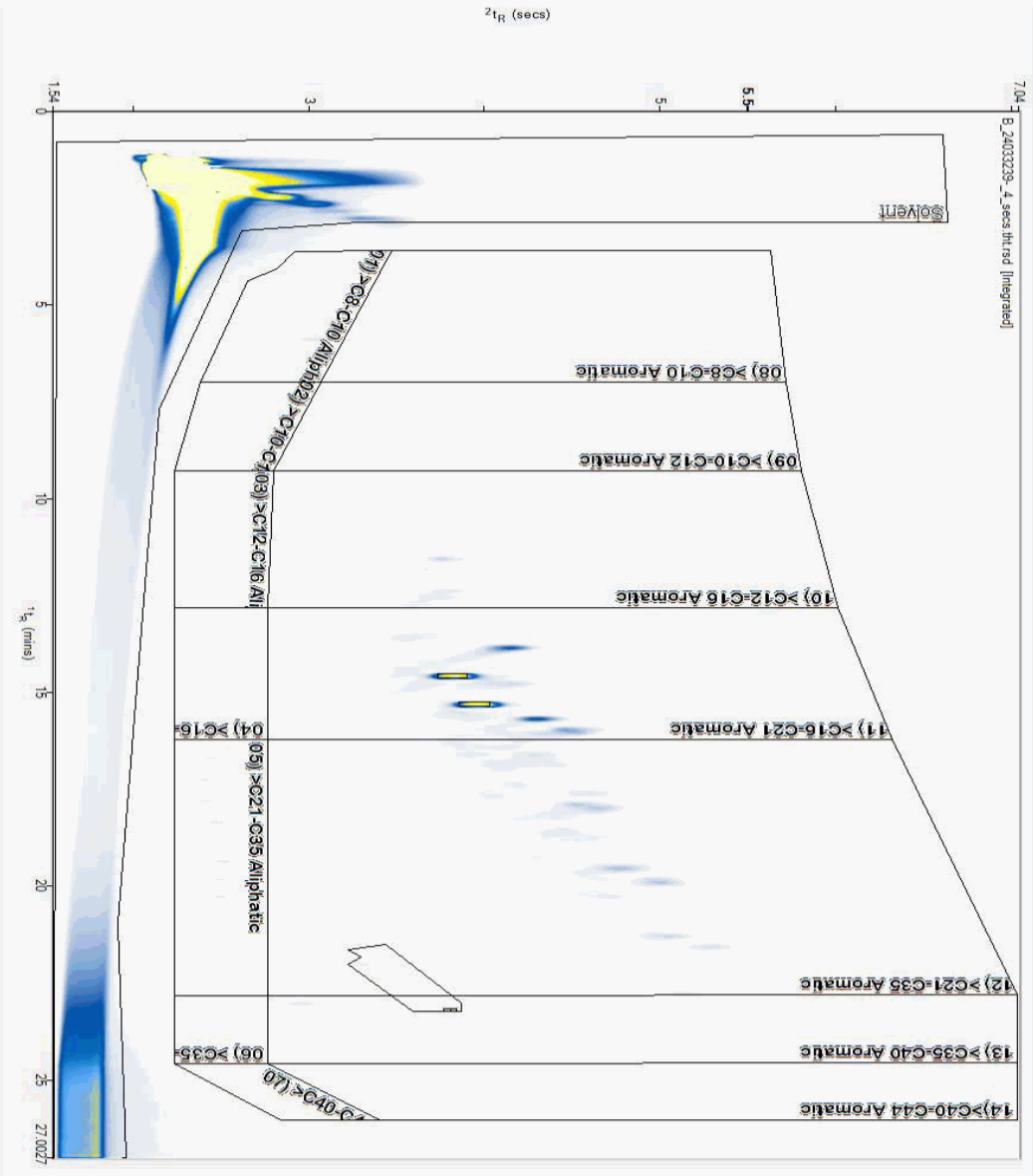
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SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South EastOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24033239 Depth : 2.50
Sample ID : TP-SRS-02

ChromSpace LIMS export
Current batch
Sample Identity: B_24033239-4_secs.tht
Date Acquired : 12/04/21 11:53:56
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

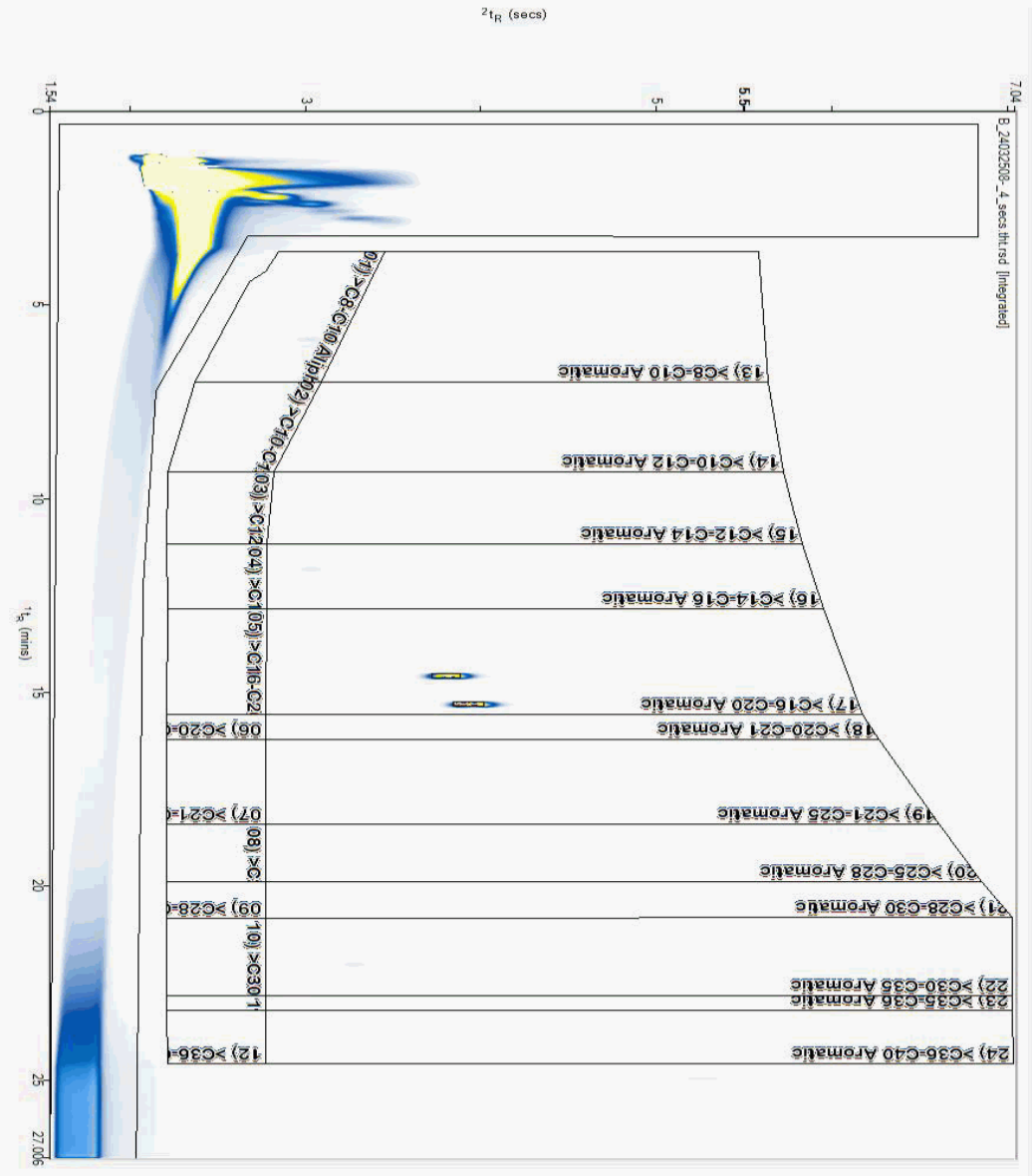
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SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South EastOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 24032508 Depth : 0.50
Sample ID : TP-SRS-01

ChromSpace LIMS export
Current batch
Sample Identity: B_24032508-4_secs.tht
Date Acquired : 11/04/21 06:11:30
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 24033200 Depth : 1.10
Sample ID : TP-SRS-02



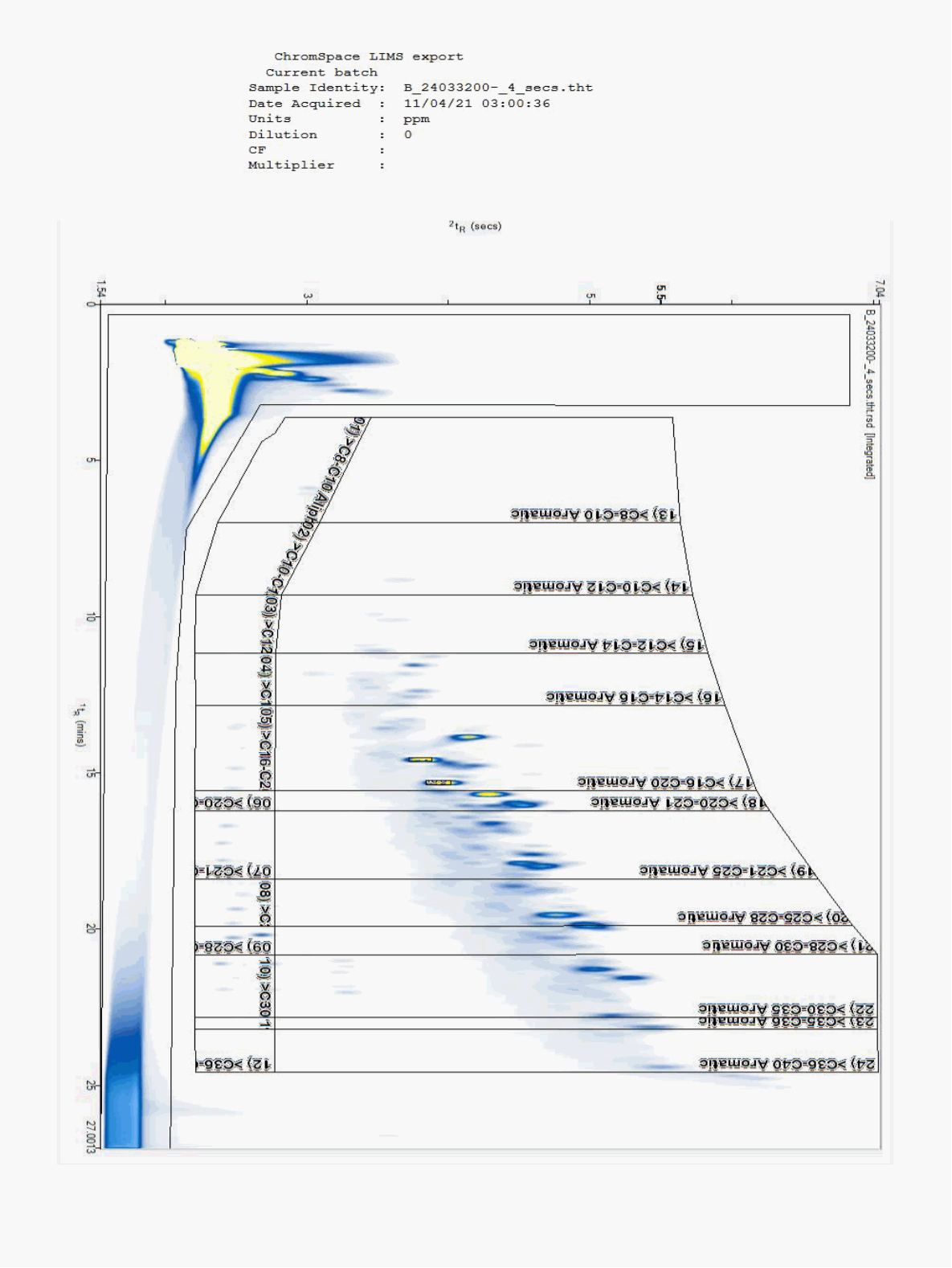
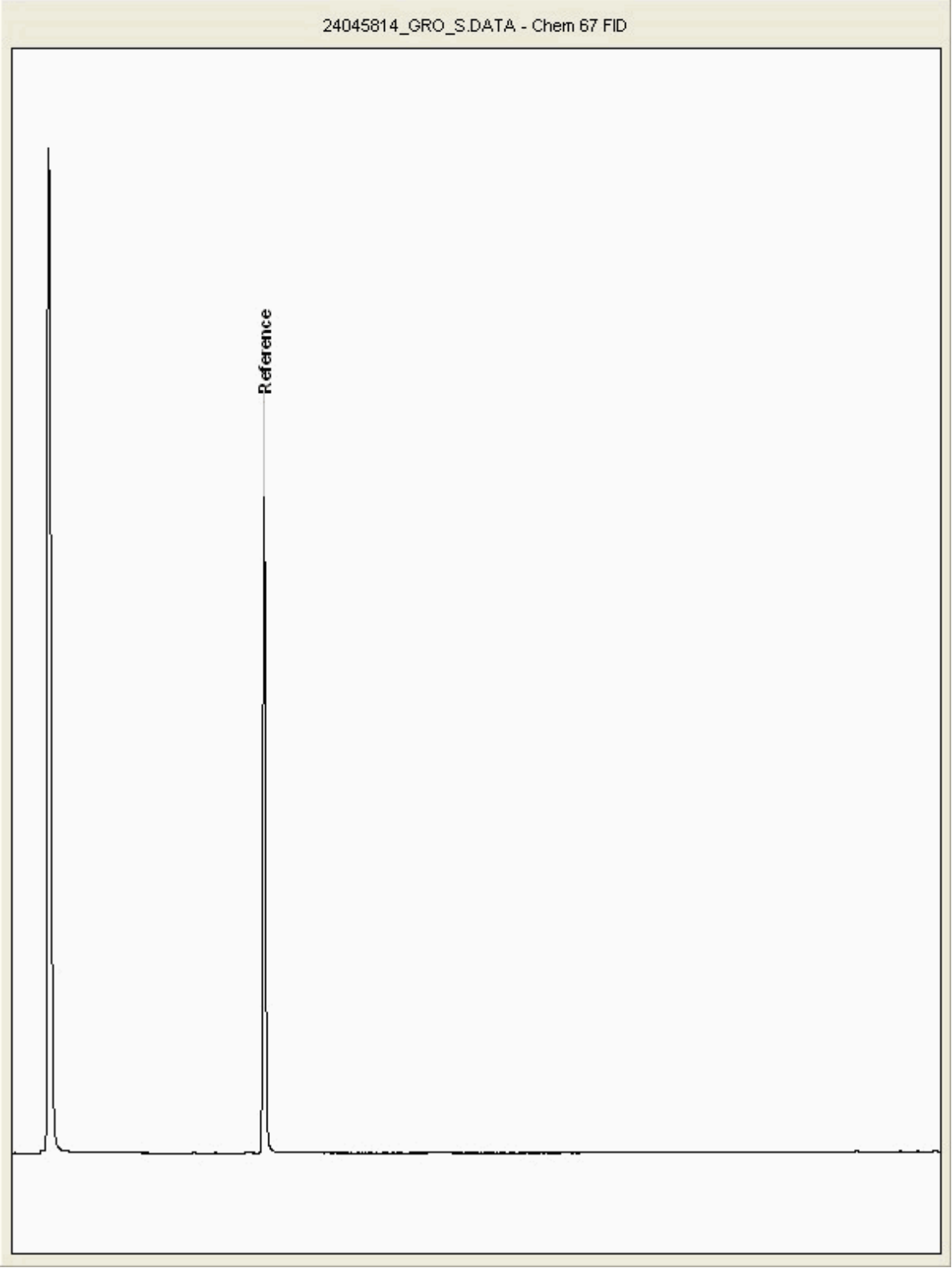
CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24045814 Depth : 1.10
Sample ID : TP-SRS-02





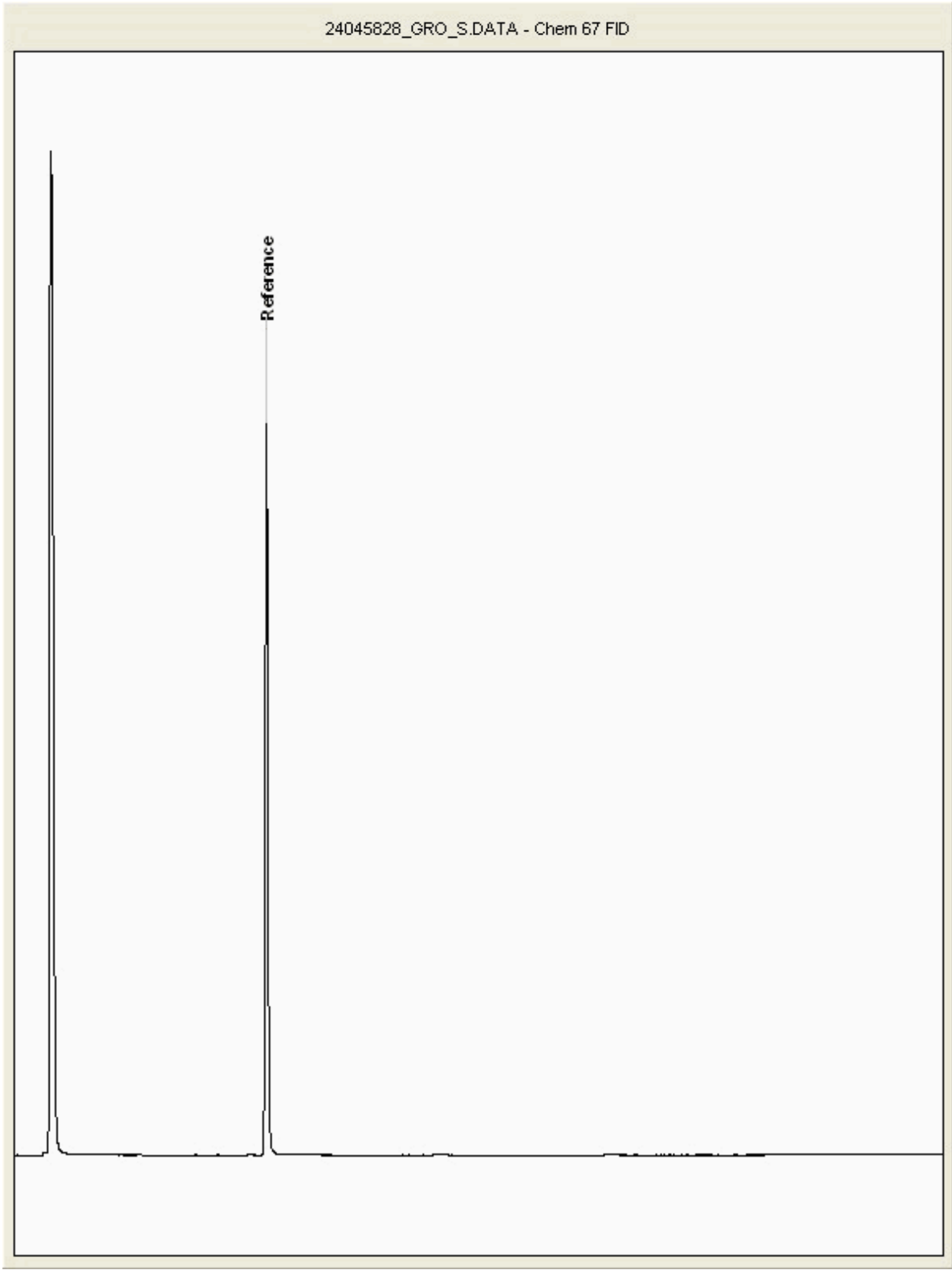
CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24045828 Depth : 0.50
Sample ID : TP-SRS-01



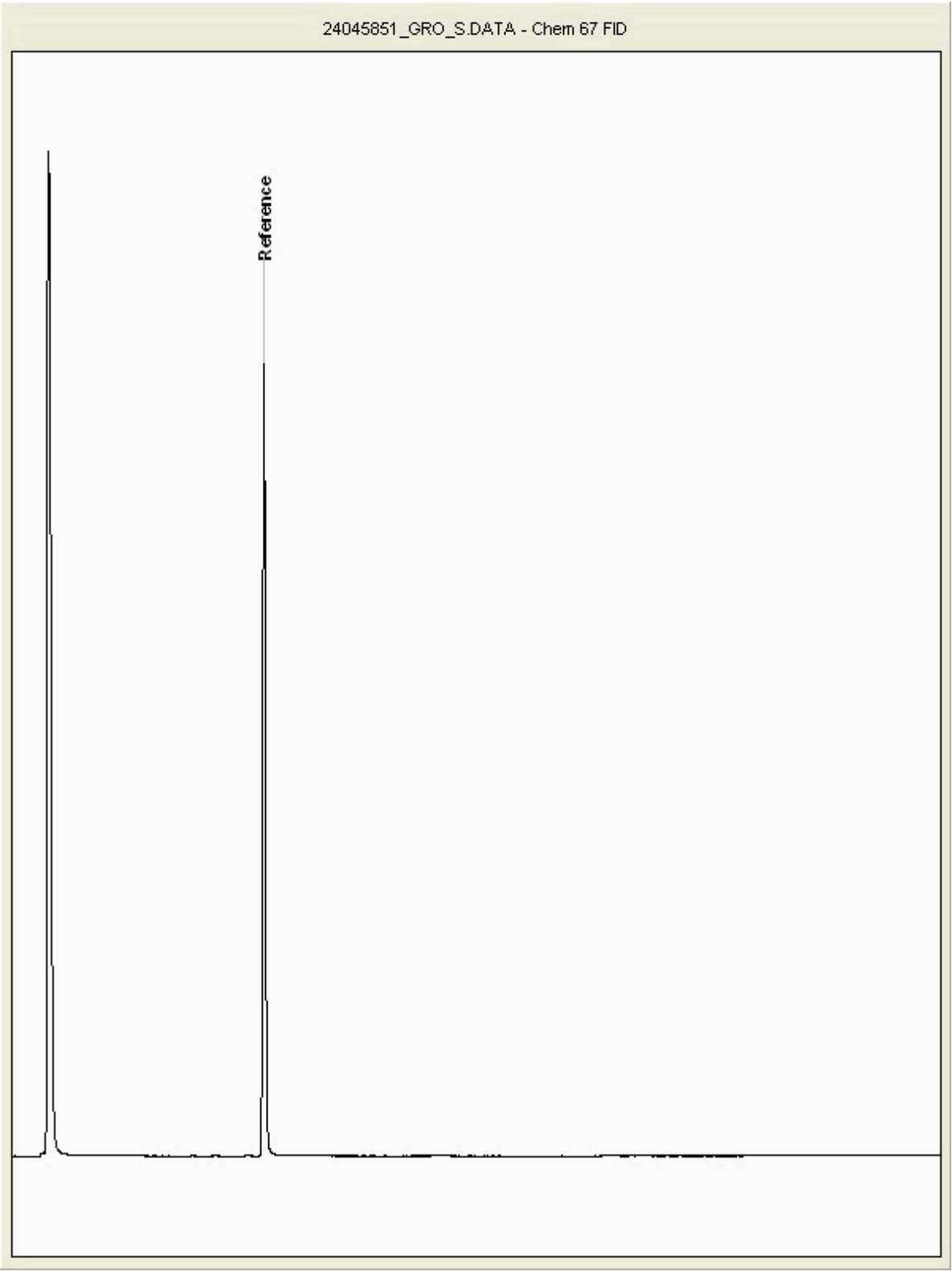
CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24045851 Depth : 2.50
Sample ID : TP-SRS-02





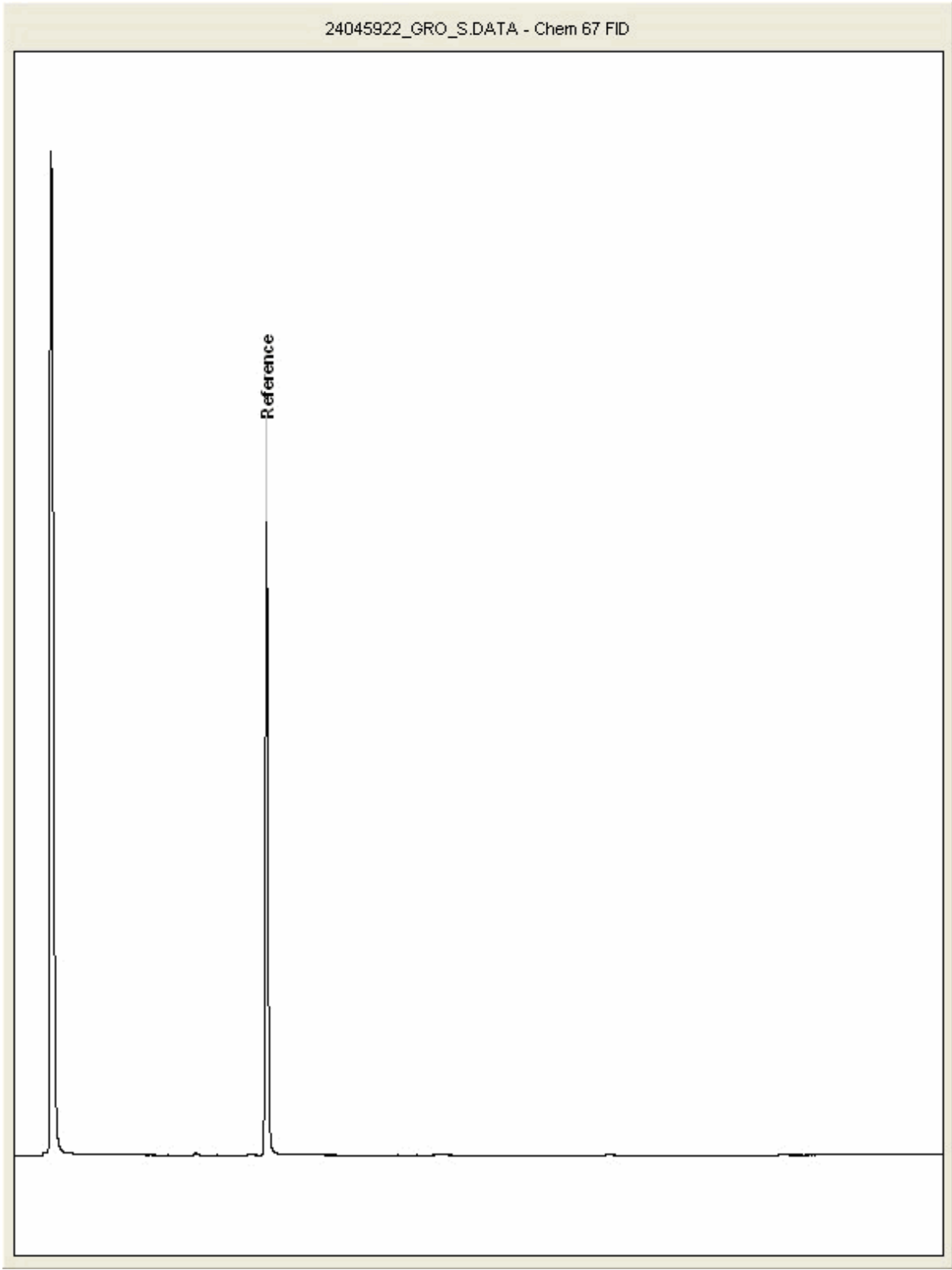
CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24045922 Depth : 1.60
Sample ID : TP-SRS-02



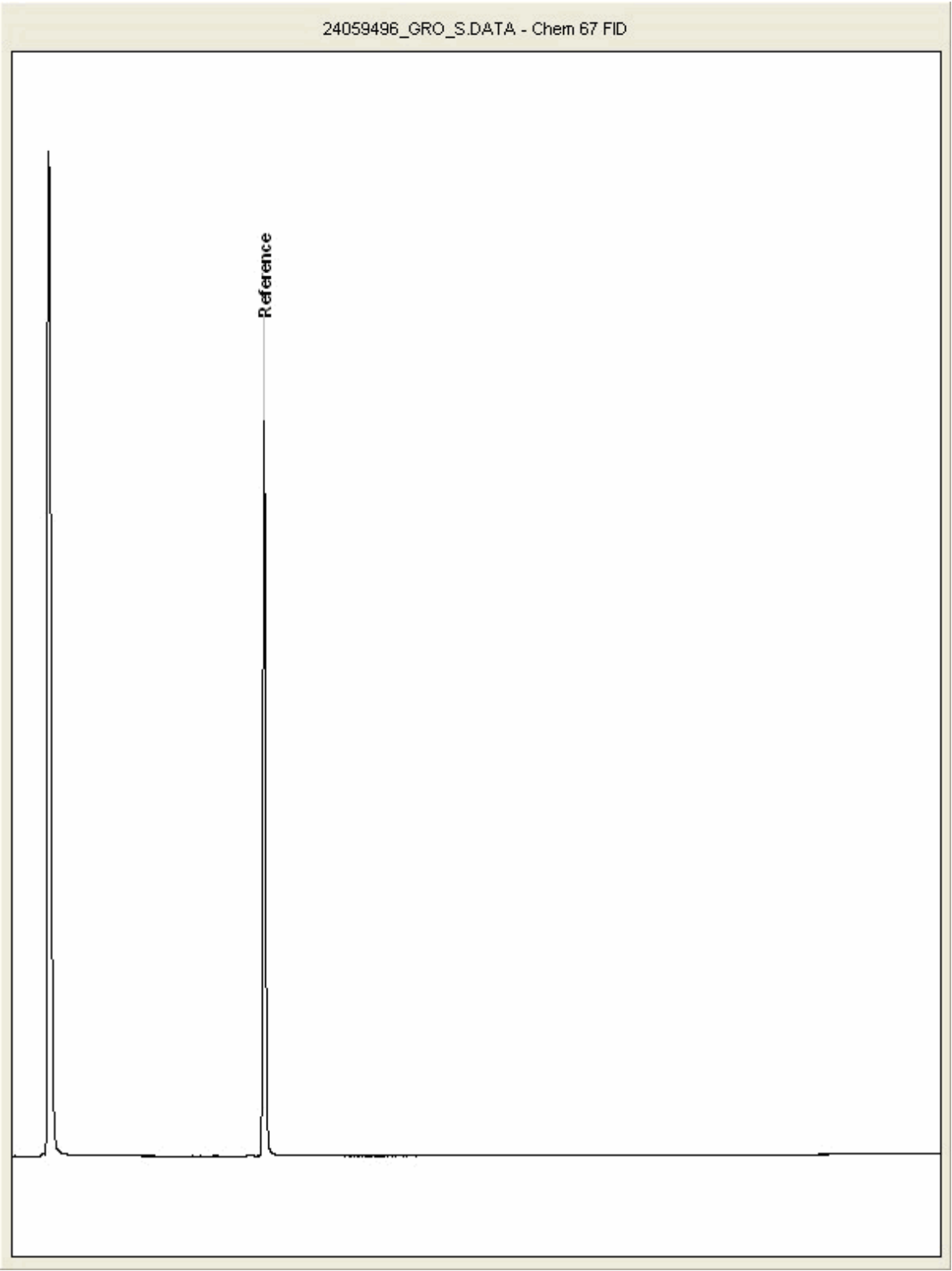
CERTIFICATE OF ANALYSIS

Validated

SDG: 210329-72 Client Reference: B025563 Report Number: 594746
Location: Cambridge South East Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24059496 Depth : 1.50
Sample ID : TP-SRS-01





CERTIFICATE OF ANALYSIS

SDG:	210329-72	Client Reference:	B025563	Report Number:	594746
Location:	idge South East Transport -	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subject to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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CERTIFICATE OF ANALYSIS

Date of report Generation:	20 April 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210330-81
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	594802

We received 4 samples on Tuesday March 30, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday April 20, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 20/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:

210330-81

Client Reference:

B025563

Report Number:

594802

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23999399	TP-OBC-08	ES10	0.50 - 0.50	26/03/2021
23999401	TP-OBC-08 ES8		0.10 - 0.10	26/03/2021
23999397	TP-OBC-08 ES9		0.20 - 0.20	26/03/2021
23999400	TP-OBC-08 ES11		1.00 - 1.00	26/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:

210330-81

Client Reference:

B025563

Report Number:

594802

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>
--

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

CERTIFICATE OF ANALYSIS

Validated

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref.	TP-OBC-08				
# M aq diss.flit tot.unfit + ** (F) 1-456	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 26/03/2021 . 30/03/2021 210330-81 23999399 ES10				
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	14				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01 @				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 @ M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05 @				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 @ M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01 @				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 @ M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 @ M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13 @				
Sulphur, Total	<0.02 %	TM132	0.0208				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00358 #				
pH	1 pH Units	TM133	8.73 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #				
Cyanide, Free	<1 mg/kg	TM153	<1 @ M				
Chromium, Trivalent	<0.9 mg/kg	TM181	8.32				
Antimony	<0.6 mg/kg	TM181	<0.6 #				
Arsenic	<0.6 mg/kg	TM181	10.7 M				
Barium	<0.6 mg/kg	TM181	47.3 #				
Beryllium	<0.01 mg/kg	TM181	0.429 M				
Cadmium	<0.02 mg/kg	TM181	0.121 M				
Chromium	<0.9 mg/kg	TM181	8.32 M				
Copper	<1.4 mg/kg	TM181	6.63 M				
Iron	<1000 mg/kg	TM181	16300 #				
Lead	<0.7 mg/kg	TM181	6.23 M				
Manganese	<0.13 mg/kg	TM181	343 M				
Mercury	<0.1 mg/kg	TM181	<0.1 M				
Molybdenum	<0.1 mg/kg	TM181	0.613 #				
Nickel	<0.2 mg/kg	TM181	12.1 M				
Selenium	<1 mg/kg	TM181	<1 #				
Vanadium	<0.2 mg/kg	TM181	23.9 #				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-OBC-08					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 26/03/2021 . 30/03/2021 210330-81 23999399 ES10					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	119	@				
Toluene-d8**	%	TM116	101	@				
4-Bromofluorobenzene**	%	TM116	101	@				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	@ M				
Chloromethane	<7 µg/kg	TM116	<7	@ #				
Vinyl Chloride	<6 µg/kg	TM116	<6	@ M				
Bromomethane	<10 µg/kg	TM116	<10	@ M				
Chloroethane	<10 µg/kg	TM116	<10	@ M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6	@ M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10	@ #				
Carbon Disulphide	<7 µg/kg	TM116	<7	@ M				
Dichloromethane	<10 µg/kg	TM116	15.4	@ #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	@ M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	@ M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8	@ M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	@ M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10	@				
Bromochloromethane	<10 µg/kg	TM116	<10	@ M				
Chloroform	<8 µg/kg	TM116	<8	@ M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	3 @ M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10	@ M				
Carbontetrachloride	<10 µg/kg	TM116	<10	@ M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5	@ M				
Benzene	<9 µg/kg	TM116	<9	@ M				
Trichloroethene	<9 µg/kg	TM116	<9	@ #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10	@ M				
Dibromomethane	<9 µg/kg	TM116	<9	@ M				
Bromodichloromethane	<7 µg/kg	TM116	<7	@ M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	@ M				
Toluene	<7 µg/kg	TM116	<7	@ M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	@				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	@ M				

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-OBC-08					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 26/03/2021 . 30/03/2021 210330-81 23999399 ES10					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7	@ M				
Tetrachloroethene	<5 µg/kg	TM116	<5	@ M				
Dibromochloromethane	<10 µg/kg	TM116	<10	@ M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10	@ M				
Chlorobenzene	<5 µg/kg	TM116	<5	@ M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	@ M				
Ethylbenzene	<4 µg/kg	TM116	<4	@ M				
p/m-Xylene	<10 µg/kg	TM116	<10	@ #				
o-Xylene	<10 µg/kg	TM116	<10	@ M				
Styrene	<10 µg/kg	TM116	<10	@ #				
Bromoform	<10 µg/kg	TM116	<10	@ M				
Isopropylbenzene	<5 µg/kg	TM116	<5	@ #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	@ #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	@ M				
Bromobenzene	<10 µg/kg	TM116	<10	@ M				
Propylbenzene	<10 µg/kg	TM116	<10	@ M				
2-Chlorotoluene	<9 µg/kg	TM116	<9	@ M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	@ M				
4-Chlorotoluene	<10 µg/kg	TM116	<10	@ M				
tert-Butylbenzene	<14 µg/kg	TM116	<14	@ M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	@ #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	@				
4-Isopropyltoluene	<10 µg/kg	TM116	<10	@ M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	@ M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	@ M				
n-Butylbenzene	<11 µg/kg	TM116	<11	@				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	@ M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	@ M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	@ #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	@				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	@				
Naphthalene	<13 µg/kg	TM116	<13	@ M				

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-58*#	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-OBC-08ES10	19/04/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50 - 0.50										
Sample Type	SOLID										
Date Sampled	26/03/2021 00:00:00										
Date Receieved	30/03/2021 08:30:00										
SDG	210330-81										
Original Sample	23999399										
Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	23999399
Customer Sample Ref.	TP-OBC-08
AGS Ref.	ES10
Depth	0.50 - 0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	18-Apr-2021
Asbestos ID in Solid Samples	19-Apr-2021
Boron Water Soluble	19-Apr-2021
Chromium III	20-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021
EPH CWG GC (S)	16-Apr-2021
GRO by GC-FID (S)	16-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021
Metals in solid samples by OES	19-Apr-2021
PAH by GCMS	15-Apr-2021
pH	14-Apr-2021
Phenols by HPLC (S)	16-Apr-2021
Sample description	14-Apr-2021
Total Organic Carbon	20-Apr-2021
Total Sulphur	19-Apr-2021
TPH CWG GC (S)	16-Apr-2021
VOC MS (S)	15-Apr-2021

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2405
Water Soluble Boron	TM222	93.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2471
Free Cyanide	TM153	98.91 79.00 : 115.00
Thiocyanate	TM153	97.44 94.09 : 113.89
Total Cyanide	TM153	93.71 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2462
QC	TM089	93.04 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2445
Hexavalent Chromium	TM151	108.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2488
Aluminium	TM181	92.04 73.56 : 108.85
Antimony	TM181	95.53 76.89 : 111.24
Arsenic	TM181	102.62 88.53 : 111.01
Barium	TM181	96.33 77.67 : 105.35
Beryllium	TM181	101.87 85.44 : 109.61
Boron	TM181	90.83 73.51 : 104.66
Cadmium	TM181	95.47 77.67 : 104.12

Metals in solid samples by OES

		QC 2488
Chromium	TM181	86.82 79.64 : 105.83
Cobalt	TM181	90.88 84.60 : 104.13
Copper	TM181	95.95 82.40 : 105.45
Iron	TM181	92.86 82.95 : 110.58
Lead	TM181	91.44 78.24 : 104.05
Manganese	TM181	107.78 94.29 : 119.51
Mercury	TM181	97.34 83.16 : 107.81
Molybdenum	TM181	97.94 87.11 : 106.87
Nickel	TM181	93.15 80.26 : 102.28
Phosphorus	TM181	108.89 94.56 : 124.28
Selenium	TM181	100.39 82.28 : 110.48
Strontium	TM181	92.87 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86
Tin	TM181	98.48 86.72 : 110.03
Titanium	TM181	88.55 66.23 : 102.06
Vanadium	TM181	98.53 86.19 : 109.45
Zinc	TM181	99.59 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2464
Acenaphthene	TM218	90.5 78.59 : 112.16
Acenaphthylene	TM218	89.0 75.11 : 109.01
Anthracene	TM218	92.5 73.99 : 113.85
Benz(a)anthracene	TM218	95.0 69.31 : 119.18
Benzo(a)pyrene	TM218	90.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	93.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	85.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	90.0 69.98 : 116.49

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
PAH by GCMS						

		QC 2464
Chrysene	TM218	91.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	87.5 64.54 : 115.22
Fluoranthene	TM218	96.5 72.56 : 111.70
Fluorene	TM218	92.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	96.0 61.22 : 113.25
Naphthalene	TM218	85.0 77.96 : 110.91
Phenanthrene	TM218	96.5 76.83 : 113.25
Pyrene	TM218	93.5 72.45 : 110.77

pH

Component	Method Code	QC 2401
pH	TM133	100.29 98.41 : 102.48

Phenols by HPLC (S)

Component	Method Code	QC 2484
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	56.49 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	52.4 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	54.97 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	52.71 76.56 : 106.38

Total Organic Carbon

Component	Method Code	QC 2426
Total Organic Carbon	TM132	105.47 87.02 : 113.45

Total Sulphur

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Total Sulphur						

Component	Method Code	QC 2464
Total Sulphur %	TM132	75.65 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2493
1,1,1,2-tetrachloroethane	TM116	103.8 79.10 : 119.66
1,1,1-Trichloroethane	TM116	108.8 84.25 : 112.57
1,1,2-Trichloroethane	TM116	98.6 81.29 : 113.79
1,1-Dichloroethane	TM116	115.4 86.77 : 122.11
1,2-Dichloroethane	TM116	112.4 90.04 : 132.28
1,4-Dichlorobenzene	TM116	109.2 80.81 : 125.07
2-Chlorotoluene	TM116	96.2 73.13 : 114.13
4-Chlorotoluene	TM116	92.6 68.66 : 109.13
Benzene	TM116	104.0 84.29 : 112.22
Carbon Disulphide	TM116	109.8 75.11 : 124.81
Carbontetrachloride	TM116	108.6 82.35 : 126.46
Chlorobenzene	TM116	104.6 82.88 : 122.42
Chloroform	TM116	113.2 90.35 : 120.38
Chloromethane	TM116	128.8 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	111.2 78.27 : 128.90
Dibromomethane	TM116	98.2 76.00 : 120.73
Dichloromethane	TM116	116.2 92.27 : 134.36
Ethylbenzene	TM116	89.8 70.95 : 113.07
Hexachlorobutadiene	TM116	56.4 14.55 : 147.92
Isopropylbenzene	TM116	80.6 52.00 : 108.19
Naphthalene	TM116	100.8 80.29 : 135.77
o-Xylene	TM116	88.0 68.34 : 101.99

SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2493
p/m-Xylene	TM116	83.8 69.47 : 97.31
Sec-Butylbenzene	TM116	70.4 27.03 : 135.73
Tetrachloroethene	TM116	99.8 81.43 : 126.65
Toluene	TM116	93.0 82.44 : 103.50
Trichloroethene	TM116	101.2 79.80 : 112.33
Trichlorofluoromethane	TM116	110.4 89.67 : 132.09
Vinyl Chloride	TM116	124.6 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC.

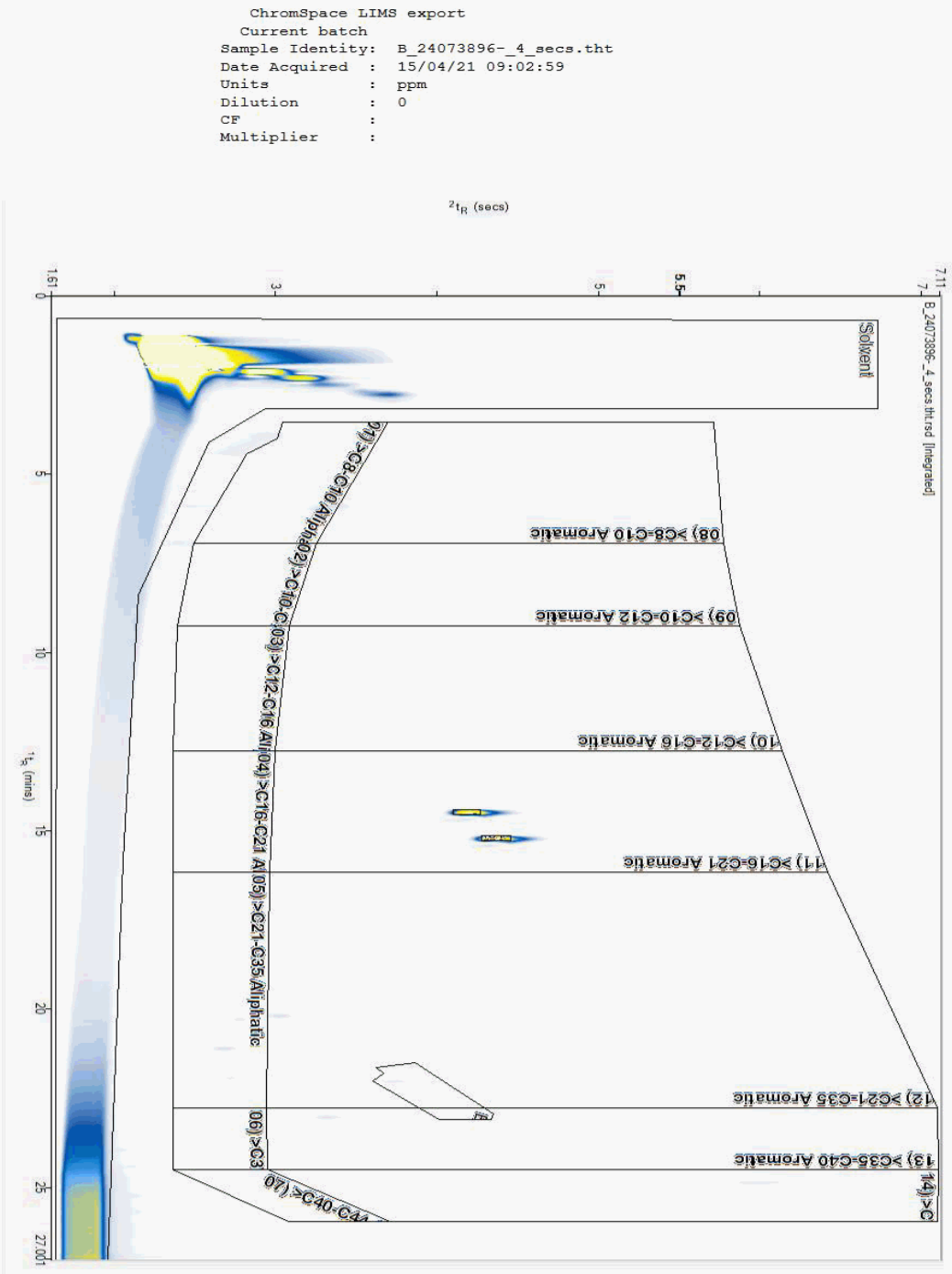
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



SDG:	210330-81	Client Reference:	B025563	Report Number:	594802
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S)	Sample No : 24073896	Depth : 0.50 - 0.50
	Sample ID : TP-OBC-08	





Tetra Tech Europe
3 Sovereign Square
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LS1 4ER

Attention: Richard Tonge

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email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS					Validated
SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24008962	BH-PTR-31		0.10	29/03/2021
24008963	BH-PTR-31		0.20	29/03/2021
24008964	BH-PTR-31		0.50	29/03/2021
24008965	BH-PTR-31		1.00	29/03/2021
24008966	BH-PTR-31		1.00	29/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 15 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210331-130
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594345

This report has been revised and directly supersedes 593929 in its entirety.

We received 5 samples on Wednesday March 31, 2021 and 1 of these samples were scheduled for analysis which was completed on Thursday April 15, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-130 Client Reference: B025563 Report Number: 594345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593929

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24008964	
	Customer Sample Reference		BH-PT-R-31	
	AGS Reference			
	Depth (m)		0.50	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1	X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X	
Boron Water Soluble	All	NDPs: 0 Tests: 1	X	
Chromium III	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X	
PAH by GCMS	All	NDPs: 0 Tests: 1	X	
pH	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1	X	
Phenols Spec MS (S)	All	NDPs: 0 Tests: 1	X	
Sample description	All	NDPs: 0 Tests: 1	X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-130 Client Reference: B025563 Report Number: 594345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593929

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24008964	
	Customer Sample Reference		BH-PT-R-31	
	AGS Reference			
	Depth (m)		0.50	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S
Speciated Mercury*	All	NDPs: 0 Tests: 1	X	
Total Organic Carbon	All	NDPs: 0 Tests: 1	X	
Total Sulphate	All	NDPs: 0 Tests: 1	X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
VOC MS (S)	All	NDPs: 0 Tests: 1		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24008964	BH-PTR-31	0.50	Dark Brown	Sandy Silt Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PTR-31				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		29/03/2021				
dis.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		31/03/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210331-130				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24008964				
(F)	Trigger breach confirmed						
1.445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	25				
Speciated Mercury - elemental*	<0.0006 mg/kg	SUB	<0.0006				
Speciated Mercury - inorganic*	<0.1 mg/kg	SUB	<0.1				
Speciated Mercury - methyl*	<0.1 mg/kg	SUB	<0.1				
Total Mercury - AAF*	<0.05 mg/kg	SUB	<0.05				
Loss on ignition	<0.7 %	TM018	7.58				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06				
Organic Carbon, Total	<0.2 %	TM132	1.76				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0176				
pH	1 pH Units	TM133	8.56				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	22.5				
Antimony	<0.6 mg/kg	TM181	<0.6				
Arsenic	<0.6 mg/kg	TM181	5.69				
Barium	<0.6 mg/kg	TM181	99.8				
Beryllium	<0.01 mg/kg	TM181	0.889				
Cadmium	<0.02 mg/kg	TM181	0.0322				
Chromium	<0.9 mg/kg	TM181	22.5				
Copper	<1.4 mg/kg	TM181	11				
Iron	<1000 mg/kg	TM181	17000				
Lead	<0.7 mg/kg	TM181	8.7				
Manganese	<0.13 mg/kg	TM181	95.4				
Mercury	<0.1 mg/kg	TM181	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.324				
Nickel	<0.2 mg/kg	TM181	20.8				
Selenium	<1 mg/kg	TM181	<1				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

Phenols Spec MS (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-31					
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
Component		LOD/Units	Method	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received
Dibromofluoromethane**		%	TM116	0.50	Soil/Solid (S)	29/03/2021		31/03/2021
Toluene-d8**		%	TM116	101				210331-130
4-Bromofluorobenzene**		%	TM116	81.1				24008964
Dichlorodifluoromethane		<6 µg/kg	TM116	<6	M			
Chloromethane		<7 µg/kg	TM116	<7	#			
Vinyl Chloride		<6 µg/kg	TM116	<6	@ M			
Bromomethane		<10 µg/kg	TM116	<10	M			
Chloroethane		<10 µg/kg	TM116	<10	M			
Trichlorofluoromethane		<6 µg/kg	TM116	<6	M			
1,1-Dichloroethene		<10 µg/kg	TM116	<10	#			
Carbon Disulphide		<7 µg/kg	TM116	<7	M			
Dichloromethane		<10 µg/kg	TM116	<10	#			
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10	M			
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10	M			
1,1-Dichloroethane		<8 µg/kg	TM116	<8	M			
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6	M			
2,2-Dichloropropane		<10 µg/kg	TM116	<10				
Bromochloromethane		<10 µg/kg	TM116	<10	M			
Chloroform		<8 µg/kg	TM116	<8	M			
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7	M			
1,1-Dichloropropene		<10 µg/kg	TM116	<10	M			
Carbontetrachloride		<10 µg/kg	TM116	<10	M			
1,2-Dichloroethane		<5 µg/kg	TM116	<5	M			
Benzene		<9 µg/kg	TM116	<9	M			
Trichloroethene		<9 µg/kg	TM116	<9	#			
1,2-Dichloropropane		<10 µg/kg	TM116	<10	M			
Dibromomethane		<9 µg/kg	TM116	<9	M			
Bromodichloromethane		<7 µg/kg	TM116	<7	M			
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10	M			
Toluene		<7 µg/kg	TM116	<7	M			
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10	M			

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-31					
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
Component		LOD/Units	Method	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received
1,3-Dichloropropane		<7 µg/kg	TM116	<7	M			
Tetrachloroethene		<5 µg/kg	TM116	<5	M			
Dibromochloromethane		<10 µg/kg	TM116	<10	M			
1,2-Dibromoethane		<10 µg/kg	TM116	<10	M			
Chlorobenzene		<5 µg/kg	TM116	<5	M			
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10	M			
Ethylbenzene		<4 µg/kg	TM116	<4	M			
p/m-Xylene		<10 µg/kg	TM116	<10	#			
o-Xylene		<10 µg/kg	TM116	<10	M			
Styrene		<10 µg/kg	TM116	<10	@ #			
Bromoform		<10 µg/kg	TM116	<10	M			
Isopropylbenzene		<5 µg/kg	TM116	<5	#			
1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10	#			
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16	M			
Bromobenzene		<10 µg/kg	TM116	<10	M			
Propylbenzene		<10 µg/kg	TM116	<10	M			
2-Chlorotoluene		<9 µg/kg	TM116	<9	M			
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8	M			
4-Chlorotoluene		<10 µg/kg	TM116	<10	M			
tert-Butylbenzene		<14 µg/kg	TM116	<14	M			
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9	#			
sec-Butylbenzene		<10 µg/kg	TM116	<10				
4-Isopropyltoluene		<10 µg/kg	TM116	<10	M			
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8	M			
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5	M			
n-Butylbenzene		<11 µg/kg	TM116	<11				
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10	M			
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14	M			
Tert-amyl methyl ether		<10 µg/kg	TM116	<10	#			
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20				
Hexachlorobutadiene		<20 µg/kg	TM116	<20				
Naphthalene		<13 µg/kg	TM116	<13	M			

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
SUB		Subcontracted Test
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM072	Modified: US EPA Method 8141A	Determination of Phenols by GC-MS
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24008964
Customer Sample Ref.	BH-PTR-31
AGS Ref.	
Depth	0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	08-Apr-2021
Asbestos ID in Solid Samples	09-Apr-2021
Boron Water Soluble	13-Apr-2021
Chromium III	13-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	09-Apr-2021
EPH CWG GC (S)	08-Apr-2021
GRO by GC-FID (S)	09-Apr-2021
Hexavalent Chromium (s)	13-Apr-2021
Loss on Ignition in soils	08-Apr-2021
Metals in solid samples by OES	09-Apr-2021
PAH by GCMS	07-Apr-2021
pH	07-Apr-2021
Phenols by HPLC (S)	08-Apr-2021
Phenols Spec MS (S)	13-Apr-2021
Sample description	02-Apr-2021
Speciated Mercury*	15-Apr-2021
Total Organic Carbon	09-Apr-2021
Total Sulphate	12-Apr-2021
TPH CWG GC (S)	09-Apr-2021
VOC MS (S)	12-Apr-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2409
Chloride (soluble)	TM243	149.74 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	154.21 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2499	QC 2435
Water Soluble Boron	TM222	110.5 84.00 : 111.00	98.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2442
Free Cyanide	TM153	87.33 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	90.91 73.07 : 107.47

EPH CWG GC (S)

Component	Method Code	QC 2414
EPH >C8-C40 Raw	TM414	95.65 72.57 : 112.44
Total Aliphatics Raw	TM414	100.77 72.68 : 112.55
Total Aromatics Raw	TM414	113.07 58.44 : 124.94

GRO by GC-FID (S)

Component	Method Code	QC 2452
QC	TM089	88.08 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2497
Hexavalent Chromium	TM151	106.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2435
Loss on Ignition	TM018	95.73 87.10 : 102.39

Metals in solid samples by OES

Component	Method Code	QC 2463
Aluminium	TM181	90.27 73.56 : 108.85
Antimony	TM181	99.19 76.89 : 111.24
Arsenic	TM181	100.29 88.53 : 111.01
Barium	TM181	99.08 77.67 : 105.35
Beryllium	TM181	98.51 85.44 : 109.61
Boron	TM181	87.11 73.51 : 104.66
Cadmium	TM181	91.77 77.67 : 104.12
Chromium	TM181	89.45 79.64 : 105.83
Cobalt	TM181	90.25 84.60 : 104.13
Copper	TM181	90.85 82.40 : 105.45
Iron	TM181	96.83 82.95 : 110.58
Lead	TM181	92.34 78.24 : 104.05
Manganese	TM181	109.72 94.29 : 119.51
Mercury	TM181	101.93 83.16 : 107.81
Molybdenum	TM181	96.71 87.11 : 106.87
Nickel	TM181	94.13 80.26 : 102.28
Phosphorus	TM181	105.25 94.56 : 124.28
Selenium	TM181	100.78 82.28 : 110.48
Strontium	TM181	91.09 79.13 : 102.79
Thallium	TM181	101.33 82.94 : 111.86
Tin	TM181	103.42 86.72 : 110.03
Titanium	TM181	71.98 66.23 : 102.06

Metals in solid samples by OES

		QC 2463
Vanadium	TM181	92.31 86.19 : 109.45
Zinc	TM181	99.18 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2451
Acenaphthene	TM218	92.5 78.59 : 112.16
Acenaphthylene	TM218	92.0 75.11 : 109.01
Anthracene	TM218	96.0 73.99 : 113.85
Benz(a)anthracene	TM218	112.5 69.31 : 119.18
Benzo(a)pyrene	TM218	104.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	103.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	98.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	109.0 69.98 : 116.49
Chrysene	TM218	111.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	100.5 64.54 : 115.22
Fluoranthene	TM218	107.0 72.56 : 111.70
Fluorene	TM218	94.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	104.5 61.22 : 113.25
Naphthalene	TM218	86.0 77.96 : 110.91
Phenanthrene	TM218	101.0 76.83 : 113.25
Pyrene	TM218	105.0 72.45 : 110.77

pH

Component	Method Code	QC 2491
pH	TM133	100.66 99.08 : 102.24

Phenols by HPLC (S)

Phenols by HPLC (S)

Component	Method Code	QC 2469
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.95 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	49.27 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	50.33 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	49.58 88.23 : 104.42

Total Organic Carbon

Component	Method Code	QC 2414
Total Organic Carbon	TM132	98.83 87.02 : 113.45

Total Sulphate

Component	Method Code	QC 2415
Total Sulphate	TM221	98.48 70.62 : 121.50

VOC MS (S)

Component	Method Code	QC 2404
1,1,1,2-tetrachloroethane	TM116	99.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	101.0 73.73 : 118.05
1,1,2-Trichloroethane	TM116	96.0 77.12 : 116.04
1,1-Dichloroethane	TM116	106.6 74.46 : 129.15
1,2-Dichloroethane	TM116	107.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	100.0 83.64 : 126.18
2-Chlorotoluene	TM116	94.2 76.03 : 113.25
4-Chlorotoluene	TM116	90.6 66.90 : 112.46
Benzene	TM116	103.2 88.60 : 113.80
Carbon Disulphide	TM116	100.0 74.91 : 122.14
Carbontetrachloride	TM116	103.0 80.31 : 124.50



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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

VOC MS (S)

		QC 2404
Chlorobenzene	TM116	100.2 83.81 : 114.18
Chloroform	TM116	106.6 87.40 : 122.49
Chloromethane	TM116	109.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.2 80.67 : 126.72
Dibromomethane	TM116	94.8 73.23 : 118.35
Dichloromethane	TM116	109.6 81.11 : 133.25
Ethylbenzene	TM116	93.4 75.92 : 110.41
Hexachlorobutadiene	TM116	72.4 12.82 : 152.73
Isopropylbenzene	TM116	85.4 55.79 : 97.59
Naphthalene	TM116	96.4 80.86 : 128.81
o-Xylene	TM116	90.6 69.99 : 108.74
p/m-Xylene	TM116	88.7 68.32 : 108.91
Sec-Butylbenzene	TM116	80.0 38.50 : 101.50
Tetrachloroethene	TM116	100.2 76.95 : 121.02
Toluene	TM116	94.8 74.24 : 107.42
Trichloroethene	TM116	97.2 85.28 : 109.36
Trichlorofluoromethane	TM116	101.6 84.55 : 133.27
Vinyl Chloride	TM116	112.8 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



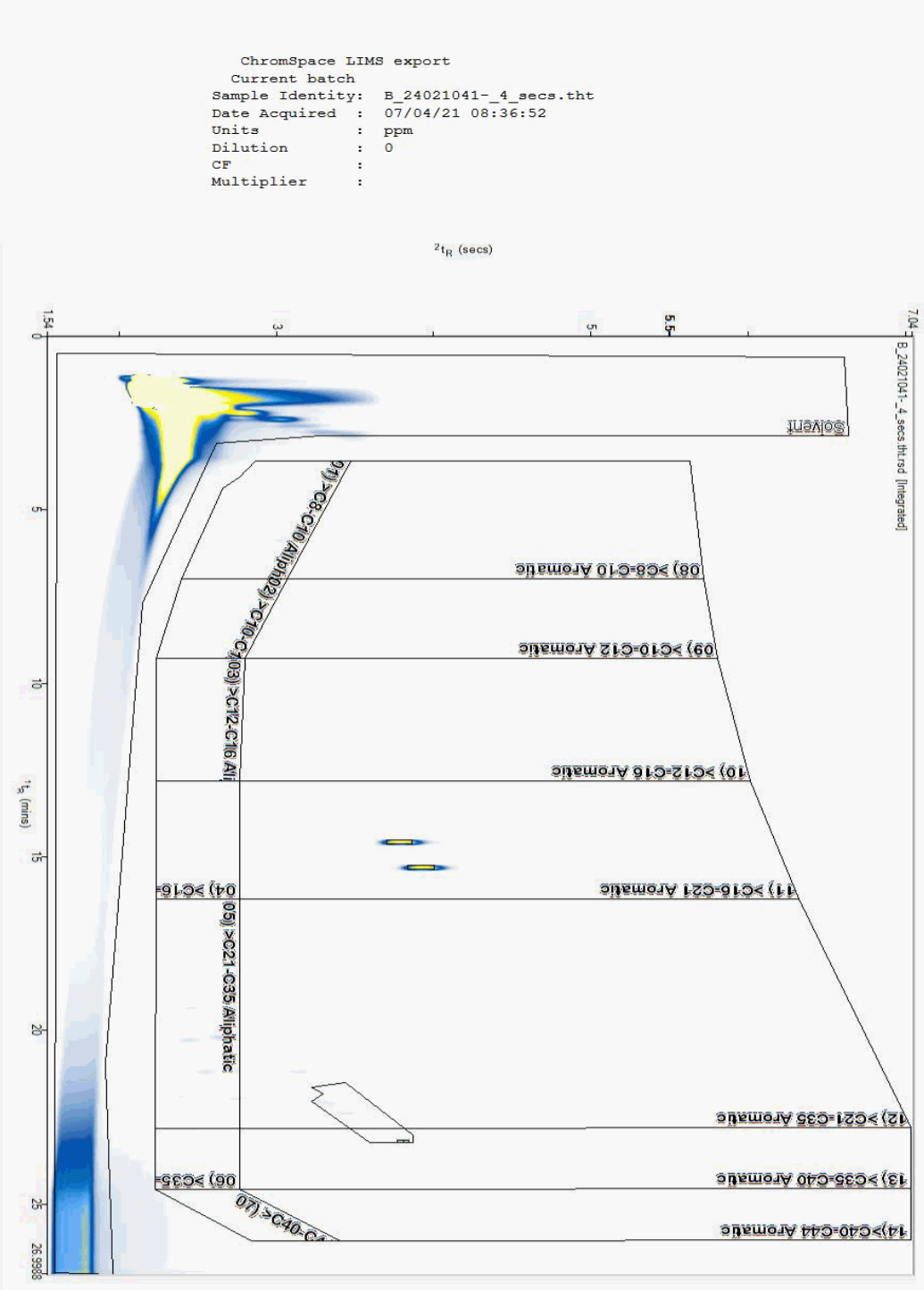
CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593929

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24021041 Depth : 0.50
Sample ID : BH-PTR-31





CERTIFICATE OF ANALYSIS

Validated

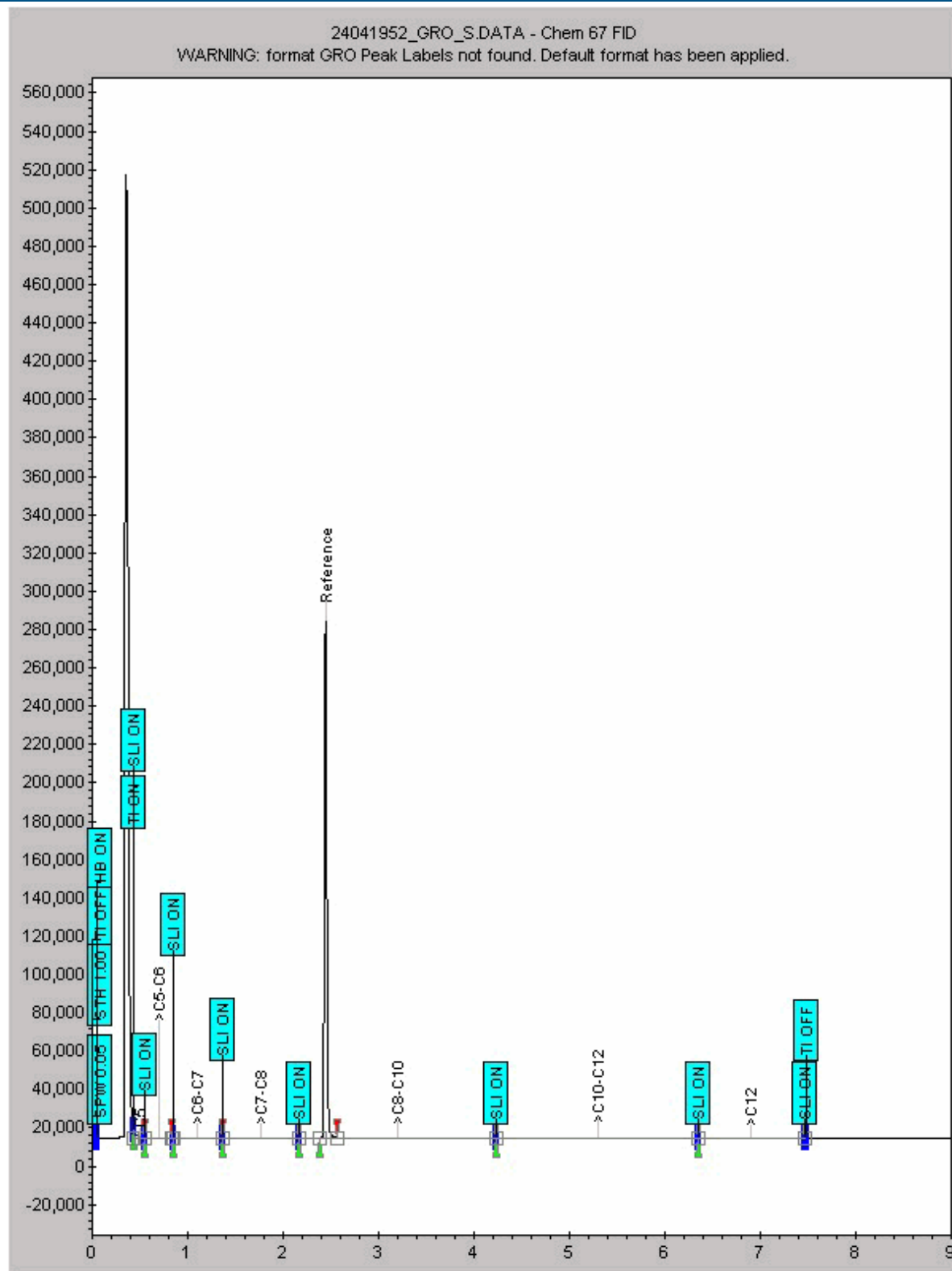
SDG: 210331-130 Client Reference: B025563 Report Number: 594345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593929

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24041952
Sample ID : BH-PTR-31

Depth : 0.50



Certificate Number 21-07233

Issued: 15-Apr-21

Client ALS Life Sciences Limited
Units 7 & 8
Hawarden Business Park
Manor Road
Hawarden
Deeside
CH5 3US

Our Reference 21-07233

Client Reference 210331-130

Order No 210331-130

Contract Title (not supplied)

Description One Soil sample.

Date Received 08-Apr-21

Date Started 08-Apr-21

Date Completed 15-Apr-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

Derwentside Environmental Testing Services Limited
Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY
Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 3



Summary of Chemical Analysis

Soil Samples

Our Ref 21-07233
Client Ref 210331-130
Contract Title

				Lab No	1828224
				.Sample ID	BH-PTR-31
				Depth	0.50
				Other ID	24021097
				Sample Type	SOIL
				Sampling Date	29/03/2021
				Sampling Time	n/s
Test	Method	LOD	Units		
Metals					
Mercury (Elemental)	DETSC 2333*	0.0006	mg/kg	< 0.0006	
Mercury (Inorganic)	DETSC 2332*	0.1	mg/kg	< 0.1	
Mercury (Methyl)	DETSC 2332*	0.1	mg/kg	< 0.10	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	



Information in Support of the Analytical Results

Our Ref 21-07233
Client Ref 210331-130
Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1828224	BH-PTR-31 0.50 SOIL	29/03/21	GJ 250ml			
Key: G-Glass J-Jar DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.						

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



CERTIFICATE OF ANALYSIS

SDG:	210331-130	Client Reference:	B025563	Report Number:	594345
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	593929

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

16 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210331-134

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

594448

We received 8 samples on Wednesday March 31, 2021 and 3 of these samples were scheduled for analysis which was completed on Friday April 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134 Client Reference: B025563 Report Number: 594448
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24009093	TP-OBC-03		0.10	29/03/2021
24009092	TP-OBC-03		0.20	29/03/2021
24009091	TP-OBC-05		0.10	29/03/2021
24009090	TP-OBC-05		0.20	29/03/2021
24009089	TP-OBC-05		1.00	29/03/2021
24009088	TP-OBC-06	ES1	0.10	29/03/2021
24009087	TP-OBC-06	ES2	0.20	29/03/2021
24009086	TP-OBC-06	ES7	1.00	29/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134 Client Reference: B025563 Report Number: 594448
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24009093	24009090	24009086
						TP-OBC-03	TP-OBC-05	TP-OBC-06
Ammonium Low	All	NDPs: 0 Tests: 2	0.10	1kg TUB with Handle (ALE210)	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
Anions by Kone (w)	All	NDPs: 0 Tests: 2	0.10	1kg TUB with Handle (ALE210)	S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
Boron Water Soluble	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
CEN Readings	All	NDPs: 0 Tests: 2	0.20	250g Amber Jar (ALE210)	S	S	S	S
Chromium III	All	NDPs: 0 Tests: 5	0.20	250g Amber Jar (ALE210)	S	S	S	S
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	0.20	250g Amber Jar (ALE210)	S	S	S	S
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	0.20	250g Amber Jar (ALE210)	S	S	S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
Fluoride	All	NDPs: 0 Tests: 2	0.20	250g Amber Jar (ALE210)	S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	0.20	250g Amber Jar (ALE210)	S	S	S	S
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	0.20	250g Amber Jar (ALE210)	S	S	S	S

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	24009086		TP-OBC-06		EST7		1.00		60g VOC (ALE215)		S	
	24009090		TP-OBC-05				0.20		250g Amber Jar (ALE210)		S	
	24009093		TP-OBC-03				0.10		60g VOC (ALE215)		S	
									1kg TUB with Handle (ALE260)		S	
									250g Amber Jar (ALE210)		S	
									1kg TUB with Handle (ALE260)		S	
<div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>												
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X		X							
Mercury Dissolved	All	NDPs: 0 Tests: 2	X		X							
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X		X					X	
PAH by GCMS	All	NDPs: 0 Tests: 3		X		X					X	
pH	All	NDPs: 0 Tests: 3		X		X					X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X		X							
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X		X					X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X		X							
Sample description	All	NDPs: 0 Tests: 3		X		X					X	
Total Organic Carbon	All	NDPs: 0 Tests: 3		X		X					X	
Total Sulphur	All	NDPs: 0 Tests: 3		X		X					X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X					X	
VOC MS (S)	All	NDPs: 0 Tests: 3		X			X					X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24009093	TP-OBC-03	0.10	Light Brown	Sandy Loam	Stones	Vegetation
24009090	TP-OBC-05	0.20	Light Brown	Sandy Loam	Stones	Vegetation
24009086	TP-OBC-06	1.00	Cream	Sand	None	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

			CERTIFICATE OF ANALYSIS			Validated		
SDG: 210331-134			Client Reference: B025563			Report Number: 594448		
Location: Cambridge South East Tra			Order Number: 7000964			Superseded Report:		
						</		

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

		Validated										
SDG:		210331-134		Client Reference:		B025563		Report Number:		594448		
Location:		Cambridge South East Tra		Order Number:		7000964		Superseded Report:				
VOC MS (S)												
Results Legend			Customer Sample Ref.		TP-OBC-03		TP-OBC-05		TP-OBC-06			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.10 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-134 24009093		0.20 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-134 24009090		1.00 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-134 24009086 ES7			
Component			LOD/Units		Method							
Dibromofluoromethane**			%		TM116		100		121		117	
							2					
Toluene-d8**			%		TM116		96.9		98.8		101	
							2					
4-Bromofluorobenzene**			%		TM116		80		85.9		98.5	
							2					
Dichlorodifluoromethane			<6 µg/kg		TM116		<6 2 M		<6 M		<6 M	
Chloromethane			<7 µg/kg		TM116		<7 2 #		<7 #		<7 #	
Vinyl Chloride			<6 µg/kg		TM116		<6 2 M		<6 @ M		<6 @ M	
Bromomethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Chloroethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Trichlorofluoromethane			<6 µg/kg		TM116		<6 2 M		<6 M		<6 M	
1,1-Dichloroethene			<10 µg/kg		TM116		<10 2 #		<10 #		<10 #	
Carbon Disulphide			<7 µg/kg		TM116		<7 2 M		<7 M		<7 M	
Dichloromethane			<10 µg/kg		TM116		27.8 2 #		<10 #		<10 #	
Methyl Tertiary Butyl Ether			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
trans-1,2-Dichloroethene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
1,1-Dichloroethane			<8 µg/kg		TM116		<8 2 M		<8 M		<8 M	
cis-1,2-Dichloroethene			<6 µg/kg		TM116		<6 2 M		<6 M		<6 M	
2,2-Dichloropropane			<10 µg/kg		TM116		<10 2		<10		<10	
Bromochloromethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Chloroform			<8 µg/kg		TM116		<8 2 M		<8 M		<8 M	
1,1,1-Trichloroethane			<7 µg/kg		TM116		<7 2 M		<7 M		<7 M	
1,1-Dichloropropene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Carbontetrachloride			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
1,2-Dichloroethane			<5 µg/kg		TM116		<5 2 M		<5 M		<5 M	
Benzene			<9 µg/kg		TM116		<9 2 M		<9 M		<9 M	
Trichloroethene			<9 µg/kg		TM116		<9 2 #		<9 #		<9 #	
1,2-Dichloropropane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Dibromomethane			<9 µg/kg		TM116		<9 2 M		<9 M		<9 M	
Bromodichloromethane			<7 µg/kg		TM116		<7 2 M		<7 M		<7 M	
cis-1,3-Dichloropropene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Toluene			<7 µg/kg		TM116		<7 2 M		<7 M		<7 M	
trans-1,3-Dichloropropene			<10 µg/kg		TM116		<10 2		<10		<10	
1,1,2-Trichloroethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	

13:46:25 16/04/2021

Page 10 of 34

		Validated										
SDG:		210331-134		Client Reference:		B025563		Report Number:		594448		
Location:		Cambridge South East Tra		Order Number:		7000964		Superseded Report:				
VOC MS (S)												
Results Legend			Customer Sample Ref.		TP-OBC-03		TP-OBC-05		TP-OBC-06			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.10 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-134 24009093		0.20 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-134 24009090		1.00 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-134 24009086 ES7			
Component			LOD/Units		Method							
1,3-Dichloropropane			<7 µg/kg		TM116		<7 2 M		<7 M		<7 M	
Tetrachloroethene			<5 µg/kg		TM116		<5 2 M		<5 M		<5 M	
Dibromochloromethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
1,2-Dibromoethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Chlorobenzene			<5 µg/kg		TM116		<5 2 M		<5 M		<5 M	
1,1,1,2-Tetrachloroethane			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Ethylbenzene			<4 µg/kg		TM116		<4 2 M		<4 M		<4 M	
p/m-Xylene			<10 µg/kg		TM116		<10 2 #		<10 #		<10 #	
o-Xylene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Styrene			<10 µg/kg		TM116		<10 2 #		<10 @ #		<10 @ #	
Bromoform			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Isopropylbenzene			<5 µg/kg		TM116		<5 2 #		<5 #		<5 #	
1,1,2,2-Tetrachloroethane			<10 µg/kg		TM116		<10 2 #		<10 #		<10 #	
1,2,3-Trichloropropane			<16 µg/kg		TM116		<16 2 M		<16 M		<16 M	
Bromobenzene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
Propylbenzene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
2-Chlorotoluene			<9 µg/kg		TM116		<9 2 M		<9 M		<9 M	
1,3,5-Trimethylbenzene			<8 µg/kg		TM116		<8 2 M		<8 M		<8 M	
4-Chlorotoluene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
tert-Butylbenzene			<14 µg/kg		TM116		<14 2 M		<14 M		<14 M	
1,2,4-Trimethylbenzene			<9 µg/kg		TM116		<9 2 #		<9 #		<9 #	
sec-Butylbenzene			<10 µg/kg		TM116		<10 2		<10		<10	
4-Isopropyltoluene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
1,3-Dichlorobenzene			<8 µg/kg		TM116		<8 2 M		<8 M		<8 M	
1,4-Dichlorobenzene			<5 µg/kg		TM116		<5 2 M		<5 M		<5 M	
n-Butylbenzene			<11 µg/kg		TM116		<11 2		<11		<11	
1,2-Dichlorobenzene			<10 µg/kg		TM116		<10 2 M		<10 M		<10 M	
1,2-Dibromo-3-chloropropane			<14 µg/kg		TM116		<14 2 M		<14 M		<14 M	
Tert-amyl methyl ether			<10 µg/kg		TM116		<10 2 #		<10 #		<10 #	
1,2,4-Trichlorobenzene			<20 µg/kg		TM116		<20 2		<20		<20	
Hexachlorobutadiene			<20 µg/kg		TM116		<20 2		<20		<20	
Naphthalene			<13 µg/kg		TM116		<13 2 M		<13 M		<13 M	

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 594448

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-OBC-03	TP-OBC-05	TP-OBC-06			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10	0.20	1.00			
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.		29/03/2021	29/03/2021	29/03/2021			
dis.filt	Dissolved / filtered sample.		-	-	-			
tot.unfilt	Total / unfiltered sample.		31/03/2021	31/03/2021	31/03/2021			
*	Subcontracted - refer to subcontractor report for accreditation status.		210331-134	210331-134	210331-134			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24009093	24009090	24009086			
(F)	Trigger breach confirmed				ES7			
1-44@	Sample deviation (see appendix)							
Component	LOD/Units		Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 2 M	<7 M	<7 M			
Tetrachloroethene	<5 µg/kg	TM116	<5 2 M	<5 M	<5 M			
Dibromochloromethane	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
1,2-Dibromoethane	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
Chlorobenzene	<5 µg/kg	TM116	<5 2 M	<5 M	<5 M			
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
Ethylbenzene	<4 µg/kg	TM116	<4 2 M	<4 M	<4 M			
p/m-Xylene	<10 µg/kg	TM116	<10 2 #	<10 #	<10 #			
o-Xylene	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
Styrene	<10 µg/kg	TM116	<10 2 #	<10 @ #	<10 @ #			
Bromoform	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
Isopropylbenzene	<5 µg/kg	TM116	<5 2 #	<5 #	<5 #			
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 2 #	<10 #	<10 #			
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 2 M	<16 M	<16 M			
Bromobenzene	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
Propylbenzene	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
2-Chlorotoluene	<9 µg/kg	TM116	<9 2 M	<9 M	<9 M			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 2 M	<8 M	<8 M			
4-Chlorotoluene	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
tert-Butylbenzene	<14 µg/kg	TM116	<14 2 M	<14 M	<14 M			
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 2 #	<9 #	<9 #			
sec-Butylbenzene	<10 µg/kg	TM116	<10 2	<10	<10			
4-Isopropyltoluene	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 2 M	<8 M	<8 M			
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 2 M	<5 M	<5 M			
n-Butylbenzene	<11 µg/kg	TM116	<11 2	<11	<11			
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 2 M	<10 M	<10 M			
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 2 M	<14 M	<14 M			
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 2 #	<10 #	<10 #			
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20 2	<20	<20			
Hexachlorobutadiene	<20 µg/kg	TM116	<20 2	<20	<20			
Naphthalene	<13 µg/kg	TM116	<13 2 M	<13 M	<13 M			

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SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)		16.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		85.8
Particle Size <4mm	>95%			

Case

SDG	210331-134			
Lab Sample Number(s)	24009090			
Sampled Date	29-Mar-2021			
Customer Sample Ref.	TP-OBC-05			
Depth (m)	0.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.016	<0.01	0.16	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	5.25	<3	52.5	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00163	<0.0005	0.0163	<0.005	-	-	-
Barium	0.078	<0.0002	0.78	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0795	<0.01	0.795	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	22.7	<0.2	227	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00173	<0.0003	0.0173	<0.003	-	-	-
Lead	0.000279	<0.0002	0.00279	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.628	<0.036	6.28	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00322	<0.003	0.0322	<0.03	-	-	-
Nickel	0.000861	<0.0004	0.00861	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00136	<0.001	0.0136	<0.01	-	-	-
Zinc	0.00963	<0.001	0.0963	<0.01	-	-	-
Chloride	3.4	<2	34	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	8.25
Conductivity (µS/cm)	121.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.885

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SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)		16.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		85.8
Particle Size <4mm	>95%			

Case

SDG	210331-134			
Lab Sample Number(s)	24009090			
Sampled Date	29-Mar-2021			
Customer Sample Ref.	TP-OBC-05			
Depth (m)	0.20			

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Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	8.25
Conductivity (µS/cm)	121.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.885

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SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.104	Natural Moisture Content (%)	15
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87
Particle Size <4mm	>95%		

Case

SDG	210331-134			
Lab Sample Number(s)	24009093			
Sampled Date	29-Mar-2021			
Customer Sample Ref.	TP-OBC-03			
Depth (m)	0.10			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.014	<0.01	0.14	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.38	<3	43.8	<30	-	-	-
Fluoride	0.525	<0.5	5.25	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00172	<0.0005	0.0172	<0.005	-	-	-
Barium	0.0923	<0.0002	0.923	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.074	<0.01	0.74	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	27.3	<0.2	273	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00189	<0.0003	0.0189	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.662	<0.036	6.62	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000806	<0.0004	0.00806	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00158	<0.001	0.0158	<0.01	-	-	-
Zinc	0.0121	<0.001	0.121	<0.01	-	-	-
Chloride	3.1	<2	31	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	7.52
Conductivity (µS/cm)	146.00
Temperature (°C)	19.50
Volume Leachant (Litres)	0.887

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SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - I
Mass Sample taken (kg)	0.104	Natural Moisture Content (%)	15	
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87	
Particle Size <4mm	>95%			

Case

SDG	210331-134			
Lab Sample Number(s)	24009093			
Sampled Date	29-Mar-2021			
Customer Sample Ref.	TP-OBC-03			
Depth (m)	0.10			

[illegible]

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	7.52
Conductivity (µS/cm)	146.00
Temperature (°C)	19.50
Volume Leachant (Litres)	0.887

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24009093	24009090	24009086
Customer Sample Ref.	TP-OBC-03	TP-OBC-05	TP-OBC-06
AGS Ref.			ES7
Depth	0.10	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	14-Apr-2021	14-Apr-2021	
Anions by Kone (soil)	14-Apr-2021	14-Apr-2021	14-Apr-2021
Anions by Kone (w)	14-Apr-2021	14-Apr-2021	
Asbestos ID in Solid Samples	13-Apr-2021	13-Apr-2021	13-Apr-2021
Boron Water Soluble	14-Apr-2021	14-Apr-2021	14-Apr-2021
CEN 10:1 Leachate (1 Stage)	09-Apr-2021	09-Apr-2021	
CEN Readings	14-Apr-2021	14-Apr-2021	
Chromium III	15-Apr-2021	15-Apr-2021	15-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021	16-Apr-2021	16-Apr-2021
Dissolved Metals by ICP-MS	14-Apr-2021	14-Apr-2021	
Dissolved Organic/Inorganic Carbon	16-Apr-2021	16-Apr-2021	
EPH CWG GC (S)	15-Apr-2021	14-Apr-2021	15-Apr-2021
Fluoride	14-Apr-2021	14-Apr-2021	
GRO by GC-FID (S)	13-Apr-2021	12-Apr-2021	12-Apr-2021
Hexavalent Chromium (s)	14-Apr-2021	15-Apr-2021	15-Apr-2021
Low Level Cyanide (W)	14-Apr-2021	14-Apr-2021	
Low Level Hexavalent Chromium (w)	14-Apr-2021	14-Apr-2021	
Mercury Dissolved	14-Apr-2021	14-Apr-2021	
Metals in solid samples by OES	15-Apr-2021	15-Apr-2021	15-Apr-2021
Moisture at 105C	09-Apr-2021	09-Apr-2021	
PAH by GCMS	13-Apr-2021	13-Apr-2021	13-Apr-2021
pH	09-Apr-2021	09-Apr-2021	09-Apr-2021
pH Value of Filtered Water	14-Apr-2021	14-Apr-2021	
Phenols by HPLC (S)	13-Apr-2021	13-Apr-2021	13-Apr-2021
Phenols by HPLC (W)	14-Apr-2021	14-Apr-2021	
Sample description	08-Apr-2021	08-Apr-2021	08-Apr-2021
Total Organic Carbon	15-Apr-2021	15-Apr-2021	15-Apr-2021
Total Sulphur	12-Apr-2021	12-Apr-2021	12-Apr-2021
TPH CWG GC (S)	15-Apr-2021	14-Apr-2021	15-Apr-2021
VOC MS (S)	13-Apr-2021	12-Apr-2021	12-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2466
Ammoniacal Nitrogen as N	TM099	101.2 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2480	QC 2408
Chloride (soluble)	TM243	147.67 83.05 : 116.28	159.07 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	171.5 70.00 : 130.00	166.82 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2400
Chloride	TM184	96.3 91.40 : 109.10
Sulphate (soluble)	TM184	98.4 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2404	QC 2426
Water Soluble Boron	TM222	94.0 84.00 : 111.00	92.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2419
Free Cyanide	TM153	100.0 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2421
Aluminium	TM152	104.0 90.98 : 111.82
Antimony	TM152	102.5 90.44 : 113.04
Arsenic	TM152	103.0 88.00 : 112.00

Dissolved Metals by ICP-MS

		QC 2421
Barium	TM152	103.33 90.20 : 111.19
Beryllium	TM152	104.83 87.77 : 113.97
Bismuth	TM152	102.5 91.90 : 112.20
Borate	TM152	106.79 88.00 : 112.00
Boron	TM152	106.67 96.48 : 114.93
Cadmium	TM152	103.5 96.43 : 110.53
Calcium	TM152	102.0 81.38 : 119.09
Chromium	TM152	101.67 91.84 : 108.67
Cobalt	TM152	101.5 88.00 : 112.00
Copper	TM152	102.5 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00
Lead	TM152	102.5 88.00 : 112.00
Lithium	TM152	103.5 91.62 : 113.12
Magnesium	TM152	99.33 93.14 : 107.91
Manganese	TM152	101.0 95.03 : 110.58
Molybdenum	TM152	99.17 88.00 : 112.00
Nickel	TM152	102.33 88.00 : 112.00
Phosphorus	TM152	103.0 88.00 : 112.00
Potassium	TM152	102.0 93.90 : 112.36
Selenium	TM152	104.83 91.58 : 115.98
Silver	TM152	99.17 88.80 : 122.30
Sodium	TM152	100.0 94.28 : 110.71
Strontium	TM152	103.0 88.00 : 112.00
Tellurium	TM152	103.17 93.32 : 114.66
Thallium	TM152	95.83 88.00 : 112.00
Tin	TM152	101.83 92.63 : 109.70
Titanium	TM152	106.33 95.58 : 111.68

Dissolved Metals by ICP-MS

		QC 2421
Tungsten	TM152	101.83 81.32 : 124.72
Uranium	TM152	100.67 88.00 : 112.00
Vanadium	TM152	97.83 88.00 : 112.00
Zinc	TM152	103.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2476
Dissolved Inorganic Carbon	TM090	102.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2459	QC 2467
Fluoride	TM104	104.67 96.67 : 108.67	105.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2451	QC 2464
QC	TM089	97.28 70.75 : 114.19	88.91 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2473	QC 2433
Hexavalent Chromium	TM151	106.0 92.00 : 111.20	104.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2450
Free Cyanide - Low Level	TM279	77.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.75 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2427
Mercury Dissolved (CVAf)	TM183	97.8 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2485	QC 2490	QC 2494
Aluminium	TM181	89.38 73.56 : 108.85	83.81 73.56 : 108.85	98.23 73.56 : 108.85
Antimony	TM181	99.59 76.89 : 111.24	98.78 76.89 : 111.24	96.34 76.89 : 111.24
Arsenic	TM181	102.91 88.53 : 111.01	100.58 88.53 : 111.01	102.03 88.53 : 111.01
Barium	TM181	94.5 77.67 : 105.35	95.41 77.67 : 105.35	98.17 77.67 : 105.35
Beryllium	TM181	100.75 85.44 : 109.61	97.76 85.44 : 109.61	99.25 85.44 : 109.61
Boron	TM181	90.26 73.51 : 104.66	87.97 73.51 : 104.66	90.54 73.51 : 104.66
Cadmium	TM181	91.77 77.67 : 104.12	93.42 77.67 : 104.12	94.65 77.67 : 104.12
Chromium	TM181	89.25 79.64 : 105.83	85.8 79.64 : 105.83	88.44 79.64 : 105.83
Cobalt	TM181	90.88 84.60 : 104.13	88.05 84.60 : 104.13	89.62 84.60 : 104.13
Copper	TM181	99.65 82.40 : 105.45	95.95 82.40 : 105.45	97.71 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58	95.24 82.95 : 110.58	96.83 82.95 : 110.58
Lead	TM181	91.22 78.24 : 104.05	91.89 78.24 : 104.05	92.79 78.24 : 104.05
Manganese	TM181	108.61 94.29 : 119.51	106.11 94.29 : 119.51	109.17 94.29 : 119.51
Mercury	TM181	100.97 83.16 : 107.81	95.89 83.16 : 107.81	97.34 83.16 : 107.81
Molybdenum	TM181	97.94 87.11 : 106.87	97.53 87.11 : 106.87	96.71 87.11 : 106.87
Nickel	TM181	93.64 80.26 : 102.28	90.71 80.26 : 102.28	92.42 80.26 : 102.28
Phosphorus	TM181	108.69 94.56 : 124.28	104.65 94.56 : 124.28	108.08 94.56 : 124.28
Selenium	TM181	101.96 82.28 : 110.48	95.29 82.28 : 110.48	100.39 82.28 : 110.48
Strontium	TM181	94.43 79.13 : 102.79	92.2 79.13 : 102.79	95.32 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86	101.33 82.94 : 111.86	101.33 82.94 : 111.86
Tin	TM181	98.86 86.72 : 110.03	97.34 86.72 : 110.03	99.24 86.72 : 110.03
Titanium	TM181	83.97 66.23 : 102.06	82.44 66.23 : 102.06	86.26 66.23 : 102.06

Metals in solid samples by OES

		QC 2485	QC 2490	QC 2494
Vanadium	TM181	100.0	97.07	98.9
		86.19 : 109.45	86.19 : 109.45	86.19 : 109.45
Zinc	TM181	99.38	96.3	98.36
		84.68 : 113.99	84.68 : 113.99	84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2495
Acenaphthene	TM218	92.0 73.47 : 109.80
Acenaphthylene	TM218	93.0 70.00 : 130.00
Anthracene	TM218	88.5 68.68 : 111.89
Benz(a)anthracene	TM218	102.0 68.12 : 118.39
Benzo(a)pyrene	TM218	101.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	100.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	93.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	95.5 73.10 : 117.03
Chrysene	TM218	94.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	94.0 67.32 : 121.35
Fluoranthene	TM218	92.0 75.16 : 117.28
Fluorene	TM218	89.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	95.5 68.91 : 117.62
Naphthalene	TM218	91.0 72.12 : 106.18
Phenanthrene	TM218	93.0 69.01 : 113.72
Pyrene	TM218	91.0 64.28 : 115.75

pH

Component	Method Code	QC 2445
pH	TM133	100.26 99.08 : 102.24

pH Value of Filtered Water

pH Value of Filtered Water

Component	Method Code	QC 2438
pH	TM256	100.53 99.06 : 101.47

Phenols by HPLC (S)

Component	Method Code	QC 2445	QC 2453
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.25 69.38 : 125.27	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.37 69.79 : 122.84	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	50.94 77.98 : 111.41	51.36 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.98 67.94 : 117.69	54.3 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.46 88.23 : 104.42	51.77 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2451
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	95.7 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	89.87 82.77 : 126.51
Cresols by HPLC (W)	TM259	96.71 76.60 : 126.28
Napthol by HPLC (W)	TM259	93.75 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	94.3 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2457
Total Organic Carbon	TM132	104.69 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2476	QC 2428
Total Sulphur %	TM132	88.6 61.64 : 114.47	79.27 61.64 : 114.47



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134

Client Reference: B025563

Report Number: 594448

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

VOC MS (S)

Component	Method Code	QC 2404	QC 2424
1,1,1,2-tetrachloroethane	TM116	99.4 84.84 : 116.25	99.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	101.0 73.73 : 118.05	98.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	96.0 77.12 : 116.04	92.8 77.12 : 116.04
1,1-Dichloroethane	TM116	106.6 74.46 : 129.15	101.8 74.46 : 129.15
1,2-Dichloroethane	TM116	107.0 92.38 : 131.65	104.6 92.38 : 131.65
1,4-Dichlorobenzene	TM116	100.0 83.64 : 126.18	104.0 83.64 : 126.18
2-Chlorotoluene	TM116	94.2 76.03 : 113.25	97.2 76.03 : 113.25
4-Chlorotoluene	TM116	90.6 66.90 : 112.46	90.6 66.90 : 112.46
Benzene	TM116	103.2 88.60 : 113.80	98.2 88.60 : 113.80
Carbon Disulphide	TM116	100.0 74.91 : 122.14	95.6 74.91 : 122.14
Carbontetrachloride	TM116	103.0 80.31 : 124.50	101.8 80.31 : 124.50
Chlorobenzene	TM116	100.2 83.81 : 114.18	97.6 83.81 : 114.18
Chloroform	TM116	106.6 87.40 : 122.49	104.0 87.40 : 122.49
Chloromethane	TM116	109.4 65.89 : 136.93	103.2 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.2 80.67 : 126.72	102.0 80.67 : 126.72
Dibromomethane	TM116	94.8 73.23 : 118.35	94.8 73.23 : 118.35
Dichloromethane	TM116	109.6 81.11 : 133.25	106.6 81.11 : 133.25
Ethylbenzene	TM116	93.4 75.92 : 110.41	92.4 75.92 : 110.41
Hexachlorobutadiene	TM116	72.4 12.82 : 152.73	84.0 12.82 : 152.73
Isopropylbenzene	TM116	85.4 55.79 : 97.59	88.8 55.79 : 97.59
Naphthalene	TM116	96.4 80.86 : 128.81	103.4 80.86 : 128.81
o-Xylene	TM116	90.6 69.99 : 108.74	88.6 69.99 : 108.74
p/m-Xylene	TM116	88.7 68.32 : 108.91	86.8 68.32 : 108.91
Sec-Butylbenzene	TM116	80.0 38.50 : 101.50	86.8 38.50 : 101.50
Tetrachloroethene	TM116	100.2 76.95 : 121.02	100.8 76.95 : 121.02
Toluene	TM116	94.8 74.24 : 107.42	91.2 74.24 : 107.42
Trichloroethene	TM116	97.2 85.28 : 109.36	94.2 85.28 : 109.36



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134

Client Reference: B025563

Report Number: 594448

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

VOC MS (S)

		QC 2404	QC 2424
Trichlorofluoromethane	TM116	101.6 84.55 : 133.27	99.6 84.55 : 133.27
Vinyl Chloride	TM116	112.8 68.02 : 143.37	105.8 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

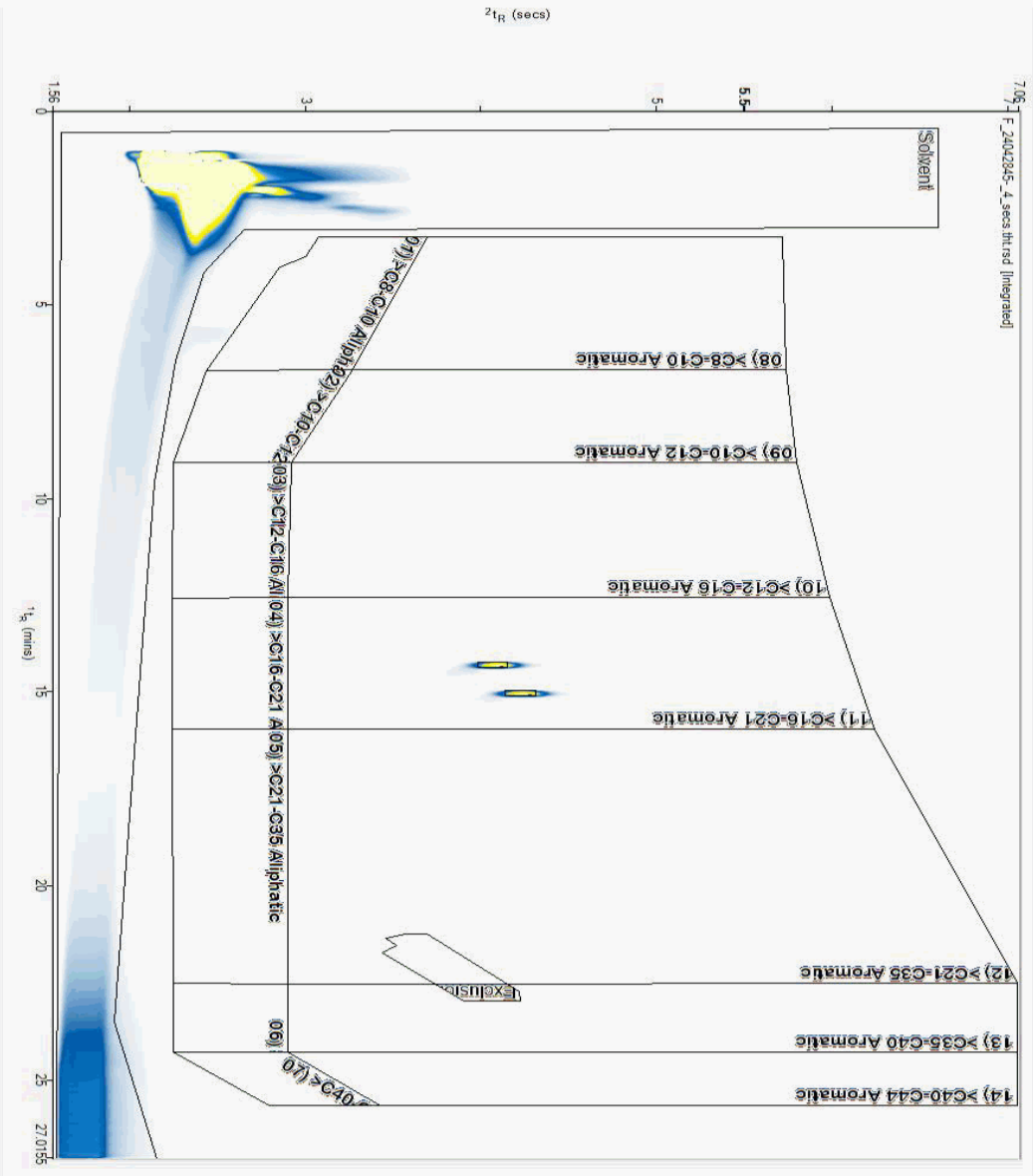
Validated

SDG: 210331-134 Client Reference: B025563 Report Number: 594448
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24042845 Depth : 1.00
Sample ID : TP-OBC-06

ChromSpace LIMS export
Current batch
Sample Identity: F_24042845-4_secs.tht
Date Acquired : 14/04/21 03:30:03
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

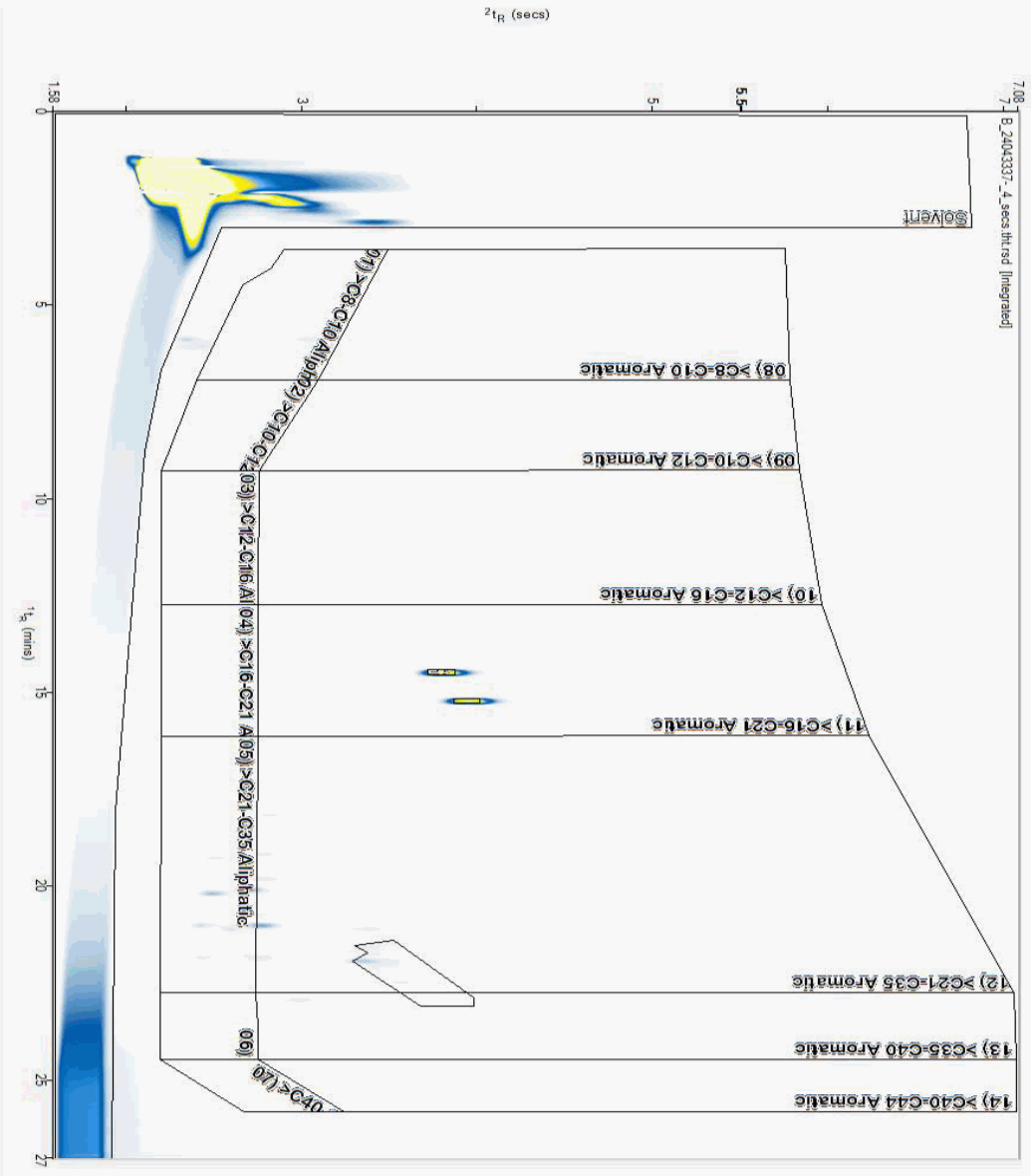
Validated

SDG: 210331-134 Client Reference: B025563 Report Number: 594448
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24043337 Depth : 0.20
Sample ID : TP-OBC-05

ChromSpace LIMS export
Current batch
Sample Identity: B_24043337-4_secs.tht
Date Acquired : 13/04/21 07:48:20
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24043428 Depth : 0.10
Sample ID : TP-OBC-03



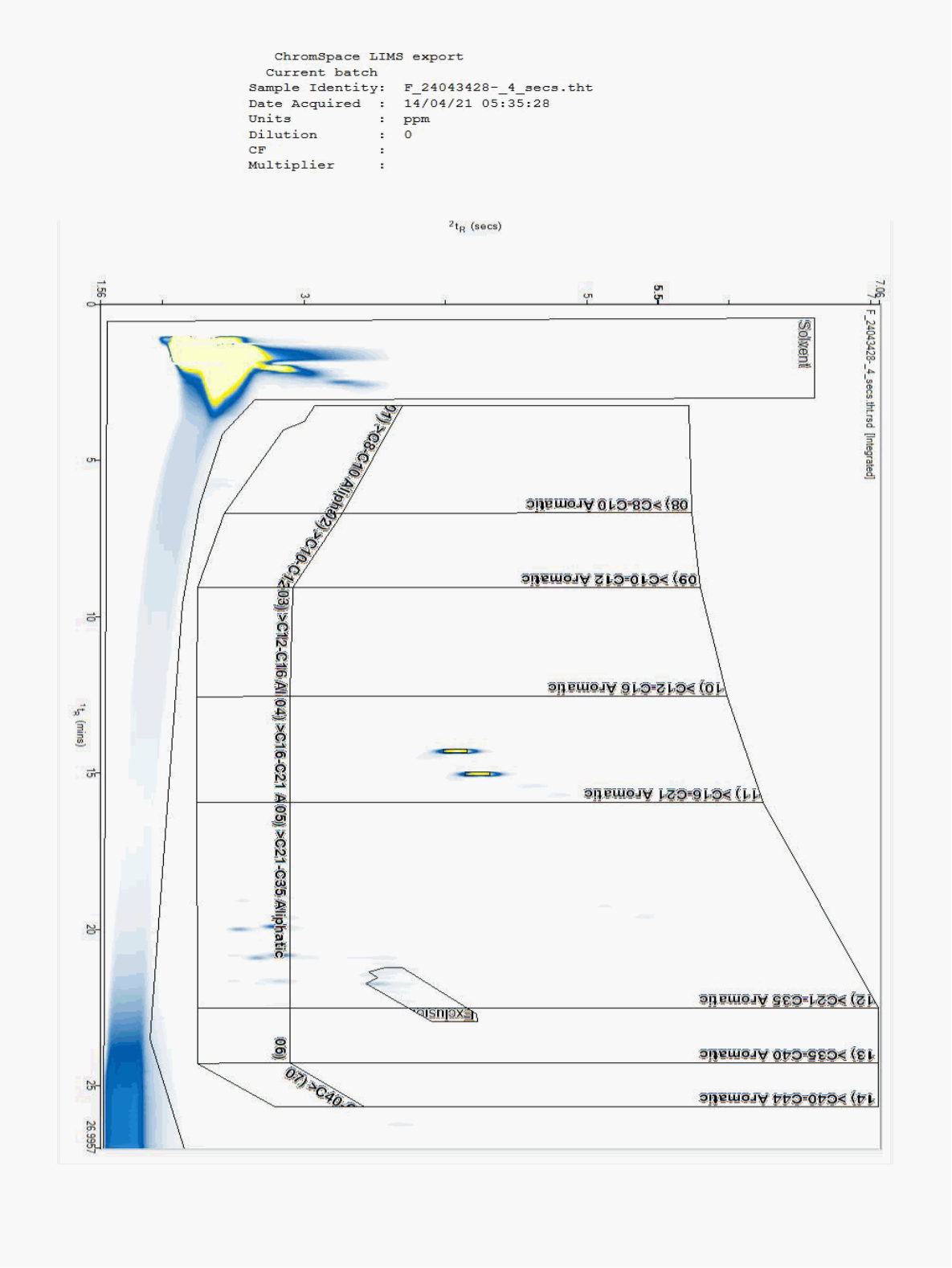
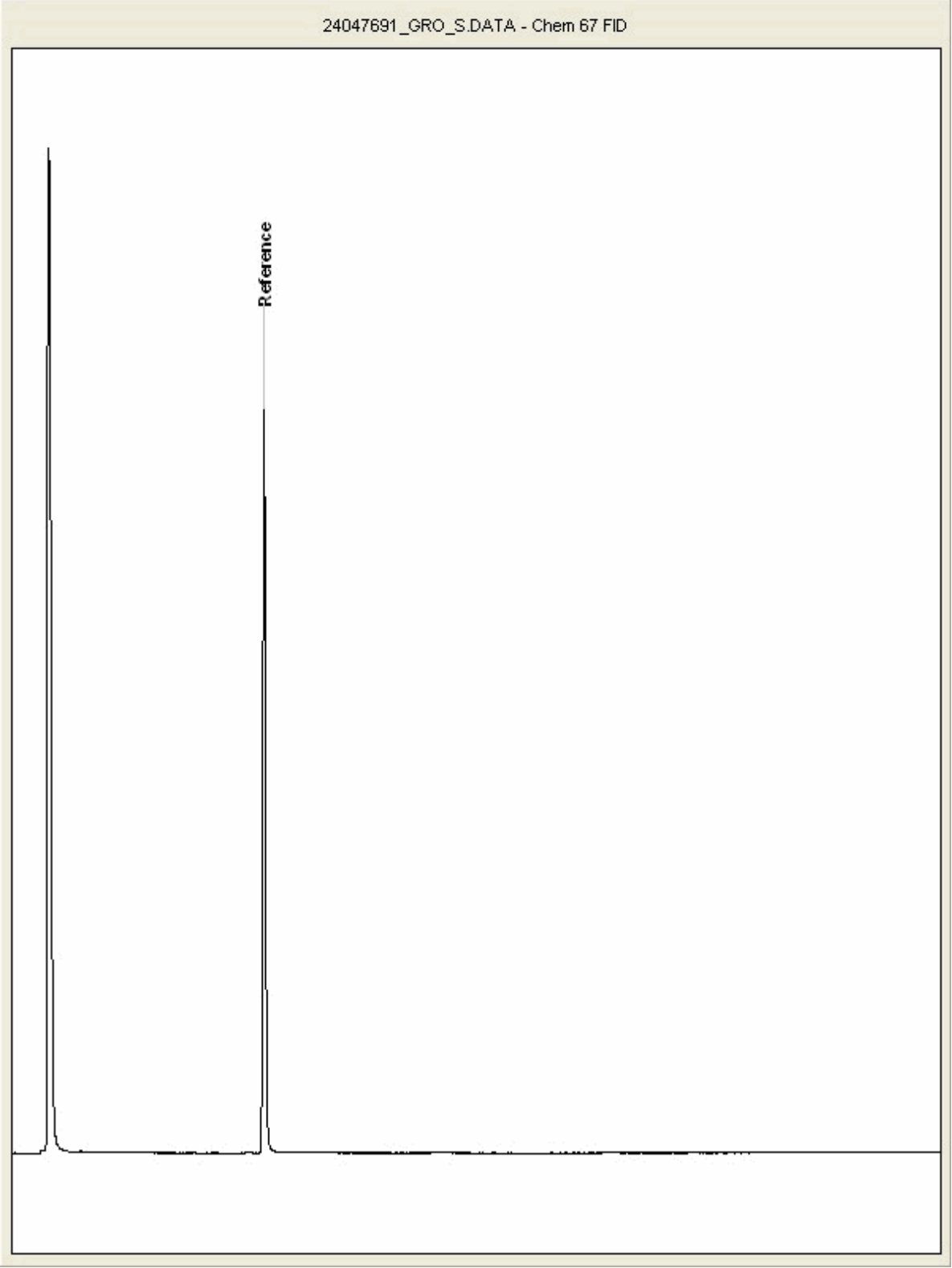
CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24047691 Depth : 1.00
Sample ID : TP-OBC-06





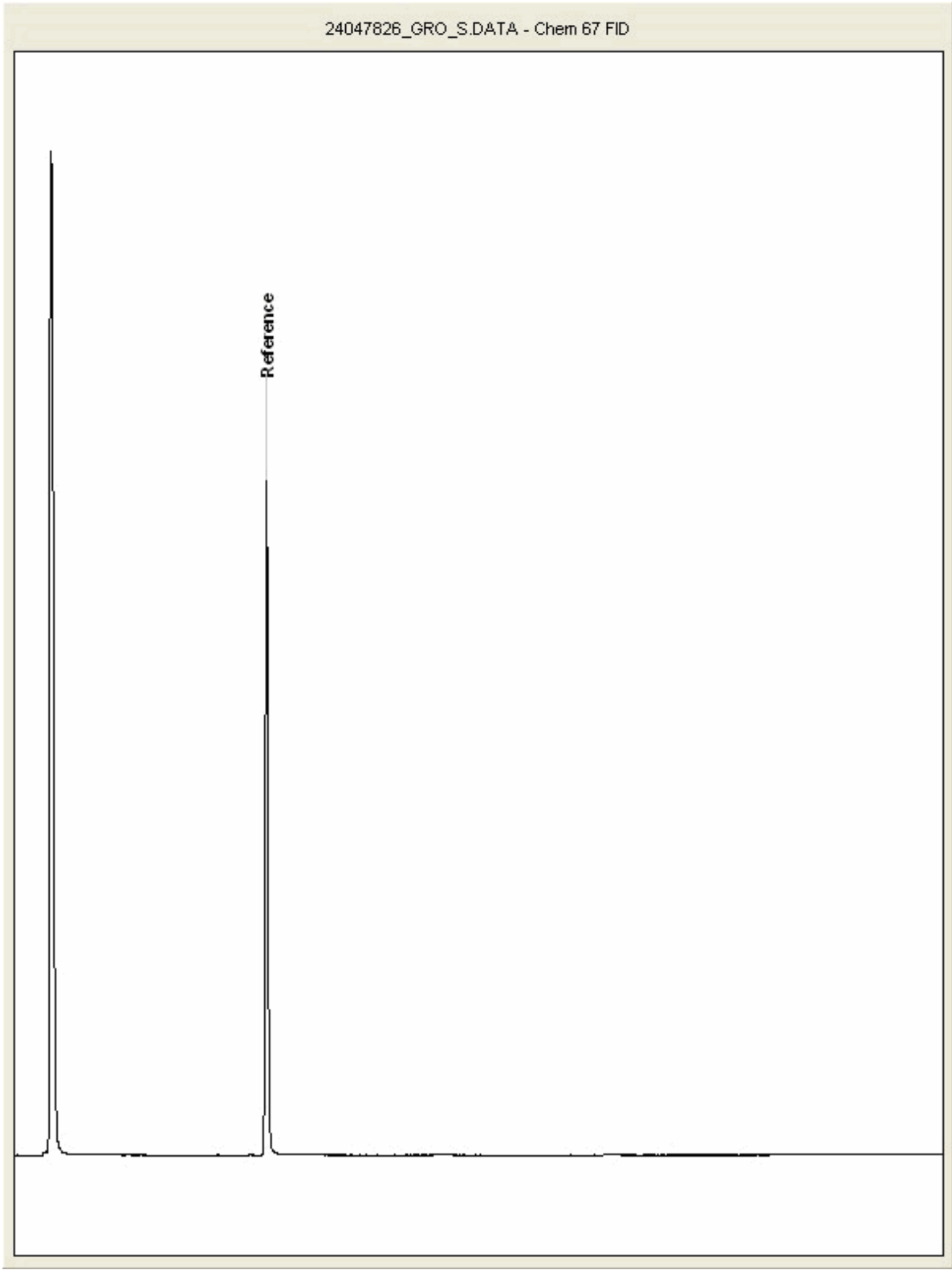
CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134 Client Reference: B025563 Report Number: 594448
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24047826 Depth : 0.20
Sample ID : TP-OBC-05



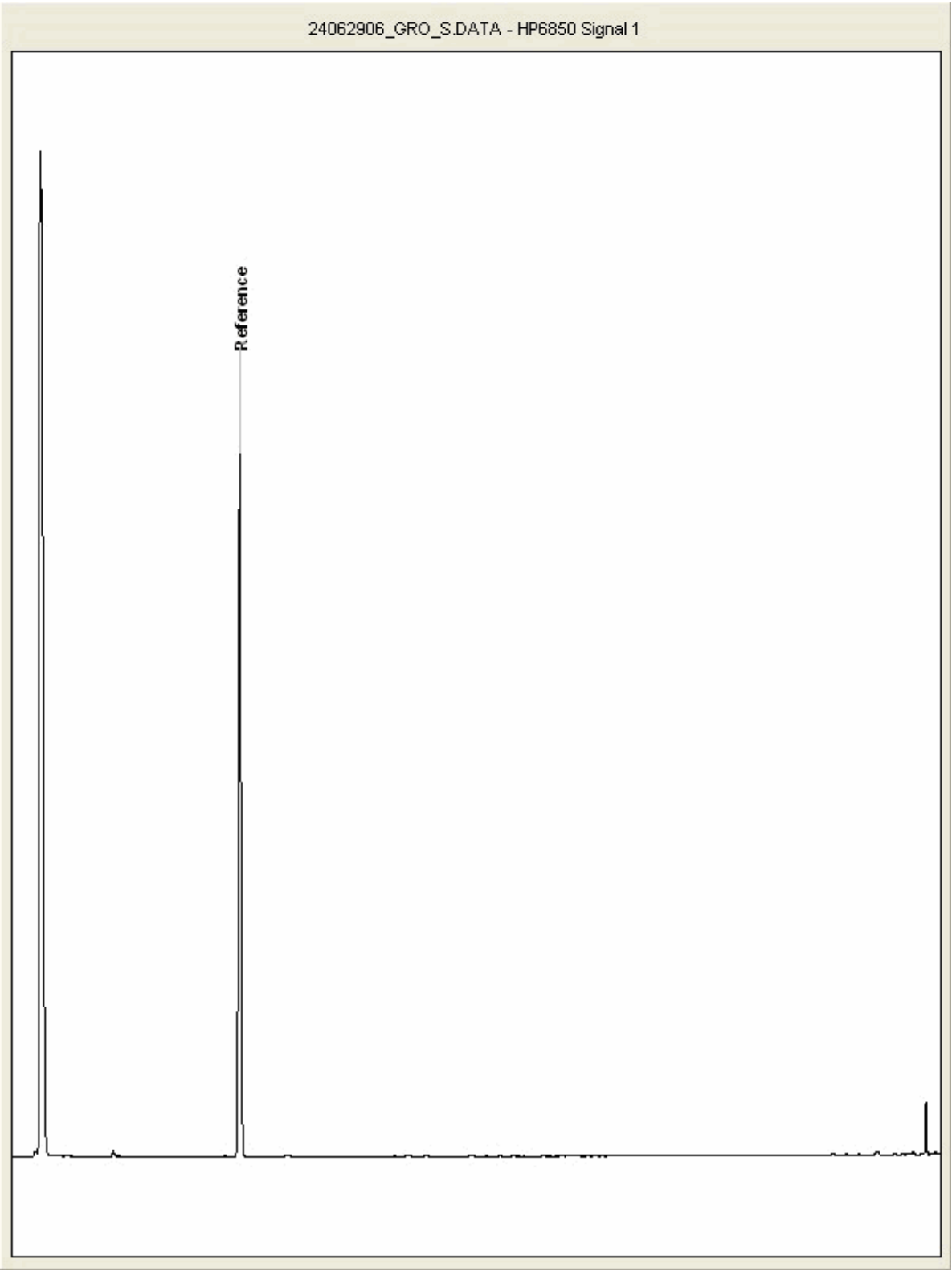
CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-134 Client Reference: B025563 Report Number: 594448
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24062906 Depth : 0.10
Sample ID : TP-OBC-03





CERTIFICATE OF ANALYSIS

SDG:	210331-134	Client Reference:	B025563	Report Number:	594448
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

Deeside

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CERTIFICATE OF ANALYSIS

Date of report Generation:	22 April 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210331-139
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	594999

This report has been revised and directly supersedes 594048 in its entirety.

We received 4 samples on Wednesday March 31, 2021 and 2 of these samples were scheduled for analysis which was completed on Wednesday April 21, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7

Version Issued: 22/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24009259	BH-PTR-16		0.10	
24009260	BH-PTR-16		0.20	
24009261	BH-PTR-16		0.50	
24009263	BH-PTR-16		1.00	

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24009260		24009263	
	Customer Sample Reference		BH-PTR-16		BH-PTR-16	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X	X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X			
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2		X	X	
CEN Readings	All	NDPs: 0 Tests: 1	X			
Chromium III	All	NDPs: 0 Tests: 3	X	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X			
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X	X	
Fluoride	All	NDPs: 0 Tests: 1	X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X	X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 2	X		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-139 Client Reference: B025563 Report Number: 594999
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 594048

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24009263		24009263	
	Customer Sample Reference		BH-PTIR-16		BH-PTIR-16	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X			
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Phenols by ms (w)	All	NDPs: 0 Tests: 1	X			
Phenols Spec MS (S)	All	NDPs: 0 Tests: 2		X		X
Sample description	All	NDPs: 0 Tests: 2		X		X
Speciated Mercury*	All	NDPs: 0 Tests: 2	X			X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphate	All	NDPs: 0 Tests: 2		X		X



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SDG: 210331-139 Client Reference: B025563 Report Number: 594999
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 594048

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24009263		24009263	
	Customer Sample Reference		BH-PTIR-16		BH-PTIR-16	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24009260	BH-PTR-16	0.20	Dark Brown	Sand	Vegetation	Stones
24009263	BH-PTR-16	1.00	White	Sand	None	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-PTR-16	BH-PTR-16				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.		0.20	1.00				
dis.filt	Dissolved / filtered sample.		Soil/Solid (S)	Soil/Solid (S)				
tot.unfilt	Total / unfiltered sample.		-	-				
*	Subcontracted - refer to subcontractor report for accreditation status.		-	-				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		31/03/2021	31/03/2021				
			210331-139	210331-139				
(F)	Trigger breach confirmed		24009260	24009263				
1.445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	17	18				
			\$	\$				
Speciated Mercury - elemental*	<0.0006 mg/kg	SUB	<0.0006	<0.0006				
			\$	\$				
Speciated Mercury - inorganic*	<0.1 mg/kg	SUB	<0.1	<0.1				
			\$	\$				
Speciated Mercury - methyl*	<0.1 mg/kg	SUB	<0.1	<0.1				
			\$	\$				
Total Mercury - AAF*	<0.05 mg/kg	SUB	0.08	<0.05				
			\$	\$				
Loss on ignition	<0.7 %	TM018	3.96	<0.7				
			\$ M	\$ M				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
			\$ M	\$ M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
			\$ M	\$ M				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
			\$ M	\$ M				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
			\$ M	\$ M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
			\$ M	\$ M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
			\$ M	\$ M				
Organic Carbon, Total	<0.2 %	TM132	1.11	<0.2				
			\$ M	\$ M				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0111	<0.002				
			\$ #	\$ #				
pH	1 pH Units	TM133	8.33	8.88				
			\$ M	\$ M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
			\$ #	\$ #				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
			\$ M	\$ M				
Chromium, Trivalent	<0.9 mg/kg	TM181	4.42	<0.9				
			\$	\$				
Antimony	<0.6 mg/kg	TM181	<0.6	1.11				
			\$ #	\$ #				
Arsenic	<0.6 mg/kg	TM181	7.65	<0.6				
			\$ M	\$ M				
Barium	<0.6 mg/kg	TM181	34.1	5.92				
			\$ #	\$ #				
Beryllium	<0.01 mg/kg	TM181	0.312	0.0487				
			\$ M	\$ M				
Cadmium	<0.02 mg/kg	TM181	0.162	0.0829				
			\$ M	\$ M				
Chromium	<0.9 mg/kg	TM181	4.42	<0.9				
			\$ M	\$ M				
Copper	<1.4 mg/kg	TM181	8.47	1.77				
			\$ M	\$ M				
Iron	<1000 mg/kg	TM181	15700	<1000				
			\$ #	\$ #				
Lead	<0.7 mg/kg	TM181	16.2	<0.7				
			\$ M	\$ M				
Manganese	<0.13 mg/kg	TM181	387	261				
			\$ M	\$ M				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
			\$ M	\$ M				
Molybdenum	<0.1 mg/kg	TM181	0.397	<0.1				
			\$ #	\$ #				
Nickel	<0.2 mg/kg	TM181	8.92	0.606				
			\$ M	\$ M				
Selenium	<1 mg/kg	TM181	<1	<1				
			\$ #	\$ #				

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SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

Phenols Spec MS (S)

[illegible]

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Validated

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-16		BH-PTR-16				
#	ISO17025 accredited. mCERTS accredited.		0.20 Soil/Solid (S)	1.00 Soil/Solid (S)					
M	Aqueous / settled sample.	Depth (m)	-	-					
aq	Dissolved / filtered sample.	Sample Type	-	-					
dis.filt	Total / unfiltered sample.	Date Sampled	31/03/2021	31/03/2021					
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.	Date Received	210331-139	210331-139					
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	SDG Ref	24009260	24009263					
**	Trigger breach confirmed	Lab Sample No.(s)							
(F)	Sample deviation (see appendix)	AGS Reference							
1-44@									
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	119	137					
			\$	\$					
Toluene-d8**	%	TM116	96.5	100					
			\$	\$					
4-Bromofluorobenzene**	%	TM116	90.8	99.7					
			\$	\$					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	<6					
			\$ M	\$ M					
Chloromethane	<7 µg/kg	TM116	<7	<7					
			\$ #	\$ #					
Vinyl Chloride	<6 µg/kg	TM116	<6	<6					
			\$ M	\$ M					
Bromomethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Chloroethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6	<6					
			\$ M	\$ M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10	<10					
			\$ #	\$ #					
Carbon Disulphide	<7 µg/kg	TM116	<7	<7					
			\$ M	\$ M					
Dichloromethane	<10 µg/kg	TM116	<10	<10					
			\$ #	\$ #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8	<8					
			\$ M	\$ M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	<6					
			\$ M	\$ M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10					
			\$	\$					
Bromochloromethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Chloroform	<8 µg/kg	TM116	<8	<8					
			\$ M	\$ M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	<7					
			\$ M	\$ M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Carbontetrachloride	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5	<5					
			\$ M	\$ M					
Benzene	<9 µg/kg	TM116	<9	<9					
			\$ M	\$ M					
Trichloroethene	<9 µg/kg	TM116	<9	<9					
			\$ #	\$ #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Dibromomethane	<9 µg/kg	TM116	<9	<9					
			\$ M	\$ M					
Bromodichloromethane	<7 µg/kg	TM116	<7	<7					
			\$ M	\$ M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Toluene	<7 µg/kg	TM116	<7	<7					
			\$ M	\$ M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10					
			\$	\$					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-16		BH-PTR-16				
#	ISO17025 accredited. mCERTS accredited.		0.20 Soil/Solid (S)	1.00 Soil/Solid (S)					
M	Aqueous / settled sample.	Depth (m)	-	-					
aq	Dissolved / filtered sample.	Sample Type	-	-					
dis.filt	Total / unfiltered sample.	Date Sampled	31/03/2021	31/03/2021					
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.	Date Received	210331-139	210331-139					
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	SDG Ref	24009260	24009263					
**	Trigger breach confirmed	Lab Sample No.(s)							
(F)	Sample deviation (see appendix)	AGS Reference							
1-44@									
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7	<7					
			\$ M	\$ M					
Tetrachloroethene	<5 µg/kg	TM116	<5	<5					
			\$ M	\$ M					
Dibromochloromethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Chlorobenzene	<5 µg/kg	TM116	<5	<5					
			\$ M	\$ M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Ethylbenzene	<4 µg/kg	TM116	<4	<4					
			\$ M	\$ M					
p/m-Xylene	<10 µg/kg	TM116	<10	<10					
			\$ #	\$ #					
o-Xylene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Styrene	<10 µg/kg	TM116	<10	<10					
			\$ #	\$ #					
Bromoform	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Isopropylbenzene	<5 µg/kg	TM116	<5	<5					
			\$ #	\$ #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	<10					
			\$ #	\$ #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	<16					
			\$ M	\$ M					
Bromobenzene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
Propylbenzene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
2-Chlorotoluene	<9 µg/kg	TM116	<9	<9					
			\$ M	\$ M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	<8					
			\$ M	\$ M					
4-Chlorotoluene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
tert-Butylbenzene	<14 µg/kg	TM116	<14	<14					
			\$ M	\$ M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	<9					
			\$ #	\$ #					
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10					
			\$	\$					
4-Isopropyltoluene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	<8					
			\$ M	\$ M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	<5					
			\$ M	\$ M					
n-Butylbenzene	<11 µg/kg	TM116	<11	<11					
			\$	\$					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	<10					
			\$ M	\$ M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	<14					
			\$ M	\$ M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	<10					
			\$ #	\$ #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20					
			\$	\$					
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20					
			\$	\$					
Naphthalene	<13 µg/kg	TM116	<13	<13					
			\$ M	\$ M					

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.109	Natural Moisture Content (%)	20.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	82.8
Particle Size <4mm	>95%		

Case

SDG	210331-139			
Lab Sample Number(s)	24009260			
Sampled Date				
Customer Sample Ref.	BH-PTR-16			
Depth (m)	0.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.019	<0.01	0.19	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Total Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Dissolved Organic Carbon	8.98	<3	89.8	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	0.0000114	<0.00001	0.000114	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	0.00131	<0.0005	0.0131	<0.005	-	-	-
Barium	0.00605	<0.0002	0.0605	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0186	<0.01	0.186	<0.1	-	-	-
Cadmium	0.000375	<0.00008	0.00375	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	3	<2	30	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Phenols Total of 5 Speciated by HPLC (W)	<0.025	<0.025	<0.25	<0.25	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-
2,4-dichlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2,4-dimethylphenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2,6-dichlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2-chlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2-methylphenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2-nitrophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
3-methylphenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
4-chloro-3-methylphenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
4-chlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
4-methylphenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Phenol	<0.001	<0.001	<0.01	<0.01	-	-	-

Leach Test Information

Date Prepared	02-Apr-2021
pH (pH Units)	8.35
Conductivity (µS/cm)	124.00
Temperature (°C)	17.30
Volume Leachant (Litres)	0.882



SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.109	Natural Moisture Content (%)		20.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		82.8
Particle Size <4mm	>95%			

Case

SDG	210331-139			
Lab Sample Number(s)	24009260			
Sampled Date				
Customer Sample Ref.	BH-PTR-16			
Depth (m)	0.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Calcium (Dis.Filt) mg/l	20.8	<0.2	208	<2	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Hardness dissolved	53.4	<0.65	534	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.683	<0.019	6.83	<0.19	-	-	-
Lead	0.00208	<0.0002	0.0208	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.343	<0.036	3.43	<0.36	-	-	-
Manganese	0.0058	<0.003	0.058	<0.03	-	-	-
Molybdenum	0.00911	<0.003	0.0911	<0.03	-	-	-
Nickel	0.00102	<0.0004	0.0102	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00254	<0.001	0.0254	<0.01	-	-	-
Zinc	0.328	<0.001	3.28	<0.01	-	-	-
2,3,4,6-tetrachlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2,3,5,6-tetrachlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2,4,5-trichlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2,4,6-trichlorophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
2,4-Dinitrophenol	<0.0025	<0.0025	<0.025	<0.025	-	-	-
4-nitrophenol	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Dinoseb	<0.004	<0.004	<0.04	<0.04	-	-	-
DNOC	<0.003	<0.003	<0.03	<0.03	-	-	-
Pentachlorophenol	<0.002	<0.002	<0.02	<0.02	-	-	-

Leach Test Information

Date Prepared	02-Apr-2021
pH (pH Units)	8.35
Conductivity (µS/cm)	124.00
Temperature (°C)	17.30
Volume Leachant (Litres)	0.882

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
SUB		Subcontracted Test
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM072	Modified: US EPA Method 8141A	Determination of Phenols by GC-MS
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM205		Determination of Phenols in Waste Waters using Solid Phase Extraction, Acetylation, Gas Chromatography and Mass Selective Detection
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24009260	24009263
Customer Sample Ref.	BH-PTR-16	BH-PTR-16
AGS Ref.		
Depth	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	09-Apr-2021	
Anions by Kone (soil)	09-Apr-2021	08-Apr-2021
Anions by Kone (w)	08-Apr-2021	
Asbestos ID in Solid Samples	08-Apr-2021	09-Apr-2021
Boron Water Soluble	09-Apr-2021	12-Apr-2021
CEN 10:1 Leachate (1 Stage)	13-Apr-2021	
CEN Readings	14-Apr-2021	
Chromium III	13-Apr-2021	13-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	09-Apr-2021	09-Apr-2021
Dissolved Metals by ICP-MS	08-Apr-2021	
Dissolved Organic/Inorganic Carbon	11-Apr-2021	
EPH CWG GC (S)	08-Apr-2021	08-Apr-2021
Fluoride	08-Apr-2021	
GRO by GC-FID (S)	09-Apr-2021	09-Apr-2021
Hexavalent Chromium (s)	13-Apr-2021	13-Apr-2021
Loss on Ignition in soils	08-Apr-2021	08-Apr-2021
Low Level Cyanide (W)	09-Apr-2021	
Low Level Hexavalent Chromium (w)	08-Apr-2021	
Mercury Dissolved	08-Apr-2021	
Metals in solid samples by OES	13-Apr-2021	09-Apr-2021
Moisture at 105C	02-Apr-2021	
PAH by GCMS	07-Apr-2021	07-Apr-2021
pH	08-Apr-2021	08-Apr-2021
pH Value of Filtered Water	09-Apr-2021	
Phenols by HPLC (S)	08-Apr-2021	08-Apr-2021
Phenols by HPLC (W)	14-Apr-2021	
Phenols by ms (w)	13-Apr-2021	
Phenols Spec MS (S)	13-Apr-2021	13-Apr-2021
Sample description	01-Apr-2021	01-Apr-2021
Speciated Mercury*	21-Apr-2021	21-Apr-2021
Total Organic Carbon	12-Apr-2021	12-Apr-2021
Total Sulphate	12-Apr-2021	13-Apr-2021
TPH CWG GC (S)	09-Apr-2021	09-Apr-2021
VOC MS (S)	12-Apr-2021	12-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2445
Ammoniacal Nitrogen as N	TM099	101.4 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2409	QC 2444
Chloride (soluble)	TM243	149.74 83.05 : 116.28	146.63 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	154.21 70.00 : 130.00	155.14 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2428
Chloride	TM184	98.2 91.40 : 109.10
Sulphate (soluble)	TM184	97.2 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2415	QC 2444
Water Soluble Boron	TM222	106.5 84.00 : 111.00	104.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2434
Free Cyanide	TM153	83.17 79.00 : 115.00
Thiocyanate	TM153	94.23 94.09 : 113.89
Total Cyanide	TM153	86.71 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2400
Aluminium	TM152	96.67 90.78 : 110.89
Antimony	TM152	100.5 77.22 : 119.42
Arsenic	TM152	98.83 86.77 : 107.67

Dissolved Metals by ICP-MS

		QC 2400
Barium	TM152	99.17 87.86 : 110.23
Beryllium	TM152	100.67 86.19 : 112.98
Bismuth	TM152	103.0 84.06 : 106.46
Borate	TM152	96.91 88.00 : 112.00
Boron	TM152	97.0 83.92 : 114.90
Cadmium	TM152	99.5 88.89 : 106.69
Calcium	TM152	96.67 80.24 : 117.95
Chromium	TM152	96.67 83.22 : 110.16
Cobalt	TM152	93.33 82.49 : 112.36
Copper	TM152	96.0 83.14 : 113.00
Iron	TM152	95.33 88.40 : 109.24
Lead	TM152	100.17 83.71 : 109.58
Lithium	TM152	100.67 84.50 : 114.28
Magnesium	TM152	93.33 87.56 : 114.57
Manganese	TM152	96.83 90.01 : 108.72
Molybdenum	TM152	97.67 85.53 : 107.42
Nickel	TM152	96.0 88.05 : 106.42
Phosphorus	TM152	97.0 82.76 : 107.72
Potassium	TM152	95.33 88.45 : 106.42
Selenium	TM152	98.17 85.61 : 111.03
Silver	TM152	97.83 88.48 : 110.48
Sodium	TM152	93.33 88.32 : 106.30
Strontium	TM152	99.0 83.77 : 107.87
Tellurium	TM152	99.0 82.83 : 104.73
Thallium	TM152	99.0 77.47 : 113.87
Tin	TM152	99.0 87.36 : 109.55
Titanium	TM152	97.0 87.29 : 108.31

Dissolved Metals by ICP-MS

		QC 2400
Tungsten	TM152	100.33 68.27 : 122.97
Uranium	TM152	100.17 82.46 : 105.16
Vanadium	TM152	93.33 88.43 : 114.30
Zinc	TM152	98.33 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2484
Dissolved Inorganic Carbon	TM090	101.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2414
EPH >C8-C40 Raw	TM414	95.65 72.57 : 112.44
Total Aliphatics Raw	TM414	100.77 72.68 : 112.55
Total Aromatics Raw	TM414	113.07 58.44 : 124.94

Fluoride

Component	Method Code	QC 2401
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2452
QC	TM089	88.08 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2497	QC 2419
Hexavalent Chromium	TM151	106.0 92.00 : 111.20	104.0 92.00 : 111.20

Hexavalent Chromium (s)

Loss on Ignition in soils

Component	Method Code	QC 2435
Loss on Ignition	TM018	95.73 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2463
Free Cyanide - Low Level	TM279	86.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	98.25 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2460
Mercury Dissolved (CVAf)	TM183	104.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2463	QC 2465
Aluminium	TM181	90.27 73.56 : 108.85	97.35 73.56 : 108.85
Antimony	TM181	99.19 76.89 : 111.24	101.63 76.89 : 111.24
Arsenic	TM181	100.29 88.53 : 111.01	102.33 88.53 : 111.01
Barium	TM181	99.08 77.67 : 105.35	97.25 77.67 : 105.35
Beryllium	TM181	98.51 85.44 : 109.61	101.49 85.44 : 109.61
Boron	TM181	87.11 73.51 : 104.66	92.55 73.51 : 104.66
Cadmium	TM181	91.77 77.67 : 104.12	100.41 77.67 : 104.12
Chromium	TM181	89.45 79.64 : 105.83	91.48 79.64 : 105.83
Cobalt	TM181	90.25 84.60 : 104.13	92.14 84.60 : 104.13
Copper	TM181	90.85 82.40 : 105.45	102.46 82.40 : 105.45
Iron	TM181	96.83 82.95 : 110.58	97.62 82.95 : 110.58
Lead	TM181	92.34 78.24 : 104.05	95.27 78.24 : 104.05

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210331-139	Client Reference:	B025563	Report Number:	594999	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048	
Metals in solid samples by OES						

		QC 2463	QC 2465
Manganese	TM181	109.72 94.29 : 119.51	107.5 94.29 : 119.51
Mercury	TM181	101.93 83.16 : 107.81	96.86 83.16 : 107.81
Molybdenum	TM181	96.71 87.11 : 106.87	100.82 87.11 : 106.87
Nickel	TM181	94.13 80.26 : 102.28	93.4 80.26 : 102.28
Phosphorus	TM181	105.25 94.56 : 124.28	107.47 94.56 : 124.28
Selenium	TM181	100.78 82.28 : 110.48	101.18 82.28 : 110.48
Strontium	TM181	91.09 79.13 : 102.79	95.77 79.13 : 102.79
Thallium	TM181	101.33 82.94 : 111.86	102.21 82.94 : 111.86
Tin	TM181	103.42 86.72 : 110.03	102.66 86.72 : 110.03
Titanium	TM181	71.98 66.23 : 102.06	84.73 66.23 : 102.06
Vanadium	TM181	92.31 86.19 : 109.45	100.37 86.19 : 109.45
Zinc	TM181	99.18 84.68 : 113.99	102.05 84.68 : 113.99

Component	Method Code	QC 2452
Acenaphthene	TM218	86.0 73.47 : 109.80
Acenaphthylene	TM218	86.0 70.00 : 130.00
Anthracene	TM218	87.5 68.68 : 111.89
Benz(a)anthracene	TM218	99.5 68.12 : 118.39
Benzo(a)pyrene	TM218	89.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	93.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	82.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	95.0 73.10 : 117.03
Chrysene	TM218	99.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	78.0 67.32 : 121.35
Fluoranthene	TM218	107.5 75.16 : 117.28
Fluorene	TM218	87.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	78.0 68.91 : 117.62

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210331-139	Client Reference:	B025563	Report Number:	594999	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048	
PAH by GCMS						

		QC 2452
Naphthalene	TM218	86.5 72.12 : 106.18
Phenanthrene	TM218	98.0 69.01 : 113.72
Pyrene	TM218	95.5 64.28 : 115.75

Component	Method Code	QC 2414	QC 2464
pH	TM133	100.66 99.08 : 102.24	100.92 98.71 : 102.32

Component	Method Code	QC 2467
pH	TM256	100.0 99.33 : 102.54

Component	Method Code	QC 2469
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.95 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	49.27 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	50.33 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	49.58 88.23 : 104.42

Component	Method Code	QC 2451
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	95.7 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	89.87 82.77 : 126.51
Cresols by HPLC (W)	TM259	96.71 76.60 : 126.28
Napthol by HPLC (W)	TM259	93.75 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	94.3 79.09 : 131.82

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048
Phenols by ms (w)						

Component	Method Code	QC 2442
2,3,4,6-tetrachlorophenol	TM205	98.5 67.00 : 128.50
2,4,5-trichlorophenol	TM205	97.0 70.75 : 134.50
2,4,6-trichlorophenol	TM205	96.13 69.88 : 134.38
2,4-dichlorophenol	TM205	96.0 69.88 : 134.38
2,4-dimethylphenol	TM205	90.25 67.50 : 138.00
2,6-dichlorophenol	TM205	97.5 70.13 : 133.13
2-chlorophenol	TM205	96.88 68.50 : 133.00
2-methylphenol	TM205	93.5 70.63 : 137.38
2-nitrophenol	TM205	99.25 58.88 : 126.38
3-methylphenol	TM205	99.0 71.25 : 138.75
4-chloro-3-methylphenol	TM205	99.63 74.25 : 138.00
4-methylphenol	TM205	94.25 74.13 : 137.13
4-nitrophenol	TM205	97.38 68.50 : 136.75
Pentachlorophenol	TM205	87.25 47.74 : 105.49
Phenol	TM205	100.88 67.27 : 72.73

Total Organic Carbon		
Component	Method Code	QC 2451
Total Organic Carbon	TM132	103.52 87.02 : 113.45

Total Sulphate			
Component	Method Code	QC 2415	QC 2438
Total Sulphate	TM221	98.48 70.62 : 121.50	94.7 70.62 : 121.50

VOC MS (S)

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048
VOC MS (S)						

Component	Method Code	QC 2499	QC 2404
1,1,1,2-tetrachloroethane	TM116	98.6 79.10 : 119.66	99.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	98.6 84.25 : 112.57	101.0 73.73 : 118.05
1,1,2-Trichloroethane	TM116	88.6 81.29 : 113.79	96.0 77.12 : 116.04
1,1-Dichloroethane	TM116	108.4 86.77 : 122.11	106.6 74.46 : 129.15
1,2-Dichloroethane	TM116	101.6 90.04 : 132.28	107.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	101.4 80.81 : 125.07	100.0 83.64 : 126.18
2-Chlorotoluene	TM116	96.6 73.13 : 114.13	94.2 76.03 : 113.25
4-Chlorotoluene	TM116	91.0 68.66 : 109.13	90.6 66.90 : 112.46
Benzene	TM116	101.4 84.29 : 112.22	103.2 88.60 : 113.80
Carbon Disulphide	TM116	99.6 75.11 : 124.81	100.0 74.91 : 122.14
Carbontetrachloride	TM116	98.6 82.35 : 126.46	103.0 80.31 : 124.50
Chlorobenzene	TM116	101.6 82.88 : 122.42	100.2 83.81 : 114.18
Chloroform	TM116	105.2 90.35 : 120.38	106.6 87.40 : 122.49
Chloromethane	TM116	127.8 67.89 : 143.51	109.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.0 78.27 : 128.90	105.2 80.67 : 126.72
Dibromomethane	TM116	89.8 76.00 : 120.73	94.8 73.23 : 118.35
Dichloromethane	TM116	112.0 92.27 : 134.36	109.6 81.11 : 133.25
Ethylbenzene	TM116	95.8 70.95 : 113.07	93.4 75.92 : 110.41
Hexachlorobutadiene	TM116	61.6 14.55 : 147.92	72.4 12.82 : 152.73
Isopropylbenzene	TM116	88.2 52.00 : 108.19	85.4 55.79 : 97.59
Naphthalene	TM116	96.0 80.29 : 135.77	96.4 80.86 : 128.81
o-Xylene	TM116	95.4 64.92 : 98.85	90.6 69.99 : 108.74
p/m-Xylene	TM116	87.6 69.47 : 97.31	88.7 68.32 : 108.91
Sec-Butylbenzene	TM116	88.8 27.03 : 135.73	80.0 38.50 : 101.50
Tetrachloroethene	TM116	104.4 81.43 : 126.65	100.2 76.95 : 121.02
Toluene	TM116	98.2 82.44 : 103.50	94.8 74.24 : 107.42
Trichloroethene	TM116	93.8 79.80 : 112.33	97.2 85.28 : 109.36



CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

VOC MS (S)

		QC 2499	QC 2404
Trichlorofluoromethane	TM116	89.4	101.6
		89.67 : 132.09	84.55 : 133.27
Vinyl Chloride	TM116	102.2	112.8
		69.66 : 136.55	68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



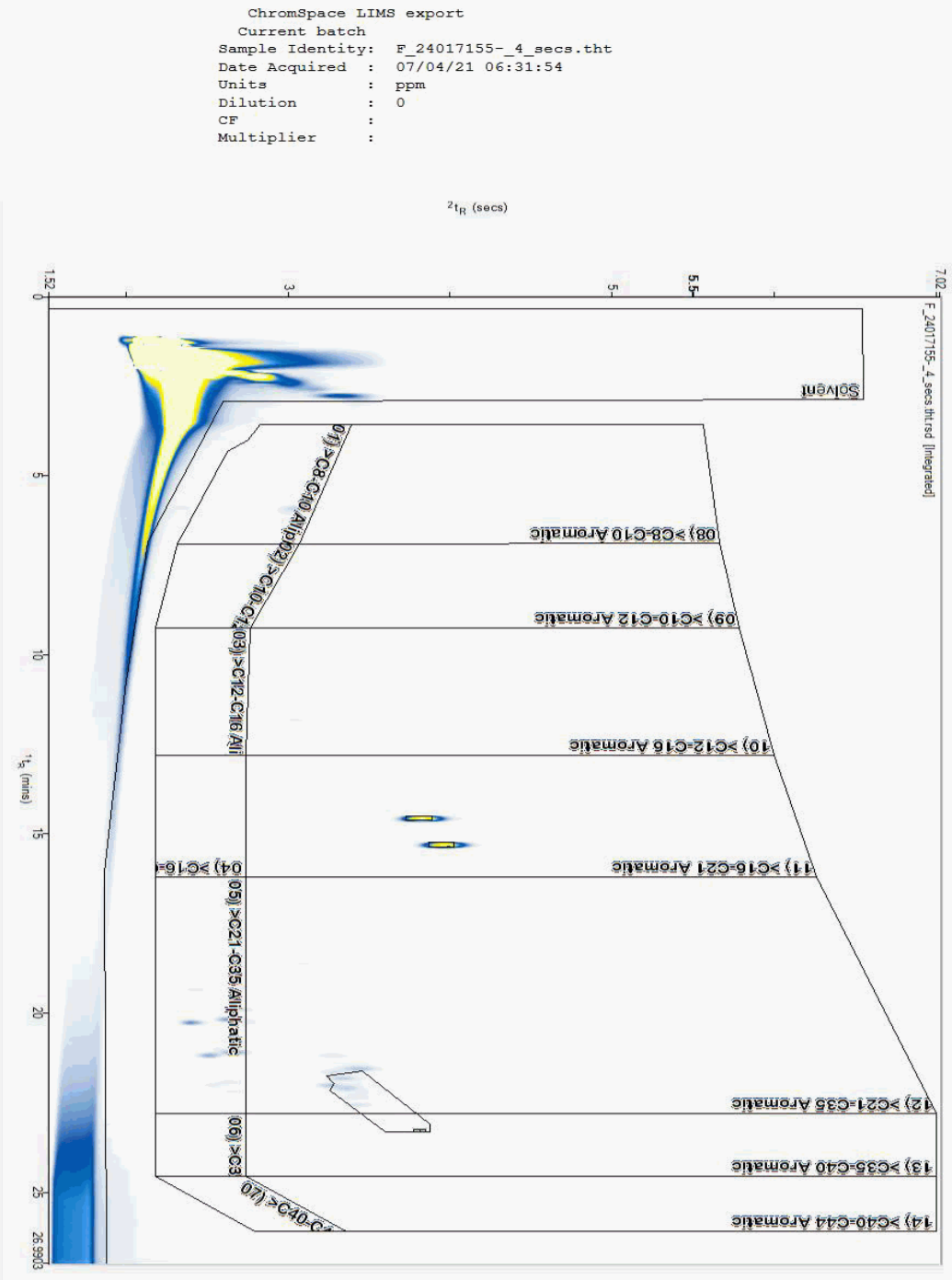
CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24017155	Depth :	0.20
		Sample ID :	BH-PTR-16		



SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

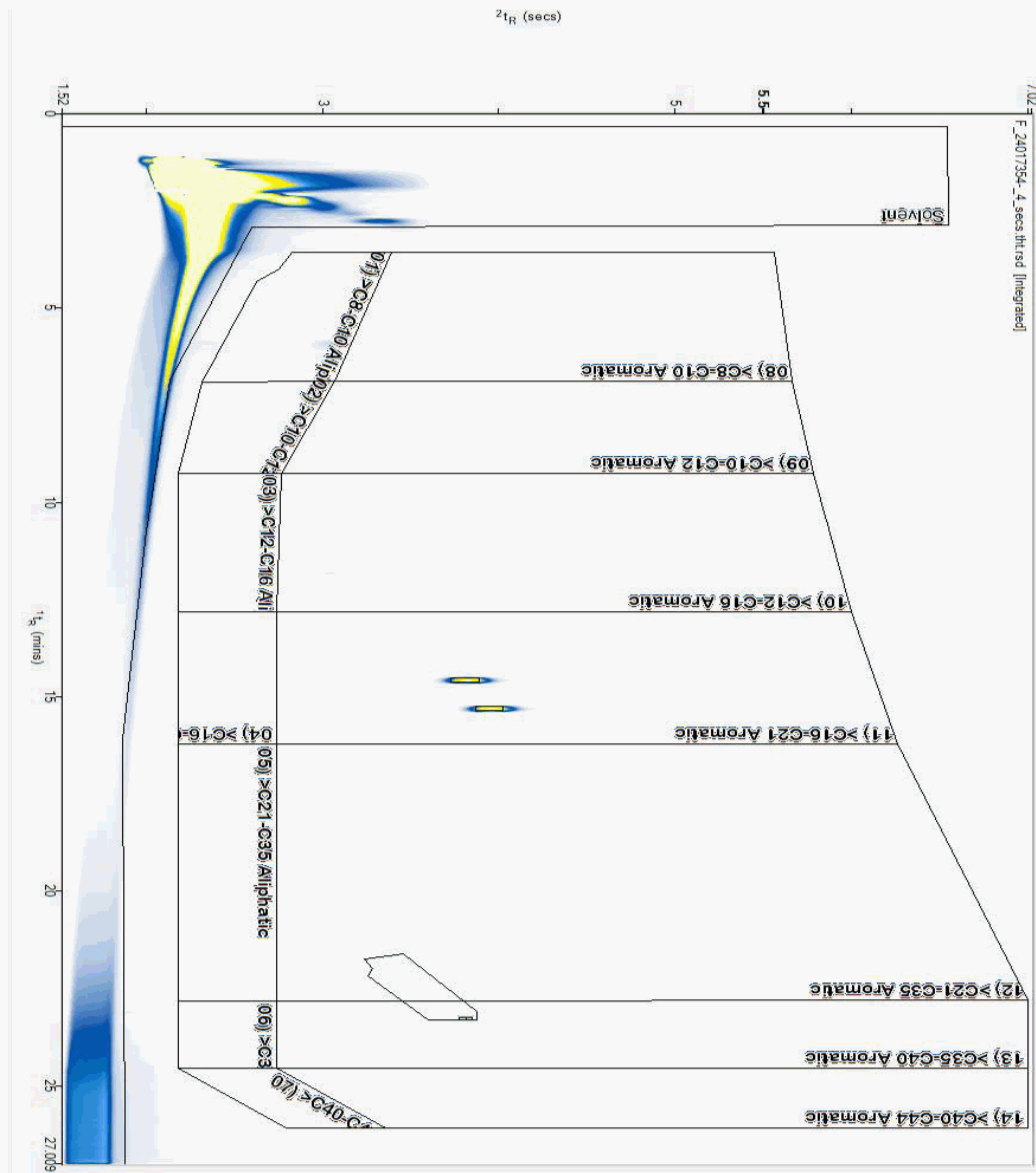
Chromatogram

Analysis: EPH CWG GC (S)	Sample No : 24017354	Depth : 1.00
	Sample ID : BH-PTR-16	

```

ChromSpace LIMS export
Current batch
Sample Identity: F_24017354-_4_secs.tht
Date Acquired  : 07/04/21 04:58:06
Units          : ppm
Dilution       : 0
CF              :
Multiplier      :

```

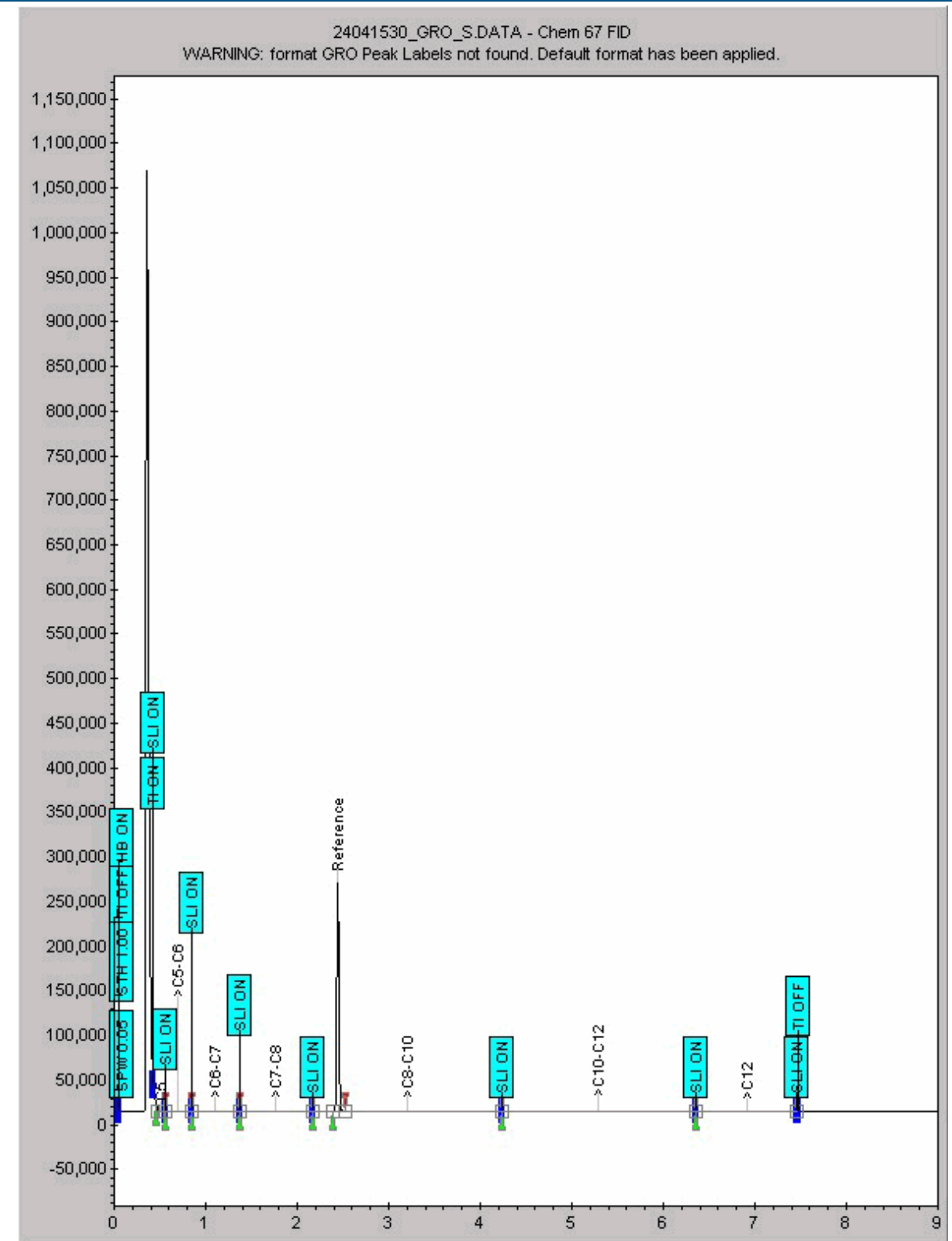


CERTIFICATE OF ANALYSIS

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	594048

Chromatogram

Analysis: GRO by GC-FID (S)	Sample No : 24041530	Depth : 0.20
	Sample ID : BH-PTR-16	





CERTIFICATE OF ANALYSIS

Validated

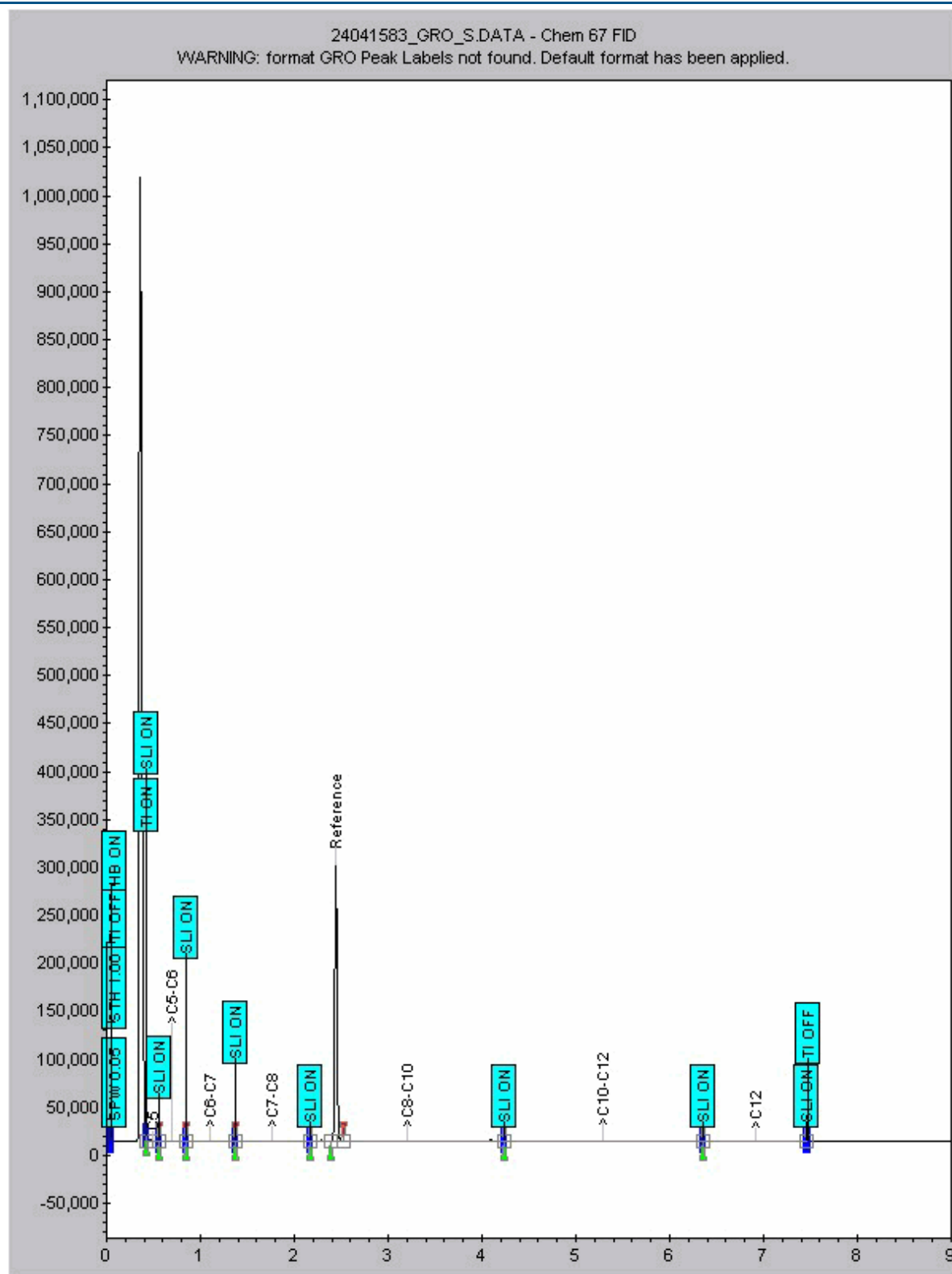
SDG: 210331-139 Client Reference: B025563 Report Number: 594999
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 594048

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24041583
Sample ID : BH-PTR-16

Depth : 1.00



Certificate Number 21-07247

Issued: 21-Apr-21

Client ALS Life Sciences Limited
Units 7 & 8
Hawarden Business Park
Manor Road
Hawarden
Deeside
CH5 3US

Our Reference 21-07247

Client Reference 210331-139

Order No 210331-139

Contract Title (not supplied)

Description 2 Soil samples.

Date Received 08-Apr-21

Date Started 08-Apr-21

Date Completed 21-Apr-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager



2139

Derwentside Environmental Testing Services Limited
Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY
Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 3



Summary of Chemical Analysis

Soil Samples

Our Ref 21-07247
Client Ref 210331-139
Contract Title

Lab No	1828262	1828263
.Sample ID	BH-PTR-16	BH-PTR-16
Depth	0.20	1.00
Other ID	24017092	24017433
Sample Type	SOIL	SOIL
Sampling Date	n/s	n/s
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Mercury (Elemental)	DETSC 2333*	0.0006	mg/kg	< 0.0006	< 0.0006
Mercury (Inorganic)	DETSC 2332*	0.1	mg/kg	< 0.1	< 0.1
Mercury (Methyl)	DETSC 2332*	0.1	mg/kg	< 0.10	< 0.10
Mercury	DETSC 2325#	0.05	mg/kg	0.08	< 0.05



Information in Support of the Analytical Results

Our Ref 21-07247
Client Ref 210331-139
Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1828262	BH-PTR-16 0.20 SOIL		GJ 250ml	Sample date not supplied, Mercury (28 days), Metals ICP Prep (182 days), Speciated Mercury (28 days)	
1828263	BH-PTR-16 1.00 SOIL		GJ 250ml	Sample date not supplied, Mercury (28 days), Metals ICP Prep (182 days), Speciated Mercury (28 days)	

Key: G-Glass J-Jar
DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



CERTIFICATE OF ANALYSIS

SDG:	210331-139	Client Reference:	B025563	Report Number:	594999
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	594048

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
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LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	22 April 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210331-141
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	594998

This report has been revised and directly supersedes 593866 in its entirety.

We received 4 samples on Wednesday March 31, 2021 and 1 of these samples were scheduled for analysis which was completed on Wednesday April 21, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 22/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-141 Client Reference: B025563 Report Number: 594998
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593866

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24009314	BH-PTR-18		0.10	29/03/2021
24009315	BH-PTR-18		0.20	29/03/2021
24009316	BH-PTR-18		0.50	29/03/2021
24009317	BH-PTR-18		1.00	29/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210331-141 Client Reference: B025563 Report Number: 594998
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report: 593866

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24009315		
	Customer Sample Reference		BH-PTR-18		
	AGS Reference				
	Depth (m)		0.20		
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols Spec MS (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div>	Lab Sample No(s)		24009315			
	Customer Sample Reference		BH-PTR-18			
	AGS Reference					
	Depth (m)		0.20			
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	
	Sample Type		S	S	S	
	Speciated Mercury*		All	NDPs: 0 Tests: 1	X	
Total Organic Carbon		All	NDPs: 0 Tests: 1		X	
Total Sulphate		All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)		All	NDPs: 0 Tests: 1		X	
VOC MS (S)		All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24009315	BH-PTR-18	0.20	Dark Brown	Sandy Silt Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltred sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-PTR-18</div> <div>0.20 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-141 24009315</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	14						
Speciated Mercury - elemental*	<0.0006 mg/kg	SUB	<0.0006						
Speciated Mercury - inorganic*	<0.1 mg/kg	SUB	0.1						
Speciated Mercury - methyl*	<0.1 mg/kg	SUB	<0.1						
Total Mercury - AAF*	<0.05 mg/kg	SUB	0.15						
Loss on ignition	<0.7 %	TM018	3.38	M					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Organic Carbon, Total	<0.2 %	TM132	0.78	M					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0078	#					
pH	1 pH Units	TM133	8.53	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
Chromium, Trivalent	<0.9 mg/kg	TM181	7.59						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	9.54	M					
Barium	<0.6 mg/kg	TM181	39.3	#					
Beryllium	<0.01 mg/kg	TM181	0.389	M					
Cadmium	<0.02 mg/kg	TM181	0.101	M					
Chromium	<0.9 mg/kg	TM181	7.59	M					
Copper	<1.4 mg/kg	TM181	10.5	M					
Iron	<1000 mg/kg	TM181	14100	#					
Lead	<0.7 mg/kg	TM181	16.1	M					
Manganese	<0.13 mg/kg	TM181	436	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	0.323	#					
Nickel	<0.2 mg/kg	TM181	12.1	M					
Selenium	<1 mg/kg	TM181	<1	#					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

[illegible]

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

Phenols Spec MS (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-PTR-18				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-141 24009315					
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4\$@	Sample deviation (see appendix)							
Component	LOD/Units			Method				
Dibromofluoromethane**	%	TM116	112					
Toluene-d8**	%	TM116	109					
4-Bromofluorobenzene**	%	TM116	81					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M					
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M					
Benzene	<9 µg/kg	TM116	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M					
Toluene	<7 µg/kg	TM116	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M					

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-PTR-18					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 29/03/2021 . 31/03/2021 210331-141 24009315						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M						
Styrene	<10 µg/kg	TM116	<10 #						
Bromoform	<10 µg/kg	TM116	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13 M						



CERTIFICATE OF ANALYSIS

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-PTR-18	09/04/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.20										
Sample Type	SOLID										
Date Sampled	29/03/2021 00:00:00										
Date Received	31/03/2021 13:15:00										
SDG	210331-141										
Original Sample	24009315										
Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
SUB		Subcontracted Test
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM072	Modified: US EPA Method 8141A	Determination of Phenols by GC-MS
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24009315
Customer Sample Ref.	BH-PTR-18
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
Anions by Kone (soil)	09-Apr-2021
Asbestos ID in Solid Samples	09-Apr-2021
Boron Water Soluble	09-Apr-2021
Chromium III	13-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	09-Apr-2021
EPH CWG GC (S)	08-Apr-2021
GRO by GC-FID (S)	09-Apr-2021
Hexavalent Chromium (s)	13-Apr-2021
Loss on Ignition in soils	08-Apr-2021
Metals in solid samples by OES	13-Apr-2021
PAH by GCMS	09-Apr-2021
pH	08-Apr-2021
Phenols by HPLC (S)	08-Apr-2021
Phenols Spec MS (S)	13-Apr-2021
Sample description	01-Apr-2021
Speciated Mercury*	21-Apr-2021
Total Organic Carbon	12-Apr-2021
Total Sulphate	12-Apr-2021
TPH CWG GC (S)	09-Apr-2021
VOC MS (S)	12-Apr-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2477
Chloride (soluble)	TM243	154.92 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	159.81 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2415
Water Soluble Boron	TM222	106.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2434
Free Cyanide	TM153	83.17 79.00 : 115.00
Thiocyanate	TM153	94.23 94.09 : 113.89
Total Cyanide	TM153	86.71 73.07 : 107.47

EPH CWG GC (S)

Component	Method Code	QC 2414
EPH >C8-C40 Raw	TM414	95.65 72.57 : 112.44
Total Aliphatics Raw	TM414	100.77 72.68 : 112.55
Total Aromatics Raw	TM414	113.07 58.44 : 124.94

GRO by GC-FID (S)

Component	Method Code	QC 2452
QC	TM089	88.08 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2419
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2435
Loss on Ignition	TM018	95.73 87.10 : 102.39

Metals in solid samples by OES

Component	Method Code	QC 2465
Aluminium	TM181	97.35 73.56 : 108.85
Antimony	TM181	101.63 76.89 : 111.24
Arsenic	TM181	102.33 88.53 : 111.01
Barium	TM181	97.25 77.67 : 105.35
Beryllium	TM181	101.49 85.44 : 109.61
Boron	TM181	92.55 73.51 : 104.66
Cadmium	TM181	100.41 77.67 : 104.12
Chromium	TM181	91.48 79.64 : 105.83
Cobalt	TM181	92.14 84.60 : 104.13
Copper	TM181	102.46 82.40 : 105.45
Iron	TM181	97.62 82.95 : 110.58
Lead	TM181	95.27 78.24 : 104.05
Manganese	TM181	107.5 94.29 : 119.51
Mercury	TM181	96.86 83.16 : 107.81
Molybdenum	TM181	100.82 87.11 : 106.87
Nickel	TM181	93.4 80.26 : 102.28
Phosphorus	TM181	107.47 94.56 : 124.28
Selenium	TM181	101.18 82.28 : 110.48
Strontium	TM181	95.77 79.13 : 102.79
Thallium	TM181	102.21 82.94 : 111.86
Tin	TM181	102.66 86.72 : 110.03
Titanium	TM181	84.73 66.23 : 102.06

Metals in solid samples by OES

		QC 2465
Vanadium	TM181	100.37 86.19 : 109.45
Zinc	TM181	102.05 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2428
Acenaphthene	TM218	90.0 73.47 : 109.80
Acenaphthylene	TM218	91.0 70.00 : 130.00
Anthracene	TM218	92.0 68.68 : 111.89
Benz(a)anthracene	TM218	92.5 68.12 : 118.39
Benzo(a)pyrene	TM218	105.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	102.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	99.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	104.5 73.10 : 117.03
Chrysene	TM218	92.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	110.0 67.32 : 121.35
Fluoranthene	TM218	84.0 75.16 : 117.28
Fluorene	TM218	88.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	107.5 68.91 : 117.62
Naphthalene	TM218	90.0 72.12 : 106.18
Phenanthrene	TM218	82.5 69.01 : 113.72
Pyrene	TM218	89.0 64.28 : 115.75

pH

Component	Method Code	QC 2414
pH	TM133	100.66 99.08 : 102.24

Phenols by HPLC (S)

Phenols by HPLC (S)

Component	Method Code	QC 2469
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.95 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	49.27 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	50.33 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	49.58 88.23 : 104.42

Total Organic Carbon

Component	Method Code	QC 2451
Total Organic Carbon	TM132	103.52 87.02 : 113.45

Total Sulphate

Component	Method Code	QC 2415
Total Sulphate	TM221	98.48 70.62 : 121.50

VOC MS (S)

Component	Method Code	QC 2499	QC 2404
1,1,1,2-tetrachloroethane	TM116	98.6 79.10 : 119.66	99.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	98.6 84.25 : 112.57	101.0 73.73 : 118.05
1,1,2-Trichloroethane	TM116	88.6 81.29 : 113.79	96.0 77.12 : 116.04
1,1-Dichloroethane	TM116	108.4 86.77 : 122.11	106.6 74.46 : 129.15
1,2-Dichloroethane	TM116	101.6 90.04 : 132.28	107.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	101.4 80.81 : 125.07	100.0 83.64 : 126.18
2-Chlorotoluene	TM116	96.6 73.13 : 114.13	94.2 76.03 : 113.25
4-Chlorotoluene	TM116	91.0 68.66 : 109.13	90.6 66.90 : 112.46
Benzene	TM116	101.4 84.29 : 112.22	103.2 88.60 : 113.80
Carbon Disulphide	TM116	99.6 75.11 : 124.81	100.0 74.91 : 122.14
Carbontetrachloride	TM116	98.6 82.35 : 126.46	103.0 80.31 : 124.50

VOC MS (S)

		QC 2499	QC 2404
Chlorobenzene	TM116	101.6 82.88 : 122.42	100.2 83.81 : 114.18
Chloroform	TM116	105.2 90.35 : 120.38	106.6 87.40 : 122.49
Chloromethane	TM116	127.8 67.89 : 143.51	109.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	105.0 78.27 : 128.90	105.2 80.67 : 126.72
Dibromomethane	TM116	89.8 76.00 : 120.73	94.8 73.23 : 118.35
Dichloromethane	TM116	112.0 92.27 : 134.36	109.6 81.11 : 133.25
Ethylbenzene	TM116	95.8 70.95 : 113.07	93.4 75.92 : 110.41
Hexachlorobutadiene	TM116	61.6 14.55 : 147.92	72.4 12.82 : 152.73
Isopropylbenzene	TM116	88.2 52.00 : 108.19	85.4 55.79 : 97.59
Naphthalene	TM116	96.0 80.29 : 135.77	96.4 80.86 : 128.81
o-Xylene	TM116	95.4 64.92 : 98.85	90.6 69.99 : 108.74
p/m-Xylene	TM116	87.6 69.47 : 97.31	88.7 68.32 : 108.91
Sec-Butylbenzene	TM116	88.8 27.03 : 135.73	80.0 38.50 : 101.50
Tetrachloroethene	TM116	104.4 81.43 : 126.65	100.2 76.95 : 121.02
Toluene	TM116	98.2 82.44 : 103.50	94.8 74.24 : 107.42
Trichloroethene	TM116	93.8 79.80 : 112.33	97.2 85.28 : 109.36
Trichlorofluoromethane	TM116	89.4 89.67 : 132.09	101.6 84.55 : 133.27
Vinyl Chloride	TM116	102.2 69.66 : 136.55	112.8 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

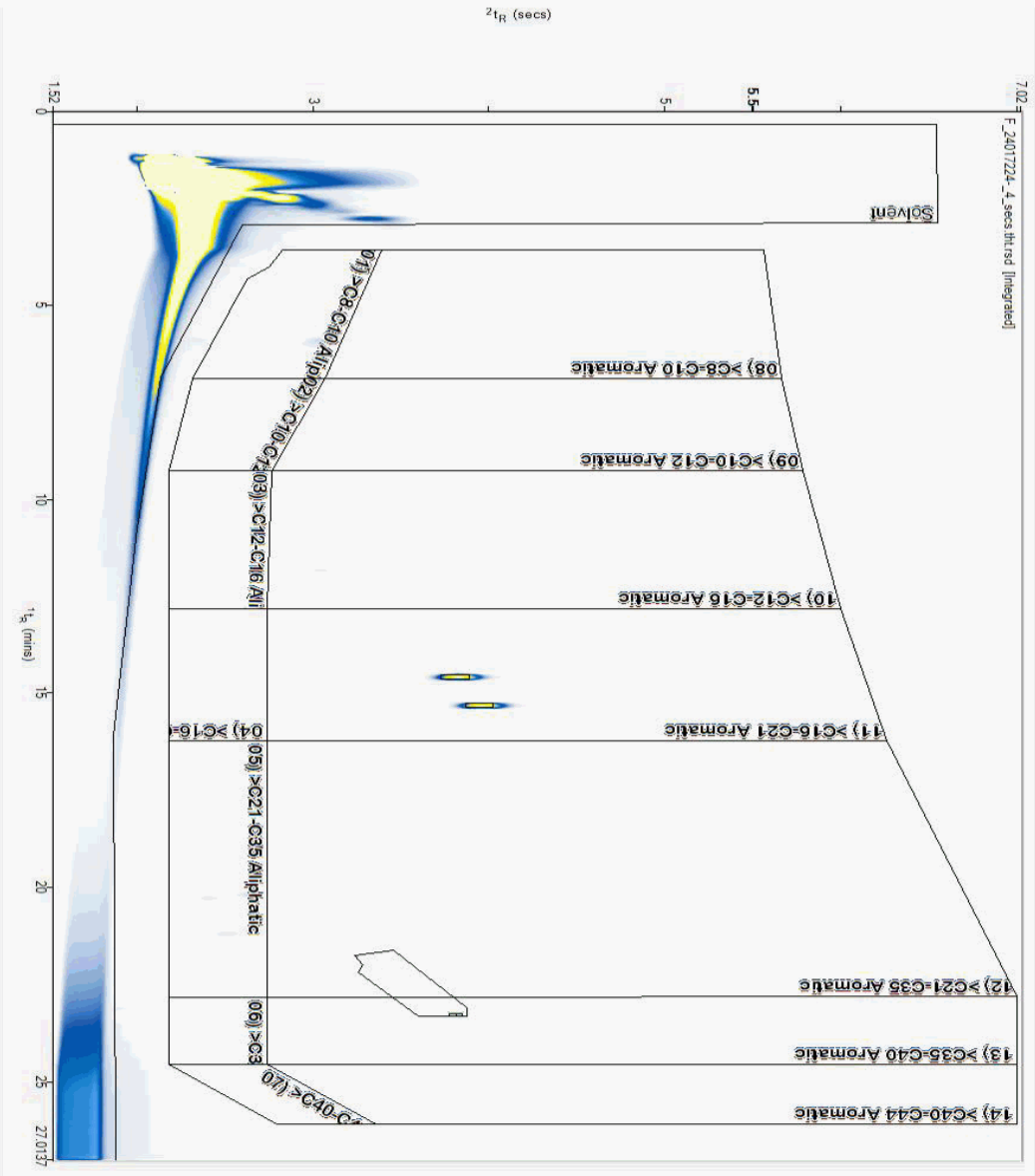
Validated

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24017224 Depth : 0.20
Sample ID : BH-PTR-18

ChromSpace LIMS export
Current batch
Sample Identity: F_24017224-4_secs.tht
Date Acquired : 07/04/21 04:26:52
Units : ppm
Dilution : 0
CF :
Multiplier :



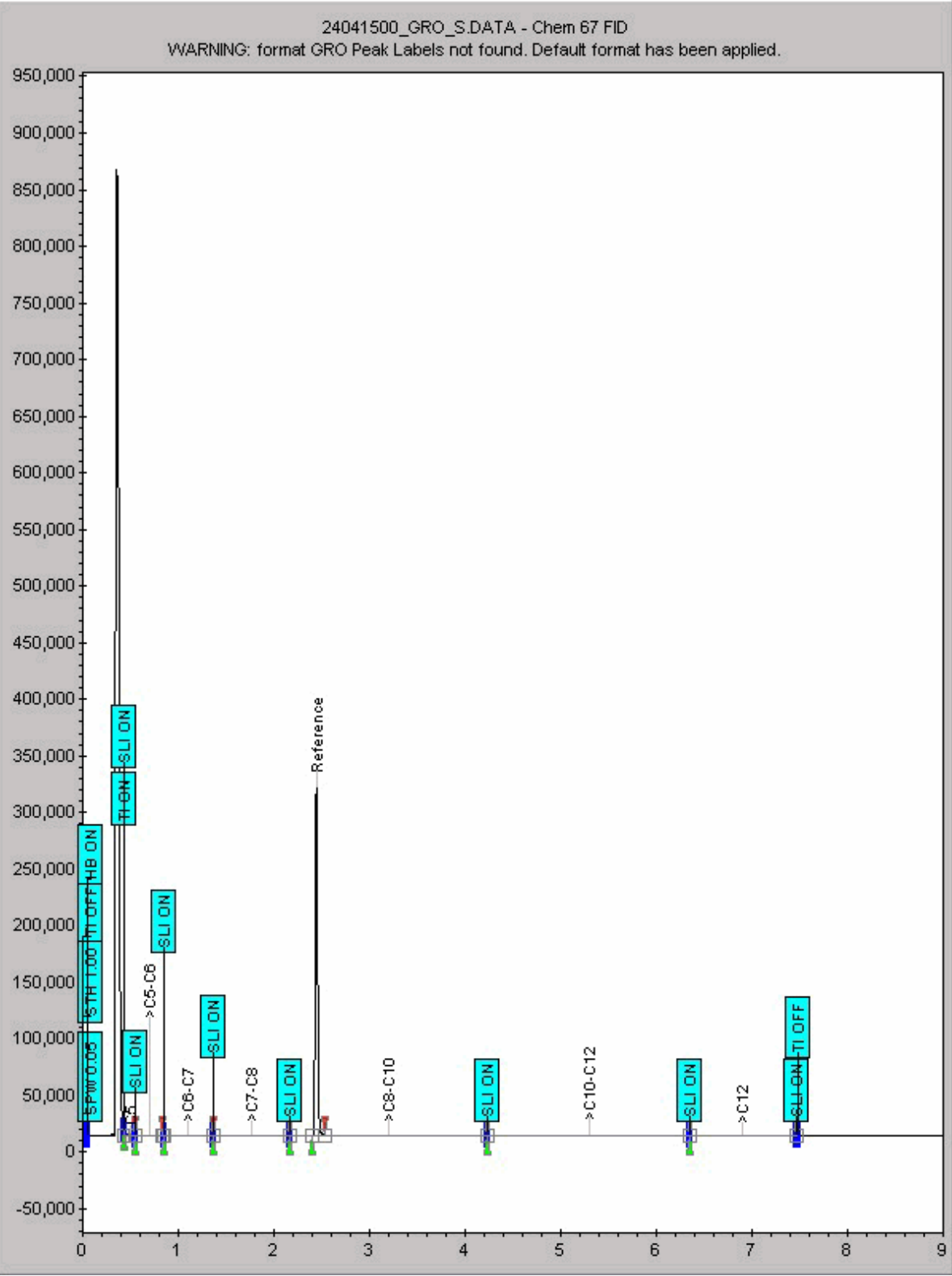
CERTIFICATE OF ANALYSIS

Validated

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	593866

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24041500 Depth : 0.20
Sample ID : BH-PTR-18



Summary of Chemical Analysis

Soil Samples

Our Ref 21-07246
Client Ref 210331-141
Contract Title

Certificate Number 21-07246

Issued: 21-Apr-21

Client ALS Life Sciences Limited
Units 7 & 8
Hawarden Business Park
Manor Road
Hawarden
Deeside
CH5 3US

Our Reference 21-07246

Client Reference 210331-141

Order No 210331-141

Contract Title (not supplied)

Description One Soil sample.

Date Received 08-Apr-21

Date Started 08-Apr-21

Date Completed 21-Apr-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Lab No	1828261
Sample ID	BH-PTR-18
Depth	0.20
Other ID	24017032
Sample Type	SOIL
Sampling Date	29/03/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Mercury (Elemental)	DETSC 2333*	0.0006	mg/kg	< 0.0006
Mercury (Inorganic)	DETSC 2332*	0.1	mg/kg	0.1
Mercury (Methyl)	DETSC 2332*	0.1	mg/kg	< 0.10
Mercury	DETSC 2325#	0.05	mg/kg	0.15



Information in Support of the Analytical Results

Our Ref 21-07246
Client Ref 210331-141
Contract

Containers Received & Deviating Samples

		Date	Holding time	Inappropriate
Lab No	Sample ID	Sampled	exceeded for	container for
		Containers Received	tests	tests
1828261	BH-PTR-18 0.20 SOIL	29/03/21	GJ 250ml	
Key: G-Glass J-Jar				
DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.				

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



CERTIFICATE OF ANALYSIS

SDG:	210331-141	Client Reference:	B025563	Report Number:	594998
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	593866

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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CERTIFICATE OF ANALYSIS					Validated
SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24017947	TP-PTR-20 ES		1.00	30/03/2021
24017945	TP-PTR-20 ES1		0.10	30/03/2021
24017946	TP-PTR-20 ES2		0.20	30/03/2021
24017942	TP-PTR-23 ES1		0.10	30/03/2021
24017943	TP-PTR-23 ES2		0.20	30/03/2021
24017944	TP-PTR-23 ES8		1.30	30/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 13 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210402-18
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 593939

We received 6 samples on Thursday April 01, 2021 and 2 of these samples were scheduled for analysis which was completed on Tuesday April 13, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-18 Client Reference: B025563 Report Number: 593939
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div>	Lab Sample No(s)		24017946	24017942
	Customer Sample Reference		TP-PTR-20 ES2	TP-PTR-23 ES1
	AGS Reference			
	Depth (m)		0.20	0.10
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215) 1kg TUB with Handle (ALE260)
	Sample Type		S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other				
Ammonium Low	All	NDPs: 0 Tests: 1	X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2	X	X
CEN Readings	All	NDPs: 0 Tests: 1	X	
Chromium III	All	NDPs: 0 Tests: 2	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
Fluoride	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X	X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-18 Client Reference: B025563 Report Number: 593939
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div>	Lab Sample No(s)		24017946	24017942
	Customer Sample Reference		TP-PTR-20 ES2	TP-PTR-23 ES1
	AGS Reference			
	Depth (m)		0.20	0.10
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215) 1kg TUB with Handle (ALE260)
	Sample Type		S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other				
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X	
Mercury Dissolved	All	NDPs: 0 Tests: 1	X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X	X
PAH by GCMS	All	NDPs: 0 Tests: 2	X	X
pH	All	NDPs: 0 Tests: 2	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X	
Sample description	All	NDPs: 0 Tests: 2	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 2	X	X
Total Sulphur	All	NDPs: 0 Tests: 2	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X	X
VOC MS (S)	All	NDPs: 0 Tests: 2	X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24017946	TP-PTR-20 ES2	0.20	Dark Brown	Sand	Stones	Vegetation
24017942	TP-PTR-23 ES1	0.10	Dark Brown	Sand	Vegetation	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-PTR-20 ES2	TP-PTR-23 ES1				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20	0.10				
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		30/03/2021	30/03/2021				
dis.filt	Dissolved / filtered sample.		01/04/2021	01/04/2021				
tot.unfilt	Total / unfiltered sample.		210402-18	210402-18				
*	Subcontracted - refer to subcontractor report for accreditation status.		24017946	24017942				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	13	12				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0389	0.0203				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0124	0.00969				
pH	1 pH Units	TM133	8.11	8.76				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	5.35	8.91				
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6				
Arsenic	<0.6 mg/kg	TM181	9.54	7.67				
Barium	<0.6 mg/kg	TM181	55.4	49.8				
Beryllium	<0.01 mg/kg	TM181	0.419	0.448				
Cadmium	<0.02 mg/kg	TM181	0.186	0.109				
Chromium	<0.9 mg/kg	TM181	5.35	8.91				
Copper	<1.4 mg/kg	TM181	10.4	10.7				
Iron	<1000 mg/kg	TM181	14900	13400				
Lead	<0.7 mg/kg	TM181	18.6	15.2				
Manganese	<0.13 mg/kg	TM181	481	627				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.377	0.293				
Nickel	<0.2 mg/kg	TM181	11.7	13.1				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	18.9	21.9				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	TP-PTR-20 ES2	TP-PTR-23 ES1				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 30/03/2021 . 01/04/2021 210402-18 24017946	0.10 Soil/Solid (S) 30/03/2021 . 01/04/2021 210402-18 24017942				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4&6	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	111	108					
			2						
Toluene-d8**	%	TM116	95.7	97.2					
			2						
4-Bromofluorobenzene**	%	TM116	77	88.8					
			2						
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 2 M	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 2 #	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 2 M	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 2 M	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 2 M	<10 M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6 2 M	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 2 #	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 2 M	<7 M					
Dichloromethane	<10 µg/kg	TM116	22.3 2 #	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 2 M	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 2 M	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 2 M	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 2 M	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10 2	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 2 M	<10 M					
Chloroform	<8 µg/kg	TM116	<8 2 M	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 2 M	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 2 M	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 2 M	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 2 M	<5 M					
Benzene	<9 µg/kg	TM116	<9 2 M	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 2 #	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 2 M	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 2 M	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 2 M	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 2 M	<10 M					
Toluene	<7 µg/kg	TM116	<7 2 M	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10 2	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 2 M	<10 M					

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-20 ES2	TP-PTR-23 ES1				
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. " % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4\$@ Sample deviation (see appendix)		0.20 Soil/Solid (S) 30/03/2021 . 01/04/2021 210402-18 24017946	0.10 Soil/Solid (S) 30/03/2021 . 01/04/2021 210402-18 24017942				
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 2 M	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 2 M	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 2 M	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 2 M	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 2 M	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 2 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 2 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 2 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 2 M	<10 M				
Styrene	<10 µg/kg	TM116	<10 2 #	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 2 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 2 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 2 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 2 M	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 2 M	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 2 M	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 2 M	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 2 M	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 2 M	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 2 M	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 2 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10 2	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 2 M	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 2 M	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 2 M	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11 2	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 2 M	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 2 M	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 2 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20 2	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20 2	<20				
Naphthalene	<13 µg/kg	TM116	<13 2 M	<13 M				



CERTIFICATE OF ANALYSIS

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP-PTR-20 ES2 0.20 SOLID 30/03/2021 00:00:00 01/04/2021 14:20:00 210402-18 24017946 TM048	12/04/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP-PTR-23 ES1 0.10 SOLID 30/03/2021 00:00:00 01/04/2021 14:20:00 210402-18 24017942 TM048	12/04/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F		
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)	15.3		
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	86.7		
Particle Size <4mm	>95%				
Case					
SDG	210402-18				
Lab Sample Number(s)	24017946				
Sampled Date	30-Mar-2021				
Customer Sample Ref.	TP-PTR-20 ES2				
Depth (m)	0.20				

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.98	<3	49.8	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00143	<0.0005	0.0143	<0.005	-	-	-
Barium	0.00426	<0.0002	0.0426	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0211	<0.01	0.211	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	25	<0.2	250	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00115	<0.0003	0.0115	<0.003	-	-	-
Lead	0.000251	<0.0002	0.00251	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.286	<0.036	2.86	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000866	<0.0004	0.00866	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00202	<0.001	0.0202	<0.01	-	-	-
Zinc	0.00613	<0.001	0.0613	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	8.25
Conductivity (µS/cm)	118.00
Temperature (°C)	16.00
Volume Leachant (Litres)	0.887



CERTIFICATE OF ANALYSIS

Validated

SDG:210402-18Client Reference: B025563Report Number: 593939

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.103

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport - f

15.3

86.7

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210402-18

24017946

30-Mar-2021

TP-PTR-20 ES2

0.20

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Hardness dissolved

63.6

<0.65

636

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.37

<0.019

3.7

<0.19

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

07-Apr-2021

8.25

118.00

16.00

0.887



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Validated

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

16:53:09 13/04/2021

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CERTIFICATE OF ANALYSIS

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SDG: 210402-18 Client Reference: B025563 Report Number: 593939
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Test Completion Dates

Lab Sample No(s)	24017946	24017942
Customer Sample Ref.	TP-PTR-20 ES2	TP-PTR-23 ES1
AGS Ref.		
Depth	0.20	0.10
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	12-Apr-2021	
Anions by Kone (soil)	13-Apr-2021	12-Apr-2021
Anions by Kone (w)	12-Apr-2021	
Asbestos ID in Solid Samples	12-Apr-2021	12-Apr-2021
Boron Water Soluble	12-Apr-2021	12-Apr-2021
CEN 10:1 Leachate (1 Stage)	08-Apr-2021	
CEN Readings	09-Apr-2021	
Chromium III	13-Apr-2021	13-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	13-Apr-2021	13-Apr-2021
Dissolved Metals by ICP-MS	10-Apr-2021	
Dissolved Organic/Inorganic Carbon	13-Apr-2021	
EPH CWG GC (S)	13-Apr-2021	13-Apr-2021
Fluoride	12-Apr-2021	
GRO by GC-FID (S)	12-Apr-2021	09-Apr-2021
Hexavalent Chromium (s)	13-Apr-2021	13-Apr-2021
Low Level Cyanide (W)	13-Apr-2021	
Low Level Hexavalent Chromium (w)	12-Apr-2021	
Mercury Dissolved	13-Apr-2021	
Metals in solid samples by OES	13-Apr-2021	13-Apr-2021
Moisture at 105C	07-Apr-2021	
PAH by GCMS	13-Apr-2021	13-Apr-2021
pH	08-Apr-2021	08-Apr-2021
pH Value of Filtered Water	12-Apr-2021	
Phenols by HPLC (S)	12-Apr-2021	12-Apr-2021
Phenols by HPLC (W)	13-Apr-2021	
Sample description	07-Apr-2021	07-Apr-2021
Total Organic Carbon	13-Apr-2021	13-Apr-2021
Total Sulphur	09-Apr-2021	09-Apr-2021
TPH CWG GC (S)	13-Apr-2021	13-Apr-2021
VOC MS (S)	12-Apr-2021	12-Apr-2021



CERTIFICATE OF ANALYSIS

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SDG: 210402-18 Client Reference: B025563 Report Number: 593939
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2454
Ammoniacal Nitrogen as N	TM099	100.6 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2481	QC 2485
Chloride (soluble)	TM243	156.99 83.05 : 116.28	148.19 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	169.16 70.00 : 130.00	168.69 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2440
Chloride	TM184	98.6 92.93 : 115.43
Sulphate (soluble)	TM184	102.8 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2459
Water Soluble Boron	TM222	108.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2439
Free Cyanide	TM153	101.98 86.90 : 108.50
Thiocyanate	TM153	109.62 94.53 : 113.33
Total Cyanide	TM153	104.2 86.13 : 102.13

Dissolved Metals by ICP-MS

Component	Method Code	QC 2497
Aluminium	TM152	104.0 90.98 : 111.82
Antimony	TM152	101.0 90.44 : 113.04
Arsenic	TM152	103.0 88.00 : 112.00



CERTIFICATE OF ANALYSIS

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SDG:

Location:

210402-18
Cambridge South East Tra

Client Reference:

Order Number:

B025563
7000964

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593939

Dissolved Metals by ICP-MS

		QC 2497
Barium	TM152	102.17 90.20 : 111.19
Beryllium	TM152	104.17 87.77 : 113.97
Bismuth	TM152	99.17 91.90 : 112.20
Borate	TM152	106.79 88.00 : 112.00
Boron	TM152	106.67 96.48 : 114.93
Cadmium	TM152	103.17 96.43 : 110.53
Calcium	TM152	102.67 81.38 : 119.09
Chromium	TM152	102.83 91.84 : 108.67
Cobalt	TM152	103.33 88.00 : 112.00
Copper	TM152	103.83 92.47 : 118.11
Iron	TM152	103.33 92.00 : 113.00
Lead	TM152	101.5 88.00 : 112.00
Lithium	TM152	103.17 91.62 : 113.12
Magnesium	TM152	102.67 93.14 : 107.91
Manganese	TM152	102.5 95.03 : 110.58
Molybdenum	TM152	100.0 88.00 : 112.00
Nickel	TM152	103.67 88.00 : 112.00
Phosphorus	TM152	103.5 88.00 : 112.00
Potassium	TM152	102.0 93.90 : 112.36
Selenium	TM152	105.17 91.58 : 115.98
Silver	TM152	98.5 88.80 : 122.30
Sodium	TM152	102.0 94.28 : 110.71
Strontium	TM152	102.33 88.00 : 112.00
Tellurium	TM152	101.17 93.32 : 114.66
Thallium	TM152	91.67 88.00 : 112.00
Tin	TM152	101.0 92.63 : 109.70
Titanium	TM152	103.0 95.58 : 111.68



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7000964

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Dissolved Metals by ICP-MS

		QC 2497
Tungsten	TM152	99.67 81.32 : 124.72
Uranium	TM152	99.67 88.00 : 112.00
Vanadium	TM152	107.83 88.00 : 112.00
Zinc	TM152	105.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2496
Dissolved Inorganic Carbon	TM090	102.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2472
Fluoride	TM104	106.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2410	QC 2412
QC	TM089	78.4 70.34 : 111.95	79.65 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2436	QC 2454
Hexavalent Chromium	TM151	104.0 92.00 : 111.20	104.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2411
Free Cyanide - Low Level	TM279	79.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	95.25 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210402-18	Client Reference:	B025563	Report Number:	593939	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2412				
Mercury Dissolved (CVAf)	TM183	91.6 69.30 : 128.70				

Metals in solid samples by OES			
Component	Method Code	QC 2473	QC 2465
Aluminium	TM181	98.23 73.56 : 108.85	97.35 73.56 : 108.85
Antimony	TM181	96.34 76.89 : 111.24	101.63 76.89 : 111.24
Arsenic	TM181	104.65 88.53 : 111.01	102.33 88.53 : 111.01
Barium	TM181	104.59 77.67 : 105.35	97.25 77.67 : 105.35
Beryllium	TM181	105.22 85.44 : 109.61	101.49 85.44 : 109.61
Boron	TM181	91.4 73.51 : 104.66	92.55 73.51 : 104.66
Cadmium	TM181	98.77 77.67 : 104.12	100.41 77.67 : 104.12
Chromium	TM181	85.6 79.64 : 105.83	91.48 79.64 : 105.83
Cobalt	TM181	94.03 84.60 : 104.13	92.14 84.60 : 104.13
Copper	TM181	99.12 82.40 : 105.45	102.46 82.40 : 105.45
Iron	TM181	103.17 82.95 : 110.58	97.62 82.95 : 110.58
Lead	TM181	93.92 78.24 : 104.05	95.27 78.24 : 104.05
Manganese	TM181	106.39 94.29 : 119.51	107.5 94.29 : 119.51
Mercury	TM181	92.75 83.16 : 107.81	96.86 83.16 : 107.81
Molybdenum	TM181	101.23 87.11 : 106.87	100.82 87.11 : 106.87
Nickel	TM181	89.98 80.26 : 102.28	93.4 80.26 : 102.28
Phosphorus	TM181	111.11 94.56 : 124.28	107.47 94.56 : 124.28
Selenium	TM181	103.53 82.28 : 110.48	101.18 82.28 : 110.48
Strontium	TM181	92.2 79.13 : 102.79	95.77 79.13 : 102.79
Thallium	TM181	104.42 82.94 : 111.86	102.21 82.94 : 111.86
Tin	TM181	100.38 86.72 : 110.03	102.66 86.72 : 110.03
Titanium	TM181	84.73 66.23 : 102.06	84.73 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210402-18	Client Reference:	B025563	Report Number:	593939	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2473	QC 2465			
Vanadium	TM181	99.63 86.19 : 109.45	100.37 86.19 : 109.45			
Zinc	TM181	100.0 84.68 : 113.99	102.05 84.68 : 113.99			

Component	Method Code	QC 2436
Acenaphthene	TM218	90.5 73.47 : 109.80
Acenaphthylene	TM218	91.0 70.00 : 130.00
Anthracene	TM218	88.5 68.68 : 111.89
Benz(a)anthracene	TM218	108.0 68.12 : 118.39
Benzo(a)pyrene	TM218	107.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	103.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	98.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	102.0 73.10 : 117.03
Chrysene	TM218	104.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	93.0 67.32 : 121.35
Fluoranthene	TM218	114.5 75.16 : 117.28
Fluorene	TM218	88.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	99.5 68.91 : 117.62
Naphthalene	TM218	88.5 72.12 : 106.18
Phenanthrene	TM218	97.5 69.01 : 113.72
Pyrene	TM218	107.5 64.28 : 115.75

pH			
Component	Method Code	QC 2445	QC 2459
pH	TM133	100.53 99.08 : 102.24	100.92 98.71 : 102.32

pH Value of Filtered Water



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SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
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VOC MS (S)

		QC 2426	QC 2441
Trichlorofluoromethane	TM116	99.8	107.0
		80.52 : 132.12	84.55 : 133.27
Vinyl Chloride	TM116	113.2	114.2
		74.57 : 146.88	68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



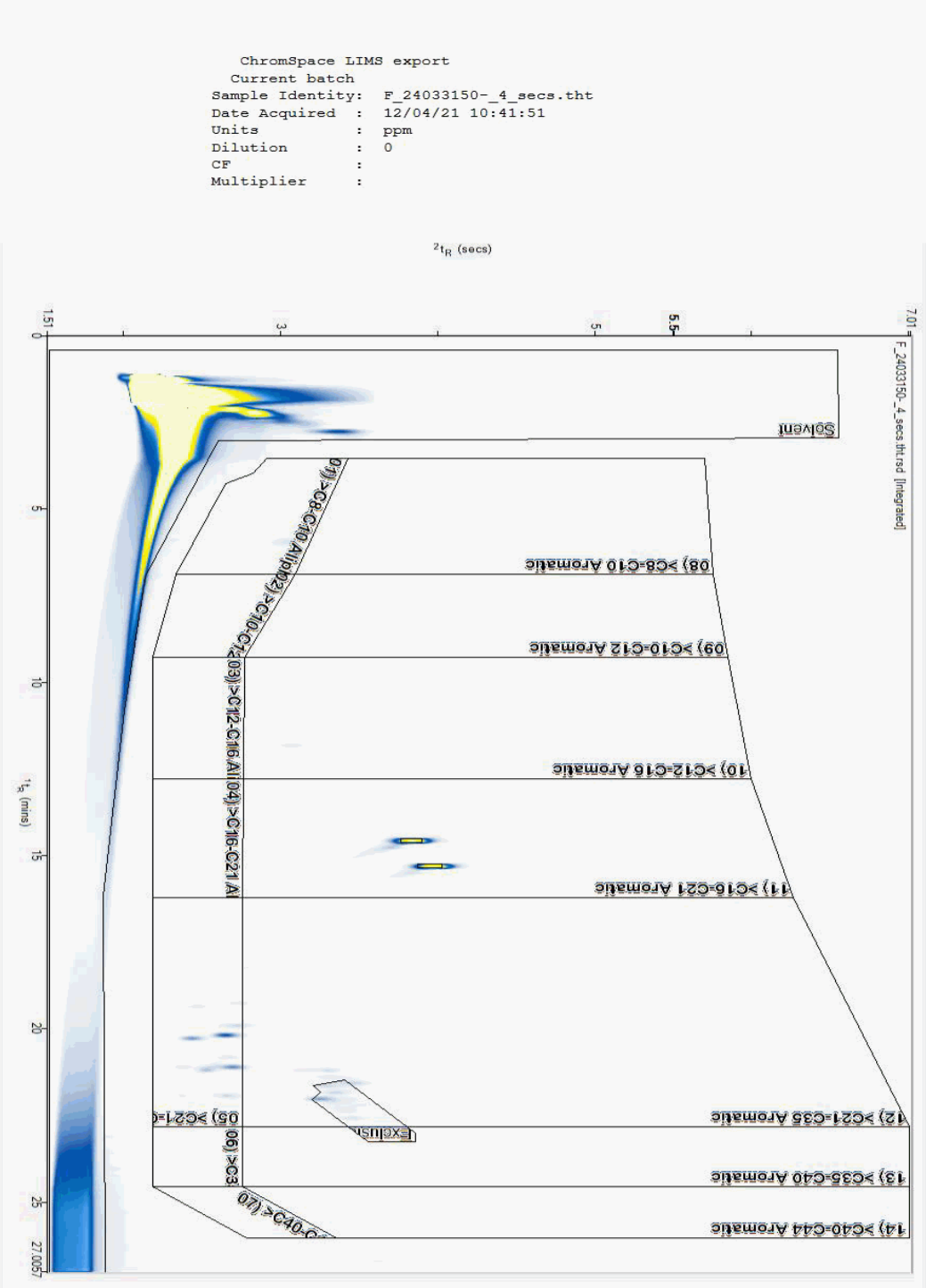
CERTIFICATE OF ANALYSIS

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SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24033150	Depth :	0.20
		Sample ID :	TP-PTR-20 ES2		

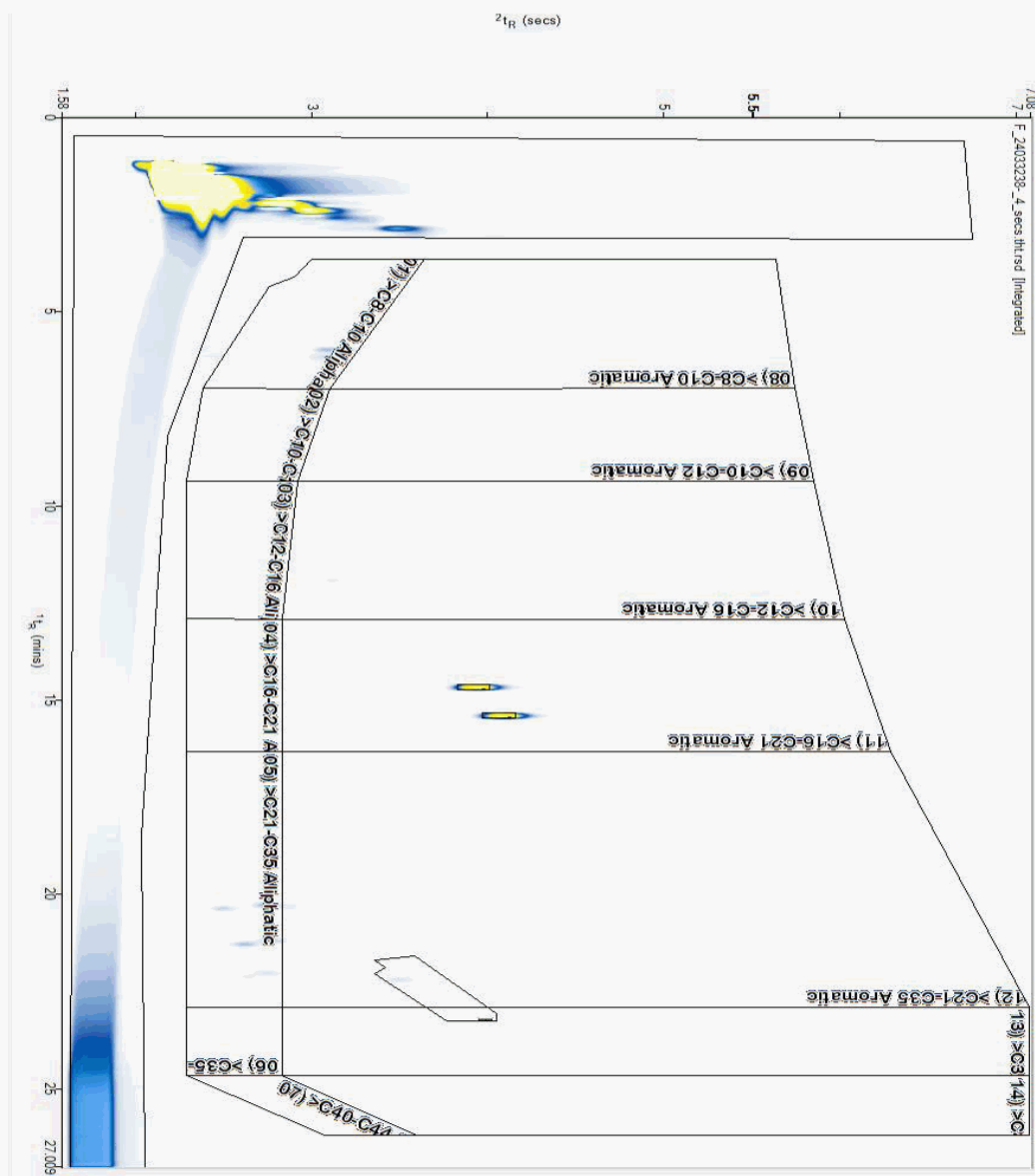


SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
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Chromatogram

Analysis: EPH CWG GC (S)	Sample No : 24033238	Depth : 0.10
	Sample ID : TP-PTR-23 ES1	

```
ChromSpace LIMS export
Current batch
Sample Identity:  F_24033238-_4_secs.tht
Date Acquired   :  13/04/21 12:23:53
Units           :  ppm
Dilution        :  0
CF               :
Multiplier      :
```



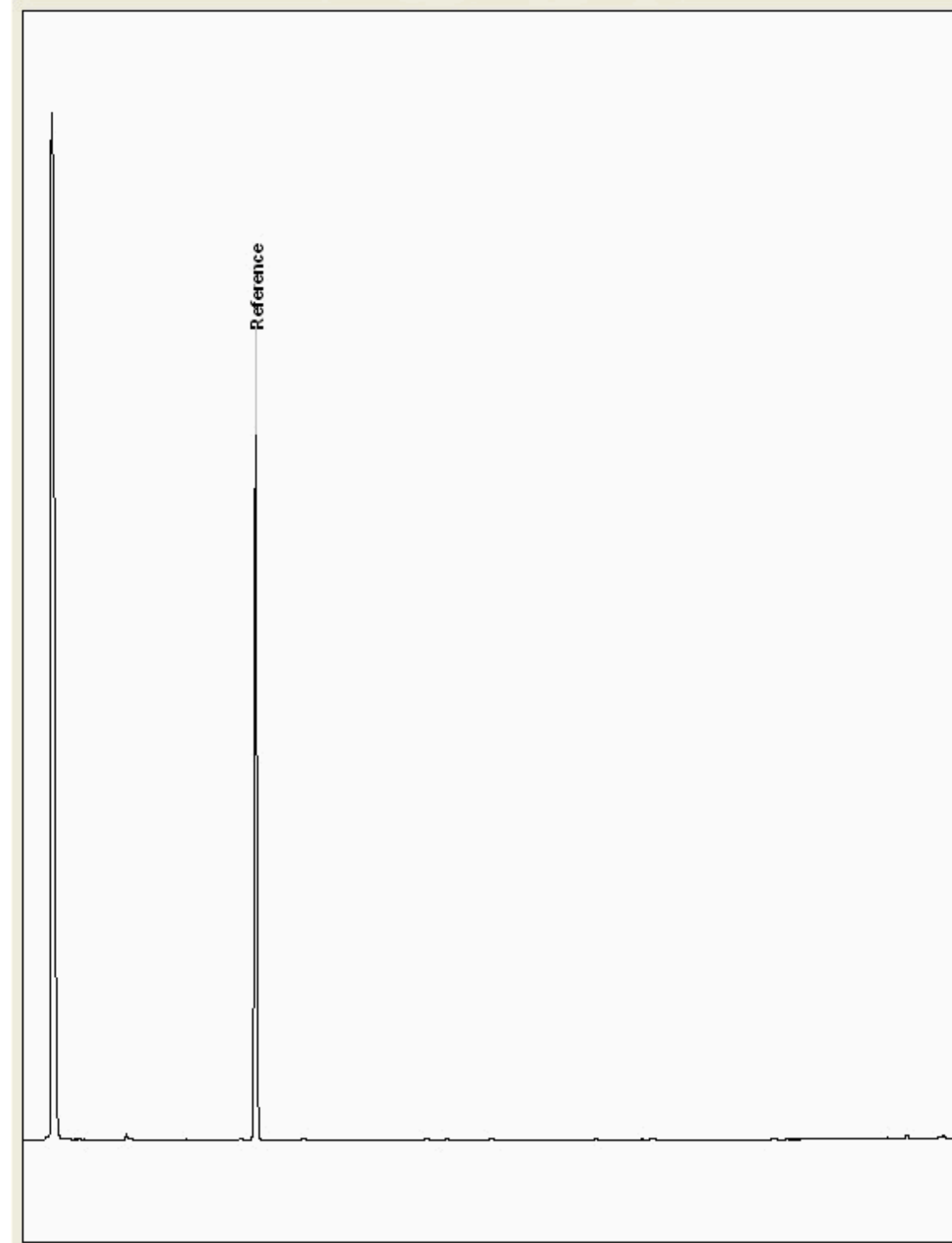
CERTIFICATE OF ANALYSIS

SDG:	210402-18	Client Reference:	B025563	Report Number:	593939
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S)	Sample No : 24047550	Depth : 0.10
	Sample ID : TP-PTR-23 ES1	

24047550 GRO S.DATA - HP6850 Signal 1





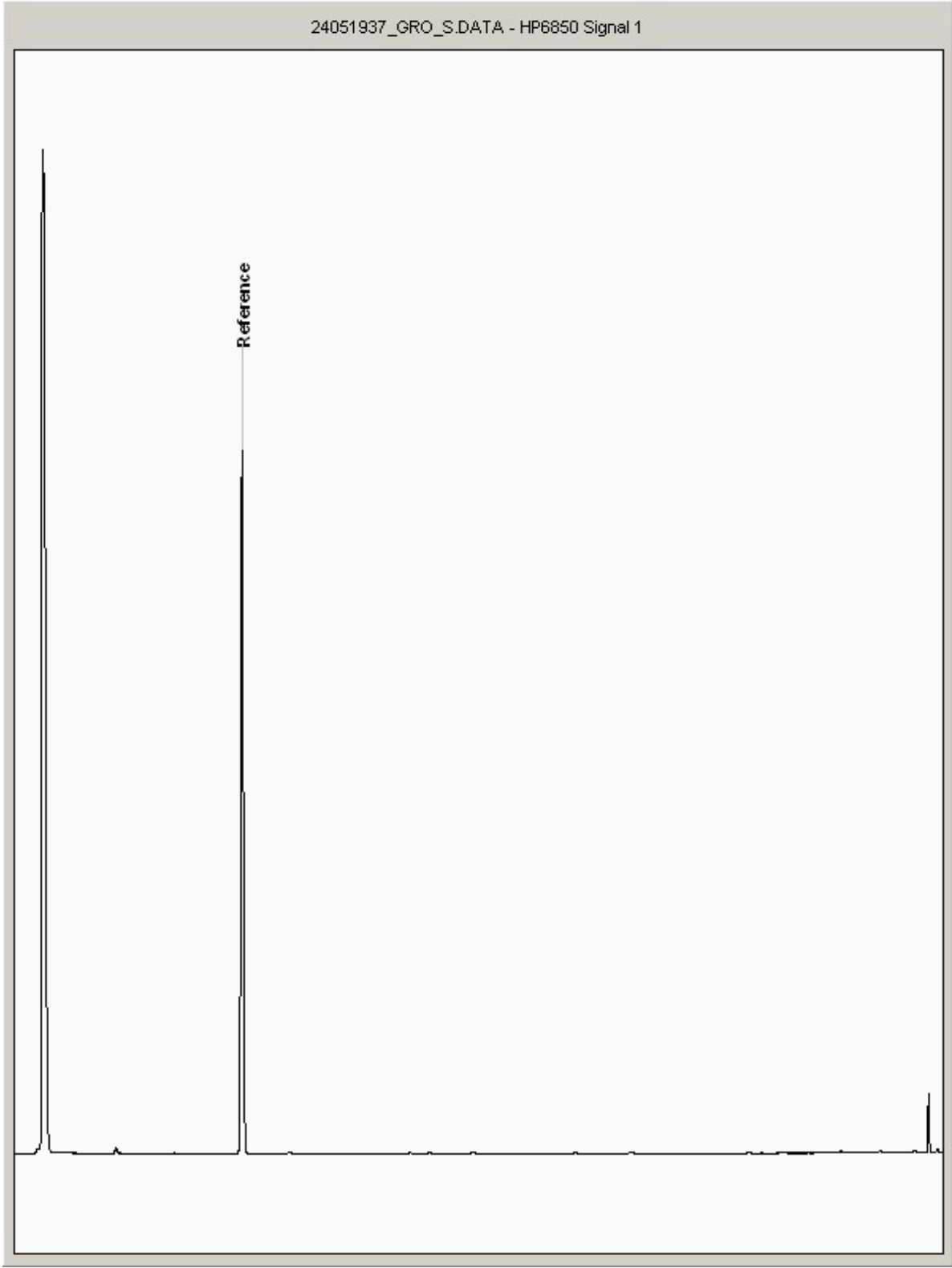
CERTIFICATE OF ANALYSIS

Validated

SDG: 210402-18 Client Reference: B025563 Report Number: 593939
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24051937 Depth : 0.20
Sample ID : TP-PTR-20 ES2



CERTIFICATE OF ANALYSIS

SDG: 210402-18 Client Reference: B025563 Report Number: 593939
Location: idge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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CERTIFICATE OF ANALYSIS

Date of report Generation: 16 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210406-45
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594450

We received 24 samples on Tuesday April 06, 2021 and 6 of these samples were scheduled for analysis which was completed on Friday April 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 **Client Reference:** B025563 **Report Number:** 594450
Location: Cambridge South East Transport - Phase 2 **Order Number:** 7000964 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24028134	BH-TH-01		0.10	31/03/2021
24028135	BH-TH-01		0.20	31/03/2021
24028136	BH-TH-01		0.50	31/03/2021
24028137	BH-TH-01		1.00	31/03/2021
24028138	BH-TH-02		0.10	31/03/2021
24028139	BH-TH-02		0.20	31/03/2021
24028140	BH-TH-02		0.50	31/03/2021
24028141	BH-TH-02		1.00	31/03/2021
24028142	BH-TH-06		0.10	31/03/2021
24028143	BH-TH-06		0.20	31/03/2021
24028144	BH-TH-06		0.50	31/03/2021
24028145	BH-TH-07		0.10	01/04/2021
24028146	BH-TH-07		0.20	01/04/2021
24028147	BH-TH-07		0.40	01/04/2021
24028157	TH01		8.80	
24028148	TP-PTR-17	ES1	0.10	31/03/2021
24028149	TP-PTR-17	ES2	0.20	31/03/2021
24028150	TP-PTR-17	ES8	1.00	31/03/2021
24028151	TP-PTR-18	ES1	0.10	31/03/2021
24028152	TP-PTR-18	ES2	0.20	31/03/2021
24028153	TP-PTR-18	ES3	1.00	31/03/2021
24028154	TP-PTR-21	ES1	0.10	31/03/2021
24028155	TP-PTR-21	ES2	0.20	31/03/2021
24028156	TP-PTR-21	ES16	1.00	31/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	24028152		TP-PTR-18		ES2		0.20		60g VOC (ALE215) 1kg TUB with Handle (ALE260)		S	
	24028145		BH-TH-07				0.10		60g VOC (ALE215) 250g Amber Jar (ALE210)		S	
	24028143		BH-TH-06				0.20		60g VOC (ALE215) 250g Amber Jar (ALE210)		S	
	24028141		BH-TH-02				1.00		1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)		S	
	24028140		BH-TH-02				0.50		60g VOC (ALE215) 250g Amber Jar (ALE210)		S	
	24028135		BH-TH-01				0.20		60g VOC (ALE215) 1kg TUB with Handle (ALE260)		S	
Ammonium Low	All	NDPs: 0 Tests: 2	X						X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 6		X		X		X	X	X		
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X						X			
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 6	X		X		X		X	X		
Boron Water Soluble	All	NDPs: 0 Tests: 6		X		X		X	X	X		
CEN Readings	All	NDPs: 0 Tests: 2	X						X			
Chromium III	All	NDPs: 0 Tests: 8	X	X		X		X	X	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6		X		X		X	X	X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X						X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X						X			
EPH CWG GC (S)	All	NDPs: 0 Tests: 6		X		X		X	X	X		
Fluoride	All	NDPs: 0 Tests: 2	X						X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6			X		X		X	X	X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 6		X		X		X		X	X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X						X			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	24028152		TP-PTR-18		ES2		0.20		60g VOC (ALE215) 1kg TUB with Handle (ALE260)		S	
	24028145		BH-TH-07				0.10		60g VOC (ALE215) 250g Amber Jar (ALE210)		S	
	24028143		BH-TH-06				0.20		60g VOC (ALE215) 250g Amber Jar (ALE210)		S	
	24028141		BH-TH-02				1.00		1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)		S	
	24028140		BH-TH-02				0.50		60g VOC (ALE215) 250g Amber Jar (ALE210)		S	
	24028135		BH-TH-01				0.20		60g VOC (ALE215) 1kg TUB with Handle (ALE260)		S	
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X						X			
Mercury Dissolved	All	NDPs: 0 Tests: 2		X					X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 6		X		X		X		X	X	
PAH by GCMS	All	NDPs: 0 Tests: 6		X		X		X		X	X	
pH	All	NDPs: 0 Tests: 6		X		X		X		X	X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X							X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 6		X		X		X		X	X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X							X		
Sample description	All	NDPs: 0 Tests: 6		X		X		X		X	X	
Total Organic Carbon	All	NDPs: 0 Tests: 6		X		X		X		X	X	
Total Sulphur	All	NDPs: 0 Tests: 6		X		X		X		X	X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 6		X		X		X		X	X	
VOC MS (S)	All	NDPs: 0 Tests: 6		X		X		X		X	X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24028135	BH-TH-01	0.20	Dark Brown	Sandy Loam	Stones	Vegetation
24028140	BH-TH-02	0.50	Light Brown	Sandy Clay Loam	Stones	Vegetation
24028141	BH-TH-02	1.00	Light Brown	Sand	Stones	None
24028143	BH-TH-06	0.20	Dark Brown	Loamy Sand	Stones	Vegetation
24028145	BH-TH-07	0.10	Dark Brown	Loamy Sand	Stones	Vegetation
24028152	TP-PTR-18	0.20	Dark Brown	Sandy Silt Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-TH-01	BH-TH-02	BH-TH-02	BH-TH-06	BH-TH-07	TP-PTR-18
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-TH-01	BH-TH-02	BH-TH-02	BH-TH-06	BH-TH-07	TP-PTR-18
M	mCERTS accredited.		0.20	0.50	1.00	0.20	0.10	0.20
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
dis.filt	Dissolved / filtered sample.		31/03/2021	31/03/2021	31/03/2021	31/03/2021	01/04/2021	31/03/2021
tot.unfilt	Total / unfiltered sample.		06/04/2021	06/04/2021	06/04/2021	06/04/2021	06/04/2021	06/04/2021
*	Subcontracted - refer to subcontractor report for accreditation status.		210406-45	210406-45	210406-45	210406-45	210406-45	210406-45
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24028135	24028140	24028141	24028143	24028145	24028152
(F)	Trigger breach confirmed							ES2
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	9.8	7.7	5.5	12	11	16
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M	<0.06 M	<0.06 M	<0.06 M	<0.06 M
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Sulphur, Total	<0.02 %	TM132	0.0246	<0.02	<0.02	0.0281	0.0256	0.0291
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00789 #	0.00209 #	<0.002 #	0.00796 #	0.00675 #	0.0104 #
pH	1 pH Units	TM133	8.45 M	8.74 M	9.09 M	8.51 M	8.48 M	8.37 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 @ M	<1 M	<1 M	<1 M	<1 M
Chromium, Trivalent	<0.9 mg/kg	TM181	9.94	12.5	5.3	8.7	9.15	8.67
Antimony	<0.6 mg/kg	TM181	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Arsenic	<0.6 mg/kg	TM181	17.5 M	19.8 M	22.7 M	11.8 M	16.4 M	6.14 M
Barium	<0.6 mg/kg	TM181	53.1 #	48.4 #	21.7 #	52.7 #	56.3 #	55 #
Beryllium	<0.01 mg/kg	TM181	0.553 M	0.685 M	0.485 M	0.497 M	0.582 M	0.43 M
Cadmium	<0.02 mg/kg	TM181	0.165 M	<0.02 M	<0.02 M	0.167 M	0.181 M	0.459 M
Chromium	<0.9 mg/kg	TM181	9.94 M	12.5 M	5.3 M	8.7 M	9.15 M	8.67 M
Copper	<1.4 mg/kg	TM181	11 M	9.23 M	7.97 M	10.9 M	11.9 M	14.6 M
Iron	<1000 mg/kg	TM181	21600 #	32600 #	36800 #	16500 #	21100 #	9430 #
Lead	<0.7 mg/kg	TM181	21.2 M	11.5 M	7.84 M	18.5 M	19.2 M	26.1 M
Manganese	<0.13 mg/kg	TM181	410 M	317 M	259 M	415 M	425 M	719 M
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Molybdenum	<0.1 mg/kg	TM181	0.492 #	0.702 #	0.929 #	0.34 #	0.497 #	0.289 #
Nickel	<0.2 mg/kg	TM181	14.2 M	21.2 M	18.7 M	11.3 M	14.2 M	11.6 M
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181	33.9 #	45.1 #	42.2 #	26 #	31.2 #	16.5 #

		Validated					
SDG: 210406-45 Location: Cambridge South East Tra		Client Reference: B025563 Order Number: 7000964		Report Number: 594450 Superseded Report:			
TPH CWG (S)		VOC MS (S)					
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>		<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>		<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>		<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>	
Customer Sample Ref.		Customer Sample Ref.		Customer Sample Ref.		Customer Sample Ref.	
BH-TH-01		BH-TH-02		BH-TH-02		BH-TH-06	
BH-TH-02		BH-TH-07		TP-PTR-18			
Depth (m)		Depth (m)		Depth (m)		Depth (m)	
Sample Type		Sample Type		Sample Type		Sample Type	
Date Sampled		Date Sampled		Date Sampled		Date Sampled	
Sampled Time		Sampled Time		Sampled Time		Sampled Time	
Date Received		Date Received		Date Received		Date Received	
SDG Ref		SDG Ref		SDG Ref		SDG Ref	
Lab Sample No.(s)		Lab Sample No.(s)		Lab Sample No.(s)		Lab Sample No.(s)	
AGS Reference		AGS Reference		AGS Reference		AGS Reference	
Component		Component		Component		Component	
LOD/Units		LOD/Units		LOD/Units		LOD/Units	
Method		Method		Method		Method	
GRO Surrogate % recovery**		Dibromofluoromethane**		Toluene-d8**		4-Bromofluorobenzene**	
Aliphatics >C5-C6		Chloromethane		Vinyl Chloride		Dichlorodifluoromethane	
Aliphatics >C6-C8		Bromomethane		Bromomethane		Chloroethane	
Aliphatics >C8-C10		Chloroethane		Trichlorofluoromethane		1,1-Dichloroethene	
Aliphatics >C10-C12		Trichlorofluoromethane		1,1-Dichloroethene		Carbon Disulphide	
Aliphatics >C12-C16		1,1-Dichloroethene		cis-1,2-Dichloroethene		Dichloromethane	
Aliphatics >C16-C21		cis-1,2-Dichloroethene		2,2-Dichloropropane		Methyl Tertiary Butyl Ether	
Aliphatics >C21-C35		2,2-Dichloropropane		Bromochloromethane		trans-1,2-Dichloroethene	
Aliphatics >C35-C44		Bromochloromethane		Chloroform		1,1-Dichloroethane	
Total Aliphatics >C10-C44		Chloroform		1,1,1-Trichloroethane		cis-1,2-Dichloroethene	
Total Aliphatics & Aromatics >C10-C44		1,1,1-Trichloroethane		1,1-Dichloropropene		2,2-Dichloropropane	
Aromatics >EC5-EC7		1,1-Dichloropropene		Carbontetrachloride		Bromochloromethane	
Aromatics >EC7-EC8		Carbontetrachloride		1,2-Dichloroethane		Chloroform	
Aromatics >EC8-EC10		1,2-Dichloroethane		Benzene		1,1,1-Trichloroethane	
Aromatics > EC10-EC12		Benzene		Trichloroethene		1,1-Dichloropropene	
Aromatics > EC12-EC16		Trichloroethene		1,2-Dichloropropane		Dibromomethane	
Aromatics > EC16-EC21		1,2-Dichloropropane		Dibromomethane		Bromodichloromethane	
Aromatics > EC21-EC35		Dibromomethane		Bromodichloromethane		cis-1,3-Dichloropropene	
Aromatics >EC35-EC44		cis-1,3-Dichloropropene		cis-1,3-Dichloropropene		Toluene	
Aromatics > EC40-EC44		Toluene		trans-1,3-Dichloropropene		1,1,2-Trichloroethane	
Total Aromatics > EC10-EC44		trans-1,3-Dichloropropene		1,1,2-Trichloroethane			
Total Aliphatics & Aromatics >C5-C44		1,1,2-Trichloroethane					
Total Aliphatics >C5-C10							
Total Aromatics >EC5-EC10							
GRO >C5-C10							
</							

		Validated				
CERTIFICATE OF ANALYSIS		CERTIFICATE OF ANALYSIS				
SDG: 210406-45 Client Reference: B025563 Report Number: 594450		SDG: 210406-45 Client Reference: B025563 Report Number: 594450				
Location: Cambridge South East TraOrder Number: 7000964		Location: Cambridge South East TraOrder Number: 7000964				
VOC MS (S)		VOC MS (S)				
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4-4@ Sample deviation (see appendix)</div>		<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4-4@ Sample deviation (see appendix)</div>				
Customer Sample Ref.		Customer Sample Ref.				
BH-TH-01		BH-TH-01				
BH-TH-02		BH-TH-02				
BH-TH-02		BH-TH-02				
BH-TH-06		BH-TH-06				
BH-TH-07		BH-TH-07				
TP-PTR-18		TP-PTR-18				
Depth (m)		Depth (m)				
Sample Type		Sample Type				
Date Sampled		Date Sampled				
Sampled Time		Sampled Time				
Date Received		Date Received				
SDG Ref		SDG Ref				
Lab Sample No.(s)		Lab Sample No.(s)				
AGS Reference		AGS Reference				
Component		Component				
LOD/Units		LOD/Units				
Method		Method				
1,3-Dichloropropane		1,3-Dichloropropane				
Tetrachloroethene		Tetrachloroethene				
Dibromochloromethane		Dibromochloromethane				
1,2-Dibromoethane		1,2-Dibromoethane				
Chlorobenzene		Chlorobenzene				
1,1,1,2-Tetrachloroethane		1,1,1,2-Tetrachloroethane				
Ethylbenzene		Ethylbenzene				
p/m-Xylene		p/m-Xylene				
o-Xylene		o-Xylene				
Styrene		Styrene				
Bromoform		Bromoform				
Isopropylbenzene		Isopropylbenzene				
1,1,2,2-Tetrachloroethane		1,1,2,2-Tetrachloroethane				
1,2,3-Trichloropropane		1,2,3-Trichloropropane				
Bromobenzene		Bromobenzene				
Propylbenzene		Propylbenzene				
2-Chlorotoluene		2-Chlorotoluene				
1,3,5-Trimethylbenzene		1,3,5-Trimethylbenzene				
4-Chlorotoluene		4-Chlorotoluene				
tert-Butylbenzene		tert-Butylbenzene				
1,2,4-Trimethylbenzene		1,2,4-Trimethylbenzene				
sec-Butylbenzene		sec-Butylbenzene				
4-Isopropyltoluene		4-Isopropyltoluene				
1,3-Dichlorobenzene		1,3-Dichlorobenzene				
1,4-Dichlorobenzene		1,4-Dichlorobenzene				
n-Butylbenzene		n-Butylbenzene				
1,2-Dichlorobenzene		1,2-Dichlorobenzene				
1,2-Dibromo-3-chloropropane		1,2-Dibromo-3-chloropropane				
Tert-amyl methyl ether		Tert-amyl methyl ether				
1,2,4-Trichlorobenzene		1,2,4-Trichlorobenzene				
Hexachlorobutadiene		Hexachlorobutadiene				
Naphthalene		Naphthalene				

		Validated				
CERTIFICATE OF ANALYSIS		CERTIFICATE OF ANALYSIS				
SDG: 210406-45 Client Reference: B025563 Report Number: 594450		SDG: 210406-45 Client Reference: B025563 Report Number: 594450				
Location: Cambridge South East TraOrder Number: 7000964		Location: Cambridge South East TraOrder Number: 7000964				
VOC MS (S)		VOC MS (S)				
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4-4@ Sample deviation (see appendix)</div>		<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. dis.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4-4@ Sample deviation (see appendix)</div>				
Customer Sample Ref.		Customer Sample Ref.				
BH-TH-01		BH-TH-01				
BH-TH-02		BH-TH-02				
BH-TH-02		BH-TH-02				
BH-TH-06		BH-TH-06				
BH-TH-07		BH-TH-07				
TP-PTR-18		TP-PTR-18				
Depth (m)		Depth (m)				
Sample Type		Sample Type				
Date Sampled		Date Sampled				
Sampled Time		Sampled Time				
Date Received		Date Received				
SDG Ref		SDG Ref				
Lab Sample No.(s)		Lab Sample No.(s)				
AGS Reference		AGS Reference				
Component		Component				
LOD/Units		LOD/Units				
Method		Method				
1,2,3-Trichlorobenzene		1,2,3-Trichlorobenzene				
1,3,5-Trichlorobenzene		1,3,5-Trichlorobenzene				
Sum of Detected Xylenes		Sum of Detected Xylenes				
Sum of BTEX		Sum of BTEX				

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH-TH-01 0.20 SOLID 31/03/2021 00:00:00 06/04/2021 08:30:00 210406-45 24028135 TM048	12.04.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH-TH-02 0.50 SOLID 31/03/2021 00:00:00 06/04/2021 08:30:00 210406-45 24028140 TM048	13/04/2021	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH-TH-02 1.00 SOLID 31/03/2021 00:00:00 06/04/2021 08:30:00 210406-45 24028141 TM048	12.04.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH-TH-06 0.20 SOLID 31/03/2021 00:00:00 06/04/2021 08:30:00 210406-45 24028143 TM048	12/04/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH-TH-07 0.10 SOLID 01/04/2021 00:00:00 06/04/2021 08:30:00 210406-45 24028145 TM048	12/04/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP-PTR-18ES2 0.20 SOLID 31/03/2021 00:00:00 06/04/2021 08:30:00 210406-45 24028152 TM048	13/04/2021	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.100	Natural Moisture Content (%)	11.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	89.6
Particle Size <4mm	>95%		

Case

SDG	210406-45
Lab Sample Number(s)	24028135
Sampled Date	31-Mar-2021
Customer Sample Ref.	BH-TH-01
Depth (m)	0.20

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.019	<0.01	0.19	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.99	<3	49.9	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00441	<0.0005	0.0441	<0.005	-	-	-
Barium	0.00359	<0.0002	0.0359	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0315	<0.01	0.315	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	17.5	<0.2	175	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00417	<0.0003	0.0417	<0.003	-	-	-
Lead	0.00123	<0.0002	0.0123	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.447	<0.036	4.47	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00541	<0.003	0.0541	<0.03	-	-	-
Nickel	0.000804	<0.0004	0.00804	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00284	<0.001	0.0284	<0.01	-	-	-
Zinc	0.00126	<0.001	0.0126	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	8.69
Conductivity (µS/cm)	82.20
Temperature (°C)	14.90
Volume Leachant (Litres)	0.890

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.100	Natural Moisture Content (%)		11.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		89.6
Particle Size <4mm	>95%			

Case

SDG	210406-45			
Lab Sample Number(s)	24028135			
Sampled Date	31-Mar-2021			
Customer Sample Ref.	BH-TH-01			
Depth (m)	0.20			

[illegible]

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	8.69
Conductivity (µS/cm)	82.20
Temperature (°C)	14.90
Volume Leachant (Litres)	0.890



SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)		12.2
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		89.2
Particle Size <4mm	>95%			

Case

SDG	210406-45			
Lab Sample Number(s)	24028145			
Sampled Date	01-Apr-2021			
Customer Sample Ref.	BH-TH-07			
Depth (m)	0.10			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.22	<3	42.2	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00231	<0.0005	0.0231	<0.005	-	-	-
Barium	0.0885	<0.0002	0.885	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.094	<0.01	0.94	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	18.2	<0.2	182	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00319	<0.0003	0.0319	<0.003	-	-	-
Lead	0.000785	<0.0002	0.00785	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.585	<0.036	5.85	<0.36	-	-	-
Manganese	0.00363	<0.003	0.0363	<0.03	-	-	-
Molybdenum	0.00793	<0.003	0.0793	<0.03	-	-	-
Nickel	0.00105	<0.0004	0.0105	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00186	<0.001	0.0186	<0.01	-	-	-
Zinc	0.00972	<0.001	0.0972	<0.01	-	-	-
Chloride	2.2	<2	22	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	07-Apr-2021
pH (pH Units)	8.29
Conductivity (µS/cm)	74.90
Temperature (°C)	19.60
Volume Leachant (Litres)	0.889

Test Completion Dates

Lab Sample No(s)	24028135	24028140	24028141	24028143	24028145	24028152
Customer Sample Ref.	BH-TH-01	BH-TH-02	BH-TH-02	BH-TH-06	BH-TH-07	TP-PTR-18
AGS Ref.						ES2
Depth	0.20	0.50	1.00	0.20	0.10	0.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	14-Apr-2021				14-Apr-2021	
Anions by Kone (soil)	14-Apr-2021	14-Apr-2021	14-Apr-2021	14-Apr-2021	14-Apr-2021	14-Apr-2021
Anions by Kone (w)	13-Apr-2021				14-Apr-2021	
Asbestos ID in Solid Samples	12-Apr-2021	13-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	13-Apr-2021
Boron Water Soluble	12-Apr-2021	14-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	13-Apr-2021
CEN 10:1 Leachate (1 Stage)	08-Apr-2021				12-Apr-2021	
CEN Readings	09-Apr-2021				14-Apr-2021	
Chromium III	14-Apr-2021	14-Apr-2021	15-Apr-2021	15-Apr-2021	16-Apr-2021	14-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	13-Apr-2021	16-Apr-2021	13-Apr-2021	13-Apr-2021	14-Apr-2021	13-Apr-2021
Dissolved Metals by ICP-MS	14-Apr-2021				14-Apr-2021	
Dissolved Organic/Inorganic Carbon	14-Apr-2021				16-Apr-2021	
EPH CWG GC (S)	14-Apr-2021	13-Apr-2021	14-Apr-2021	14-Apr-2021	13-Apr-2021	14-Apr-2021
Fluoride	12-Apr-2021				14-Apr-2021	
GRO by GC-FID (S)	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	09-Apr-2021	13-Apr-2021
Hexavalent Chromium (s)	14-Apr-2021	14-Apr-2021	15-Apr-2021	15-Apr-2021	16-Apr-2021	14-Apr-2021
Low Level Cyanide (W)	13-Apr-2021				14-Apr-2021	
Low Level Hexavalent Chromium (w)	12-Apr-2021				14-Apr-2021	
Mercury Dissolved	13-Apr-2021				14-Apr-2021	
Metals in solid samples by OES	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	14-Apr-2021
Moisture at 105C	07-Apr-2021				07-Apr-2021	
PAH by GCMS	13-Apr-2021	13-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	13-Apr-2021
pH	08-Apr-2021	08-Apr-2021	08-Apr-2021	08-Apr-2021	08-Apr-2021	08-Apr-2021
pH Value of Filtered Water	12-Apr-2021				14-Apr-2021	
Phenols by HPLC (S)	13-Apr-2021	13-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021
Phenols by HPLC (W)	13-Apr-2021				14-Apr-2021	
Sample description	07-Apr-2021	07-Apr-2021	07-Apr-2021	07-Apr-2021	07-Apr-2021	07-Apr-2021
Total Organic Carbon	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021	13-Apr-2021
Total Sulphur	09-Apr-2021	09-Apr-2021	12-Apr-2021	09-Apr-2021	09-Apr-2021	12-Apr-2021
TPH CWG GC (S)	14-Apr-2021	13-Apr-2021	14-Apr-2021	14-Apr-2021	13-Apr-2021	14-Apr-2021
VOC MS (S)	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021	12-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2410	QC 2466
Ammoniacal Nitrogen as N	TM099	102.8 96.04 : 106.80	101.2 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2405
Chloride (soluble)	TM243	148.7 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	164.95 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2401	QC 2400
Chloride	TM184	102.0 92.93 : 115.43	96.3 91.40 : 109.10
Sulphate (soluble)	TM184	102.8 90.53 : 113.03	98.4 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2405	QC 2460	QC 2404
Water Soluble Boron	TM222	100.0 84.00 : 111.00	97.0 84.00 : 111.00	94.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2489	QC 2464	QC 2419
Free Cyanide	TM153	102.97 86.90 : 108.50	80.79 79.00 : 115.00	100.0 79.00 : 115.00
Thiocyanate	TM153	110.9 94.53 : 113.33	83.97 94.09 : 113.89	101.28 94.09 : 113.89
Total Cyanide	TM153	104.2 86.13 : 102.13	83.22 73.07 : 107.47	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2485	QC 2430	QC 2445
Aluminium	TM152	104.33 90.98 : 111.82	95.0 90.78 : 110.89	94.67 90.78 : 110.89
Antimony	TM152	102.5 90.44 : 113.04	94.17 77.22 : 119.42	92.67 77.22 : 119.42
Arsenic	TM152	103.83 88.00 : 112.00	94.33 86.77 : 107.67	93.5 86.77 : 107.67

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210406-45	Client Reference:	B025563	Report Number:	594450	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Dissolved Metals by ICP-MS						

		QC 2485	QC 2430	QC 2445
Barium	TM152	101.5 90.20 : 111.19	93.5 87.86 : 110.23	93.17 87.86 : 110.23
Beryllium	TM152	105.0 87.77 : 113.97	95.67 86.19 : 112.98	94.67 86.19 : 112.98
Bismuth	TM152	100.33 91.90 : 112.20	94.83 84.06 : 106.46	92.67 84.06 : 106.46
Borate	TM152	107.41 88.00 : 112.00	98.77 88.00 : 112.00	96.91 88.00 : 112.00
Boron	TM152	107.0 96.48 : 114.93	98.33 83.92 : 114.90	96.67 83.92 : 114.90
Cadmium	TM152	102.17 96.43 : 110.53	94.33 88.89 : 106.69	94.0 88.89 : 106.69
Calcium	TM152	102.67 81.38 : 119.09	96.67 80.24 : 117.95	98.67 80.24 : 117.95
Chromium	TM152	102.5 91.84 : 108.67	95.33 83.22 : 110.16	92.67 83.22 : 110.16
Cobalt	TM152	103.33 88.00 : 112.00	92.67 82.49 : 112.36	94.33 82.49 : 112.36
Copper	TM152	105.17 92.47 : 118.11	94.83 83.14 : 113.00	94.17 83.14 : 113.00
Iron	TM152	102.0 92.00 : 113.00	94.0 88.40 : 109.24	94.67 88.40 : 109.24
Lead	TM152	100.83 88.00 : 112.00	92.33 83.71 : 109.58	91.83 83.71 : 109.58
Lithium	TM152	104.67 91.62 : 113.12	94.17 84.50 : 114.28	93.67 84.50 : 114.28
Magnesium	TM152	101.33 93.14 : 107.91	92.0 87.56 : 114.57	91.33 87.56 : 114.57
Manganese	TM152	104.5 95.03 : 110.58	94.67 90.01 : 108.72	94.17 90.01 : 108.72
Molybdenum	TM152	98.83 88.00 : 112.00	92.83 85.53 : 107.42	92.17 85.53 : 107.42
Nickel	TM152	103.67 88.00 : 112.00	94.67 88.05 : 106.42	93.67 88.05 : 106.42
Phosphorus	TM152	104.83 88.00 : 112.00	93.83 82.76 : 107.72	91.67 82.76 : 107.72
Potassium	TM152	102.67 93.90 : 112.36	90.67 88.45 : 106.42	91.33 88.45 : 106.42
Selenium	TM152	105.33 91.58 : 115.98	92.5 85.61 : 111.03	93.0 85.61 : 111.03
Silver	TM152	99.83 88.80 : 122.30	92.5 88.48 : 110.48	92.5 88.48 : 110.48
Sodium	TM152	101.33 94.28 : 110.71	92.0 88.32 : 106.30	90.67 88.32 : 106.30
Strontium	TM152	102.0 88.00 : 112.00	94.0 83.77 : 107.87	94.33 83.77 : 107.87
Tellurium	TM152	101.83 93.32 : 114.66	92.0 82.83 : 104.73	92.17 82.83 : 104.73
Thallium	TM152	95.83 88.00 : 112.00	91.17 77.47 : 113.87	90.33 77.47 : 113.87
Tin	TM152	99.17 92.63 : 109.70	91.33 87.36 : 109.55	92.33 87.36 : 109.55
Titanium	TM152	103.67 95.58 : 111.68	93.83 87.29 : 108.31	93.33 87.29 : 108.31

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210406-45	Client Reference:	B025563	Report Number:	594450	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Dissolved Metals by ICP-MS						

		QC 2485	QC 2430	QC 2445
Tungsten	TM152	100.33 81.32 : 124.72	94.83 68.27 : 122.97	93.0 68.27 : 122.97
Uranium	TM152	100.17 88.00 : 112.00	92.67 82.46 : 105.16	91.5 82.46 : 105.16
Vanadium	TM152	109.0 88.00 : 112.00	93.17 88.43 : 114.30	89.5 88.43 : 114.30
Zinc	TM152	106.67 92.98 : 118.95	97.67 85.57 : 114.31	96.0 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2423	QC 2476
Dissolved Inorganic Carbon	TM090	108.33 93.58 : 112.28	102.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.33 96.13 : 109.53	102.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2472	QC 2469
Fluoride	TM104	106.0 96.67 : 108.67	103.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2452	QC 2468
QC	TM089	88.08 70.75 : 114.19	95.27 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2473	QC 2440
Hexavalent Chromium	TM151	106.0 92.00 : 111.20	102.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2429	QC 2450
Free Cyanide - Low Level	TM279	78.25 88.26 : 122.21	77.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.5 81.83 : 110.45	96.75 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210406-45	Client Reference:	B025563	Report Number:	594450	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2493	QC 2469			
Mercury Dissolved (CVAF)	TM183	90.3 69.30 : 128.70	99.1 69.30 : 128.70			

Metals in solid samples by OES			
Component	Method Code	QC 2450	QC 2465
Aluminium	TM181	93.81 73.56 : 108.85	95.58 73.56 : 108.85
Antimony	TM181	96.75 76.89 : 111.24	98.78 76.89 : 111.24
Arsenic	TM181	104.36 88.53 : 111.01	104.07 88.53 : 111.01
Barium	TM181	99.08 77.67 : 105.35	98.17 77.67 : 105.35
Beryllium	TM181	107.46 85.44 : 109.61	102.61 85.44 : 109.61
Boron	TM181	91.12 73.51 : 104.66	93.98 73.51 : 104.66
Cadmium	TM181	95.47 77.67 : 104.12	92.59 77.67 : 104.12
Chromium	TM181	85.6 79.64 : 105.83	90.47 79.64 : 105.83
Cobalt	TM181	93.4 84.60 : 104.13	92.14 84.60 : 104.13
Copper	TM181	99.82 82.40 : 105.45	100.7 82.40 : 105.45
Iron	TM181	96.83 82.95 : 110.58	95.24 82.95 : 110.58
Lead	TM181	93.24 78.24 : 104.05	94.14 78.24 : 104.05
Manganese	TM181	103.61 94.29 : 119.51	108.61 94.29 : 119.51
Mercury	TM181	91.06 83.16 : 107.81	101.45 83.16 : 107.81
Molybdenum	TM181	100.41 87.11 : 106.87	99.18 87.11 : 106.87
Nickel	TM181	88.02 80.26 : 102.28	94.13 80.26 : 102.28
Phosphorus	TM181	111.31 94.56 : 124.28	109.9 94.56 : 124.28
Selenium	TM181	103.14 82.28 : 110.48	104.71 82.28 : 110.48
Strontium	TM181	90.65 79.13 : 102.79	95.1 79.13 : 102.79
Thallium	TM181	104.87 82.94 : 111.86	101.77 82.94 : 111.86
Tin	TM181	97.34 86.72 : 110.03	101.52 86.72 : 110.03
Titanium	TM181	87.02 66.23 : 102.06	85.5 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210406-45	Client Reference:	B025563	Report Number:	594450	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2450	QC 2465			
Vanadium	TM181	101.1 86.19 : 109.45	101.47 86.19 : 109.45			
Zinc	TM181	99.79 84.68 : 113.99	102.05 84.68 : 113.99			

PAH by GCMS			
Component	Method Code	QC 2463	QC 2405
Acenaphthene	TM218	93.5 78.59 : 112.16	89.5 73.47 : 109.80
Acenaphthylene	TM218	92.5 75.11 : 109.01	89.5 70.00 : 130.00
Anthracene	TM218	90.5 73.99 : 113.85	86.5 68.68 : 111.89
Benz(a)anthracene	TM218	99.5 69.31 : 119.18	100.0 68.12 : 118.39
Benzo(a)pyrene	TM218	93.0 66.97 : 114.92	101.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	94.0 67.41 : 114.46	94.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	94.0 62.92 : 114.36	93.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	94.0 69.98 : 116.49	94.5 73.10 : 117.03
Chrysene	TM218	101.0 69.86 : 114.50	93.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	93.5 64.54 : 115.22	97.0 67.32 : 121.35
Fluoranthene	TM218	91.0 72.56 : 111.70	93.5 75.16 : 117.28
Fluorene	TM218	92.0 79.13 : 111.49	88.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	93.0 61.22 : 113.25	93.0 68.91 : 117.62
Naphthalene	TM218	91.0 77.96 : 110.91	81.0 72.12 : 106.18
Phenanthrene	TM218	90.5 76.83 : 113.25	87.0 69.01 : 113.72
Pyrene	TM218	90.5 72.45 : 110.77	91.0 64.28 : 115.75

pH			
Component	Method Code	QC 2459	QC 2431
pH	TM133	100.92 98.71 : 102.32	100.4 99.08 : 102.24

pH Value of Filtered Water

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
	pH Value of Filtered Water					

Component	Method Code	QC 2467	QC 2448
pH	TM256	100.53 99.33 : 102.54	100.53 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2448	QC 2445
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.25 70.71 : 116.42	53.25 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.03 64.54 : 117.79	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	50.52 74.40 : 108.98	50.94 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	50.83 76.56 : 106.38	51.46 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2436	QC 2451
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	50.0 77.41 : 127.55	95.7 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	48.0 82.77 : 126.51	89.87 82.77 : 126.51
Cresols by HPLC (W)	TM259	49.67 76.60 : 126.28	96.71 76.60 : 126.28
Napthol by HPLC (W)	TM259	49.0 75.40 : 129.40	93.75 75.40 : 129.40
Phenol by HPLC (W)	TM259	50.0 85.77 : 125.91	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	50.17 79.09 : 131.82	94.3 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2430	QC 2456
Total Organic Carbon	TM132	102.34 87.02 : 113.45	97.27 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2494	QC 2466	QC 2476
Total Sulphur %	TM132	87.05 61.64 : 114.47	69.95 61.64 : 114.47	88.6 61.64 : 114.47

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
	VOC MS (S)					

Component	Method Code	QC 2456	QC 2430	QC 2482
1,1,1,2-tetrachloroethane	TM116	95.2 84.84 : 116.25	98.6 84.84 : 116.25	103.6 86.59 : 118.97
1,1,1-Trichloroethane	TM116	97.8 73.73 : 118.05	101.0 73.73 : 118.05	106.4 86.26 : 117.53
1,1,2-Trichloroethane	TM116	92.8 77.12 : 116.04	97.8 77.12 : 116.04	94.8 75.16 : 112.70
1,1-Dichloroethane	TM116	104.0 74.46 : 129.15	106.0 74.46 : 129.15	107.4 83.27 : 122.16
1,2-Dichloroethane	TM116	108.0 92.38 : 131.65	110.8 92.38 : 131.65	105.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	98.8 83.64 : 126.18	100.4 83.64 : 126.18	120.4 82.59 : 123.23
2-Chlorotoluene	TM116	90.4 76.03 : 113.25	93.6 76.03 : 113.25	114.8 66.81 : 118.43
4-Chlorotoluene	TM116	83.8 66.90 : 112.46	88.0 66.90 : 112.46	115.2 65.88 : 114.76
Benzene	TM116	102.4 88.60 : 113.80	103.0 88.60 : 113.80	96.8 93.16 : 123.63
Carbon Disulphide	TM116	96.0 74.91 : 122.14	99.0 74.91 : 122.14	103.2 75.11 : 124.81
Carbontetrachloride	TM116	100.6 80.31 : 124.50	103.4 80.31 : 124.50	116.0 82.35 : 126.46
Chlorobenzene	TM116	96.6 83.81 : 114.18	98.0 83.81 : 114.18	104.8 85.07 : 118.13
Chloroform	TM116	104.4 87.40 : 122.49	106.8 87.40 : 122.49	102.8 88.13 : 122.71
Chloromethane	TM116	106.2 65.89 : 136.93	103.0 65.89 : 136.93	116.6 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	101.6 80.67 : 126.72	104.0 80.67 : 126.72	103.0 78.27 : 128.90
Dibromomethane	TM116	94.8 73.23 : 118.35	101.0 73.23 : 118.35	101.4 77.47 : 121.29
Dichloromethane	TM116	109.8 81.11 : 133.25	109.8 81.11 : 133.25	110.0 87.89 : 134.72
Ethylbenzene	TM116	90.0 75.92 : 110.41	92.0 75.92 : 110.41	97.6 79.92 : 110.05
Hexachlorobutadiene	TM116	62.8 12.82 : 152.73	89.4 12.82 : 152.73	90.2 16.78 : 153.29
Isopropylbenzene	TM116	82.8 55.79 : 97.59	86.2 55.79 : 97.59	97.2 64.20 : 119.59
Naphthalene	TM116	96.4 80.86 : 128.81	102.0 80.86 : 128.81	103.6 79.29 : 125.59
o-Xylene	TM116	86.2 69.99 : 108.74	88.0 69.99 : 108.74	97.6 72.86 : 102.10
p/m-Xylene	TM116	83.9 68.32 : 108.91	86.7 68.32 : 108.91	89.3 74.06 : 106.47
Sec-Butylbenzene	TM116	74.6 38.50 : 101.50	86.6 38.50 : 101.50	105.2 44.71 : 117.87
Tetrachloroethene	TM116	96.6 76.95 : 121.02	99.6 76.95 : 121.02	101.4 77.82 : 125.00
Toluene	TM116	91.6 74.24 : 107.42	93.8 74.24 : 107.42	95.2 87.82 : 116.21
Trichloroethene	TM116	97.4 85.28 : 109.36	96.4 85.28 : 109.36	98.2 79.80 : 112.33

CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2456	QC 2430	QC 2482
Trichlorofluoromethane	TM116	96.8 84.55 : 133.27	101.2 84.55 : 133.27	101.8 80.52 : 132.12
Vinyl Chloride	TM116	102.6 68.02 : 143.37	111.0 68.02 : 143.37	114.4 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

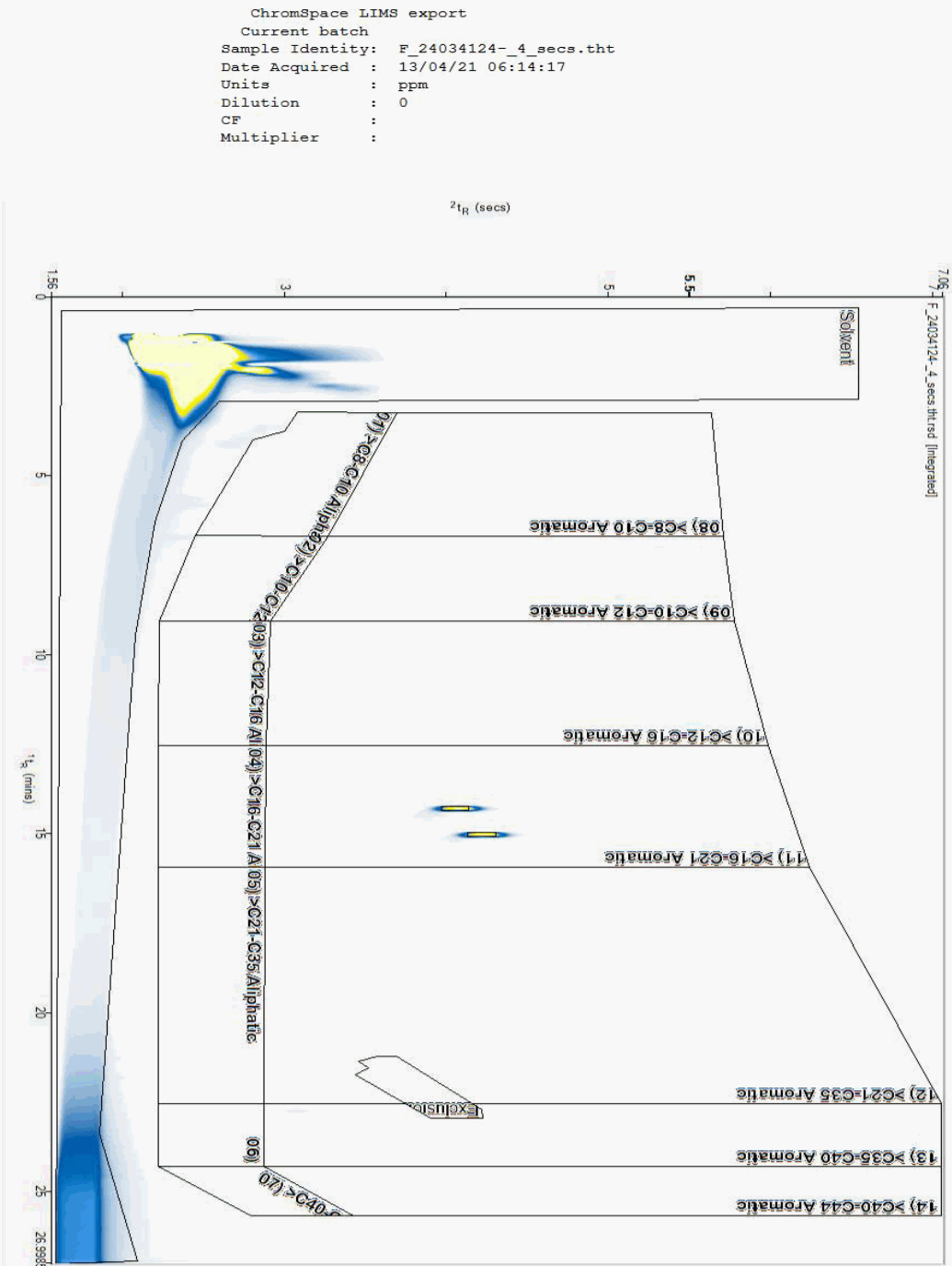
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24034124

Depth : 1.00

Sample ID : BH-TH-02





CERTIFICATE OF ANALYSIS

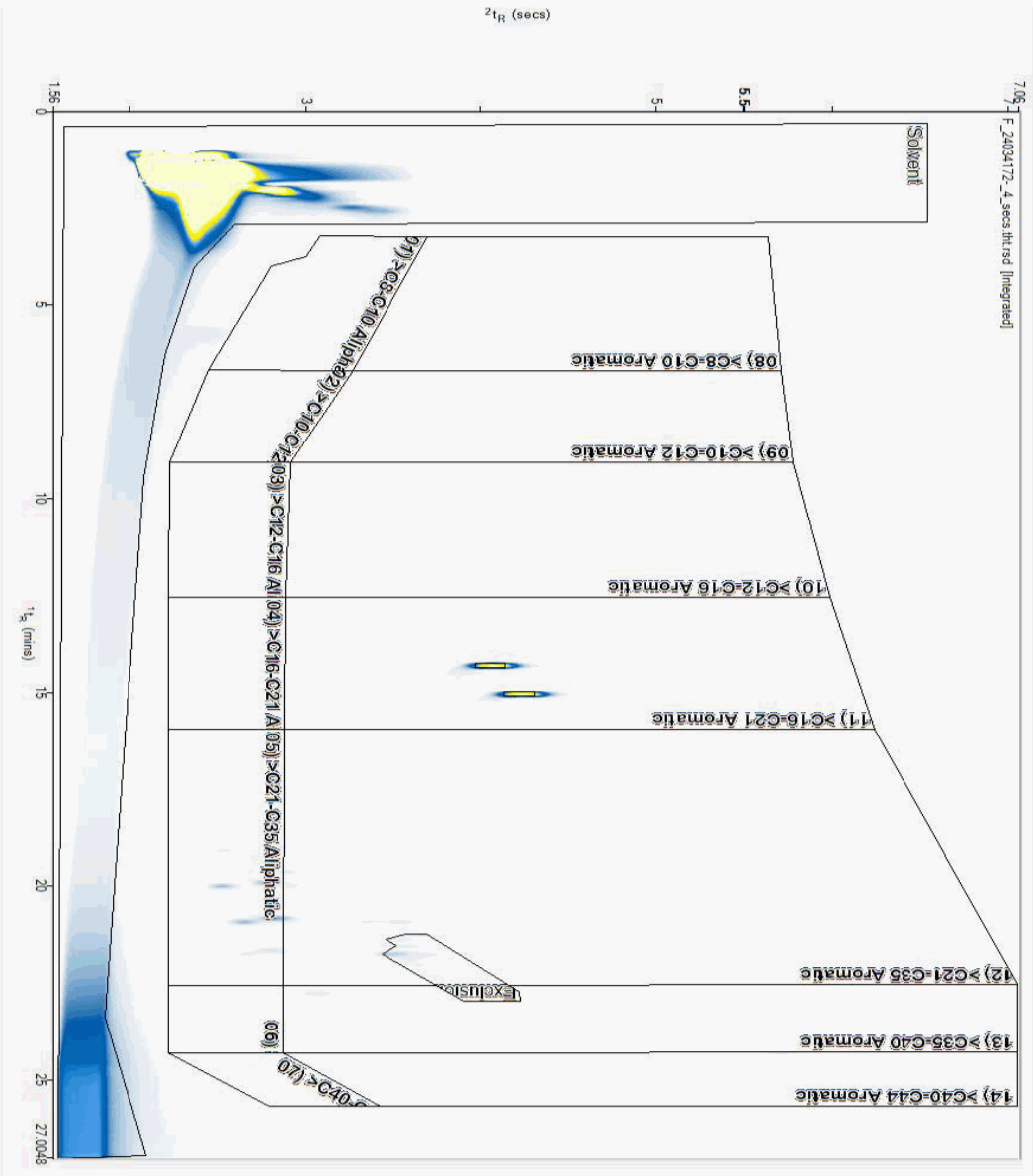
Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24034172 Depth : 0.20
Sample ID : BH-TH-01

ChromSpace LIMS export
Current batch
Sample Identity: F_24034172-4_secs.tht
Date Acquired : 13/04/21 03:06:05
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

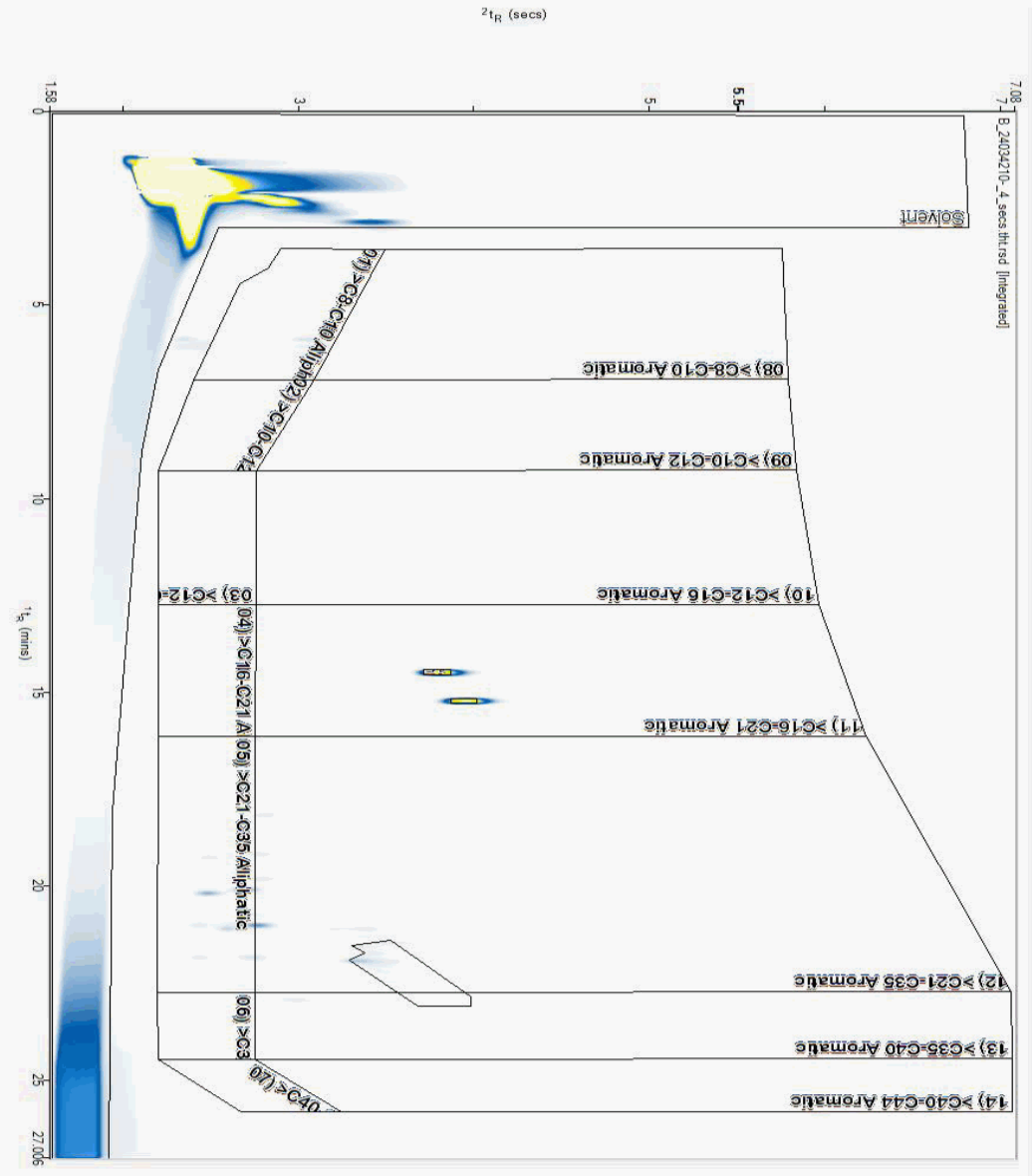
Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24034210 Depth : 0.10
Sample ID : BH-TH-07

ChromSpace LIMS export
Current batch
Sample Identity: B_24034210-4_secs.tht
Date Acquired : 12/04/21 11:38:18
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

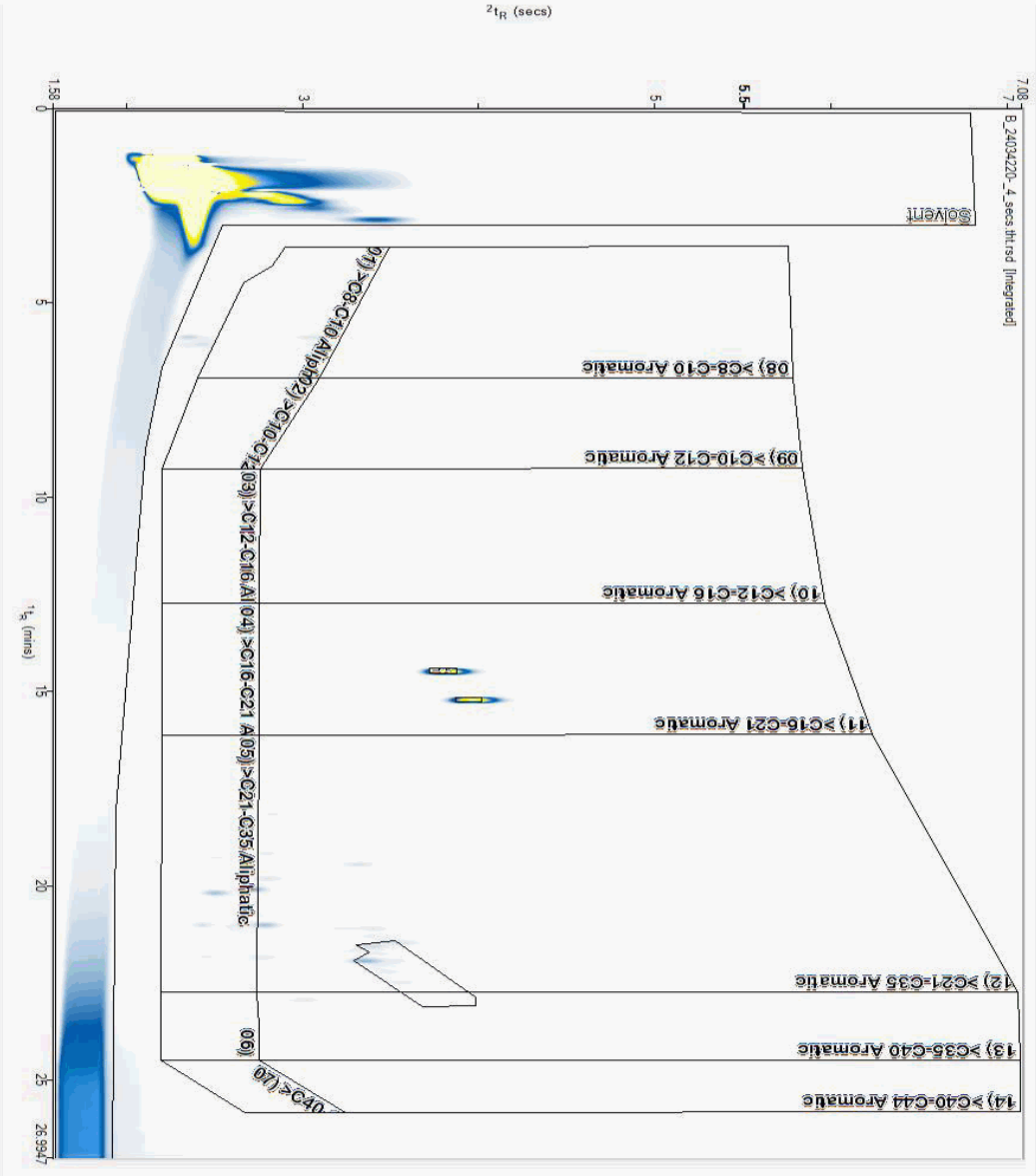
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24034220
Sample ID : TP-PTR-18

Depth : 0.20

ChromSpace LIMS export
Current batch
Sample Identity: B_24034220-4_secs.tht
Date Acquired : 13/04/21 09:53:37
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

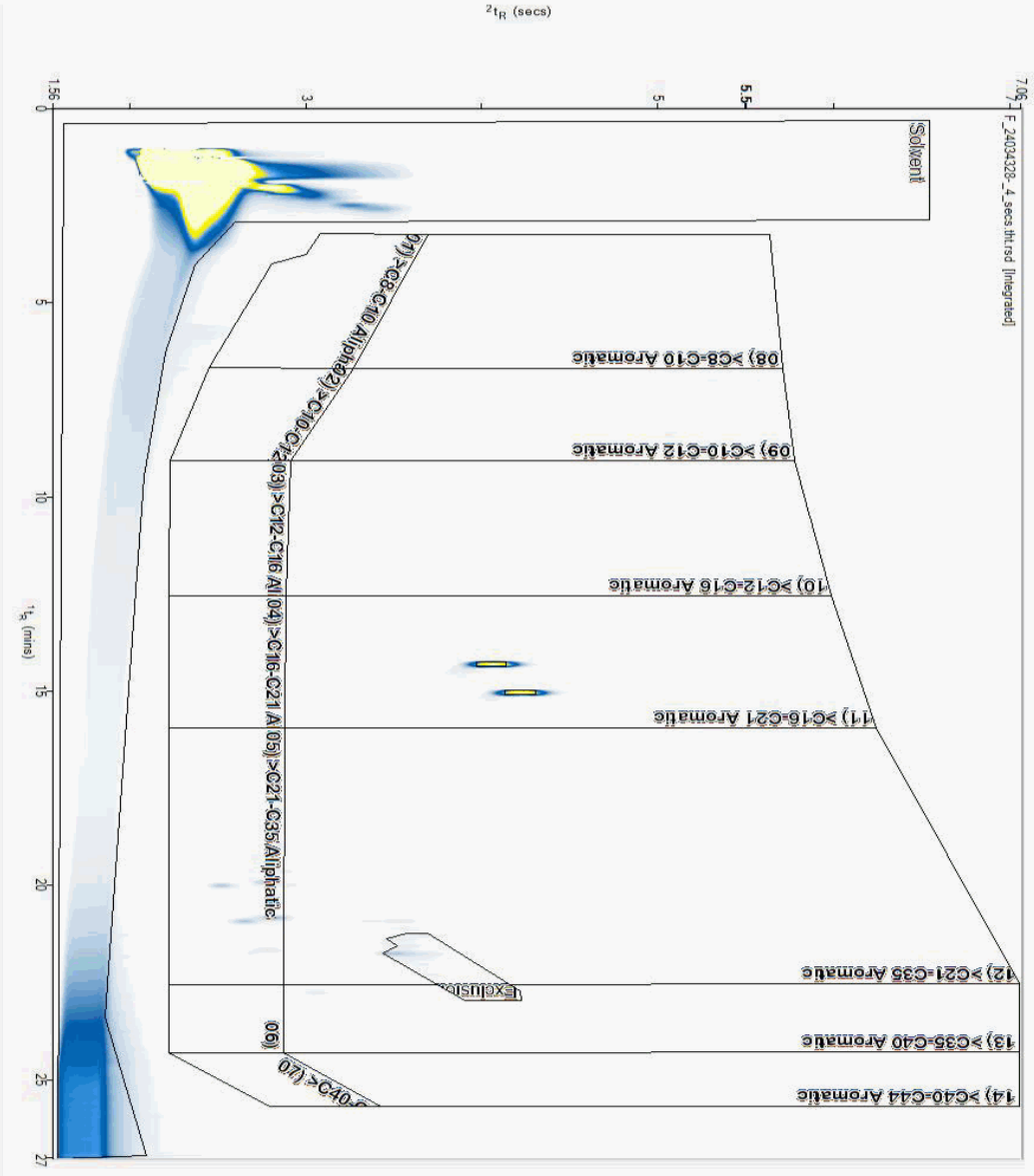
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24034328
Sample ID : BH-TH-06

Depth : 0.20

ChromSpace LIMS export
Current batch
Sample Identity: F_24034328-4_secs.tht
Date Acquired : 13/04/21 07:48:19
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

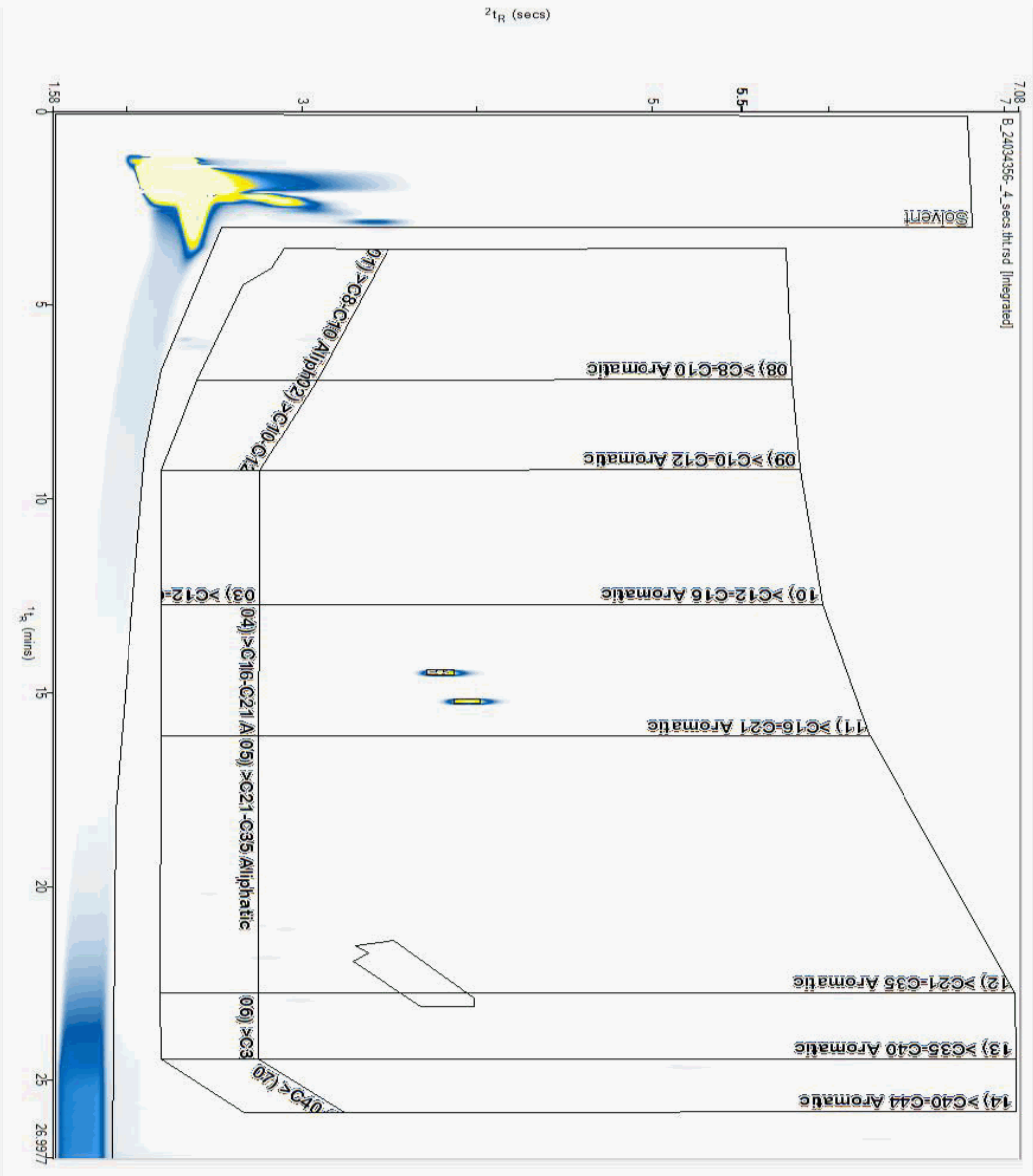
Validated

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24034356 Depth : 0.50
Sample ID : BH-TH-02

ChromSpace LIMS export
Current batch
Sample Identity: B_24034356-4_secs.tht
Date Acquired : 12/04/21 07:27:22
Units : ppm
Dilution : 0
CF :
Multiplier :



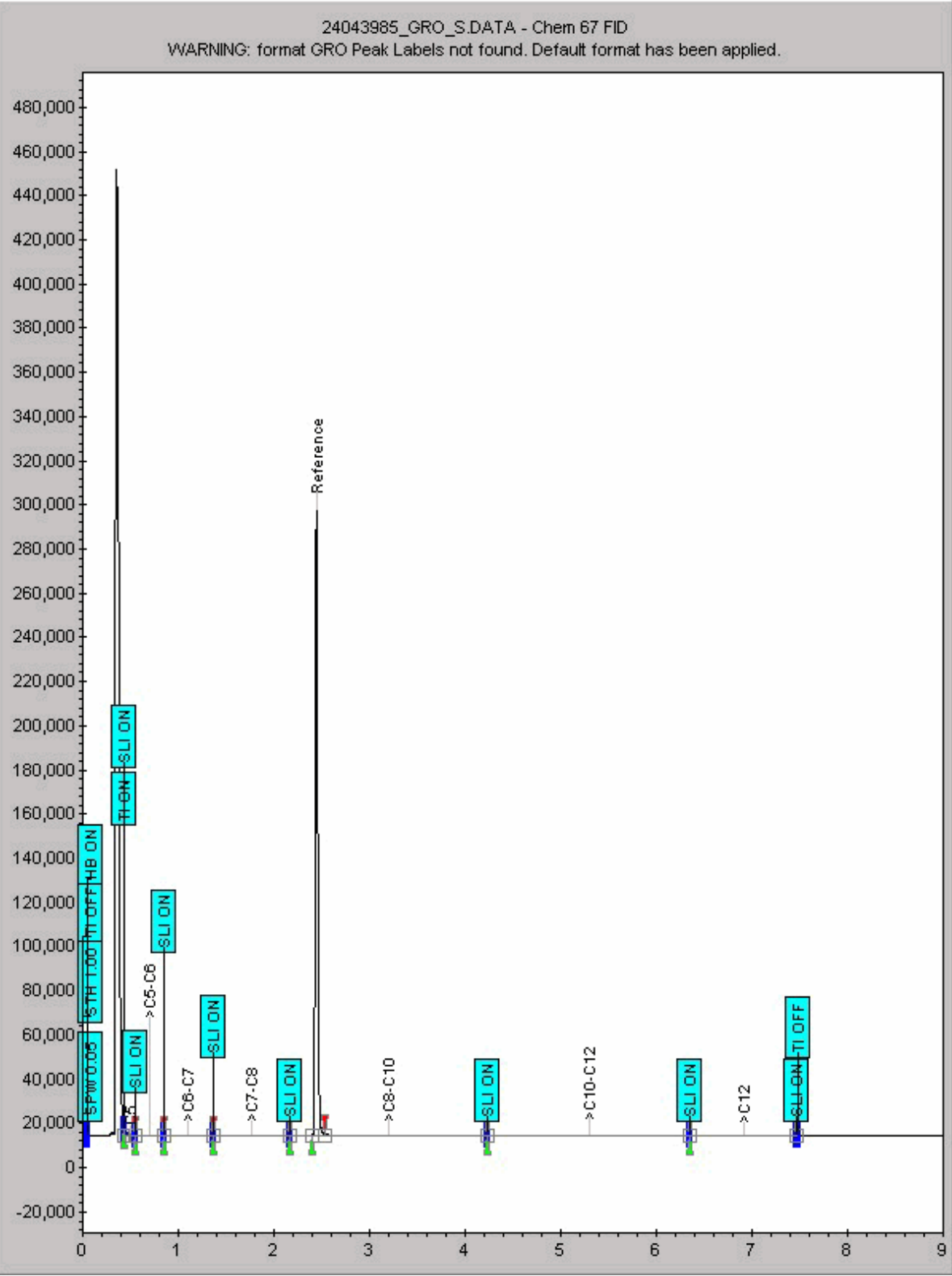
CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-45	Client Reference:	B025563	Report Number:	594450
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24043985 Depth : 0.10
Sample ID : BH-TH-07





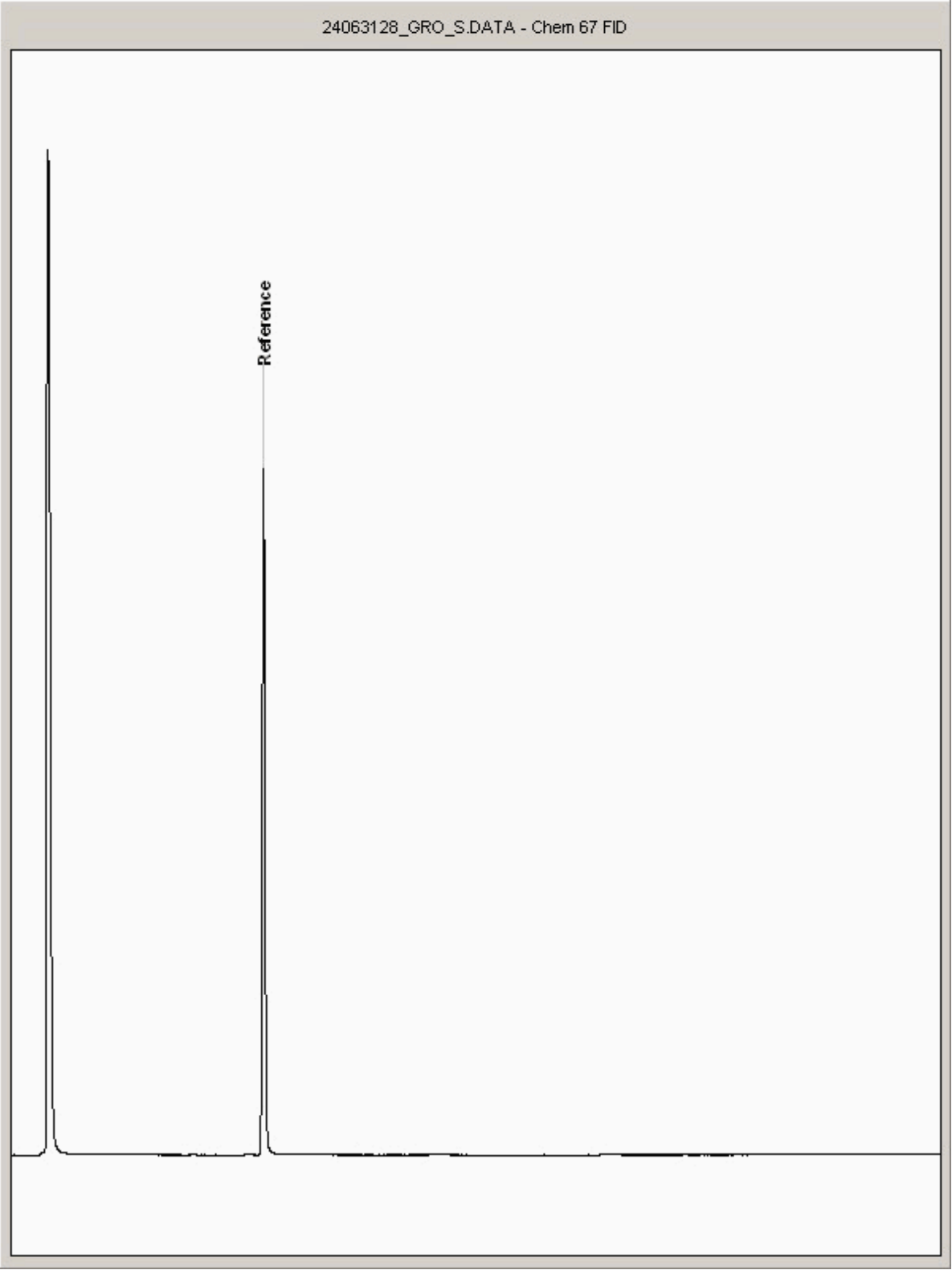
CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24063128 Depth : 0.20
Sample ID : BH-TH-01



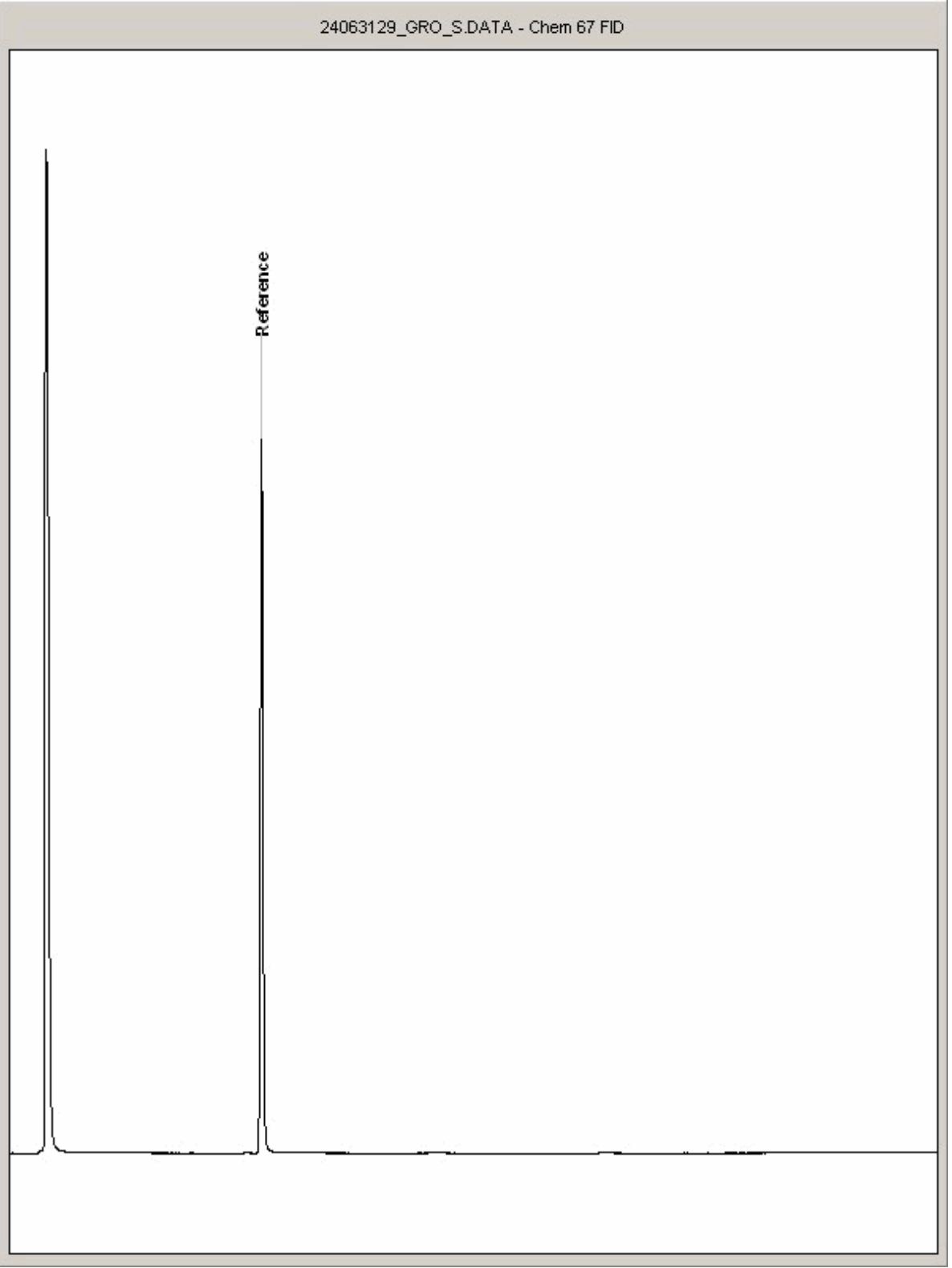
CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24063129 Depth : 1.00
Sample ID : BH-TH-02





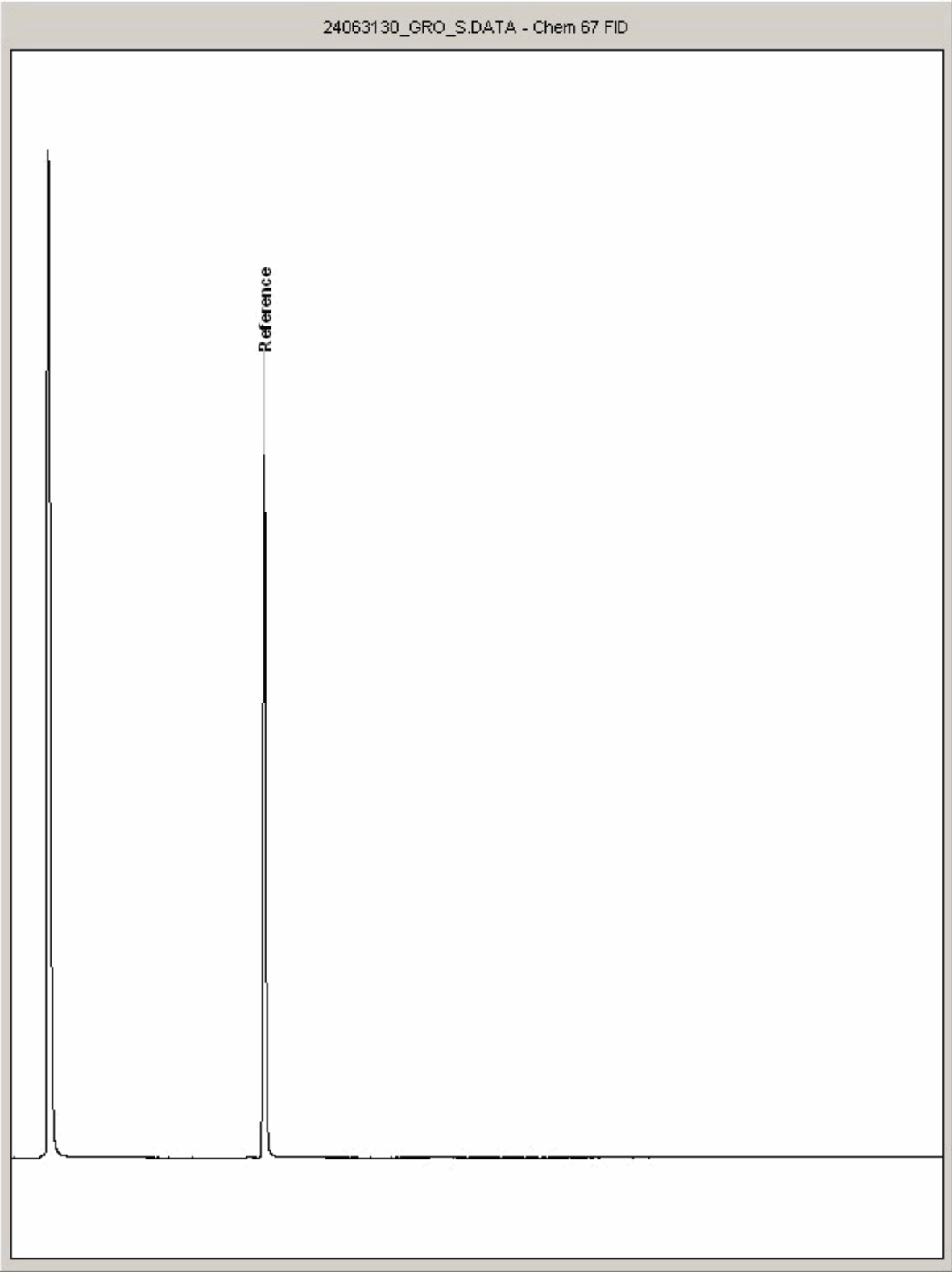
CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24063130 Depth : 0.50
Sample ID : BH-TH-02



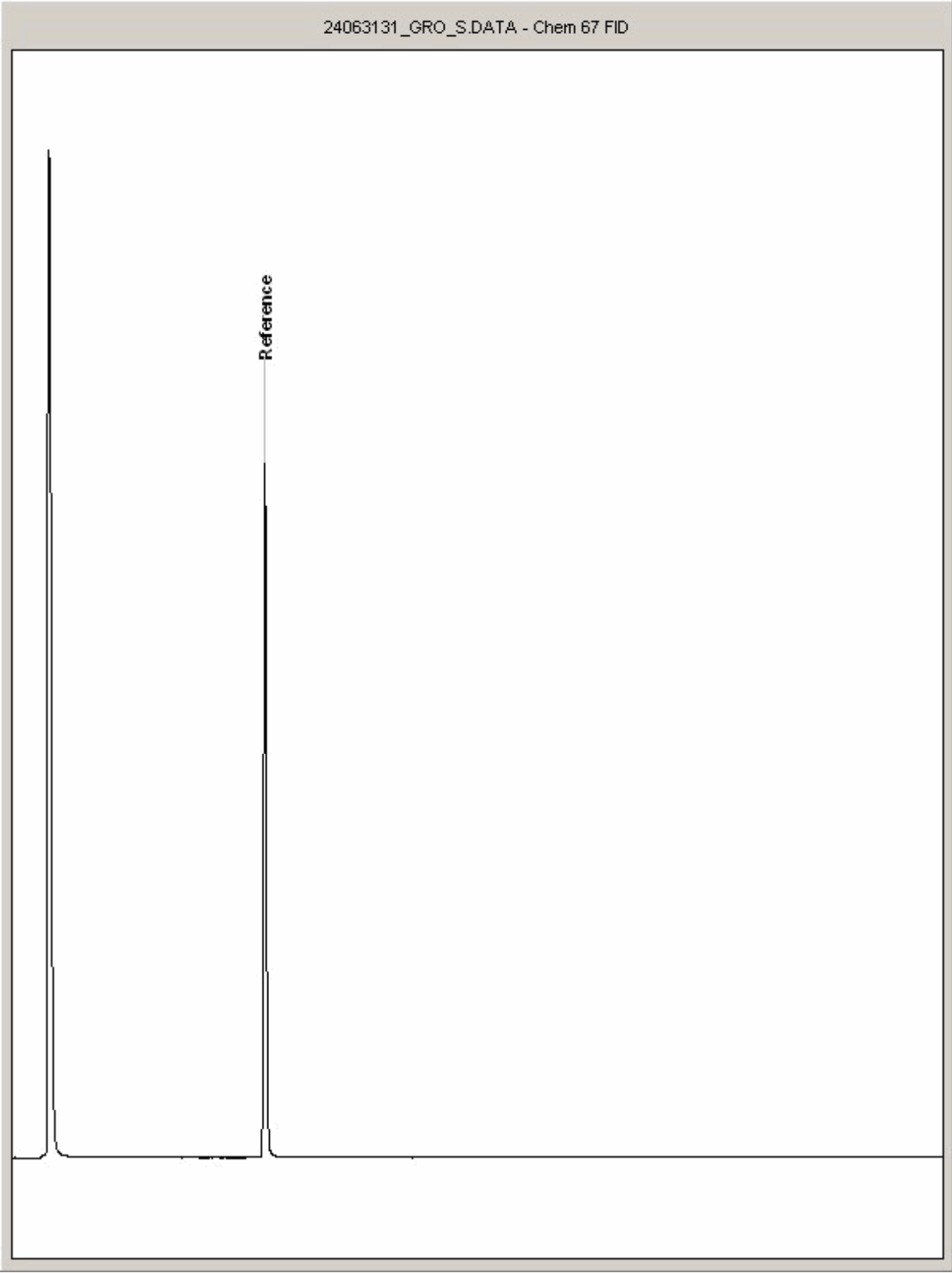
CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24063131 Depth : 0.20
Sample ID : BH-TH-06





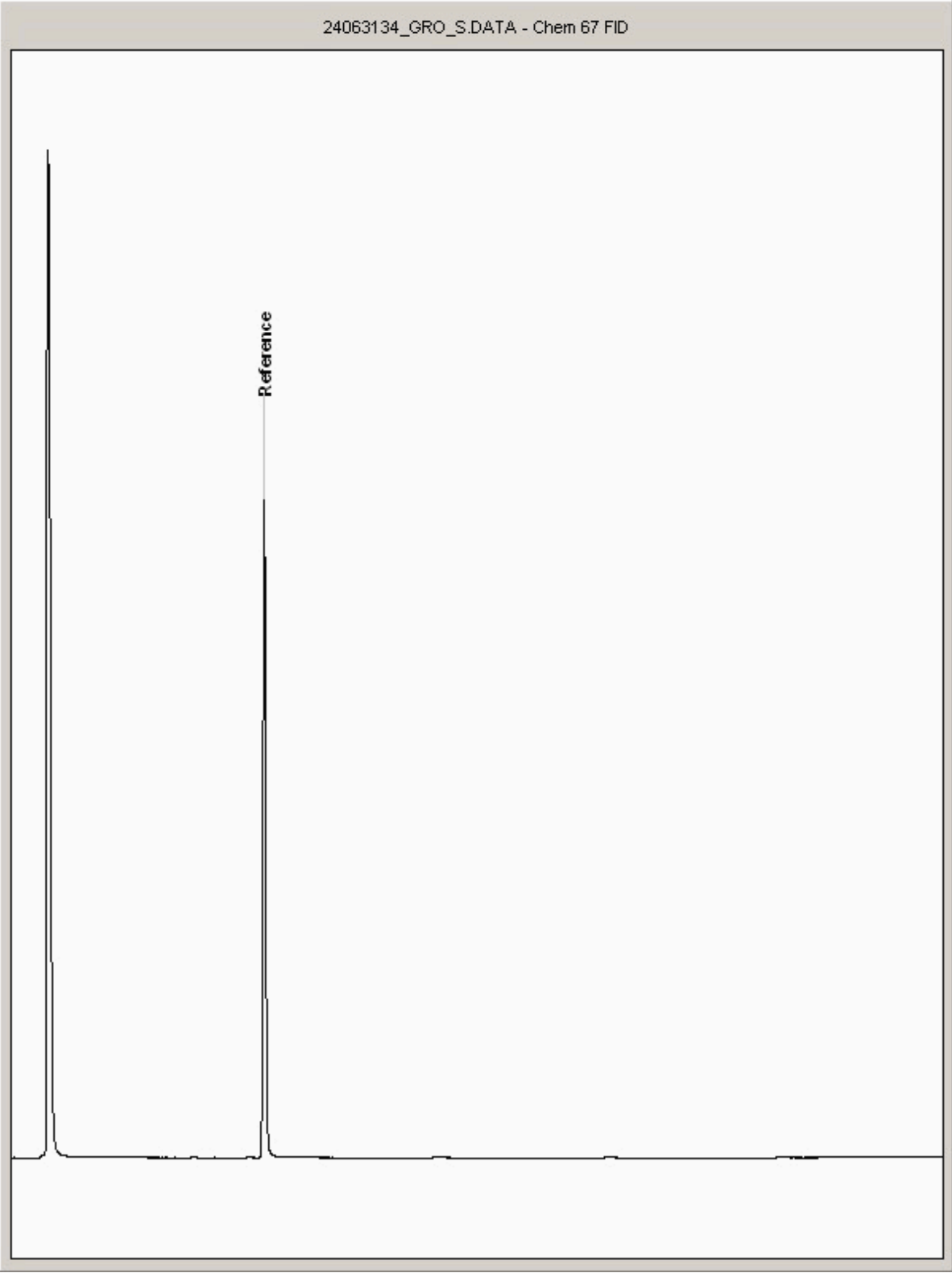
CERTIFICATE OF ANALYSIS

Validated

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24063134 Depth : 0.20
Sample ID : TP-PTR-18



CERTIFICATE OF ANALYSIS

SDG: 210406-45 Client Reference: B025563 Report Number: 594450
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
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Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS					Validated
SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24028273	BH-OBC-16	ES	0.10	30/03/2021
24028274	BH-OBC-16	ES	0.20	30/03/2021
24028275	BH-OBC-16	ES	0.30	30/03/2021
24028276	BH-OBC-16	ES	0.50	30/03/2021
24028277	BH-OBC-16	ES	1.00	30/03/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 16 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210406-46
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594363

We received 5 samples on Tuesday April 06, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday April 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24028273	
	Customer Sample Reference		BH-OBC-16	
	AGS Reference		ES	
	Depth (m)		0.10	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Anions by Kone (soil)		AllNDPs: 0 Tests: 1	X
	Asbestos ID in Solid Samples		AllNDPs: 0 Tests: 1	X
	Boron Water Soluble		AllNDPs: 0 Tests: 1	X
	Chromium III		AllNDPs: 0 Tests: 1	X
	Cyanide Comp/Free/Total/Thiocyanate		AllNDPs: 0 Tests: 1	X
	EPH CWG GC (S)		AllNDPs: 0 Tests: 1	X
	GRO by GC-FID (S)		AllNDPs: 0 Tests: 1	X
	Hexavalent Chromium (s)		AllNDPs: 0 Tests: 1	X
	Metals in solid samples by OES		AllNDPs: 0 Tests: 1	X
	PAH by GCMS		AllNDPs: 0 Tests: 1	X
	pH		AllNDPs: 0 Tests: 1	X
	Phenols by HPLC (S)		AllNDPs: 0 Tests: 1	X
	Sample description		AllNDPs: 0 Tests: 1	X
	Total Organic Carbon		AllNDPs: 0 Tests: 1	X
	Total Sulphur		AllNDPs: 0 Tests: 1	X

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24028273	
	Customer Sample Reference		BH-OBC-16	
	AGS Reference		ES	
	Depth (m)		0.10	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	TPH CWG GC (S)		AllNDPs: 0 Tests: 1	X
	VOC MS (S)		AllNDPs: 0 Tests: 1	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24028273	BH-OBC-16	0.10	Light Brown	Sandy Silt Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH-OBC-16				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		30/03/2021				
disa.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		06/04/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210406-46				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24028273				
(F)	Trigger breach confirmed		ES				
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	9.9				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00847#				
pH	1 pH Units	TM133	8.47M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6#				
Cyanide, Free	<1 mg/kg	TM153	<1@ M				
Chromium, Trivalent	<0.9 mg/kg	TM181	9.21				
Antimony	<0.6 mg/kg	TM181	<0.6#				
Arsenic	<0.6 mg/kg	TM181	10.6M				
Barium	<0.6 mg/kg	TM181	42.8#				
Beryllium	<0.01 mg/kg	TM181	0.453M				
Cadmium	<0.02 mg/kg	TM181	0.121M				
Chromium	<0.9 mg/kg	TM181	9.21M				
Copper	<1.4 mg/kg	TM181	11.1M				
Iron	<1000 mg/kg	TM181	17800#				
Lead	<0.7 mg/kg	TM181	14.2M				
Manganese	<0.13 mg/kg	TM181	312M				
Mercury	<0.1 mg/kg	TM181	<0.1M				
Molybdenum	<0.1 mg/kg	TM181	0.401#				
Nickel	<0.2 mg/kg	TM181	14M				
Selenium	<1 mg/kg	TM181	<1#				
Vanadium	<0.2 mg/kg	TM181	26.8#				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

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SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-OBC-16 0.10 Soil/Solid (S) 30/03/2021 . 06/04/2021 210406-46 24028273 ES				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	104				
Toluene-d8**	%	TM116	96.3				
4-Bromofluorobenzene**	%	TM116	78.2				
Dichlorodifluoromethane	<6 µg/kg	TM116	<120 M				
Chloromethane	<7 µg/kg	TM116	<140 #				
Vinyl Chloride	<6 µg/kg	TM116	<120 @ M				
Bromomethane	<10 µg/kg	TM116	<200 M				
Chloroethane	<10 µg/kg	TM116	<200 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<120 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<200 #				
Carbon Disulphide	<7 µg/kg	TM116	<140 M				
Dichloromethane	<10 µg/kg	TM116	<200 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<160 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<200				
Bromochloromethane	<10 µg/kg	TM116	<200 M				
Chloroform	<8 µg/kg	TM116	<160 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<200 M				
Carbontetrachloride	<10 µg/kg	TM116	<200 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<100 M				
Benzene	<9 µg/kg	TM116	<180 M				
Trichloroethene	<9 µg/kg	TM116	<180 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<200 M				
Dibromomethane	<9 µg/kg	TM116	<180 M				
Bromodichloromethane	<7 µg/kg	TM116	<140 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200 M				
Toluene	<7 µg/kg	TM116	<140 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200 M				

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SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-OBC-16					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 30/03/2021 . 06/04/2021 210406-46 24028273 ES					
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<140 M					
Tetrachloroethene	<5 µg/kg	TM116	<100 M					
Dibromochloromethane	<10 µg/kg	TM116	<200 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<200 M					
Chlorobenzene	<5 µg/kg	TM116	<100 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<200 M					
Ethylbenzene	<4 µg/kg	TM116	<80 M					
p/m-Xylene	<10 µg/kg	TM116	<200 #					
o-Xylene	<10 µg/kg	TM116	<200 M					
Styrene	<10 µg/kg	TM116	<200 @ #					
Bromoform	<10 µg/kg	TM116	<200 M					
Isopropylbenzene	<5 µg/kg	TM116	<100 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<200 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<320 M					
Bromobenzene	<10 µg/kg	TM116	<200 M					
Propylbenzene	<10 µg/kg	TM116	<200 M					
2-Chlorotoluene	<9 µg/kg	TM116	<180 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<160 M					
4-Chlorotoluene	<10 µg/kg	TM116	<200 M					
tert-Butylbenzene	<14 µg/kg	TM116	<280 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<180 #					
sec-Butylbenzene	<10 µg/kg	TM116	<200					
4-Isopropyltoluene	<10 µg/kg	TM116	<200 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<160 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<100 M					
n-Butylbenzene	<11 µg/kg	TM116	<220					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<200 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<280 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<200 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<400					
Hexachlorobutadiene	<20 µg/kg	TM116	<400					
Naphthalene	<13 µg/kg	TM116	<260 M					



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SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
M	mCERTS accredited.										
*	Subcontracted test										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	BH-OBC-16ES	13/04/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.10										
Sample Type	SOLID										
Date Sampled	30/03/2021 00:00:00										
Date Received	06/04/2021 08:40:00										
SDG	210406-46										
Original Sample	24028273										
Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



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SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	24028273
Customer Sample Ref.	BH-OBC-16
AGS Ref.	ES
Depth	0.10
Type	Soil/Solid (S)
Anions by Kone (soil)	14-Apr-2021
Asbestos ID in Solid Samples	13-Apr-2021
Boron Water Soluble	12-Apr-2021
Chromium III	14-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021
EPH CWG GC (S)	13-Apr-2021
GRO by GC-FID (S)	12-Apr-2021
Hexavalent Chromium (s)	14-Apr-2021
Metals in solid samples by OES	13-Apr-2021
PAH by GCMS	13-Apr-2021
pH	08-Apr-2021
Phenols by HPLC (S)	13-Apr-2021
Sample description	07-Apr-2021
Total Organic Carbon	13-Apr-2021
Total Sulphur	09-Apr-2021
TPH CWG GC (S)	13-Apr-2021
VOC MS (S)	12-Apr-2021



CERTIFICATE OF ANALYSIS

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SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2405
Chloride (soluble)	TM243	148.7 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	164.95 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2405
Water Soluble Boron	TM222	100.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2419
Free Cyanide	TM153	100.0 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2412
QC	TM089	79.65 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2473
Hexavalent Chromium	TM151	106.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2465
Aluminium	TM181	95.58 73.56 : 108.85
Antimony	TM181	98.78 76.89 : 111.24
Arsenic	TM181	104.07 88.53 : 111.01

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210406-46	Client Reference:	B025563	Report Number:	594363	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2465
Barium	TM181	98.17 77.67 : 105.35
Beryllium	TM181	102.61 85.44 : 109.61
Boron	TM181	93.98 73.51 : 104.66
Cadmium	TM181	92.59 77.67 : 104.12
Chromium	TM181	90.47 79.64 : 105.83
Cobalt	TM181	92.14 84.60 : 104.13
Copper	TM181	100.7 82.40 : 105.45
Iron	TM181	95.24 82.95 : 110.58
Lead	TM181	94.14 78.24 : 104.05
Manganese	TM181	108.61 94.29 : 119.51
Mercury	TM181	101.45 83.16 : 107.81
Molybdenum	TM181	99.18 87.11 : 106.87
Nickel	TM181	94.13 80.26 : 102.28
Phosphorus	TM181	109.9 94.56 : 124.28
Selenium	TM181	104.71 82.28 : 110.48
Strontium	TM181	95.1 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	101.52 86.72 : 110.03
Titanium	TM181	85.5 66.23 : 102.06
Vanadium	TM181	101.47 86.19 : 109.45
Zinc	TM181	102.05 84.68 : 113.99

PAH by GCMS		
Component	Method Code	QC 2405
Acenaphthene	TM218	89.5 73.47 : 109.80
Acenaphthylene	TM218	89.5 70.00 : 130.00
Anthracene	TM218	86.5 68.68 : 111.89
Benz(a)anthracene	TM218	100.0 68.12 : 118.39

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210406-46	Client Reference:	B025563	Report Number:	594363	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
PAH by GCMS						

		QC 2405
Benzo(a)pyrene	TM218	101.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	94.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	93.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	94.5 73.10 : 117.03
Chrysene	TM218	93.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	97.0 67.32 : 121.35
Fluoranthene	TM218	93.5 75.16 : 117.28
Fluorene	TM218	88.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	93.0 68.91 : 117.62
Naphthalene	TM218	81.0 72.12 : 106.18
Phenanthrene	TM218	87.0 69.01 : 113.72
Pyrene	TM218	91.0 64.28 : 115.75

pH		
Component	Method Code	QC 2431
pH	TM133	100.4 99.08 : 102.24

Phenols by HPLC (S)		
Component	Method Code	QC 2445
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.25 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	50.94 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.46 88.23 : 104.42

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2456
Total Organic Carbon	TM132	97.27 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2494
Total Sulphur %	TM132	87.05 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2420
1,1,1,2-tetrachloroethane	TM116	96.0 84.84 : 116.25
1,1,1-Trichloroethane	TM116	99.0 73.73 : 118.05
1,1,2-Trichloroethane	TM116	98.2 77.12 : 116.04
1,1-Dichloroethane	TM116	105.4 74.46 : 129.15
1,2-Dichloroethane	TM116	110.8 92.38 : 131.65
1,4-Dichlorobenzene	TM116	92.6 83.64 : 126.18
2-Chlorotoluene	TM116	86.6 76.03 : 113.25
4-Chlorotoluene	TM116	78.4 66.90 : 112.46
Benzene	TM116	103.4 88.60 : 113.80
Carbon Disulphide	TM116	98.4 74.91 : 122.14
Carbontetrachloride	TM116	104.2 80.31 : 124.50
Chlorobenzene	TM116	97.4 83.81 : 114.18
Chloroform	TM116	106.6 87.40 : 122.49
Chloromethane	TM116	108.4 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	102.8 80.67 : 126.72
Dibromomethane	TM116	98.6 73.23 : 118.35
Dichloromethane	TM116	108.8 81.11 : 133.25

VOC MS (S)

		QC 2420
Ethylbenzene	TM116	88.4 75.92 : 110.41
Hexachlorobutadiene	TM116	58.2 12.82 : 152.73
Isopropylbenzene	TM116	77.8 55.79 : 97.59
Naphthalene	TM116	104.4 80.86 : 128.81
o-Xylene	TM116	84.8 69.99 : 108.74
p/m-Xylene	TM116	83.5 68.32 : 108.91
Sec-Butylbenzene	TM116	66.2 38.50 : 101.50
Tetrachloroethene	TM116	98.0 76.95 : 121.02
Toluene	TM116	93.0 74.24 : 107.42
Trichloroethene	TM116	99.4 85.28 : 109.36
Trichlorofluoromethane	TM116	102.0 84.55 : 133.27
Vinyl Chloride	TM116	109.4 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

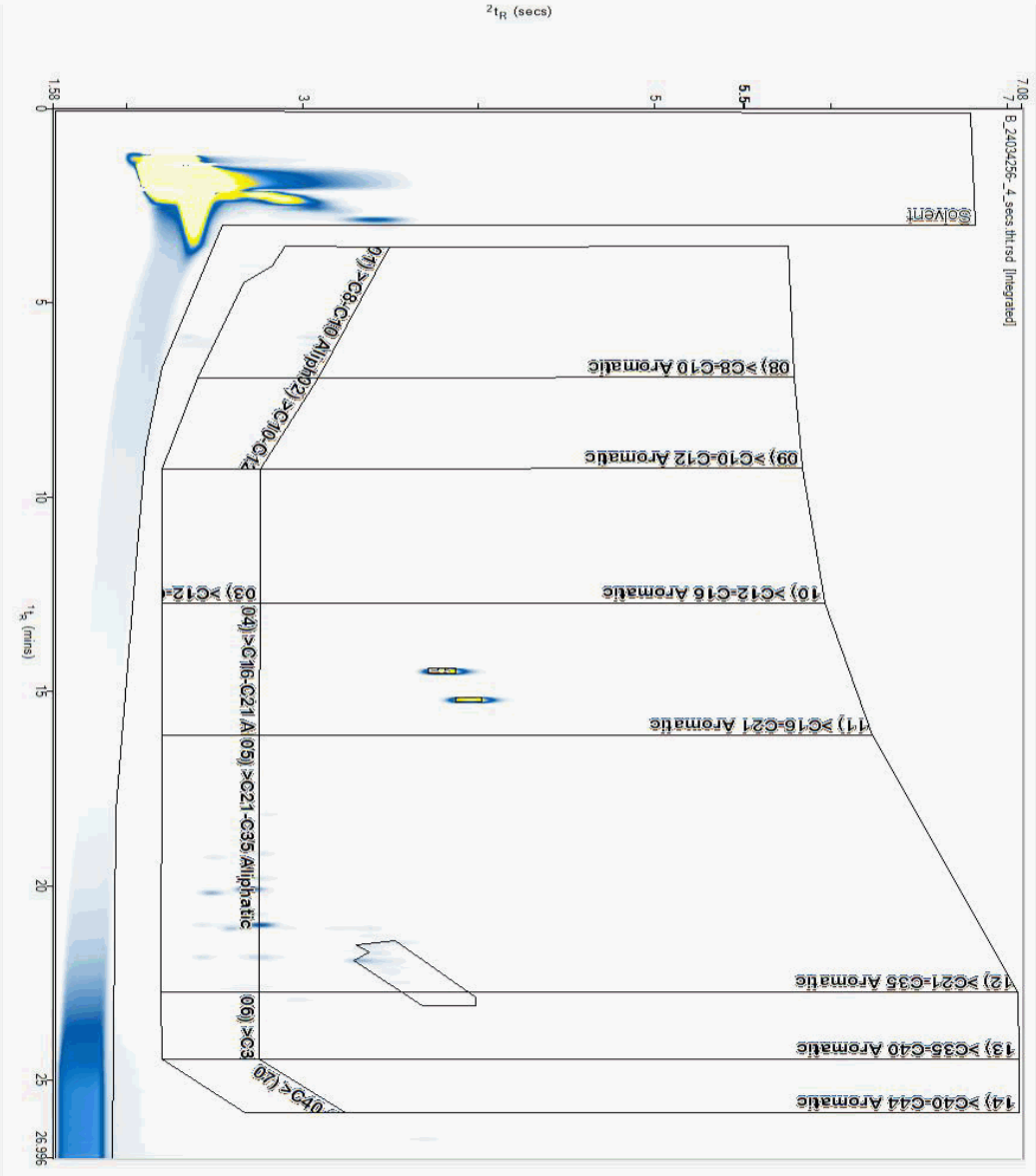
Validated

SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24034256 Depth : 0.10
Sample ID : BH-OBC-16

ChromSpace LIMS export
Current batch
Sample Identity: B_24034256-4_secs.tht
Date Acquired : 13/04/21 12:09:42
Units : ppm
Dilution : 0
CF :
Multiplier :



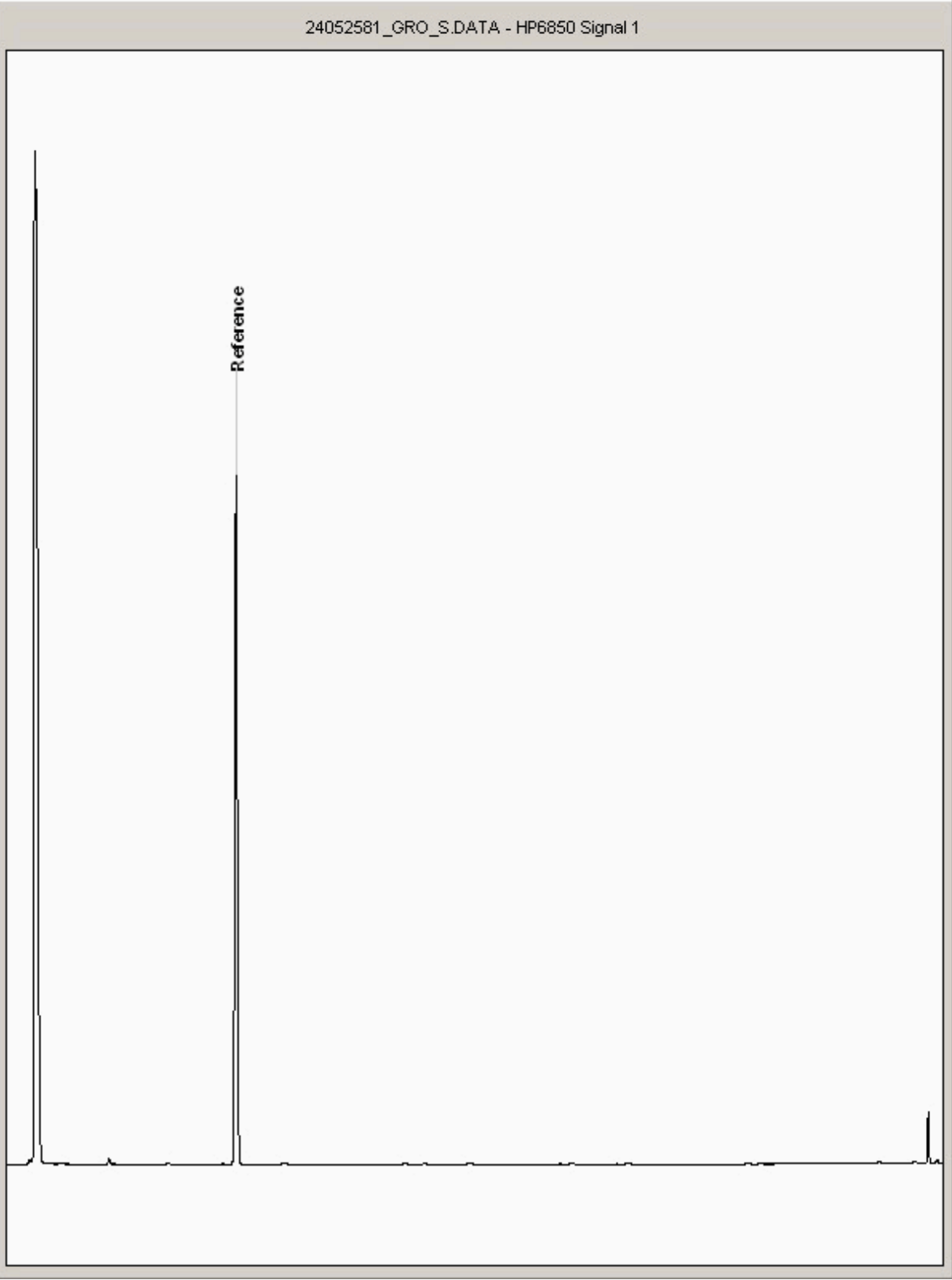
CERTIFICATE OF ANALYSIS

Validated

SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24052581 Depth : 0.10
Sample ID : BH-OBC-16





CERTIFICATE OF ANALYSIS

SDG:	210406-46	Client Reference:	B025563	Report Number:	594363
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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CH5 3US

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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

20 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210407-83

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

594786

We received 4 samples on Wednesday April 07, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday April 20, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 20/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:

210407-83

Client Reference:

B025563

Report Number:

594786

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24033274	BH-TH-08		0.10	01/04/2021
24033275	BH-TH-08		0.20	01/04/2021
24033276	BH-TH-08		0.50	01/04/2021
24033277	BH-TH-08		0.55	01/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:

210407-83

Client Reference:

B025563

Report Number:

594786

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Lab Sample No(s)		24033275	
	Customer Sample Reference		BH-TH-08	
	AGS Reference			
	Depth (m)		0.20	
	Container		60g VOC (ALE215)	1kg TUB with Handle (ALE260)
	Sample Type		S	S
	Anions by Kone (soil)	All	NDPs: 0 Tests: 1	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X	
Boron Water Soluble	All	NDPs: 0 Tests: 1	X	
Chromium III	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X	
PAH by GCMS	All	NDPs: 0 Tests: 1	X	
pH	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1	X	
Sample description	All	NDPs: 0 Tests: 1	X	
Total Organic Carbon	All	NDPs: 0 Tests: 1	X	
Total Sulphur	All	NDPs: 0 Tests: 1	X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210407-83		Client Reference: B025563		Report Number: 594786	
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:	

<div>Results Legend</div> <div> <div>X</div> Test </div> <div> <div>N</div> No Determination Possible </div> <div>Sample Types -</div> <div> S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other </div>	Lab Sample No(s)		24033275	
	Customer Sample Reference		BH-TH-08	
	AGS Reference			
	Depth (m)		0.20	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S
	TPH CWG GC (S)	All	NDPs: 0 Tests: 1	<div>X</div>
VOC MS (S)	All	NDPs: 0 Tests: 1	<div>X</div>	



CERTIFICATE OF ANALYSIS

Validated

SDG:

210407-83

Location:

Cambridge South East Tra

Client Reference:

B025563

Order Number:

7000964

Report Number:

594786

Superseded Report:

Sample Descriptions

Grain Sizes

very fine

<0.063mm

fine

0.063mm - 0.1mm

medium

0.1mm - 2mm

coarse

2mm - 10mm

very coarse

>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24033275	BH-TH-08	0.20	Dark Brown	Silty Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-TH-08</div> <div>0.20 Soil/Solid (S) 01/04/2021 . 07/04/2021 210407-83 24033275</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	11						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01 @						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M						
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 @ M						
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05 @						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 @ M						
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01 @						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M						
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 @ M						
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 @ M						
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13 @						
Sulphur, Total	<0.02 %	TM132	0.0225						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0142 #						
pH	1 pH Units	TM133	8.23 M						
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #						
Cyanide, Free	<1 mg/kg	TM153	<1 @ M						
Chromium, Trivalent	<0.9 mg/kg	TM181	13.4						
Antimony	<0.6 mg/kg	TM181	<0.6 #						
Arsenic	<0.6 mg/kg	TM181	14.6 M						
Barium	<0.6 mg/kg	TM181	57.6 #						
Beryllium	<0.01 mg/kg	TM181	0.641 M						
Cadmium	<0.02 mg/kg	TM181	0.277 M						
Chromium	<0.9 mg/kg	TM181	13.4 M						
Copper	<1.4 mg/kg	TM181	13.8 M						
Iron	<1000 mg/kg	TM181	23500 #						
Lead	<0.7 mg/kg	TM181	29.5 M						
Manganese	<0.13 mg/kg	TM181	493 M						
Mercury	<0.1 mg/kg	TM181	<0.1 M						
Molybdenum	<0.1 mg/kg	TM181	0.54 #						
Nickel	<0.2 mg/kg	TM181	18.9 M						
Selenium	<1 mg/kg	TM181	<1 #						
Vanadium	<0.2 mg/kg	TM181	35.8 #						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-TH-08					
#	ISO17025 accredited. mCERTS accredited.							
M	Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 01/04/2021 . 07/04/2021 210407-83 24033275					
aq	Dissolved / filtered sample.							
dis.filt	Total / unfiltered sample.							
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
**	Trigger breach confirmed							
(F)	Sample deviation (see appendix)							
1-44@								
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	120					
Toluene-d8**	%	TM116	94.7					
4-Bromofluorobenzene**	%	TM116	71.8					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M					
Benzene	<9 µg/kg	TM116	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M					
Toluene	<7 µg/kg	TM116	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M					

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-TH-08 0.20 Soil/Solid (S) 01/04/2021 . 07/04/2021 210407-83 24033275					
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M					
Tetrachloroethene	<5 µg/kg	TM116	<5 M					
Dibromochloromethane	<10 µg/kg	TM116	<10 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M					
Chlorobenzene	<5 µg/kg	TM116	<5 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M					
Ethylbenzene	<4 µg/kg	TM116	<4 M					
p/m-Xylene	<10 µg/kg	TM116	<10 #					
o-Xylene	<10 µg/kg	TM116	<10 M					
Styrene	<10 µg/kg	TM116	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 M					
Isopropylbenzene	<5 µg/kg	TM116	<5 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M					
Bromobenzene	<10 µg/kg	TM116	<10 M					
Propylbenzene	<10 µg/kg	TM116	<10 M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #					
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M					
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13 M					

VOC MS (S)

Results Legend		Customer Sample Ref.		BH-TH-08					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 01/04/2021 . 07/04/2021 210407-83 24033275						
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4*\$/@	Sample deviation (see appendix)								
Component	LOD/Units								
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20	#					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20						
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02						
Sum of BTEX	<40 µg/kg	TM116	<40						
							</		

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24033275
Customer Sample Ref.	BH-TH-08
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
Anions by Kone (soil)	18-Apr-2021
Asbestos ID in Solid Samples	16-Apr-2021
Boron Water Soluble	19-Apr-2021
Chromium III	20-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021
EPH CWG GC (S)	16-Apr-2021
GRO by GC-FID (S)	15-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021
Metals in solid samples by OES	19-Apr-2021
PAH by GCMS	15-Apr-2021
pH	15-Apr-2021
Phenols by HPLC (S)	16-Apr-2021
Sample description	14-Apr-2021
Total Organic Carbon	20-Apr-2021
Total Sulphur	19-Apr-2021
TPH CWG GC (S)	16-Apr-2021
VOC MS (S)	15-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2433
Chloride (soluble)	TM243	145.6 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	159.35 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2400
Water Soluble Boron	TM222	109.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2471
Free Cyanide	TM153	98.91 79.00 : 115.00
Thiocyanate	TM153	97.44 94.09 : 113.89
Total Cyanide	TM153	93.71 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2451
QC	TM089	88.79 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2486
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2484
Aluminium	TM181	84.42 73.56 : 108.85
Antimony	TM181	98.37 76.89 : 111.24
Arsenic	TM181	102.03 88.53 : 111.01



CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Metals in solid samples by OES

		QC 2484
Barium	TM181	95.41 77.67 : 105.35
Beryllium	TM181	102.24 85.44 : 109.61
Boron	TM181	87.39 73.51 : 104.66
Cadmium	TM181	94.24 77.67 : 104.12
Chromium	TM181	86.61 79.64 : 105.83
Cobalt	TM181	90.25 84.60 : 104.13
Copper	TM181	96.65 82.40 : 105.45
Iron	TM181	96.83 82.95 : 110.58
Lead	TM181	91.89 78.24 : 104.05
Manganese	TM181	106.94 94.29 : 119.51
Mercury	TM181	98.31 83.16 : 107.81
Molybdenum	TM181	99.18 87.11 : 106.87
Nickel	TM181	92.42 80.26 : 102.28
Phosphorus	TM181	108.69 94.56 : 124.28
Selenium	TM181	101.96 82.28 : 110.48
Strontium	TM181	91.54 79.13 : 102.79
Thallium	TM181	100.0 82.94 : 111.86
Tin	TM181	98.48 86.72 : 110.03
Titanium	TM181	87.02 66.23 : 102.06
Vanadium	TM181	98.53 86.19 : 109.45
Zinc	TM181	96.71 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2464
Acenaphthene	TM218	90.5 78.59 : 112.16
Acenaphthylene	TM218	89.0 75.11 : 109.01
Anthracene	TM218	92.5 73.99 : 113.85
Benz(a)anthracene	TM218	95.0 69.31 : 119.18

PAH by GCMS

		QC 2464
Benzo(a)pyrene	TM218	90.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	93.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	85.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	90.0 69.98 : 116.49
Chrysene	TM218	91.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	87.5 64.54 : 115.22
Fluoranthene	TM218	96.5 72.56 : 111.70
Fluorene	TM218	92.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	96.0 61.22 : 113.25
Naphthalene	TM218	85.0 77.96 : 110.91
Phenanthrene	TM218	96.5 76.83 : 113.25
Pyrene	TM218	93.5 72.45 : 110.77

pH

Component	Method Code	QC 2492
pH	TM133	100.0 98.41 : 102.48

Phenols by HPLC (S)

Component	Method Code	QC 2456
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	55.19 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.78 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	51.57 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	53.64 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	52.08 76.56 : 106.38

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2464
Total Organic Carbon	TM132	101.95 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2464
Total Sulphur %	TM132	75.65 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2454
1,1,1,2-tetrachloroethane	TM116	95.6 84.84 : 116.25
1,1,1-Trichloroethane	TM116	99.2 73.73 : 118.05
1,1,2-Trichloroethane	TM116	90.4 77.12 : 116.04
1,1-Dichloroethane	TM116	102.6 74.46 : 129.15
1,2-Dichloroethane	TM116	104.8 92.38 : 131.65
1,4-Dichlorobenzene	TM116	90.8 83.64 : 126.18
2-Chlorotoluene	TM116	82.6 76.03 : 113.25
4-Chlorotoluene	TM116	74.6 66.90 : 112.46
Benzene	TM116	100.0 88.60 : 113.80
Carbon Disulphide	TM116	87.8 74.91 : 122.14
Carbontetrachloride	TM116	99.4 80.31 : 124.50
Chlorobenzene	TM116	94.0 83.81 : 114.18
Chloroform	TM116	102.4 87.40 : 122.49
Chloromethane	TM116	95.8 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	100.8 80.67 : 126.72
Dibromomethane	TM116	92.6 73.23 : 118.35
Dichloromethane	TM116	105.2 81.11 : 133.25



CERTIFICATE OF ANALYSIS

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SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2454
Ethylbenzene	TM116	81.8 75.92 : 110.41
Hexachlorobutadiene	TM116	26.2 12.82 : 152.73
Isopropylbenzene	TM116	66.2 55.79 : 97.59
Naphthalene	TM116	95.0 80.86 : 128.81
o-Xylene	TM116	78.2 69.99 : 108.74
p/m-Xylene	TM116	76.5 68.32 : 108.91
Sec-Butylbenzene	TM116	49.0 38.50 : 101.50
Tetrachloroethene	TM116	90.6 76.95 : 121.02
Toluene	TM116	88.4 74.24 : 107.42
Trichloroethene	TM116	94.8 85.28 : 109.36
Trichlorofluoromethane	TM116	93.4 84.55 : 133.27
Vinyl Chloride	TM116	99.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



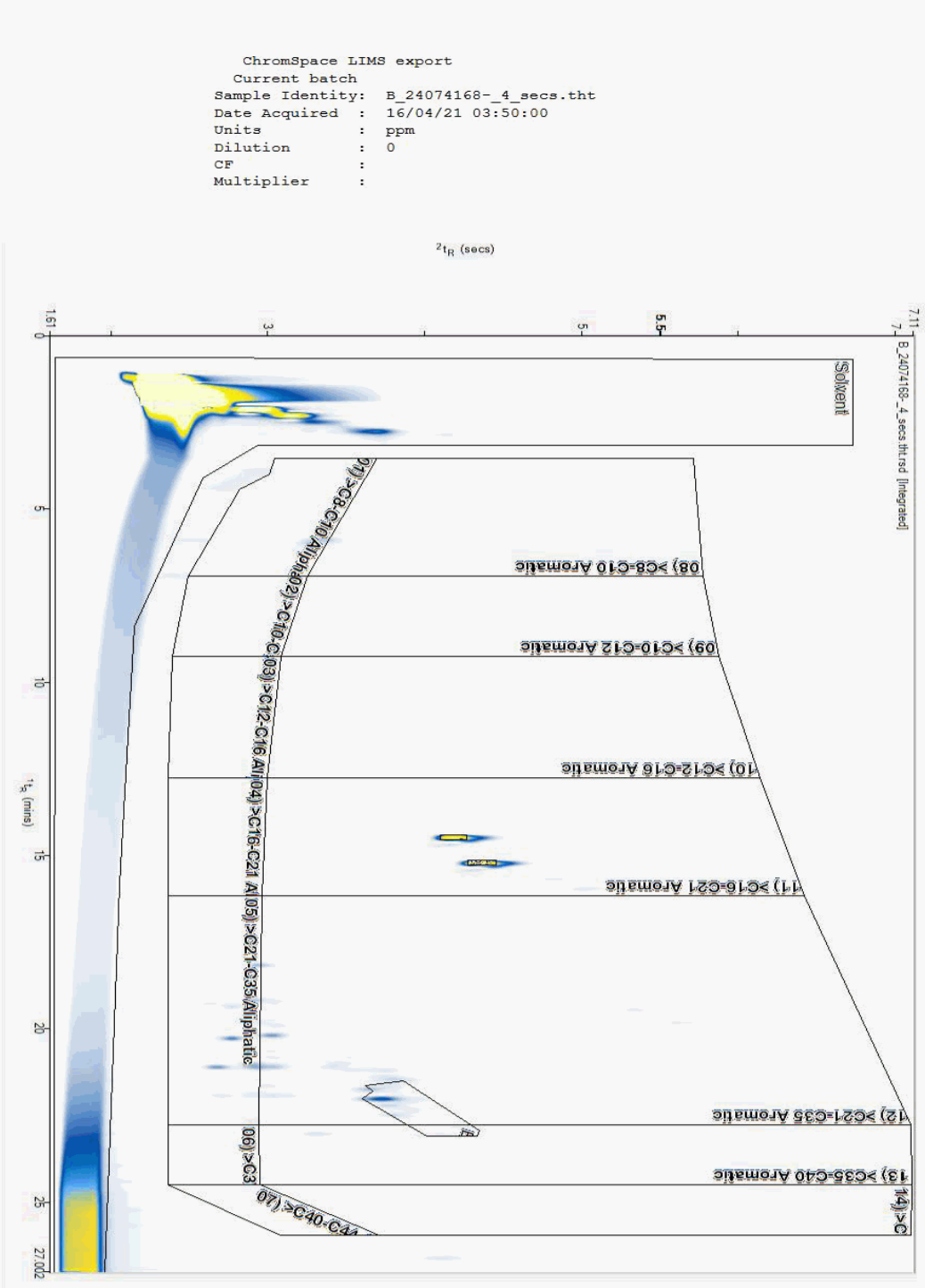
CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-83	Client Reference:	B025563	Report Number:	594786
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24074168	Depth :	0.20
		Sample ID :	BH-TH-08		





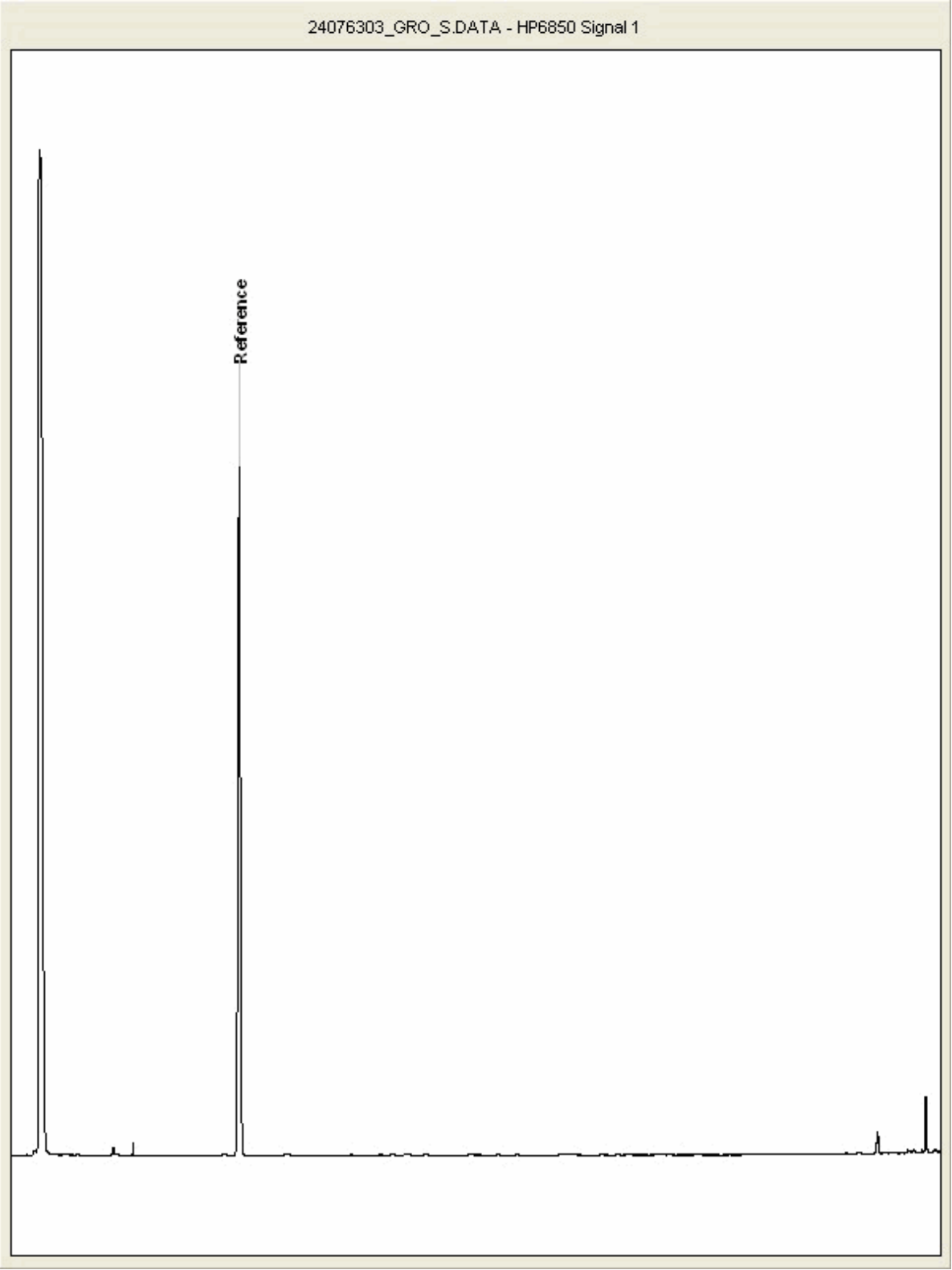
CERTIFICATE OF ANALYSIS

Validated

SDG: 210407-83 Client Reference: B025563 Report Number: 594786
Location: Cambridge South East Tra Order Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24076303 Depth : 0.20
Sample ID : BH-TH-08



CERTIFICATE OF ANALYSIS

SDG: 210407-83 Client Reference: B025563 Report Number: 594786
Location: ridge South East Transport - Ph Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
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LS1 4ER

Attention: Richard Tonge

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Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS					Validated
SDG:	210407-85	Client Reference:	B025563	Report Number:	594654
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24033384	BH-BP01		0.20	01/04/2021
24033385	TP-PTR-28		0.10	06/04/2021
24033386	TP-PTR-28		0.20	06/04/2021
24033387	TP-PTR-28		0.50	06/04/2021
24033400	TP-PTR-28		1.00	06/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 19 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210407-85
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594654

We received 5 samples on Wednesday April 07, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday April 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:

210407-85

Client Reference:

B025563

Report Number:

594654

Location:

Cambridge South East Tra

Order Number:

7000964

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24033400		
	Customer Sample Reference		TP-PTR-28		
	AGS Reference				
	Depth (m)		1.00		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Anions by Kone (soil)		All	NDPs: 0 Tests: 1	<div>X</div>
	Asbestos ID in Solid Samples		All	NDPs: 0 Tests: 1	<div>X</div>
	Boron Water Soluble		All	NDPs: 0 Tests: 1	<div>X</div>
	Chromium III		All	NDPs: 0 Tests: 1	<div>X</div>
	Cyanide Comp/Free/Total/Thiocyanate		All	NDPs: 0 Tests: 1	<div>X</div>
	EPH CWG GC (S)		All	NDPs: 0 Tests: 1	<div>X</div>
	GRO by GC-FID (S)		All	NDPs: 0 Tests: 1	<div>X</div>
	Hexavalent Chromium (s)		All	NDPs: 0 Tests: 1	<div>X</div>
	Metals in solid samples by OES		All	NDPs: 0 Tests: 1	<div>X</div>
	PAH by GCMS		All	NDPs: 0 Tests: 1	<div>X</div>
	pH		All	NDPs: 0 Tests: 1	<div>X</div>
	Phenols by HPLC (S)		All	NDPs: 0 Tests: 1	<div>X</div>
	Sample description		All	NDPs: 0 Tests: 1	<div>X</div>
	Total Organic Carbon		All	NDPs: 0 Tests: 1	<div>X</div>
	Total Sulphur		All	NDPs: 0 Tests: 1	<div>X</div>



CERTIFICATE OF ANALYSIS

Validated

SDG:

210407-85

Client Reference:

B025563

Report Number:

594654

Location:

Cambridge South East Tra

Order Number:

7000964

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24033400		
	Customer Sample Reference		TP-PTR-28		
	AGS Reference				
	Depth (m)		1.00		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	TPH CWG GC (S)		All	NDPs: 0 Tests: 1	<div>X</div>
	VOC MS (S)		All	NDPs: 0 Tests: 1	<div>X</div>

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24033400	TP-PTR-28	1.00	White	Silt Loam	None	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-PTR-28				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		06/04/2021				
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		07/04/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210407-85				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24033400				
(F)	Trigger breach confirmed						
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	21				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	#			
pH	1 pH Units	TM133	8.94	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	1.55				
Antimony	<0.6 mg/kg	TM181	1.39	#			
Arsenic	<0.6 mg/kg	TM181	<0.6	M			
Barium	<0.6 mg/kg	TM181	16.6	#			
Beryllium	<0.01 mg/kg	TM181	0.088	M			
Cadmium	<0.02 mg/kg	TM181	0.035	M			
Chromium	<0.9 mg/kg	TM181	1.55	M			
Copper	<1.4 mg/kg	TM181	3.65	M			
Iron	<1000 mg/kg	TM181	1630	#			
Lead	<0.7 mg/kg	TM181	2.11	M			
Manganese	<0.13 mg/kg	TM181	467	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	<0.1	#			
Nickel	<0.2 mg/kg	TM181	3.41	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	2.31	#			

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SDG:	210407-85	Client Reference:	B025563	Report Number:	594654
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TPH CWG (S)

[illegible]

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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-28				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 Soil/Solid (S) 06/04/2021 . 07/04/2021 210407-85 24033400				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	118				
Toluene-d8**	%	TM116	97.3				
4-Bromofluorobenzene**	%	TM116	97.9				
Dichlorodifluoromethane	<6 µg/kg	TM116	<120 M				
Chloromethane	<7 µg/kg	TM116	<140 #				
Vinyl Chloride	<6 µg/kg	TM116	<120 ♦ M				
Bromomethane	<10 µg/kg	TM116	<200 M				
Chloroethane	<10 µg/kg	TM116	<200 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<120 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<200 #				
Carbon Disulphide	<7 µg/kg	TM116	<140 M				
Dichloromethane	<10 µg/kg	TM116	<200 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<160 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<200				
Bromochloromethane	<10 µg/kg	TM116	<200 M				
Chloroform	<8 µg/kg	TM116	<160 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<200 M				
Carbontetrachloride	<10 µg/kg	TM116	<200 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<100 M				
Benzene	<9 µg/kg	TM116	<180 M				
Trichloroethene	<9 µg/kg	TM116	<180 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<200 M				
Dibromomethane	<9 µg/kg	TM116	<180 M				
Bromodichloromethane	<7 µg/kg	TM116	<140 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200 M				
Toluene	<7 µg/kg	TM116	<140 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200 M				

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
M	mCERTS accredited.										
*	Subcontracted test										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-PTR-28 1.00 SOLID	13/04/2021	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)											
Sample Type	06/04/2021 00:00:00										
Date Sampled	07/04/2021 08:40:00										
Date Received	210407-85										
SDG	24033400										
Original Sample Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



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Test Completion Dates

Lab Sample No(s)	24033400
Customer Sample Ref.	TP-PTR-28
AGS Ref.	
Depth	1.00
Type	Soil/Solid (S)
Anions by Kone (soil)	14-Apr-2021
Asbestos ID in Solid Samples	13-Apr-2021
Boron Water Soluble	14-Apr-2021
Chromium III	15-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021
EPH CWG GC (S)	15-Apr-2021
GRO by GC-FID (S)	13-Apr-2021
Hexavalent Chromium (s)	14-Apr-2021
Metals in solid samples by OES	15-Apr-2021
PAH by GCMS	13-Apr-2021
pH	09-Apr-2021
Phenols by HPLC (S)	13-Apr-2021
Sample description	08-Apr-2021
Total Organic Carbon	15-Apr-2021
Total Sulphur	12-Apr-2021
TPH CWG GC (S)	15-Apr-2021
VOC MS (S)	14-Apr-2021



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ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2408
Chloride (soluble)	TM243	159.07 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	166.82 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2404
Water Soluble Boron	TM222	94.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2419
Free Cyanide	TM153	100.0 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2411
QC	TM089	91.5 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2473
Hexavalent Chromium	TM151	106.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2490
Aluminium	TM181	83.81 73.56 : 108.85
Antimony	TM181	98.78 76.89 : 111.24
Arsenic	TM181	100.58 88.53 : 111.01



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Metals in solid samples by OES

		QC 2490
Barium	TM181	95.41 77.67 : 105.35
Beryllium	TM181	97.76 85.44 : 109.61
Boron	TM181	87.97 73.51 : 104.66
Cadmium	TM181	93.42 77.67 : 104.12
Chromium	TM181	85.8 79.64 : 105.83
Cobalt	TM181	88.05 84.60 : 104.13
Copper	TM181	95.95 82.40 : 105.45
Iron	TM181	95.24 82.95 : 110.58
Lead	TM181	91.89 78.24 : 104.05
Manganese	TM181	106.11 94.29 : 119.51
Mercury	TM181	95.89 83.16 : 107.81
Molybdenum	TM181	97.53 87.11 : 106.87
Nickel	TM181	90.71 80.26 : 102.28
Phosphorus	TM181	104.65 94.56 : 124.28
Selenium	TM181	95.29 82.28 : 110.48
Strontium	TM181	92.2 79.13 : 102.79
Thallium	TM181	101.33 82.94 : 111.86
Tin	TM181	97.34 86.72 : 110.03
Titanium	TM181	82.44 66.23 : 102.06
Vanadium	TM181	97.07 86.19 : 109.45
Zinc	TM181	96.3 84.68 : 113.99

Component	Method Code	QC 2413
Acenaphthene	TM218	98.0 76.79 : 103.90
Acenaphthylene	TM218	97.0 78.40 : 108.66
Anthracene	TM218	99.5 70.90 : 109.22
Benz(a)anthracene	TM218	102.0 73.77 : 119.26



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Client Reference:

Order Number:

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Report Number:

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PAH by GCMS

		QC 2413
Benzo(a)pyrene	TM218	99.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	99.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	101.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	103.5 75.98 : 116.59
Chrysene	TM218	99.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	100.5 69.17 : 115.30
Fluoranthene	TM218	97.0 75.88 : 112.84
Fluorene	TM218	99.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	97.0 70.26 : 117.95
Naphthalene	TM218	94.0 74.70 : 101.83
Phenanthrene	TM218	99.5 73.62 : 109.34
Pyrene	TM218	98.0 71.46 : 117.00

Component	Method Code	QC 2485
pH	TM133	100.53 99.08 : 102.24

Component	Method Code	QC 2453
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	51.36 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	54.3 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.77 76.56 : 106.38

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2457
Total Organic Carbon	TM132	104.69 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2466
Total Sulphur %	TM132	69.95 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2495
1,1,1,2-tetrachloroethane	TM116	104.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	103.4 86.26 : 117.53
1,1,2-Trichloroethane	TM116	96.4 75.16 : 112.70
1,1-Dichloroethane	TM116	106.2 83.27 : 122.16
1,2-Dichloroethane	TM116	105.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	115.2 82.59 : 123.23
2-Chlorotoluene	TM116	106.8 66.81 : 118.43
4-Chlorotoluene	TM116	111.0 65.88 : 114.76
Benzene	TM116	95.4 93.16 : 123.63
Carbon Disulphide	TM116	98.6 75.11 : 124.81
Carbontetrachloride	TM116	117.0 82.35 : 126.46
Chlorobenzene	TM116	104.8 85.07 : 118.13
Chloroform	TM116	105.8 88.13 : 122.71
Chloromethane	TM116	115.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	105.2 78.27 : 128.90
Dibromomethane	TM116	103.4 77.47 : 121.29
Dichloromethane	TM116	112.0 87.89 : 134.72

VOC MS (S)

		QC 2495
Ethylbenzene	TM116	90.6 79.92 : 110.05
Hexachlorobutadiene	TM116	92.8 16.78 : 153.29
Isopropylbenzene	TM116	83.6 64.20 : 119.59
Naphthalene	TM116	96.4 79.29 : 125.59
o-Xylene	TM116	94.2 72.86 : 102.10
p/m-Xylene	TM116	84.5 74.06 : 106.47
Sec-Butylbenzene	TM116	89.8 44.71 : 117.87
Tetrachloroethene	TM116	98.2 77.82 : 125.00
Toluene	TM116	90.6 87.82 : 116.21
Trichloroethene	TM116	97.8 79.80 : 112.33
Trichlorofluoromethane	TM116	99.4 80.52 : 132.12
Vinyl Chloride	TM116	114.8 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



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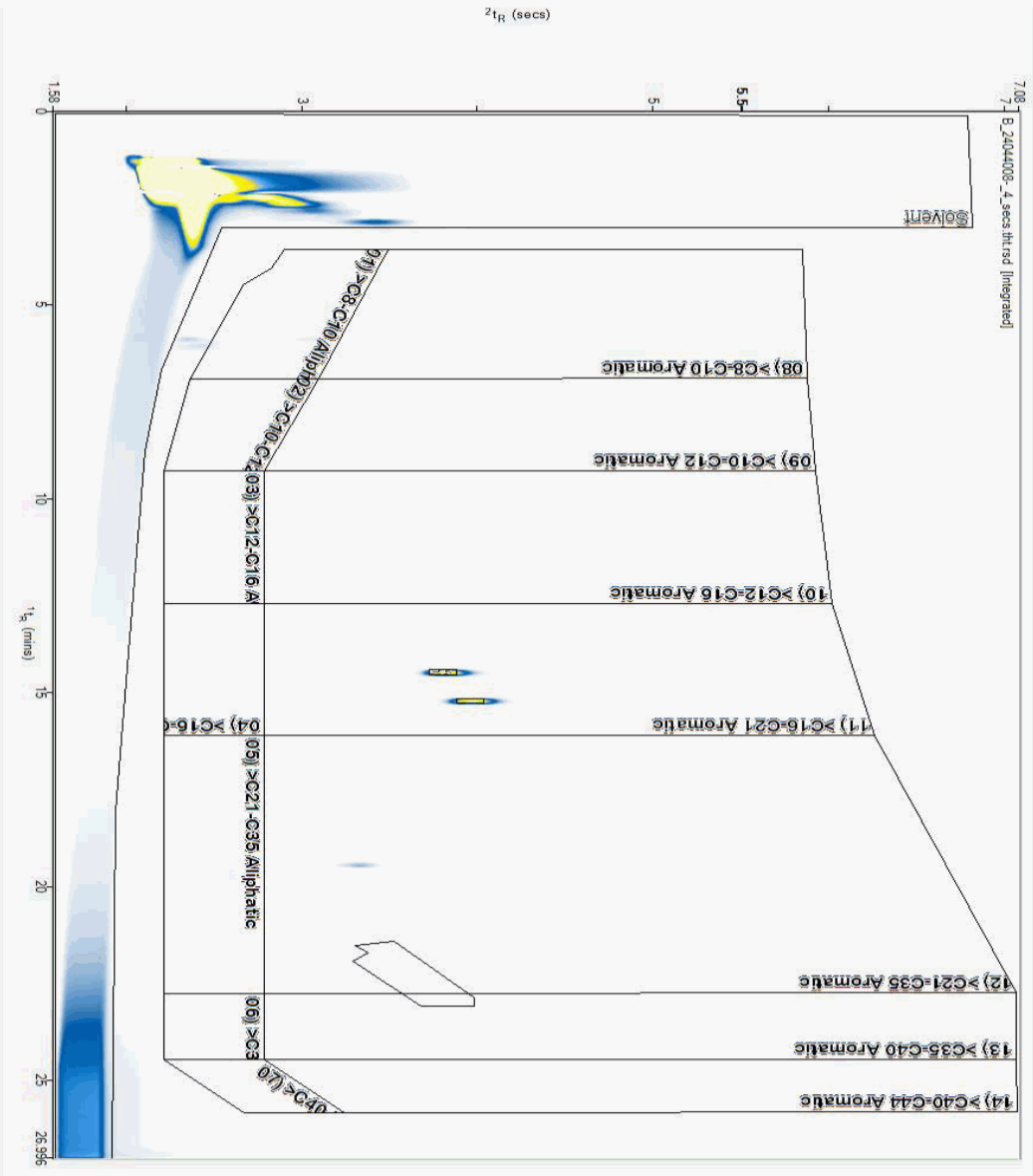
Validated

SDG: 210407-85 Client Reference: B025563 Report Number: 594654
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24044008 Depth : 1.00
Sample ID : TP-PTR-28

ChromSpace LIMS export
Current batch
Sample Identity: B_24044008-4_secs.tht
Date Acquired : 14/04/21 01:55:53
Units : ppm
Dilution : 0
CF :
Multiplier :



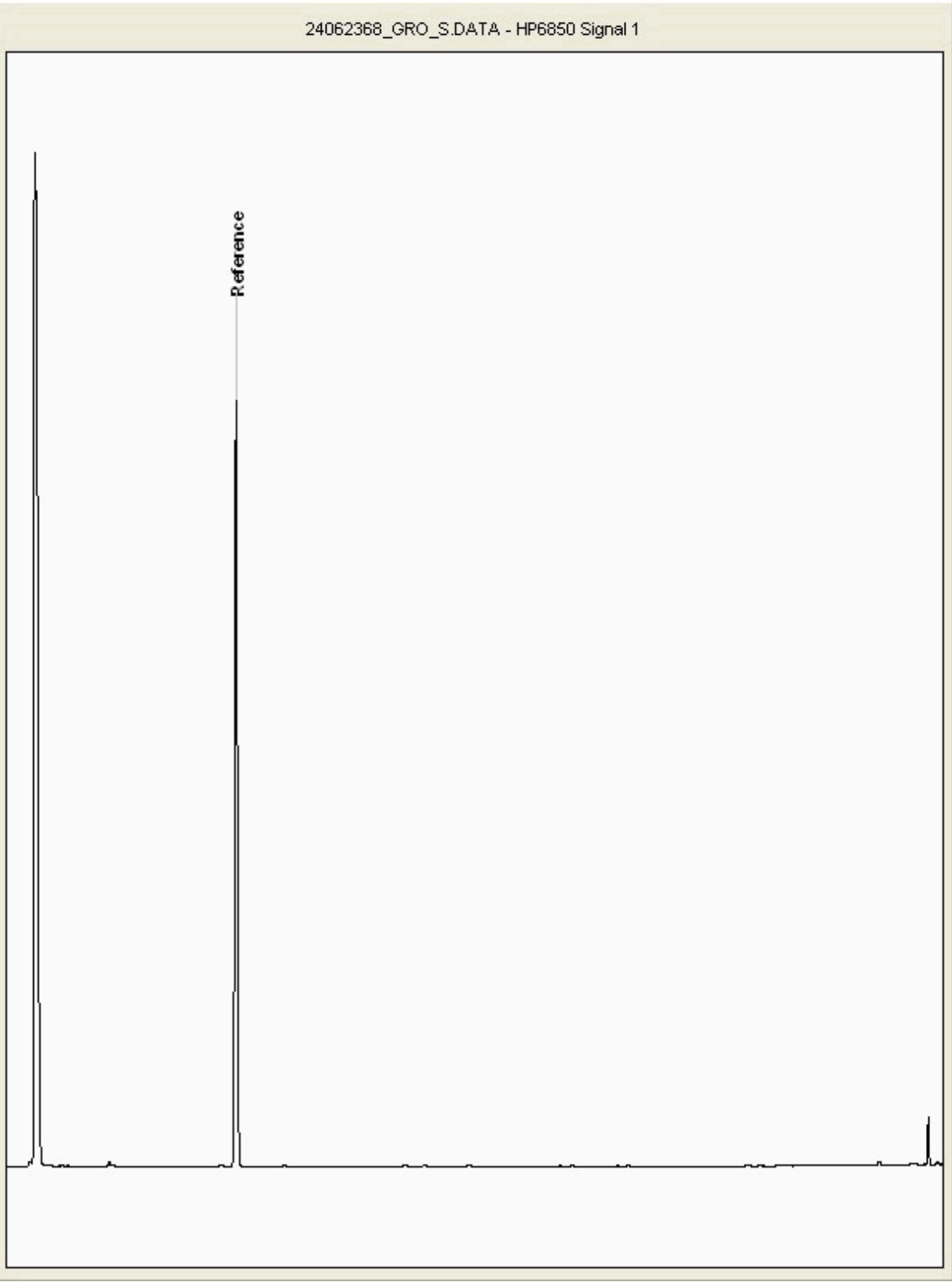
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Validated

SDG: 210407-85 Client Reference: B025563 Report Number: 594654
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24062368 Depth : 1.00
Sample ID : TP-PTR-28





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Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
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LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)

Hawarden

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CH5 3US

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CERTIFICATE OF ANALYSIS

Date of report Generation:

19 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210407-86

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

594655

We received 5 samples on Wednesday April 07, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday April 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 19/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210407-86 Client Reference: B025563 Report Number: 594655
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24033508	BH-PTR-4S		2.00	06/04/2021
24033502	BH-TH-03		0.10	01/04/2021
24033504	BH-TH-03		0.20	01/04/2021
24033505	BH-TH-03		0.50	01/04/2021
24033507	BH-TH-03		1.00	01/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210407-86 Client Reference: B025563 Report Number: 594655
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24033507		
	Customer Sample Reference		BH-TH-03		
	AGS Reference				
	Depth (m)		1.00		
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG:

210407-86

Location:

Cambridge South East Tra

Client Reference:

B025563

Order Number:

7000964

Report Number:

594655

Superseded Report:

Results Legend

X

Test

N

No Determination Possible

Sample Types -

S - Soil/Solid

UNS - Unspecified Solid

GW - Ground Water

SW - Surface Water

LE - Land Leachate

PL - Prepared Leachate

PR - Process Water

SA - Saline Water

TE - Trade Effluent

TS - Treated Sewage

US - Untreated Sewage

RE - Recreational Water

DW - Drinking Water Non-regulatory

UNL - Unspecified Liquid

SL - Sludge

G - Gas

OTH - Other

Lab Sample No(s)

24033507

Customer Sample Reference

BH-TH-03

AGS Reference

Depth (m)

1.00

Container

60g VOC (ALE215)

250g Amber Jar (ALE210)

1kg TUB with Handle (ALE260)

Sample Type

S

S

S

TPH CWG GC (S)

All

NDPs: 0

Tests: 1

X

VOC MS (S)

All

NDPs: 0

Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG:210407-86

Client Reference:B025563

Report Number:594655

Location:Cambridge South East Tra

Order Number:7000964

Superseded Report:

Sample Descriptions

Grain Sizes

very fine

<0.063mm

fine

0.063mm - 0.1mm

medium

0.1mm - 2mm

coarse

2mm - 10mm

very coarse

>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24033507	BH-TH-03	1.00	Light Brown	Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>BH-TH-03</div> <div>1.00 Soil/Solid (S) 01/04/2021 . 07/04/2021 210407-86 24033507</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	6.1						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Sulphur, Total	<0.02 %	TM132	<0.02						
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	#					
pH	1 pH Units	TM133	8.93	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	@ M					
Chromium, Trivalent	<0.9 mg/kg	TM181	7.99						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	18.7	M					
Barium	<0.6 mg/kg	TM181	38.7	#					
Beryllium	<0.01 mg/kg	TM181	0.39	M					
Cadmium	<0.02 mg/kg	TM181	0.0547	M					
Chromium	<0.9 mg/kg	TM181	7.99	M					
Copper	<1.4 mg/kg	TM181	6.69	M					
Iron	<1000 mg/kg	TM181	24000	#					
Lead	<0.7 mg/kg	TM181	8.72	M					
Manganese	<0.13 mg/kg	TM181	242	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	0.562	#					
Nickel	<0.2 mg/kg	TM181	15.8	M					
Selenium	<1 mg/kg	TM181	<1	#					
Vanadium	<0.2 mg/kg	TM181	35.1	#					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-TH-03					
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 Soil/Solid (S) 01/04/2021 07/04/2021 210407-86 24033507					
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	108					
Toluene-d8**	%	TM116	98.1					
4-Bromofluorobenzene**	%	TM116	102					
Dichlorodifluoromethane	<6 µg/kg	TM116	<120					
Chloromethane	<7 µg/kg	TM116	<140					
Vinyl Chloride	<6 µg/kg	TM116	<120					
Bromomethane	<10 µg/kg	TM116	<200					
Chloroethane	<10 µg/kg	TM116	<200					
Trichlorofluoromethane	<6 µg/kg	TM116	<120					
1,1-Dichloroethene	<10 µg/kg	TM116	<200					
Carbon Disulphide	<7 µg/kg	TM116	<140					
Dichloromethane	<10 µg/kg	TM116	<200					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<200					
1,1-Dichloroethane	<8 µg/kg	TM116	<160					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<120					
2,2-Dichloropropane	<10 µg/kg	TM116	<200					
Bromochloromethane	<10 µg/kg	TM116	<200					
Chloroform	<8 µg/kg	TM116	<160					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<140					
1,1-Dichloropropene	<10 µg/kg	TM116	<200					
Carbontetrachloride	<10 µg/kg	TM116	<200					
1,2-Dichloroethane	<5 µg/kg	TM116	<100					
Benzene	<9 µg/kg	TM116	<180					
Trichloroethene	<9 µg/kg	TM116	<180					
1,2-Dichloropropane	<10 µg/kg	TM116	<200					
Dibromomethane	<9 µg/kg	TM116	<180					
Bromodichloromethane	<7 µg/kg	TM116	<140					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<200					
Toluene	<7 µg/kg	TM116	<140					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<200					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<200					

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-TH-03					
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 Soil/Solid (S) 01/04/2021 07/04/2021 210407-86 24033507					
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<140					
Tetrachloroethene	<5 µg/kg	TM116	<100					
Dibromochloromethane	<10 µg/kg	TM116	<200					
1,2-Dibromoethane	<10 µg/kg	TM116	<200					
Chlorobenzene	<5 µg/kg	TM116	<100					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<200					
Ethylbenzene	<4 µg/kg	TM116	<80					
p/m-Xylene	<10 µg/kg	TM116	<200					
o-Xylene	<10 µg/kg	TM116	<200					
Styrene	<10 µg/kg	TM116	<200					
Bromoform	<10 µg/kg	TM116	<200					
Isopropylbenzene	<5 µg/kg	TM116	<100					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<200					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<320					
Bromobenzene	<10 µg/kg	TM116	<200					
Propylbenzene	<10 µg/kg	TM116	<200					
2-Chlorotoluene	<9 µg/kg	TM116	<180					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<160					
4-Chlorotoluene	<10 µg/kg	TM116	<200					
tert-Butylbenzene	<14 µg/kg	TM116	<280					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<180					
sec-Butylbenzene	<10 µg/kg	TM116	<200					
4-Isopropyltoluene	<10 µg/kg	TM116	<200					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<160					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<100					
n-Butylbenzene	<11 µg/kg	TM116	<220					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<200					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<280					
Tert-amyl methyl ether	<10 µg/kg	TM116	<200					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<400					
Hexachlorobutadiene	<20 µg/kg	TM116	<400					
Naphthalene	<13 µg/kg	TM116	<260					

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24033507
Customer Sample Ref.	BH-TH-03
AGS Ref.	
Depth	1.00
Type	Soil/Solid (S)
Anions by Kone (soil)	14-Apr-2021
Asbestos ID in Solid Samples	13-Apr-2021
Boron Water Soluble	14-Apr-2021
Chromium III	15-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021
EPH CWG GC (S)	15-Apr-2021
GRO by GC-FID (S)	13-Apr-2021
Hexavalent Chromium (s)	15-Apr-2021
Metals in solid samples by OES	15-Apr-2021
PAH by GCMS	13-Apr-2021
pH	09-Apr-2021
Phenols by HPLC (S)	13-Apr-2021
Sample description	09-Apr-2021
Total Organic Carbon	15-Apr-2021
Total Sulphur	12-Apr-2021
TPH CWG GC (S)	15-Apr-2021
VOC MS (S)	14-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2408
Chloride (soluble)	TM243	159.07 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	166.82 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2426
Water Soluble Boron	TM222	92.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2419
Free Cyanide	TM153	100.0 79.00 : 115.00
Thiocyanate	TM153	101.28 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2411
QC	TM089	91.5 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2433
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2485
Aluminium	TM181	89.38 73.56 : 108.85
Antimony	TM181	99.59 76.89 : 111.24
Arsenic	TM181	102.91 88.53 : 111.01



CERTIFICATE OF ANALYSIS

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SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Metals in solid samples by OES

		QC 2485
Barium	TM181	94.5 77.67 : 105.35
Beryllium	TM181	100.75 85.44 : 109.61
Boron	TM181	90.26 73.51 : 104.66
Cadmium	TM181	91.77 77.67 : 104.12
Chromium	TM181	89.25 79.64 : 105.83
Cobalt	TM181	90.88 84.60 : 104.13
Copper	TM181	99.65 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	91.22 78.24 : 104.05
Manganese	TM181	108.61 94.29 : 119.51
Mercury	TM181	100.97 83.16 : 107.81
Molybdenum	TM181	97.94 87.11 : 106.87
Nickel	TM181	93.64 80.26 : 102.28
Phosphorus	TM181	108.69 94.56 : 124.28
Selenium	TM181	101.96 82.28 : 110.48
Strontium	TM181	94.43 79.13 : 102.79
Thallium	TM181	101.77 82.94 : 111.86
Tin	TM181	98.86 86.72 : 110.03
Titanium	TM181	83.97 66.23 : 102.06
Vanadium	TM181	100.0 86.19 : 109.45
Zinc	TM181	99.38 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2495
Acenaphthene	TM218	92.0 73.47 : 109.80
Acenaphthylene	TM218	93.0 70.00 : 130.00
Anthracene	TM218	88.5 68.68 : 111.89
Benz(a)anthracene	TM218	102.0 68.12 : 118.39

PAH by GCMS

		QC 2495
Benzo(a)pyrene	TM218	101.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	100.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	93.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	95.5 73.10 : 117.03
Chrysene	TM218	94.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	94.0 67.32 : 121.35
Fluoranthene	TM218	92.0 75.16 : 117.28
Fluorene	TM218	89.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	95.5 68.91 : 117.62
Naphthalene	TM218	91.0 72.12 : 106.18
Phenanthrene	TM218	93.0 69.01 : 113.72
Pyrene	TM218	91.0 64.28 : 115.75

pH

Component	Method Code	QC 2445
pH	TM133	100.26 99.08 : 102.24

Phenols by HPLC (S)

Component	Method Code	QC 2453
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	51.36 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	54.3 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.77 76.56 : 106.38

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2457
Total Organic Carbon	TM132	104.69 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2421
Total Sulphur %	TM132	101.04 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2495
1,1,1,2-tetrachloroethane	TM116	104.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	103.4 86.26 : 117.53
1,1,2-Trichloroethane	TM116	96.4 75.16 : 112.70
1,1-Dichloroethane	TM116	106.2 83.27 : 122.16
1,2-Dichloroethane	TM116	105.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	115.2 82.59 : 123.23
2-Chlorotoluene	TM116	106.8 66.81 : 118.43
4-Chlorotoluene	TM116	111.0 65.88 : 114.76
Benzene	TM116	95.4 93.16 : 123.63
Carbon Disulphide	TM116	98.6 75.11 : 124.81
Carbontetrachloride	TM116	117.0 82.35 : 126.46
Chlorobenzene	TM116	104.8 85.07 : 118.13
Chloroform	TM116	105.8 88.13 : 122.71
Chloromethane	TM116	115.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	105.2 78.27 : 128.90
Dibromomethane	TM116	103.4 77.47 : 121.29
Dichloromethane	TM116	112.0 87.89 : 134.72



CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2495
Ethylbenzene	TM116	90.6 79.92 : 110.05
Hexachlorobutadiene	TM116	92.8 16.78 : 153.29
Isopropylbenzene	TM116	83.6 64.20 : 119.59
Naphthalene	TM116	96.4 79.29 : 125.59
o-Xylene	TM116	94.2 72.86 : 102.10
p/m-Xylene	TM116	84.5 74.06 : 106.47
Sec-Butylbenzene	TM116	89.8 44.71 : 117.87
Tetrachloroethene	TM116	98.2 77.82 : 125.00
Toluene	TM116	90.6 87.82 : 116.21
Trichloroethene	TM116	97.8 79.80 : 112.33
Trichlorofluoromethane	TM116	99.4 80.52 : 132.12
Vinyl Chloride	TM116	114.8 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



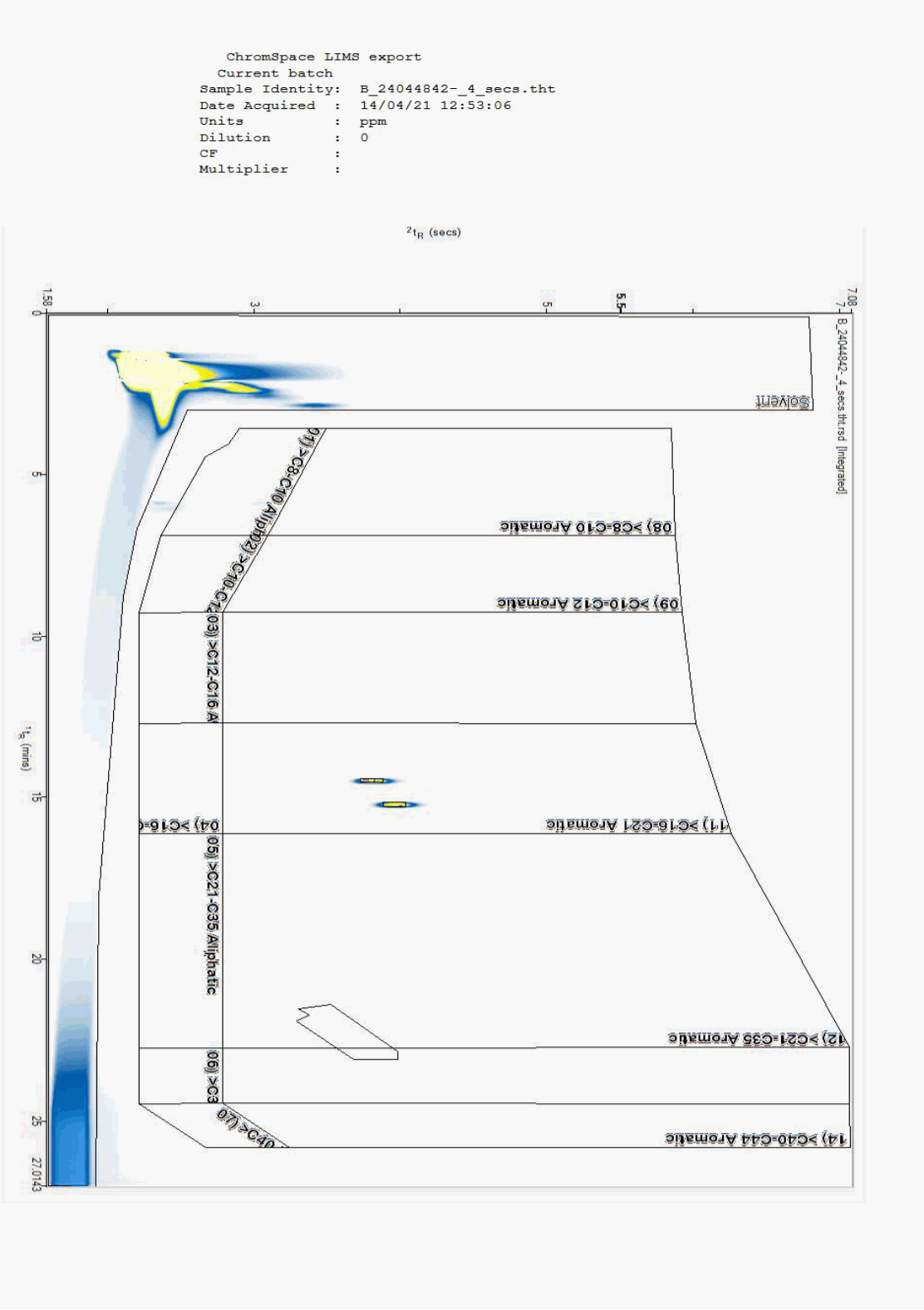
CERTIFICATE OF ANALYSIS

Validated

SDG:	210407-86	Client Reference:	B025563	Report Number:	594655
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24044842	Depth :	1.00
		Sample ID :	BH-TH-03		





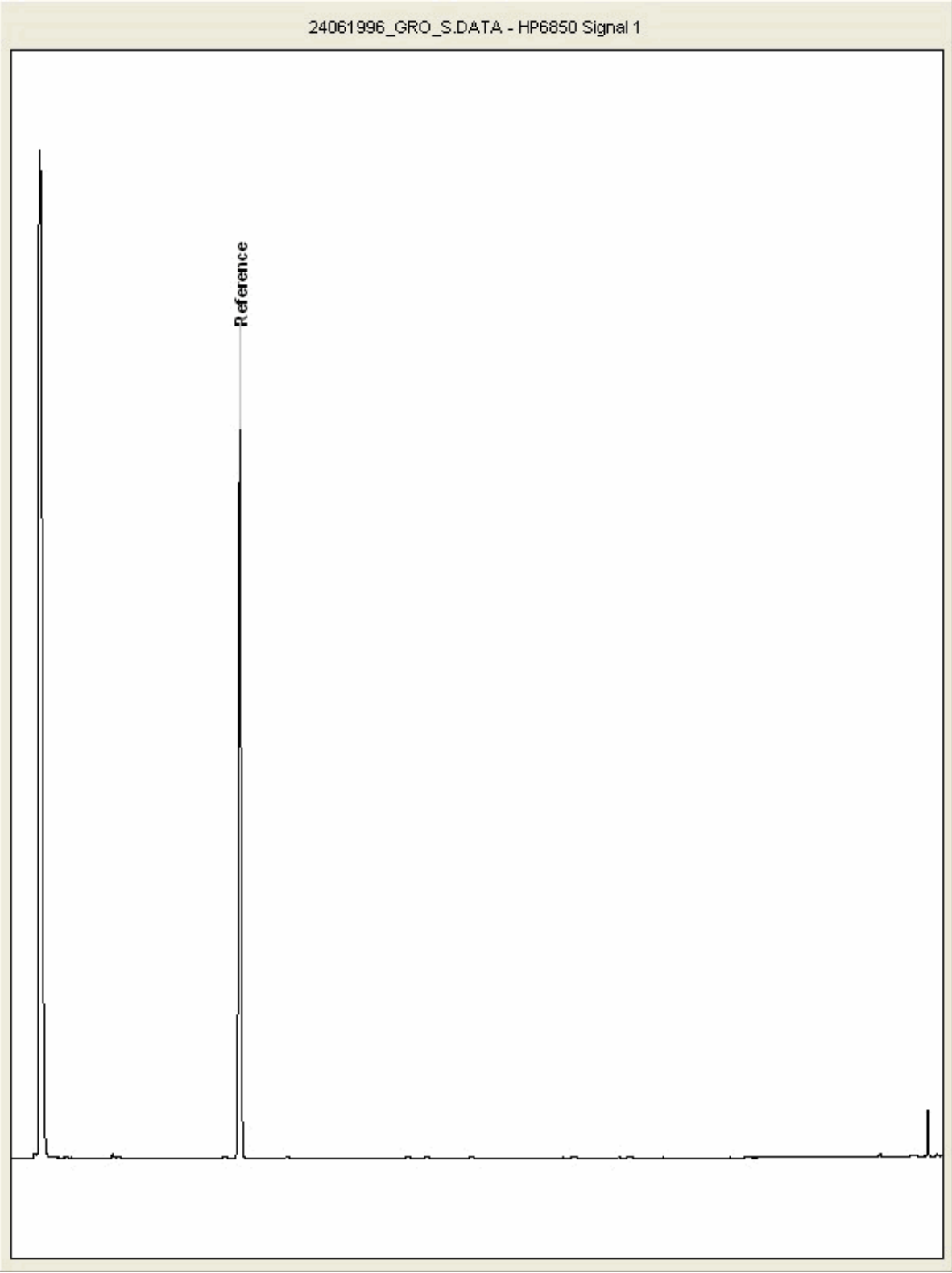
CERTIFICATE OF ANALYSIS

Validated

SDG: 210407-86 Client Reference: B025563 Report Number: 594655
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24061996 Depth : 1.00
Sample ID : BH-TH-03



CERTIFICATE OF ANALYSIS

SDG: 210407-86 Client Reference: B025563 Report Number: 594655
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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LS1 4ER

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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 16 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210409-38
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594479

We received 8 samples on Thursday April 08, 2021 and 1 of these samples were scheduled for analysis which was completed on Friday April 16, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24046376	TP-PTR-19	ES1	0.10	01/04/2021
24046377	TP-PTR-19	ES2	0.20	01/04/2021
24046378	TP-PTR-19	ES7	1.00	01/04/2021
24046383	TP-PTR-19	ES7	1.00	01/04/2021
24046379	TP-PTR-29	ES1	0.10	01/04/2021
24046380	TP-PTR-29	ES2	0.20	01/04/2021
24046381	TP-PTR-29	ES6	0.50	01/04/2021
24046382	TP-PTR-29	ES12	1.00	01/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24046376	
	Customer Sample Reference		TP-PTR-19	
	AGS Reference		ES1	
	Depth (m)		0.10	
	Container		60g VOC (ALE215) 1kg TUB with Handle (ALE260)	
	Sample Type		S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 1	X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X	
Boron Water Soluble	All	NDPs: 0 Tests: 1	X	
CEN Readings	All	NDPs: 0 Tests: 1	X	
Chromium III	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
Fluoride	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24046376	
	Customer Sample Reference		TP-PTR-19	
	AGS Reference		ES1	
	Depth (m)		0.10	
	Container		60g VOC (ALE215) 1kg TUB with Handle (ALE260)	
	Sample Type		S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X	
Mercury Dissolved	All	NDPs: 0 Tests: 1	X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X	
PAH by GCMS	All	NDPs: 0 Tests: 1	X	
pH	All	NDPs: 0 Tests: 1	X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1	X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X	
Sample description	All	NDPs: 0 Tests: 1	X	
Total Organic Carbon	All	NDPs: 0 Tests: 1	X	
Total Sulphur	All	NDPs: 0 Tests: 1	X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
VOC MS (S)	All	NDPs: 0 Tests: 1		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24046376	TP-PTR-19	0.10	Dark Brown	Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-PTR-19				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		01/04/2021				
disa.filt	Dissolved / filtered sample.		.				
tot.unfilt	Total / unfiltered sample.		08/04/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210409-38				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24046376				
(F)	Trigger breach confirmed		ES1				
1-445@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	7.2				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0358				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0127	#			
pH	1 pH Units	TM133	8.4	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	3.02				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	10.4	M			
Barium	<0.6 mg/kg	TM181	49.6	#			
Beryllium	<0.01 mg/kg	TM181	0.334	M			
Cadmium	<0.02 mg/kg	TM181	0.169	M			
Chromium	<0.9 mg/kg	TM181	3.02	M			
Copper	<1.4 mg/kg	TM181	16.4	M			
Iron	<1000 mg/kg	TM181	21400	#			
Lead	<0.7 mg/kg	TM181	26.1	M			
Manganese	<0.13 mg/kg	TM181	718	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	1.07	#			
Nickel	<0.2 mg/kg	TM181	28.4	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	17.2	#			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-19				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4-5-6 Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 01/04/2021 . 08/04/2021 210409-38 24046376 ES1				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	101				
Toluene-d8**	%	TM116	98.2				
4-Bromofluorobenzene**	%	TM116	80.7				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		TP-PTR-19					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 01/04/2021 . 08/04/2021 210409:38 24046376 ES1						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M						
Styrene	<10 µg/kg	TM116	<10 @ #						
Bromoform	<10 µg/kg	TM116	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13 M						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-PTR-19ES1	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Depth (m)	0.10										
Sample Type	SOLID										
Date Sampled	01/04/2021 00:00:00										
Date Received	08/04/2021 08:30:00										
SDG	210409-38										
Original Sample Method Number	24046376 TM048										
		13/04/2021	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F		
Mass Sample taken (kg)	0.098	Natural Moisture Content (%)	9.42		
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	91.4		
Particle Size <4mm	>95%				
Case					
SDG	210409-38				
Lab Sample Number(s)	24046376				
Sampled Date	01-Apr-2021				
Customer Sample Ref.	TP-PTR-19 ES1				
Depth (m)	0.10				

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.9	<3	49	<30	-	-	-
Fluoride	0.535	<0.5	5.35	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00124	<0.0005	0.0124	<0.005	-	-	-
Barium	0.0931	<0.0002	0.931	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0688	<0.01	0.688	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	21	<0.2	210	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.0022	<0.0003	0.022	<0.003	-	-	-
Lead	0.0003	<0.0002	0.003	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.273	<0.036	2.73	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00302	<0.003	0.0302	<0.03	-	-	-
Nickel	0.000512	<0.0004	0.00512	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00242	<0.001	0.0242	<0.01	-	-	-
Zinc	0.0111	<0.001	0.111	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	7.38
Conductivity (µS/cm)	103.00
Temperature (°C)	20.50
Volume Leachant (Litres)	0.892



CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.098	Natural Moisture Content (%)	9.42
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	91.4
Particle Size <4mm	>95%		

Case

SDG	210409-38
Lab Sample Number(s)	24046376
Sampled Date	01-Apr-2021
Customer Sample Ref.	TP-PTR-19 ES1
Depth (m)	0.10

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Leach Test Information

Date Prepared	09-Apr-2021
pH (pH Units)	7.38
Conductivity (µS/cm)	103.00
Temperature (°C)	20.50
Volume Leachant (Litres)	0.892

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	24046376
Customer Sample Ref.	TP-PTR-19
AGS Ref.	ES1
Depth	0.10
Type	Soil/Solid (S)
Ammonium Low	15-Apr-2021
Anions by Kone (soil)	16-Apr-2021
Anions by Kone (w)	14-Apr-2021
Asbestos ID in Solid Samples	13-Apr-2021
Boron Water Soluble	14-Apr-2021
CEN 10:1 Leachate (1 Stage)	10-Apr-2021
CEN Readings	15-Apr-2021
Chromium III	15-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	14-Apr-2021
Dissolved Metals by ICP-MS	14-Apr-2021
Dissolved Organic/Inorganic Carbon	16-Apr-2021
EPH CWG GC (S)	15-Apr-2021
Fluoride	14-Apr-2021
GRO by GC-FID (S)	13-Apr-2021
Hexavalent Chromium (s)	15-Apr-2021
Low Level Cyanide (W)	14-Apr-2021
Low Level Hexavalent Chromium (w)	14-Apr-2021
Mercury Dissolved	14-Apr-2021
Metals in solid samples by OES	15-Apr-2021
Moisture at 105C	09-Apr-2021
PAH by GCMS	13-Apr-2021
pH	12-Apr-2021
pH Value of Filtered Water	15-Apr-2021
Phenols by HPLC (S)	13-Apr-2021
Phenols by HPLC (W)	16-Apr-2021
Sample description	09-Apr-2021
Total Organic Carbon	15-Apr-2021
Total Sulphur	12-Apr-2021
TPH CWG GC (S)	15-Apr-2021
VOC MS (S)	13-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2450
Ammoniacal Nitrogen as N	TM099	102.2 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2403
Chloride (soluble)	TM243	138.86 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	155.61 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2410
Chloride	TM184	92.7 91.40 : 109.10
Sulphate (soluble)	TM184	96.4 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2426
Water Soluble Boron	TM222	92.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2486
Free Cyanide	TM153	101.98 79.00 : 115.00
Thiocyanate	TM153	103.21 94.09 : 113.89
Total Cyanide	TM153	102.1 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2421
Aluminium	TM152	104.0 90.98 : 111.82
Antimony	TM152	102.5 90.44 : 113.04
Arsenic	TM152	103.0 88.00 : 112.00



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2421
Barium	TM152	103.33 90.20 : 111.19
Beryllium	TM152	104.83 87.77 : 113.97
Bismuth	TM152	102.5 91.90 : 112.20
Borate	TM152	106.79 88.00 : 112.00
Boron	TM152	106.67 96.48 : 114.93
Cadmium	TM152	103.5 96.43 : 110.53
Calcium	TM152	102.0 81.38 : 119.09
Chromium	TM152	101.67 91.84 : 108.67
Cobalt	TM152	101.5 88.00 : 112.00
Copper	TM152	102.5 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00
Lead	TM152	102.5 88.00 : 112.00
Lithium	TM152	103.5 91.62 : 113.12
Magnesium	TM152	99.33 93.14 : 107.91
Manganese	TM152	101.0 95.03 : 110.58
Molybdenum	TM152	99.17 88.00 : 112.00
Nickel	TM152	102.33 88.00 : 112.00
Phosphorus	TM152	103.0 88.00 : 112.00
Potassium	TM152	102.0 93.90 : 112.36
Selenium	TM152	104.83 91.58 : 115.98
Silver	TM152	99.17 88.80 : 122.30
Sodium	TM152	100.0 94.28 : 110.71
Strontium	TM152	103.0 88.00 : 112.00
Tellurium	TM152	103.17 93.32 : 114.66
Thallium	TM152	95.83 88.00 : 112.00
Tin	TM152	101.83 92.63 : 109.70
Titanium	TM152	106.33 95.58 : 111.68



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Dissolved Metals by ICP-MS

		QC 2421
Tungsten	TM152	101.83 81.32 : 124.72
Uranium	TM152	100.67 88.00 : 112.00
Vanadium	TM152	97.83 88.00 : 112.00
Zinc	TM152	103.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2476
Dissolved Inorganic Carbon	TM090	102.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.67 96.13 : 109.53

Fluoride

Component	Method Code	QC 2467
Fluoride	TM104	105.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2464
QC	TM089	88.91 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2433
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2450
Free Cyanide - Low Level	TM279	77.25 88.26 : 122.21
Total Cyanide - Low Level	TM279	96.75 81.83 : 110.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210409-38	Client Reference:	B025563	Report Number:	594479	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2427				
Mercury Dissolved (CVAf)	TM183	97.8 69.30 : 128.70				

Metals in solid samples by OES

Component	Method Code	QC 2412
Aluminium	TM181	96.46 73.56 : 108.85
Antimony	TM181	94.72 76.89 : 111.24
Arsenic	TM181	99.13 88.53 : 111.01
Barium	TM181	96.33 77.67 : 105.35
Beryllium	TM181	98.88 85.44 : 109.61
Boron	TM181	90.54 73.51 : 104.66
Cadmium	TM181	90.12 77.67 : 104.12
Chromium	TM181	88.64 79.64 : 105.83
Cobalt	TM181	89.31 84.60 : 104.13
Copper	TM181	92.43 82.40 : 105.45
Iron	TM181	96.03 82.95 : 110.58
Lead	TM181	90.09 78.24 : 104.05
Manganese	TM181	109.72 94.29 : 119.51
Mercury	TM181	95.65 83.16 : 107.81
Molybdenum	TM181	97.12 87.11 : 106.87
Nickel	TM181	89.24 80.26 : 102.28
Phosphorus	TM181	110.1 94.56 : 124.28
Selenium	TM181	100.0 82.28 : 110.48
Strontium	TM181	93.32 79.13 : 102.79
Thallium	TM181	98.23 82.94 : 111.86
Tin	TM181	100.0 86.72 : 110.03
Titanium	TM181	86.26 66.23 : 102.06

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210409-38	Client Reference:	B025563	Report Number:	594479	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2412				
Vanadium	TM181	97.44 86.19 : 109.45				
Zinc	TM181	97.95 84.68 : 113.99				

PAH by GCMS

Component	Method Code	QC 2443
Acenaphthene	TM218	85.0 76.79 : 103.90
Acenaphthylene	TM218	82.0 78.40 : 108.66
Anthracene	TM218	84.5 70.90 : 109.22
Benz(a)anthracene	TM218	84.5 73.77 : 119.26
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	78.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	86.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	86.0 75.98 : 116.59
Chrysene	TM218	88.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	86.0 69.17 : 115.30
Fluoranthene	TM218	84.0 75.88 : 112.84
Fluorene	TM218	84.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	82.5 70.26 : 117.95
Naphthalene	TM218	79.0 74.70 : 101.83
Phenanthrene	TM218	85.0 73.62 : 109.34
Pyrene	TM218	84.5 71.46 : 117.00

pH

Component	Method Code	QC 2457
pH	TM133	99.85 98.41 : 102.48

pH Value of Filtered Water

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH Value of Filtered Water						

Component	Method Code	QC 2446
pH	TM256	100.27 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2453
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	51.36 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	54.3 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.77 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2402
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	101.56 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	95.6 82.77 : 126.51
Cresols by HPLC (W)	TM259	101.97 76.60 : 126.28
Napthol by HPLC (W)	TM259	101.56 75.40 : 129.40
Phenol by HPLC (W)	TM259	98.3 85.77 : 125.91
Xylenols by HPLC (W)	TM259	99.05 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2433
Total Organic Carbon	TM132	103.91 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2428
Total Sulphur %	TM132	79.27 61.64 : 114.47

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210409-38	Client Reference:	B025563	Report Number:	594479
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
VOC MS (S)						

Component	Method Code	QC 2424
1,1,1,2-tetrachloroethane	TM116	99.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	98.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	92.8 77.12 : 116.04
1,1-Dichloroethane	TM116	101.8 74.46 : 129.15
1,2-Dichloroethane	TM116	104.6 92.38 : 131.65
1,4-Dichlorobenzene	TM116	104.0 83.64 : 126.18
2-Chlorotoluene	TM116	97.2 76.03 : 113.25
4-Chlorotoluene	TM116	90.6 66.90 : 112.46
Benzene	TM116	98.2 88.60 : 113.80
Carbon Disulphide	TM116	95.6 74.91 : 122.14
Carbontetrachloride	TM116	101.8 80.31 : 124.50
Chlorobenzene	TM116	97.6 83.81 : 114.18
Chloroform	TM116	104.0 87.40 : 122.49
Chloromethane	TM116	103.2 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	102.0 80.67 : 126.72
Dibromomethane	TM116	94.8 73.23 : 118.35
Dichloromethane	TM116	106.6 81.11 : 133.25
Ethylbenzene	TM116	92.4 75.92 : 110.41
Hexachlorobutadiene	TM116	84.0 12.82 : 152.73
Isopropylbenzene	TM116	88.8 55.79 : 97.59
Naphthalene	TM116	103.4 80.86 : 128.81
o-Xylene	TM116	88.6 69.99 : 108.74
p/m-Xylene	TM116	86.8 68.32 : 108.91
Sec-Butylbenzene	TM116	86.8 38.50 : 101.50
Tetrachloroethene	TM116	100.8 76.95 : 121.02
Toluene	TM116	91.2 74.24 : 107.42
Trichloroethene	TM116	94.2 85.28 : 109.36



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

VOC MS (S)

		QC 2424
Trichlorofluoromethane	TM116	99.6 84.55 : 133.27
Vinyl Chloride	TM116	105.8 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



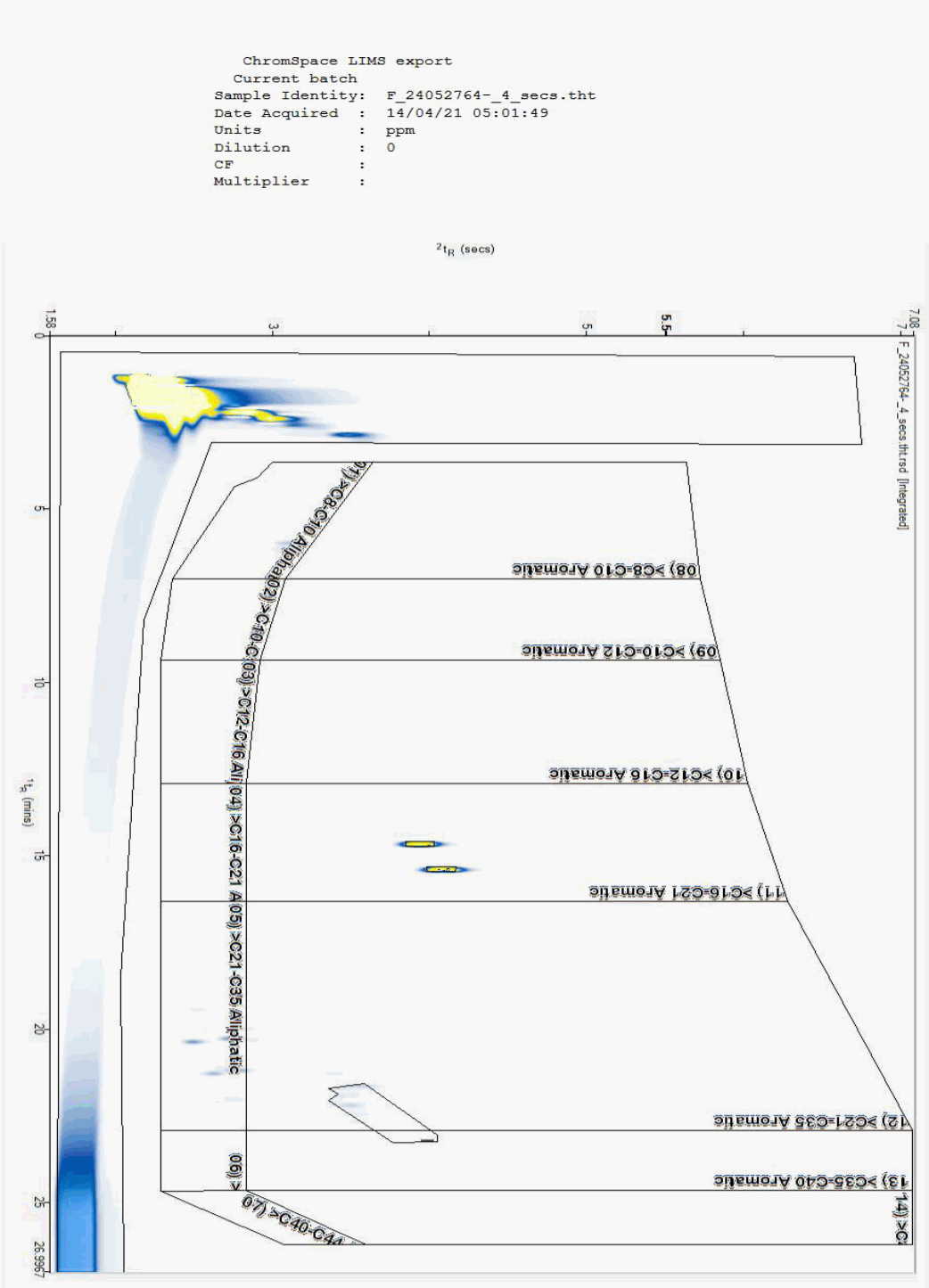
CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24052764 Depth : 0.10
Sample ID : TP-PTR-19





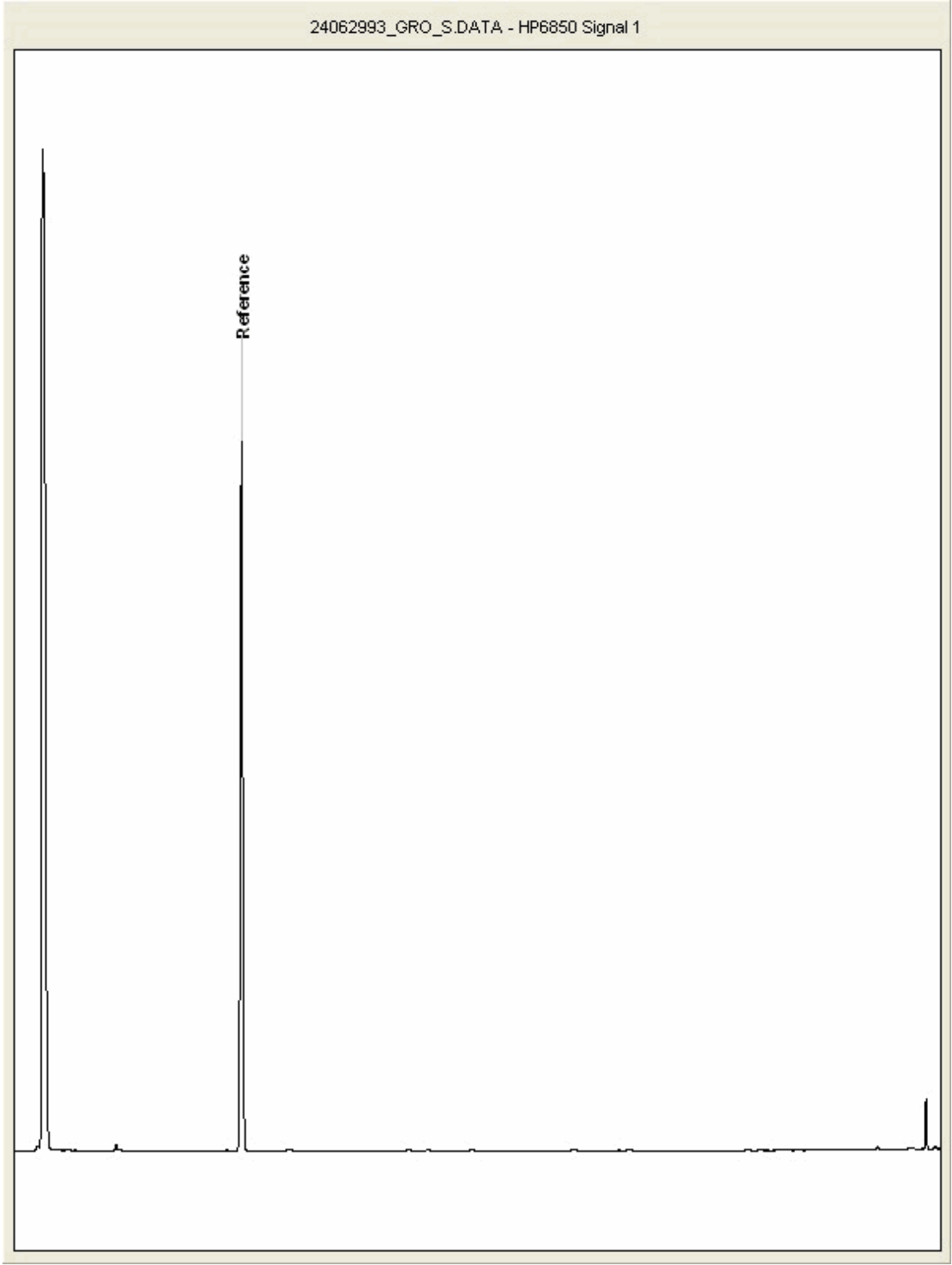
CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24062993 Depth : 0.10
Sample ID : TP-PTR-19



CERTIFICATE OF ANALYSIS

SDG: 210409-38 Client Reference: B025563 Report Number: 594479
Location: Cambridge South East Transport - PhOrder Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 22 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210409-49
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 595114

We received 11 samples on Friday April 09, 2021 and 2 of these samples were scheduled for analysis which was completed on Thursday April 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-49 Client Reference: B025563 Report Number: 595114
Location: Cambridge South East Transport - Phase 2 Order Number: 700964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24047527	BH-TH-03		0.10	06/04/2021
24047528	BH-TH-03		0.20	06/04/2021
24047530	BH-TH-03		0.50	06/04/2021
24047531	BH-TH-03		1.00	06/04/2021
24047518	TP-PTR-24		0.10	06/04/2021
24047519	TP-PTR-24		0.20	06/04/2021
24047520	TP-PTR-24		0.50	06/04/2021
24047522	TP-PTR-25		0.10	07/04/2021
24047523	TP-PTR-25		0.20	06/04/2021
24047524	TP-PTR-25		0.50	06/04/2021
24047526	TP-PTR-25		1.00	07/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-49 Client Reference: B025563 Report Number: 595114
Location: Cambridge South East TraOrder Number: 700964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24047519		24047526	
	Customer Sample Reference		TP-PTR-24		TP-PTR-25	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X		X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2		X		X
Chromium III	All	NDPs: 0 Tests: 2		X		X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X		X
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X		X
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Sample description	All	NDPs: 0 Tests: 1		X		
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-49 Client Reference: B025563 Report Number: 595114
Location: Cambridge South East TraOrder Number: 700964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24047519		24047526	
	Customer Sample Reference		TP-PTR-24		TP-PTR-25	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24047519	TP-PTR-24	0.20	Dark Brown	Clay Loam	Stones	Vegetation
24047526	TP-PTR-25	1.00	Beige	Loamy Sand	N/A	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-PTR-24	TP-PTR-25				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.20	1.00				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		06/04/2021	07/04/2021				
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.		09/04/2021	09/04/2021				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210409-49	210409-49				
(F)	Trigger breach confirmed		24047519	24047526				
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	13	14				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.037	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0126	<0.002				
pH	1 pH Units	TM133	8.38	8.82				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	12	3.39				
Antimony	<0.6 mg/kg	TM181	1.62	0.817				
Arsenic	<0.6 mg/kg	TM181	9.94	4.89				
Barium	<0.6 mg/kg	TM181	60.8	13.6				
Beryllium	<0.01 mg/kg	TM181	0.336	0.0576				
Cadmium	<0.02 mg/kg	TM181	0.183	0.0311				
Chromium	<0.9 mg/kg	TM181	12	3.39				
Copper	<1.4 mg/kg	TM181	17.2	5.75				
Iron	<1000 mg/kg	TM181	15200	6420				
Lead	<0.7 mg/kg	TM181	28.7	0.728				
Manganese	<0.13 mg/kg	TM181	695	346				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.457	0.183				
Nickel	<0.2 mg/kg	TM181	13.3	6.62				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	23	8.09				

SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
Location:	Cambridge South East Tra	Order Number:	700964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
Location:	Cambridge South East Tra	Order Number:	700964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-24	TP-PTR-25				
# M aq diss.flit totUnflit *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44\$@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 06/04/2021 . 09/04/2021 210409-49 24047519	1.00 Soil/Solid (S) 07/04/2021 . 09/04/2021 210409-49 24047526				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	102	105				
Toluene-d8**	%	TM116	93.5	100				
4-Bromofluorobenzene**	%	TM116	73.1	99.5				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M				
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M				
Benzene	<9 µg/kg	TM116	<9 M	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M				
Toluene	<7 µg/kg	TM116	<7 M	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M				

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
M	mCERTS accredited.										
*	Subcontracted test										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP-PTR-24 0.20 SOLID 06/04/2021 00:00:00 09/04/2021 08:20:00 210409-49 24047519 TM048	19.04.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP-PTR-25 1.00 SOLID 07/04/2021 00:00:00 09/04/2021 08:20:00 210409-49 24047526 TM048	20/04/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
Location:	Cambridge South East Tra	Order Number:	700964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	24047519	24047526
Customer Sample Ref.	TP-PTR-24	TP-PTR-25
AGS Ref.		
Depth	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	20-Apr-2021	20-Apr-2021
Asbestos ID in Solid Samples	19-Apr-2021	20-Apr-2021
Boron Water Soluble	20-Apr-2021	20-Apr-2021
Chromium III	21-Apr-2021	21-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Apr-2021	19-Apr-2021
EPH CWG GC (S)	19-Apr-2021	19-Apr-2021
GRO by GC-FID (S)	16-Apr-2021	16-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	20-Apr-2021
Metals in solid samples by OES	21-Apr-2021	21-Apr-2021
PAH by GCMS	16-Apr-2021	16-Apr-2021
pH	16-Apr-2021	16-Apr-2021
Phenols by HPLC (S)	19-Apr-2021	19-Apr-2021
Sample description	15-Apr-2021	15-Apr-2021
Total Organic Carbon	22-Apr-2021	22-Apr-2021
Total Sulphur	19-Apr-2021	19-Apr-2021
TPH CWG GC (S)	19-Apr-2021	19-Apr-2021
VOC MS (S)	19-Apr-2021	19-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
Location:	Cambridge South East Tra	Order Number:	700964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2477
Chloride (soluble)	TM243	135.75 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	156.54 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2457
Water Soluble Boron	TM222	103.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2499
Free Cyanide	TM153	92.97 79.00 : 115.00
Thiocyanate	TM153	101.92 94.09 : 113.89
Total Cyanide	TM153	98.6 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2462
QC	TM089	93.04 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2485	QC 2497
Hexavalent Chromium	TM151	104.0 92.00 : 111.20	102.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2416
Aluminium	TM181	113.27 77.46 : 123.98
Antimony	TM181	103.66 87.04 : 111.16
Arsenic	TM181	106.1 87.34 : 110.87

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
	Location:	Cambridge South East Tra	Order Number:	700964	Superseded Report:	
Total Organic Carbon						

Component	Method Code	QC 2456
Total Organic Carbon	TM132	108.2 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2417
Total Sulphur %	TM132	93.78 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2406
1,1,1,2-tetrachloroethane	TM116	100.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	100.2 73.73 : 118.05
1,1,2-Trichloroethane	TM116	93.4 77.12 : 116.04
1,1-Dichloroethane	TM116	100.8 74.46 : 129.15
1,2-Dichloroethane	TM116	108.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	99.8 83.64 : 126.18
2-Chlorotoluene	TM116	86.8 76.03 : 113.25
4-Chlorotoluene	TM116	81.2 66.90 : 112.46
Benzene	TM116	100.0 88.60 : 113.80
Carbon Disulphide	TM116	94.6 74.91 : 122.14
Carbontetrachloride	TM116	104.4 80.31 : 124.50
Chlorobenzene	TM116	100.4 83.81 : 114.18
Chloroform	TM116	105.2 87.40 : 122.49
Chloromethane	TM116	104.6 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	101.0 80.67 : 126.72
Dibromomethane	TM116	97.0 73.23 : 118.35
Dichloromethane	TM116	107.6 81.11 : 133.25

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
	Location:	Cambridge South East Tra	Order Number:	700964	Superseded Report:	
	VOC MS (S)					

		QC 2406
Ethylbenzene	TM116	88.6 75.92 : 110.41
Hexachlorobutadiene	TM116	54.2 12.82 : 152.73
Isopropylbenzene	TM116	71.0 55.79 : 97.59
Naphthalene	TM116	99.8 80.86 : 128.81
o-Xylene	TM116	86.8 69.99 : 108.74
p/m-Xylene	TM116	82.4 68.32 : 108.91
Sec-Butylbenzene	TM116	59.6 38.50 : 101.50
Tetrachloroethene	TM116	98.6 76.95 : 121.02
Toluene	TM116	91.6 74.24 : 107.42
Trichloroethene	TM116	95.6 85.28 : 109.36
Trichlorofluoromethane	TM116	101.8 84.55 : 133.27
Vinyl Chloride	TM116	104.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:210409-49Client Reference: B025563Report Number: 595114

Location:Cambridge South East TraOrder Number: 700964Superseded Report:

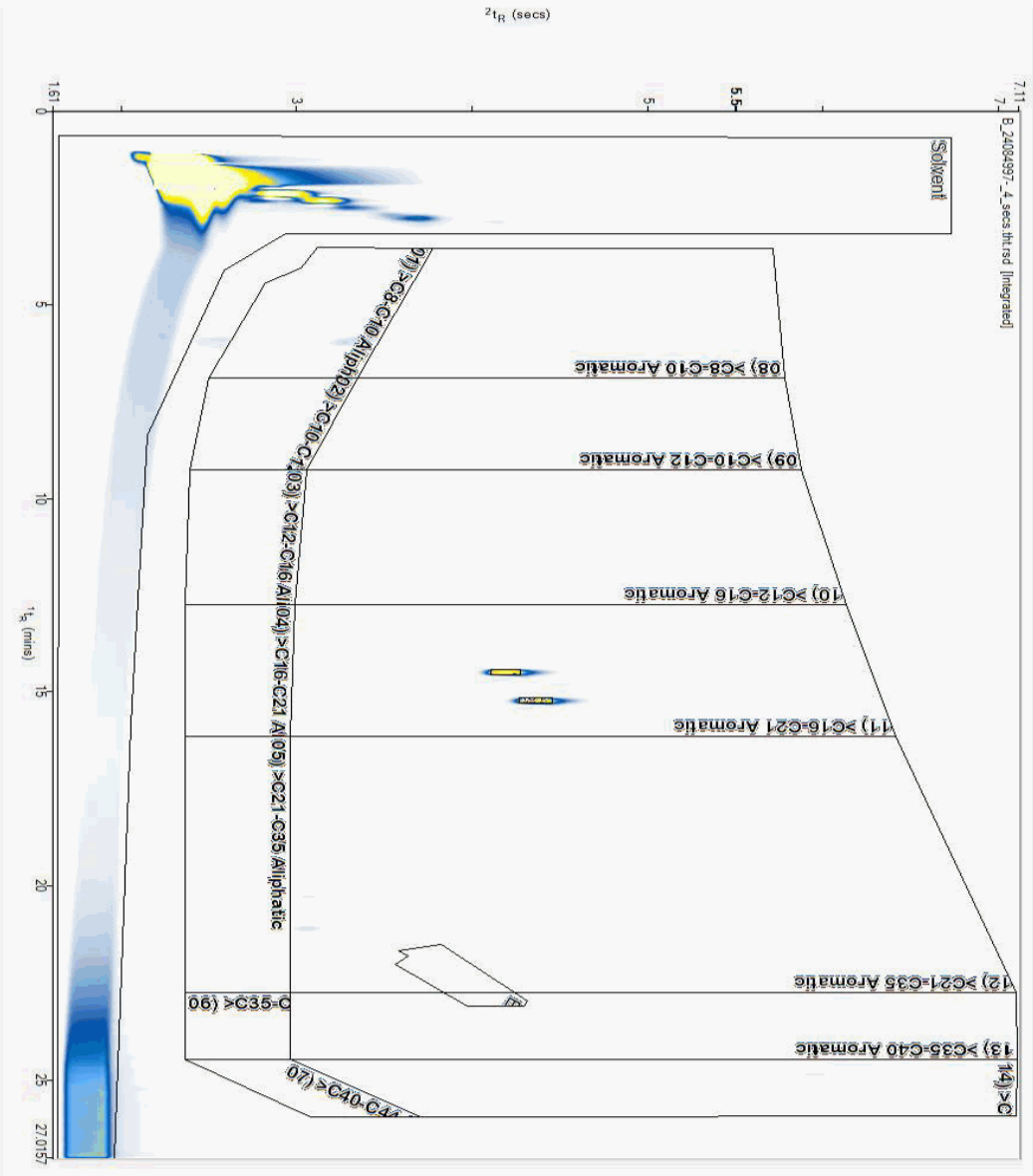
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24084997Sample ID : TP-PTR-25

Depth : 1.00

ChromSpace LIMS export
Current batch
Sample Identity: B_24084997-4_secs.tht
Date Acquired : 17/04/21 11:37:47
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

Validated

SDG:210409-49Client Reference: B025563Report Number: 595114

Location:Cambridge South East TraOrder Number: 700964Superseded Report:

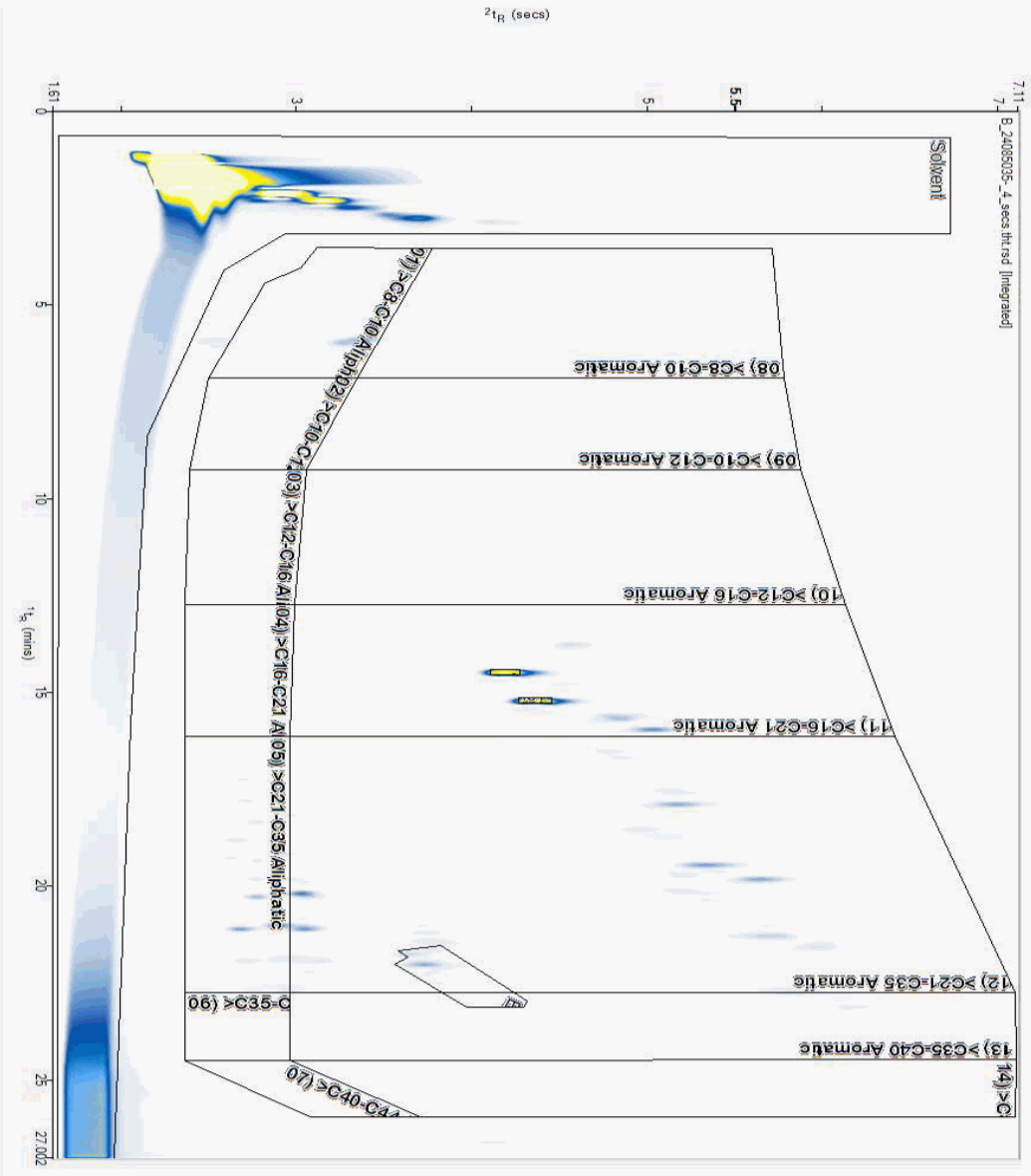
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24085035Sample ID : TP-PTR-24

Depth : 0.20

ChromSpace LIMS export
Current batch
Sample Identity: B_24085035-4_secs.tht
Date Acquired : 18/04/21 03:16:38
Units : ppm
Dilution : 0
CF :
Multiplier :





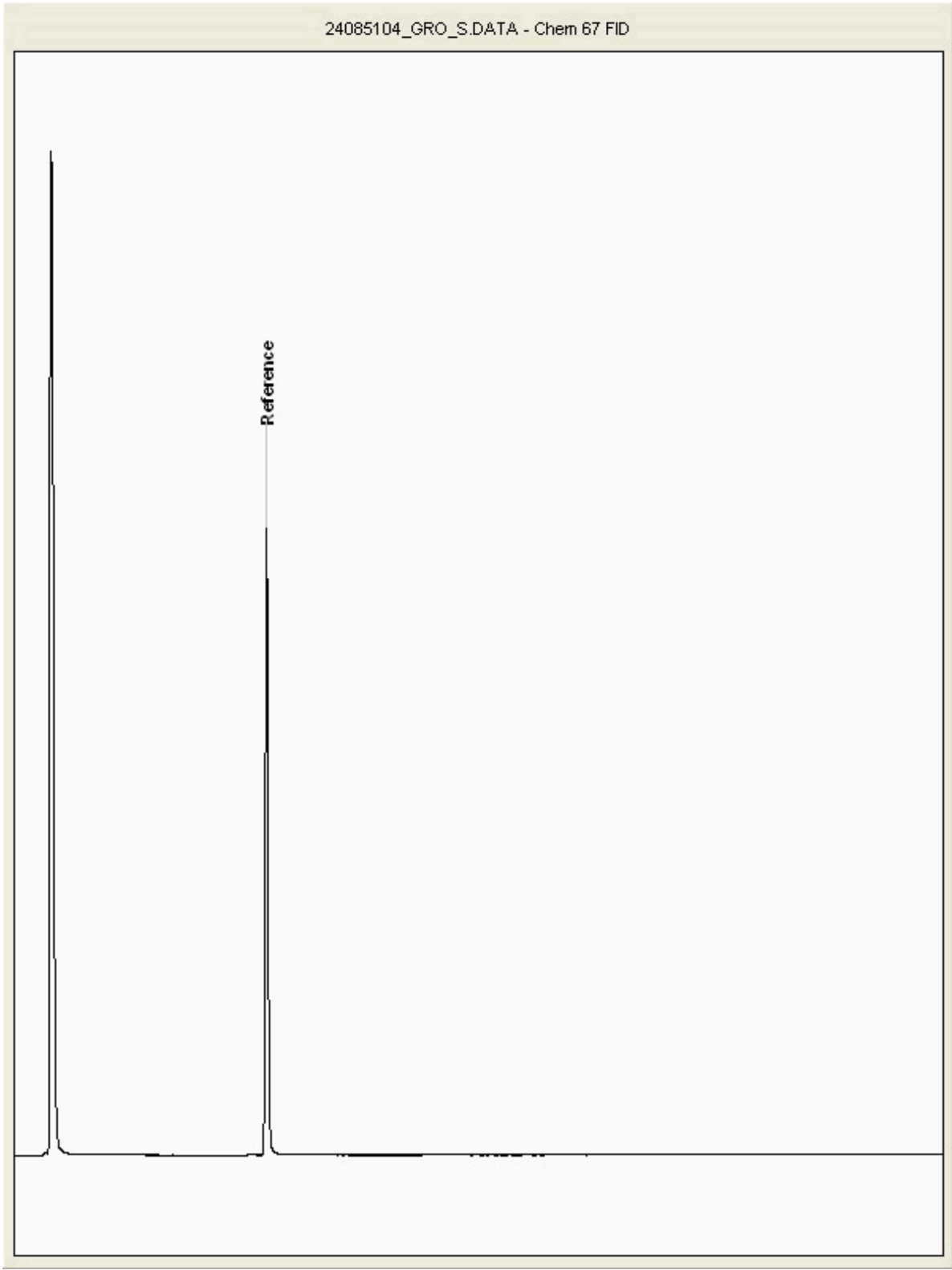
CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-49 Client Reference: B025563 Report Number: 595114
Location: Cambridge South East TraOrder Number: 700964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24085104 Depth : 1.00
Sample ID : TP-PTR-25



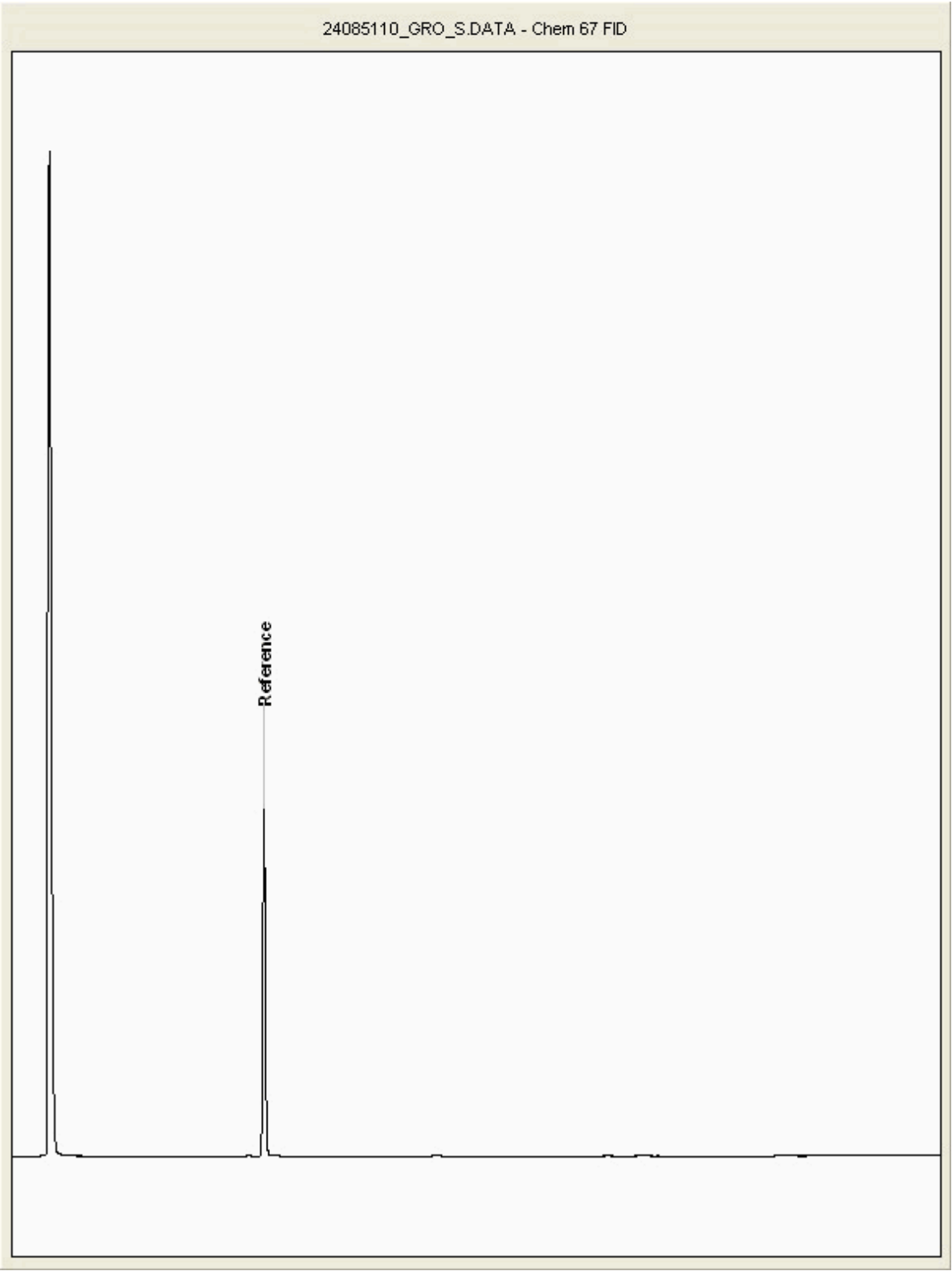
CERTIFICATE OF ANALYSIS

Validated

SDG: 210409-49 Client Reference: B025563 Report Number: 595114
Location: Cambridge South East TraOrder Number: 700964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24085110 Depth : 0.20
Sample ID : TP-PTR-24





CERTIFICATE OF ANALYSIS

SDG:	210409-49	Client Reference:	B025563	Report Number:	595114
Location:	bridge South East Transport - Ph	Order Number:	700964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Leeds
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LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

22 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210412-34

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

595115

We received 5 samples on Monday April 12, 2021 and 1 of these samples were scheduled for analysis which was completed on Thursday April 22, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 22/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210412-34 Client Reference: B025563 Report Number: 595115
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24061730	BH-PTR-45A		6.80	08/04/2021
24061726	BH-TH-10		0.10	08/04/2021
24061727	BH-TH-10		0.20	08/04/2021
24061728	BH-TH-10		0.50	08/04/2021
24061729	BH-TH-10		1.00	08/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210412-34 Client Reference: B025563 Report Number: 595115
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24061727		
	Customer Sample Reference		BH-TH-10		
	AGS Reference				
	Depth (m)		0.20		
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	

		CERTIFICATE OF ANALYSIS				Validated	
SDG: 210412-34		Client Reference: B025563		Report Number: 595115			
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:			
<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>		Lab Sample No(s)		24061727			
		Customer Sample Reference		BH-TH-10			
		AGS Reference					
		Depth (m)		0.20			
		Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	
		Sample Type		S	S	S	
TPH CWG GC (S)		All	NDPs: 0 Tests: 1		X		
VOC MS (S)		All	NDPs: 0 Tests: 1			X	



CERTIFICATE OF ANALYSIS

Validated

SDG:

210412-34

Location:

Cambridge South East Tra

Client Reference:

B025563

Order Number:

7000964

Report Number:

595115

Superseded Report:

Sample Descriptions

Grain Sizes

very fine

<0.063mm

fine

0.063mm - 0.1mm

medium

0.1mm - 2mm

coarse

2mm - 10mm

very coarse

>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24061727	BH-TH-10	0.20	Dark Brown	Loamy Sand	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref.	BH-TN-10	0.20 Soil/Solid (S) 08/04/2021 - 12/04/2021 210412:34 24061727			
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-445@ Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	9.9				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0443				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0091	#			
pH	1 pH Units	TM133	8.37	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	15.5				
Antimony	<0.6 mg/kg	TM181	0.639	#			
Arsenic	<0.6 mg/kg	TM181	20.1	M			
Barium	<0.6 mg/kg	TM181	65.4	#			
Beryllium	<0.01 mg/kg	TM181	0.36	M			
Cadmium	<0.02 mg/kg	TM181	0.186	M			
Chromium	<0.9 mg/kg	TM181	15.5	M			
Copper	<1.4 mg/kg	TM181	12.3	M			
Iron	<1000 mg/kg	TM181	21400	#			
Lead	<0.7 mg/kg	TM181	21.9	M			
Manganese	<0.13 mg/kg	TM181	466	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.559	#			
Nickel	<0.2 mg/kg	TM181	14.9	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	32.2	#			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-TH-10					
#	ISO17025 accredited. mCERTS accredited.							
M	Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 08/04/2021 . 12/04/2021 210412-34 24061727					
aq	Dissolved / filtered sample.							
dis.filt	Total / unfiltered sample.							
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
**	Trigger breach confirmed							
(F)	Sample deviation (see appendix)							
1-44@								
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	102					
Toluene-d8**	%	TM116	96.9					
4-Bromofluorobenzene**	%	TM116	82.4					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M					
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M					
Benzene	<9 µg/kg	TM116	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M					
Toluene	<7 µg/kg	TM116	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M					

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH-TH-10 0.20 Soil/Solid (S) 08/04/2021 12/04/2021 210412-34 24061727					
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M					
Tetrachloroethene	<5 µg/kg	TM116	<5 M					
Dibromochloromethane	<10 µg/kg	TM116	<10 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M					
Chlorobenzene	<5 µg/kg	TM116	<5 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M					
Ethylbenzene	<4 µg/kg	TM116	<4 M					
p/m-Xylene	<10 µg/kg	TM116	<10 #					
o-Xylene	<10 µg/kg	TM116	<10 M					
Styrene	<10 µg/kg	TM116	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 M					
Isopropylbenzene	<5 µg/kg	TM116	<5 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M					
Bromobenzene	<10 µg/kg	TM116	<10 M					
Propylbenzene	<10 µg/kg	TM116	<10 M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #					
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M					
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13 M					

Table of Results - Appendix		
Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates	
Lab Sample No(s)	24061727
Customer Sample Ref.	BH-TH-10
AGS Ref.	
Depth	0.20
Type	Soil/Solid (S)
Anions by Kone (soil)	20-Apr-2021
Asbestos ID in Solid Samples	19-Apr-2021
Boron Water Soluble	19-Apr-2021
Chromium III	21-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Apr-2021
EPH CWG GC (S)	19-Apr-2021
GRO by GC-FID (S)	19-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021
Metals in solid samples by OES	21-Apr-2021
PAH by GCMS	20-Apr-2021
pH	16-Apr-2021
Phenols by HPLC (S)	20-Apr-2021
Sample description	15-Apr-2021
Total Organic Carbon	22-Apr-2021
Total Sulphur	19-Apr-2021
TPH CWG GC (S)	19-Apr-2021
VOC MS (S)	16-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2405
Water Soluble Boron	TM222	93.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2499
Free Cyanide	TM153	92.97 79.00 : 115.00
Thiocyanate	TM153	101.92 94.09 : 113.89
Total Cyanide	TM153	98.6 73.07 : 107.47

EPH CWG GC (S)

Component	Method Code	QC 2471
EPH >C8-C40 Raw	TM414	92.64 67.87 : 120.05
Total Aliphatics Raw	TM414	98.55 66.68 : 120.89
Total Aromatics Raw	TM414	102.38 61.16 : 129.42

GRO by GC-FID (S)

Component	Method Code	QC 2417
QC	TM089	92.73 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2485
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2416
Aluminium	TM181	113.27 77.46 : 123.98
Antimony	TM181	103.66 87.04 : 111.16
Arsenic	TM181	106.1 87.34 : 110.87



CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Metals in solid samples by OES

		QC 2416
Barium	TM181	108.26 80.73 : 115.16
Beryllium	TM181	107.46 89.47 : 112.97
Boron	TM181	103.72 76.57 : 104.15
Cadmium	TM181	95.06 78.94 : 102.43
Chromium	TM181	100.0 77.55 : 104.47
Cobalt	TM181	95.6 82.95 : 107.41
Copper	TM181	101.58 84.36 : 106.14
Iron	TM181	109.52 81.43 : 115.79
Lead	TM181	101.58 81.95 : 107.63
Manganese	TM181	100.28 94.29 : 119.51
Mercury	TM181	100.24 82.73 : 106.36
Molybdenum	TM181	104.12 86.61 : 111.07
Nickel	TM181	97.07 79.72 : 103.80
Phosphorus	TM181	115.15 92.65 : 125.47
Selenium	TM181	107.06 88.36 : 111.25
Strontium	TM181	100.89 78.06 : 99.91
Thallium	TM181	107.96 88.60 : 116.73
Tin	TM181	101.14 89.77 : 112.62
Titanium	TM181	93.13 66.29 : 105.96
Vanadium	TM181	104.03 75.51 : 108.87
Zinc	TM181	108.42 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2422
Acenaphthene	TM218	84.0 76.79 : 103.90
Acenaphthylene	TM218	81.5 74.19 : 106.17
Anthracene	TM218	83.0 70.90 : 109.22
Benz(a)anthracene	TM218	85.0 73.77 : 119.26

PAH by GCMS

		QC 2422
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59
Chrysene	TM218	85.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30
Fluoranthene	TM218	79.5 66.06 : 114.63
Fluorene	TM218	83.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95
Naphthalene	TM218	84.0 74.70 : 101.83
Phenanthrene	TM218	82.0 73.62 : 109.34
Pyrene	TM218	81.0 71.46 : 117.00

pH

Component	Method Code	QC 2472
pH	TM133	98.68 97.51 : 101.32

Phenols by HPLC (S)

Component	Method Code	QC 2484
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	47.39 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	47.71 76.56 : 106.38

Total Organic Carbon

Total Organic Carbon

Component	Method Code	QC 2456
Total Organic Carbon	TM132	108.2 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2417
Total Sulphur %	TM132	93.78 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2406
1,1,1,2-tetrachloroethane	TM116	100.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	100.2 73.73 : 118.05
1,1,2-Trichloroethane	TM116	93.4 77.12 : 116.04
1,1-Dichloroethane	TM116	100.8 74.46 : 129.15
1,2-Dichloroethane	TM116	108.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	99.8 83.64 : 126.18
2-Chlorotoluene	TM116	86.8 76.03 : 113.25
4-Chlorotoluene	TM116	81.2 66.90 : 112.46
Benzene	TM116	100.0 88.60 : 113.80
Carbon Disulphide	TM116	94.6 74.91 : 122.14
Carbontetrachloride	TM116	104.4 80.31 : 124.50
Chlorobenzene	TM116	100.4 83.81 : 114.18
Chloroform	TM116	105.2 87.40 : 122.49
Chloromethane	TM116	104.6 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	101.0 80.67 : 126.72
Dibromomethane	TM116	97.0 73.23 : 118.35
Dichloromethane	TM116	107.6 81.11 : 133.25



CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2406
Ethylbenzene	TM116	88.6 75.92 : 110.41
Hexachlorobutadiene	TM116	54.2 12.82 : 152.73
Isopropylbenzene	TM116	71.0 55.79 : 97.59
Naphthalene	TM116	99.8 80.86 : 128.81
o-Xylene	TM116	86.8 69.99 : 108.74
p/m-Xylene	TM116	82.4 68.32 : 108.91
Sec-Butylbenzene	TM116	59.6 38.50 : 101.50
Tetrachloroethene	TM116	98.6 76.95 : 121.02
Toluene	TM116	91.6 74.24 : 107.42
Trichloroethene	TM116	95.6 85.28 : 109.36
Trichlorofluoromethane	TM116	101.8 84.55 : 133.27
Vinyl Chloride	TM116	104.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



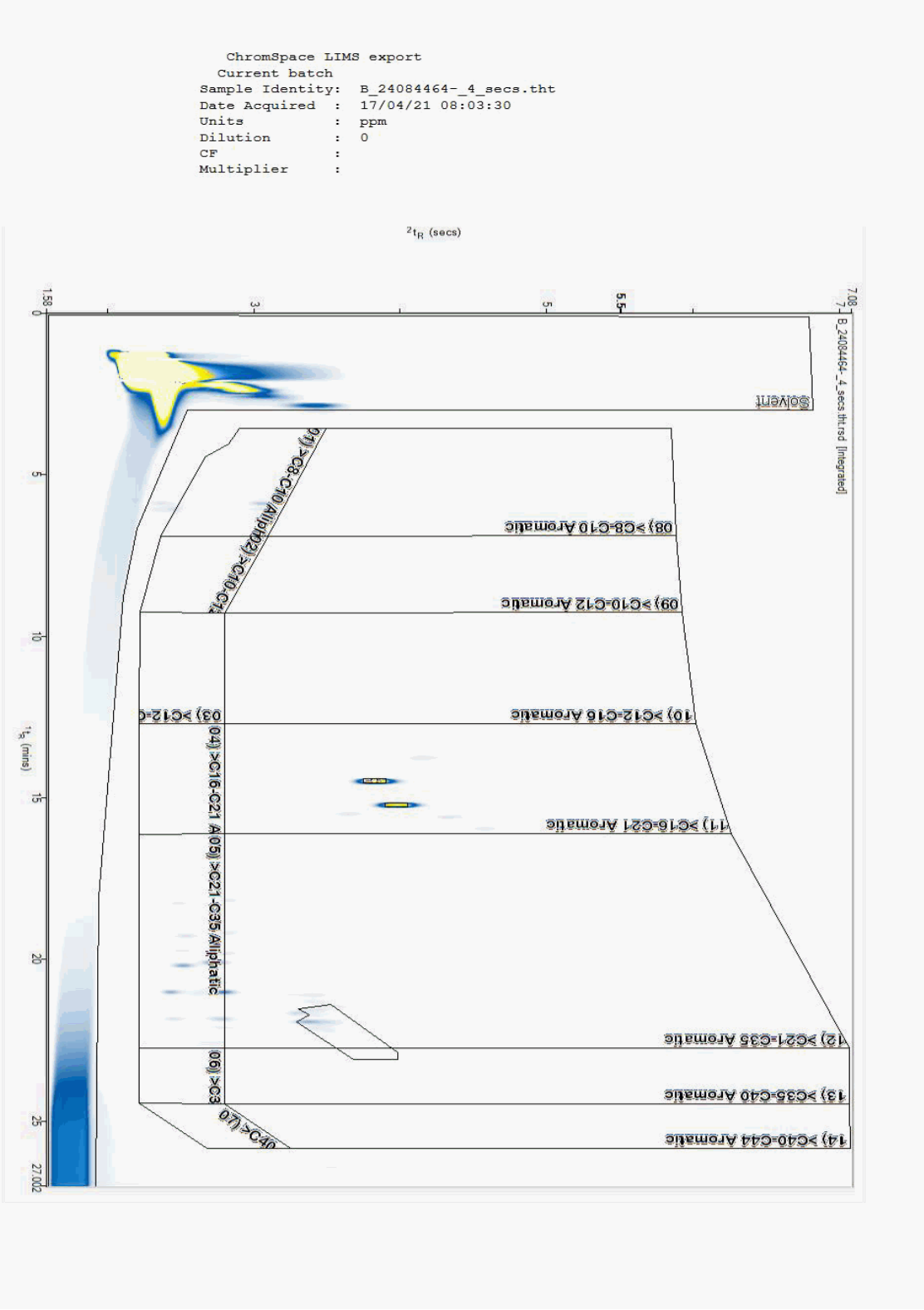
CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-34	Client Reference:	B025563	Report Number:	595115
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24084464	Depth :	0.20
		Sample ID :	BH-TH-10		





CERTIFICATE OF ANALYSIS

Validated

SDG: 210412-34 Client Reference: B025563 Report Number: 595115
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24090764 Depth : 0.20
Sample ID : BH-TH-10

24090764_GRO_S.DATA - Chem 67 FID



CERTIFICATE OF ANALYSIS

SDG: 210412-34 Client Reference: B025563 Report Number: 595115
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

Attention: Richard Tonge

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email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk



CERTIFICATE OF ANALYSIS					Validated
SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24061874	TP-PTR-12		0.10 - 0.10	
24061875	TP-PTR-12		0.20 - 0.20	
24061876	TP-PTR-12		0.50 - 0.50	
24061877	TP-PTR-12		1.00 - 1.00	
24061878	TP-PTR-16		1.00 - 1.00	

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

Date of report Generation: 20 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210412-36
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594799

We received 5 samples on Monday April 12, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday April 20, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan
Operations Manager



<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24061878
	Customer Sample Reference		TP-PR-16
	AGS Reference		
	Depth (m)		1.00 - 1.00
	Container		1kg TUB with Handle (ALE260)
	Sample Type		S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X
Boron Water Soluble	All	NDPs: 0 Tests: 1	X
Chromium III	All	NDPs: 0 Tests: 1	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X
EPH CWG GC (S)	All	NDPs: 0 Tests: 1	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X
PAH by GCMS	All	NDPs: 0 Tests: 1	X
pH	All	NDPs: 0 Tests: 1	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1	X
Sample description	All	NDPs: 0 Tests: 1	X
Total Organic Carbon	All	NDPs: 0 Tests: 1	X
Total Sulphur	All	NDPs: 0 Tests: 1	X

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24061878
	Customer Sample Reference		TP-PTR-16
	AGS Reference		
	Depth (m)		1.00 - 1.00
	Container		1kg TUB with Handle (ALE260)
	Sample Type		S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X
VOC MS (S)	All	NDPs: 0 Tests: 1	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24061878	TP-PTR-16	1.00 - 1.00	Grey	N/A	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-PTR-16					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.00					
M	mCERTS accredited.		Soil/Solid (S)					
aq	Aqueous / settled sample.		-					
dis.filt	Dissolved / filtered sample.		-					
tot.unfilt	Total / unfiltered sample.		12/04/2021					
*	Subcontracted - refer to subcontractor report for accreditation status.		210412-36					
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24061878					
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	22	\$				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	\$				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	\$				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	\$				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	\$				
Xylenols	<0.015 mg/kg	TM062 (S)	0.0512	\$				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	\$				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	\$				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	\$				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	\$				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	\$				
Sulphur, Total	<0.02 %	TM132	<0.02	\$				
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	\$ #				
pH	1 pH Units	TM133	8.92	\$				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	\$				
Cyanide, Free	<1 mg/kg	TM153	<1	\$				
Chromium, Trivalent	<0.9 mg/kg	TM181	2.3	\$				
Antimony	<0.6 mg/kg	TM181	1.21	\$				
Arsenic	<0.6 mg/kg	TM181	<0.6	\$				
Barium	<0.6 mg/kg	TM181	13.2	\$				
Beryllium	<0.01 mg/kg	TM181	0.119	\$				
Cadmium	<0.02 mg/kg	TM181	0.0606	\$				
Chromium	<0.9 mg/kg	TM181	2.3	\$				
Copper	<1.4 mg/kg	TM181	2.34	\$				
Iron	<1000 mg/kg	TM181	1950	\$				
Lead	<0.7 mg/kg	TM181	0.994	\$				
Manganese	<0.13 mg/kg	TM181	420	\$				
Mercury	<0.1 mg/kg	TM181	<0.1	\$				
Molybdenum	<0.1 mg/kg	TM181	<0.1	\$				
Nickel	<0.2 mg/kg	TM181	3.99	\$				
Selenium	<1 mg/kg	TM181	<1	\$				
Vanadium	<0.2 mg/kg	TM181	3.38	\$				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-16				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.00 Soil/Solid (S) - 12/04/2021 210412-36 24061878				
** (F) 1-4§6	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	109	2 §			
Toluene-d8**	%	TM116	98.7	2 §			
4-Bromofluorobenzene**	%	TM116	98.2	2 §			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	2 §			
Chloromethane	<7 µg/kg	TM116	<7	2 §			
Vinyl Chloride	<6 µg/kg	TM116	<6	2 §			
Bromomethane	<10 µg/kg	TM116	<10	2 §			
Chloroethane	<10 µg/kg	TM116	<10	2 §			
Trichlorofluoromethane	<6 µg/kg	TM116	<6	2 §			
1,1-Dichloroethene	<10 µg/kg	TM116	<10	2 §			
Carbon Disulphide	<7 µg/kg	TM116	<7	2 §			
Dichloromethane	<10 µg/kg	TM116	<10	2 §			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	2 §			
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	2 §			
1,1-Dichloroethane	<8 µg/kg	TM116	<8	2 §			
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	2 §			
2,2-Dichloropropane	<10 µg/kg	TM116	<10	2 §			
Bromochloromethane	<10 µg/kg	TM116	<10	2 §			
Chloroform	<8 µg/kg	TM116	<8	3 §			
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	3 §			
1,1-Dichloropropene	<10 µg/kg	TM116	<10	2 §			
Carbontetrachloride	<10 µg/kg	TM116	<10	2 §			
1,2-Dichloroethane	<5 µg/kg	TM116	<5	2 §			
Benzene	<9 µg/kg	TM116	<9	2 §			
Trichloroethene	<9 µg/kg	TM116	<9	2 §			
1,2-Dichloropropane	<10 µg/kg	TM116	<10	2 §			
Dibromomethane	<9 µg/kg	TM116	<9	2 §			
Bromodichloromethane	<7 µg/kg	TM116	<7	2 §			
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	2 §			
Toluene	<7 µg/kg	TM116	<7	2 §			
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	2 §			
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	2 §			

VOC MS (S)

Results Legend		Customer Sample Ref.		TP-PTR-16					
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4% Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.00 Soil/Solid (S) - 12/04/2021 210412:36 24061878						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 2 §						
Tetrachloroethene	<5 µg/kg	TM116	<5 2 §						
Dibromochloromethane	<10 µg/kg	TM116	<10 2 §						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 2 §						
Chlorobenzene	<5 µg/kg	TM116	<5 2 §						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 2 §						
Ethylbenzene	<4 µg/kg	TM116	<4 2 §						
p/m-Xylene	<10 µg/kg	TM116	<10 2 §						
o-Xylene	<10 µg/kg	TM116	<10 2 §						
Styrene	<10 µg/kg	TM116	<10 2 §						
Bromoform	<10 µg/kg	TM116	<10 2 §						
Isopropylbenzene	<5 µg/kg	TM116	<5 2 §						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 2 §						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 2 §						
Bromobenzene	<10 µg/kg	TM116	<10 2 §						
Propylbenzene	<10 µg/kg	TM116	<10 2 §						
2-Chlorotoluene	<9 µg/kg	TM116	<9 2 §						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 2 §						
4-Chlorotoluene	<10 µg/kg	TM116	<10 2 §						
tert-Butylbenzene	<14 µg/kg	TM116	<14 2 §						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 2 §						
sec-Butylbenzene	<10 µg/kg	TM116	<10 2 §						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 2 §						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 2 §						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 2 §						
n-Butylbenzene	<11 µg/kg	TM116	<11 2 §						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 2 §						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 2 §						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 2 §						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20 2 §						
Hexachlorobutadiene	<20 µg/kg	TM116	<20 2 §						
Naphthalene	<13 µg/kg	TM116	<13 2 §						

VOC MS (S)

Results Legend		Customer Sample Ref.		TP-PTR-16					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.00 Soil/Solid (S) - - 12/04/2021 210412-36 24061878						
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4%	Sample deviation (see appendix)								
Component	LOD/Units								
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20	2	\$				
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20	2	\$				
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02		\$				
Sum of BTEX	<40 µg/kg	TM116	<40		\$				
						</			

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-PTR-16	19/04/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	1.00 - 1.00										
Sample Type	SOLID										
Date Sampled	12/04/2021 08:00:00										
Date Received	210412-36										
SDG	24061878										
Original Sample	TM048										
Method Number											

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	24061878
Customer Sample Ref.	TP-PTR-16
AGS Ref.	
Depth	1.00 - 1.00
Type	Soil/Solid (S)
Anions by Kone (soil)	19-Apr-2021
Asbestos ID in Solid Samples	19-Apr-2021
Boron Water Soluble	19-Apr-2021
Chromium III	20-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Apr-2021
EPH CWG GC (S)	19-Apr-2021
GRO by GC-FID (S)	19-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021
Metals in solid samples by OES	20-Apr-2021
PAH by GCMS	19-Apr-2021
pH	16-Apr-2021
Phenols by HPLC (S)	19-Apr-2021
Sample description	16-Apr-2021
Total Organic Carbon	20-Apr-2021
Total Sulphur	19-Apr-2021
TPH CWG GC (S)	19-Apr-2021
VOC MS (S)	19-Apr-2021



CERTIFICATE OF ANALYSIS

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SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2476
Chloride (soluble)	TM243	144.56 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	161.21 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2405
Water Soluble Boron	TM222	93.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2462
Free Cyanide	TM153	91.88 79.00 : 115.00
Thiocyanate	TM153	100.0 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2417
QC	TM089	92.73 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2485
Hexavalent Chromium	TM151	104.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2412
Aluminium	TM181	85.49 73.56 : 108.85
Antimony	TM181	91.87 76.89 : 111.24
Arsenic	TM181	98.84 88.53 : 111.01



CERTIFICATE OF ANALYSIS

Validated

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Client Reference: B025563

Report Number: 594799

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

Metals in solid samples by OES

		QC 2412
Barium	TM181	98.17 77.67 : 105.35
Beryllium	TM181	97.39 85.44 : 109.61
Boron	TM181	95.99 73.51 : 104.66
Cadmium	TM181	94.24 77.67 : 104.12
Chromium	TM181	84.58 79.64 : 105.83
Cobalt	TM181	88.05 84.60 : 104.13
Copper	TM181	93.13 82.40 : 105.45
Iron	TM181	98.41 82.95 : 110.58
Lead	TM181	89.64 78.24 : 104.05
Manganese	TM181	103.61 94.29 : 119.51
Mercury	TM181	94.69 83.16 : 107.81
Molybdenum	TM181	94.24 87.11 : 106.87
Nickel	TM181	89.73 80.26 : 102.28
Phosphorus	TM181	104.24 94.56 : 124.28
Selenium	TM181	98.04 82.28 : 110.48
Strontium	TM181	90.2 79.13 : 102.79
Thallium	TM181	97.79 82.94 : 111.86
Tin	TM181	97.34 86.72 : 110.03
Titanium	TM181	80.15 66.23 : 102.06
Vanadium	TM181	94.87 86.19 : 109.45
Zinc	TM181	96.1 84.68 : 113.99

Component	Method Code	QC 2441
Acenaphthene	TM218	86.5 76.79 : 103.90
Acenaphthylene	TM218	85.5 78.40 : 108.66
Anthracene	TM218	91.5 70.90 : 109.22
Benz(a)anthracene	TM218	95.5 73.77 : 119.26



CERTIFICATE OF ANALYSIS

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Report Number: 594799

Location: Cambridge South East Tra

Order Number: 7000964

Superseded Report:

PAH by GCMS

		QC 2441
Benzo(a)pyrene	TM218	82.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	87.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	82.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	87.0 75.98 : 116.59
Chrysene	TM218	91.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	79.0 69.17 : 115.30
Fluoranthene	TM218	92.5 75.88 : 112.84
Fluorene	TM218	87.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	86.5 70.26 : 117.95
Naphthalene	TM218	85.0 74.70 : 101.83
Phenanthrene	TM218	90.5 73.62 : 109.34
Pyrene	TM218	94.0 71.46 : 117.00

Component	Method Code	QC 2432
pH	TM133	98.97 97.51 : 101.32

Component	Method Code	QC 2479
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	55.19 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	52.19 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	55.63 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.87 76.56 : 106.38

Total Organic Carbon

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210412-36	Client Reference:	B025563	Report Number:	594799	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Organic Carbon						
Component	Method Code	QC 2493				
Total Organic Carbon	TM132	100.0 87.02 : 113.45				

Total Sulphur						
Component	Method Code	QC 2417				
Total Sulphur %	TM132	93.78 61.64 : 114.47				

VOC MS (S)						
Component	Method Code	QC 2483				
1,1,1,2-tetrachloroethane	TM116	113.8 79.10 : 119.66				
1,1,1-Trichloroethane	TM116	114.2 88.34 : 114.50				
1,1,2-Trichloroethane	TM116	99.6 81.29 : 113.79				
1,1-Dichloroethane	TM116	120.6 86.77 : 122.11				
1,2-Dichloroethane	TM116	121.4 90.04 : 132.28				
1,4-Dichlorobenzene	TM116	112.8 80.81 : 125.07				
2-Chlorotoluene	TM116	104.2 73.13 : 114.13				
4-Chlorotoluene	TM116	98.4 68.66 : 109.13				
Benzene	TM116	108.0 84.29 : 112.22				
Carbon Disulphide	TM116	107.2 75.11 : 124.81				
Carbontetrachloride	TM116	116.8 82.35 : 126.46				
Chlorobenzene	TM116	110.4 82.88 : 122.42				
Chloroform	TM116	120.4 90.35 : 120.38				
Chloromethane	TM116	130.0 67.89 : 143.51				
Cis-1,2-Dichloroethene	TM116	117.8 78.27 : 128.90				
Dibromomethane	TM116	105.2 76.00 : 120.73				
Dichloromethane	TM116	124.6 92.27 : 134.36				

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210412-36	Client Reference:	B025563	Report Number:	594799	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2483				
Ethylbenzene	TM116	99.8 70.95 : 113.07				
Hexachlorobutadiene	TM116	56.6 14.55 : 147.92				
Isopropylbenzene	TM116	90.8 52.00 : 108.19				
Naphthalene	TM116	110.0 80.29 : 135.77				
o-Xylene	TM116	96.6 68.34 : 101.99				
p/m-Xylene	TM116	92.4 69.47 : 97.31				
Sec-Butylbenzene	TM116	76.2 27.03 : 135.73				
Tetrachloroethene	TM116	108.8 81.43 : 126.65				
Toluene	TM116	98.0 82.44 : 103.50				
Trichloroethene	TM116	104.2 79.80 : 112.33				
Trichlorofluoromethane	TM116	116.6 89.67 : 132.09				
Vinyl Chloride	TM116	129.4 69.66 : 136.55				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24085906 Depth : 1.00 - 1.00
Sample ID : TP-PTR-16



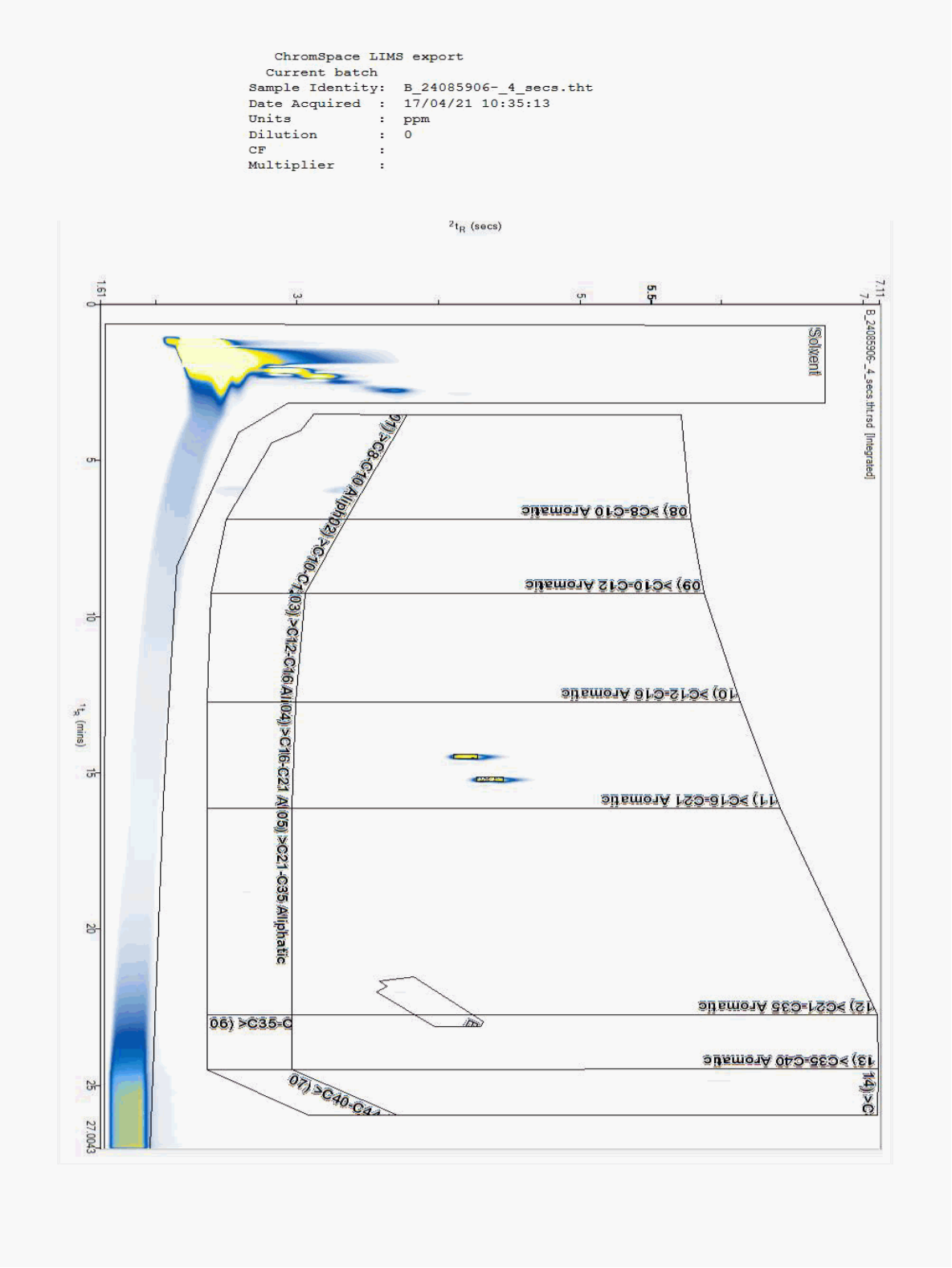
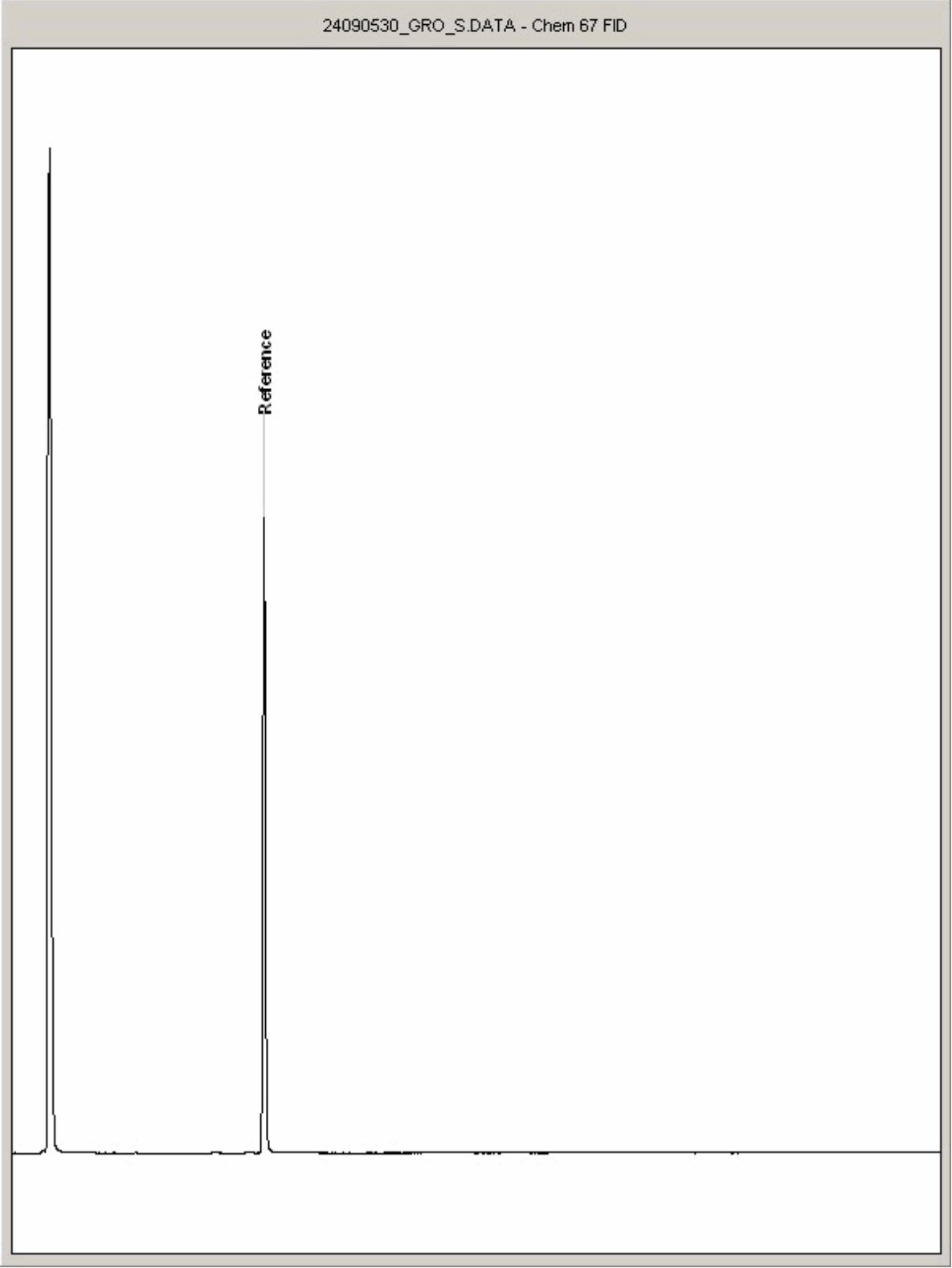
CERTIFICATE OF ANALYSIS

Validated

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24090530 Depth : 1.00 - 1.00
Sample ID : TP-PTR-16





CERTIFICATE OF ANALYSIS

SDG:	210412-36	Client Reference:	B025563	Report Number:	594799
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Leeds
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LS1 4ER

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CH5 3US

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CERTIFICATE OF ANALYSIS

Date of report Generation:

24 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210413-81

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

595331

We received 5 samples on Tuesday April 13, 2021 and 3 of these samples were scheduled for analysis which was completed on Saturday April 24, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24068738	BH - PTR - 44	ES1	0.10	09/04/2021
24068739	BH - PTR - 44	ES2	0.20	09/04/2021
24068740	BH - PTR - 44	ES3	0.50	09/04/2021
24068742	BH - PTR - 44	ES4	1.00	09/04/2021
24068743	BH - PTR - 44	ES5	1.40	09/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24068739	24068740	24068743
						BH - PTR - 44	BH - PTR - 44	BH - PTR - 44
Ammonium Low	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S	S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1	0.50	60g VOC (ALE215)	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	1.00	60g VOC (ALE215)	S	S	S	S
Anions by Kone (w)	All	NDPs: 0 Tests: 2	1.40	60g VOC (ALE215)	S	S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3		60g VOC (ALE215)	S	S	S	S
Boron Water Soluble	All	NDPs: 0 Tests: 3		60g VOC (ALE215)	S	S	S	S
CEN Readings	All	NDPs: 0 Tests: 2		60g VOC (ALE215)	S	S	S	S
Chromium III	All	NDPs: 0 Tests: 5		60g VOC (ALE215)	S	S	S	S
Coronene	All	NDPs: 0 Tests: 1		60g VOC (ALE215)	S	S	S	S
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3		60g VOC (ALE215)	S	S	S	S
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2		60g VOC (ALE215)	S	S	S	S
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2		60g VOC (ALE215)	S	S	S	S
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1		60g VOC (ALE215)	S	S	S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 3		60g VOC (ALE215)	S	S	S	S
Fluoride	All	NDPs: 0 Tests: 2		60g VOC (ALE215)	S	S	S	S



CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81Client Reference: B025563Report Number: 595331

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24068739	24068740	24068743										
	Customer Sample Reference		BH - PTR - 44	BH - PTR - 44	BH - PTR - 44										
	AGS Reference		ES2	ES3	ES5										
	Depth (m)		0.20	0.50	1.40										
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	Sample Type
			S	S	S	S	S	S	S	S	S	S	S	S	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X			X				X				
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3		X			X				X				
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X											
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X						X						
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X						X						
Mercury Dissolved	All	NDPs: 0 Tests: 2	X						X						
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X			X				X				
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X											
PAH by GCMS	All	NDPs: 0 Tests: 3		X			X				X				
PCBs by GCMS	All	NDPs: 0 Tests: 1		X											
pH	All	NDPs: 0 Tests: 3		X			X				X				
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X						X						
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X			X				X				
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X						X						
Sample description	All	NDPs: 0 Tests: 3		X			X				X				



CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81Client Reference: B025563Report Number: 595331

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24068739	24068740	24068743										
	Customer Sample Reference		BH - PTR - 44	BH - PTR - 44	BH - PTR - 44										
	AGS Reference		ES2	ES3	ES5										
	Depth (m)		0.20	0.50	1.40										
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE215)	60g VOC (ALE215)	Sample Type
			S	S	S	S	S	S	S	S	S	S	S	S	
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X												
Total Organic Carbon	All	NDPs: 0 Tests: 3		X			X				X				
Total Sulphur	All	NDPs: 0 Tests: 3		X			X				X				
TPH CWG GC (S)	All	NDPs: 0 Tests: 3	X				X				X				
VOC MS (S)	All	NDPs: 0 Tests: 3			X			X				X			

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24068739	BH - PTR - 44	0.20	Dark Brown	Sandy Loam	Stones	Vegetation
24068740	BH - PTR - 44	0.50	Dark Brown	Sandy Loam	Stones	None
24068743	BH - PTR - 44	1.40	Dark Brown	Sandy Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH - PTR - 44	BH - PTR - 44	BH - PTR - 44			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.		0.20	0.50	1.40			
dis.filt	Dissolved / filtered sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
tot.unfilt	Total / unfiltered sample.		09/04/2021	09/04/2021	09/04/2021			
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		13/04/2021	13/04/2021	13/04/2021			
(F)	Trigger breach confirmed		210413-81	210413-81	210413-81			
1-445@	Sample deviation (see appendix)		24068739	24068740	24068743			
			ES2	ES3	ES5			
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	12	11	15			
Loss on ignition	<0.7 %	TM018	5.78					
			M					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
			M	M	M			
Cresols	<0.01 mg/kg	TM062 (S)	0.0228	<0.01	<0.01			
			M	M	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
			M	M	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
			M	M	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
			M	M	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06	<0.06			
			M	M	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13			
Organic Carbon, Total	<0.2 %	TM132	5.41					
			M					
Sulphur, Total	<0.02 %	TM132	0.0365	0.038	0.0449			
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0541	0.00677	0.0135			
			#	#	#			
pH	1 pH Units	TM133	8.2	8.6	8.11			
			M	M	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6			
			#	#	#			
Cyanide, Free	<1 mg/kg	TM153	<1	<1	<1			
			M	M	M			
PCB congener 28	<3 µg/kg	TM168	<15					
			M					
PCB congener 52	<3 µg/kg	TM168	<15					
			M					
PCB congener 101	<3 µg/kg	TM168	<15					
			M					
PCB congener 118	<3 µg/kg	TM168	<15					
			M					
PCB congener 138	<3 µg/kg	TM168	<15					
			M					
PCB congener 153	<3 µg/kg	TM168	<15					
			M					
PCB congener 180	<3 µg/kg	TM168	<15					
			M					
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<105					
Chromium, Trivalent	<0.9 mg/kg	TM181	10.9	12.3	9.83			
Antimony	<0.6 mg/kg	TM181	2.11	<0.6	<0.6			
			#	#	#			
Arsenic	<0.6 mg/kg	TM181	11.4	13.9	9.56			
			M	M	M			
Barium	<0.6 mg/kg	TM181	88.4	66	83.3			
			#	#	#			
Beryllium	<0.01 mg/kg	TM181	0.371	0.964	0.612			
			M	M	M			
Cadmium	<0.02 mg/kg	TM181	0.525	0.0495	0.431			
			M	M	M			

SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH - PTR - 44		BH - PTR - 44		BH - PTR - 44				
#	ISO17025 accredited.			0.20	0.50	1.40						
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)						
aq	Aqueous / settled sample.			09/04/2021	09/04/2021	09/04/2021						
dis.filt	Dissolved / filtered sample.			.	.	.						
tot.unfilt	Total / unfiltered sample.			13/04/2021	13/04/2021	13/04/2021						
*	Subcontracted - refer to subcontractor report for accreditation status.			210413-81	210413-81	210413-81						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			24068739	24068740	24068743						
(F)	Trigger breach confirmed			ES2	ES3	ES5						
1-4+5@	Sample deviation (see appendix)											
Component		LOD/Units	Method									
Dibromofluoromethane**		%	TM116	107	106	133						
Toluene-d8**		%	TM116	88.8	96.7	96.8						
4-Bromofluorobenzene**		%	TM116	70.8	81.3	87.3						
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M	<6 M	<6 M						
Chloromethane		<7 µg/kg	TM116	<7 #	<7 #	<7 #						
Vinyl Chloride		<6 µg/kg	TM116	<6 M	<6 M	<6 M						
Bromomethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
Chloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
Trichlorofluoromethane		<6 µg/kg	TM116	<6 M	<6 M	<6 M						
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #	<10 #	<10 #						
Carbon Disulphide		<7 µg/kg	TM116	<7 M	<7 M	<7 M						
Dichloromethane		<10 µg/kg	TM116	<10 #	<10 #	<10 #						
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M	<8 M	<8 M						
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M	<6 M	<6 M						
2,2-Dichloropropane		<10 µg/kg	TM116	<10	<10	<10						
Bromochloromethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
Chloroform		<8 µg/kg	TM116	<8 M	<8 M	<8 M						
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M	<7 M	<7 M						
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
Carbontetrachloride		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M	<5 M	<5 M						
Benzene		<9 µg/kg	TM116	<9 M	<9 M	<9 M						
Trichloroethene		<9 µg/kg	TM116	<9 #	<9 #	<9 #						
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
Dibromomethane		<9 µg/kg	TM116	<9 M	<9 M	<9 M						
Bromodichloromethane		<7 µg/kg	TM116	<7 M	<7 M	<7 M						
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M	<10 M	<10 M						
Toluene		<7 µg/kg	TM116	<7 M	<7 M	10.3 M						
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10	<10	<10						
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M						

			Validated		
CERTIFICATE OF ANALYSIS			CERTIFICATE OF ANALYSIS		
SDG: 210413-81 Client Reference: B025563 Report Number: 595331			SDG: 210413-81 Client Reference: B025563 Report Number: 595331		
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:			Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:		
VOC MS (S)			VOC MS (S)		
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1.44g Sample deviation (see appendix)</div>			<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1.44g Sample deviation (see appendix)</div>		
Customer Sample Ref.			Customer Sample Ref.		
BH - PTR - 44			BH - PTR - 44		
BH - PTR - 44			BH - PTR - 44		
BH - PTR - 44			BH - PTR - 44		
Depth (m)			Depth (m)		
Sample Type			Sample Type		
Date Sampled			Date Sampled		
Sampled Time			Sampled Time		
Date Received			Date Received		
SDG Ref			SDG Ref		
Lab Sample No.(s)			Lab Sample No.(s)		
AGS Reference			AGS Reference		
Component			Component		
LOD/Units			LOD/Units		
Method			Method		
1,3-Dichloropropane			1,2,3-Trichlorobenzene		
<7			<20		
µg/kg			µg/kg		
TM116			TM116		
M			#		
M			#		
M			#		
Tetrachloroethene			1,3,5-Trichlorobenzene		
<5			<20		
µg/kg			µg/kg		
TM116			TM116		
M			TM116		
M			TM116		
M			TM116		
Dibromochloromethane			Sum of Detected Xylenes		
<10			<0.02		
µg/kg			mg/kg		
TM116			TM116		
M			TM116		
M			TM116		
M			TM116		
1,2-Dibromoethane			Sum of BTEX		
<10			<40		
µg/kg			µg/kg		
TM116			TM116		
M			TM116		
M			TM116		
M			TM116		
Chlorobenzene					
<5					
µg/kg					
TM116					
M					
M					
M					
1,1,1,2-Tetrachloroethane					
<10					
µg/kg					
TM116					
M					
M					
M					
Ethylbenzene					
<4					
µg/kg					
TM116					
M					
M					
M					
p/m-Xylene					
<10					
µg/kg					
TM116					
#					
#					
#					
o-Xylene					
<10					
µg/kg					
TM116					
M					
M					
M					
Styrene					
<10					
µg/kg					
TM116					
#					
#					
#					
Bromoform					
<10					
µg/kg					
TM116					
M					
M					
M					
Isopropylbenzene					
<5					
µg/kg					
TM116					
#					
#					
#					
1,1,2,2-Tetrachloroethane					
<10					
µg/kg					
TM116					
#					
#					
#					
1,2,3-Trichloropropane					
<16					
µg/kg					
TM116					
M					
M					
M					
Bromobenzene					
<10					
µg/kg					
TM116					
M					
M					
M					
Propylbenzene					
<10					
µg/kg					
TM116					
M					
M					
M					
2-Chlorotoluene					
<9					
µg/kg					
TM116					
M					
M					
M					
1,3,5-Trimethylbenzene					
<8					
µg/kg					
TM116					
M					
M					
M					
4-Chlorotoluene					
<10					
µg/kg					
TM116					
M					
M					
M					
tert-Butylbenzene					
<14					
µg/kg					
TM116					
M					
M					
M					
1,2,4-Trimethylbenzene					
<9					
µg/kg					
TM116					
#					
#					
#					
sec-Butylbenzene					
<10					
µg/kg					
TM116					
M					

CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81Client Reference: B025563Report Number: 595331

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

Client Reference210413-81Site LocationCambridge South East Transport - F

Mass Sample taken (kg)0.105Natural Moisture Content (%)15.9

Mass of dry sample (kg)0.090Dry Matter Content (%)86.3

Particle Size <4mm>95%

Case

SDG210413-81

Lab Sample Number(s)24068739

Sampled Date09-Apr-2021

Customer Sample Ref.BH - PTR - 44 ES2

Depth (m)0.20

Solid Waste Analysis

Result	
Total Organic Carbon (%)	5.41
Loss on Ignition (%)	5.78
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.105
Mineral Oil (mg/kg)	15.5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.2
ANC to pH 6 (mol/kg)	0.0498
ANC to pH 4 (mol/kg)	0.798

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Eluate Analysis

	C2Conc ⁿ in 10:1 eluate (mg/l)		A210:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	-	-	-	-	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	-	-	-	-	0.04	1	5
Chromium	-	-	-	-	0.5	10	70
Copper	-	-	-	-	2	50	100
Mercury Dissolved (CVAf)	0.0000335	<0.00001	0.000335	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	-	-	-	-	0.4	10	40
Lead	-	-	-	-	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	-	-	-	-	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	89.7	<5	897	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	5.51	<3	55.1	<30	500	800	1000

Leach Test Information

Date Prepared	15-Apr-2021
pH (pH Units)	8.37
Conductivity (µS/cm)	118.00
Temperature (°C)	22.20
Volume Leachant (Litres)	0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

Validated

SDG:210413-81Client Reference: B025563Report Number: 595331

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.105

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site Location

Natural Moisture Content (%)15.9

Dry Matter Content (%)86.3

Cambridge South East Transport - f

Case

SDG210413-81

Lab Sample Number(s)24068739

Sampled Date09-Apr-2021

Customer Sample Ref.BH - PTR - 44 ES2

Depth (m)0.20

Eluate Analysis

C2Concⁿ in 10:1 eluate (mg/l)

A210:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Ammoniacal Nitrogen as N

0.014

<0.01

0.14

<0.1

-

-

-

Low Level Hexavalent Chromium

<0.003

<0.003

<0.03

<0.03

-

-

-

Chromium III (Low)

<0.003

<0.003

<0.03

<0.03

-

-

-

Complex Cyanide - Low Level

<0.005

<0.005

<0.05

<0.05

-

-

-

Free Cyanide - Low Level

<0.0025

<0.0025

<0.025

<0.025

-

-

-

Antimony

0.00167

<0.001

0.0167

<0.01

-

-

-

Arsenic

0.00204

<0.0005

0.0204

<0.005

-

-

-

Barium

0.154

<0.0002

1.54

<0.002

-

-

-

Beryllium

<0.0001

<0.0001

<0.001

<0.001

-

-

-

Boron

0.062

<0.01

0.62

<0.1

-

-

-

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

-

-

-

Calcium (Dis.Filt) mg/l

24

<0.2

240

<2

-

-

-

Chromium

<0.001

<0.001

<0.01

<0.01

-

-

-

Copper

0.0129

<0.0003

0.129

<0.003

-

-

-

Hardness dissolved

62.6

<0.65

626

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.265

<0.019

2.65

<0.19

-

-

-

Lead

0.00223

<0.0002

0.0223

<0.002

-

-

-

Magnesium (Dis.Filt) mg/l

0.632

<0.036

6.32

<0.36

-

-

-

Manganese

<0.003

<0.003

<0.03

<0.03

-

-

-

Molybdenum

<0.003

<0.003

<0.03

<0.03

-

-

-

Nickel

0.00105

<0.0004

0.0105

<0.004

-

-

-

Selenium

<0.001

<0.001

<0.01

<0.01

-

-

-

Vanadium

0.00164

<0.001

0.0164

<0.01

-

-

-

Zinc

0.0258

<0.001

0.258

<0.01

-

-

-

2.3.5 Trimethyl-Phenol by HPLC (W)

<0.003

<0.003

<0.03

<0.03

-

-

-

2-Isopropyl Phenol by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Catechol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Cresols by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Napthol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

NG Total Speciated Phenols by HPLC (W)

<0.045

<0.045

<0.45

<0.45

-

-

-

Phenol by HPLC (W)

<0.002

<0.002

<0.02

<0.02

-

-

-

Resorcinol HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Total Monohydric Phenols (W)

<0.016

<0.016

<0.16

<0.16

-

-

-

Xylenols by HPLC (W)

<0.008

<0.008

<0.08

<0.08

-

-

-

Leach Test Information

Date Prepared15-Apr-2021

pH (pH Units)8.37

Conductivity (µS/cm)118.00

Temperature (°C)22.20

Volume Leachant (Litres)0.885

		CERTIFICATE OF ANALYSIS				Validated		
SDG:		210413-81	Client Reference:		B025563	Report Number:		595331
Location:		Cambridge South East Tra	Order Number:		7000964	Superseded Report:		
CEN 10:1 SINGLE STAGE LEACHATE TEST								
CEN ANALYTICAL RESULTS					REF : BS EN 12457/2			
Client Reference			Site Location			Cambridge South East Transport - F		
Mass Sample taken (kg)		0.107	Natural Moisture Content (%)		18.8			
Mass of dry sample (kg)		0.090	Dry Matter Content (%)		84.2			
Particle Size <4mm		>95%						
Case								
SDG		210413-81						
Lab Sample Number(s)		24068743						
Sampled Date		09-Apr-2021						
Customer Sample Ref.		BH - PTR - 44 ES5						
Depth (m)		1.40						
Eluate Analysis			C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)			
			Result	Limit of Detection	Result	Limit of Detection		
Ammoniacal Nitrogen as N			3.61	<0.01	36.1	<0.1	-	-
Low Level Hexavalent Chromium			<0.003	<0.003	<0.03	<0.03	-	-
Chromium III (Low)			<0.003	<0.003	<0.03	<0.03	-	-
Complex Cyanide - Low Level			<0.005	<0.005	<0.05	<0.05	-	-
Free Cyanide - Low Level			<0.0025	<0.0025	<0.025	<0.025	-	-
Dissolved Organic Carbon			8.78	<3	87.8	<30	-	-
Fluoride			<0.5	<0.5	<5	<5	-	-
Mercury Dissolved (CVAf)			<0.00001	<0.00001	<0.0001	<0.0001	-	-
Arsenic			0.00233	<0.0005	0.0233	<0.005	-	-
Barium			0.0462	<0.0002	0.462	<0.002	-	-
Beryllium			<0.0001	<0.0001	<0.001	<0.001	-	-
Boron			0.106	<0.01	1.06	<0.1	-	-
Cadmium			<0.00008	<0.00008	<0.0008	<0.0008	-	-
Calcium (Dis.Filt) mg/l			43.2	<0.2	432	<2	-	-
Chromium			<0.001	<0.001	<0.01	<0.01	-	-
Copper			0.00651	<0.0003	0.0651	<0.003	-	-
Lead			<0.0002	<0.0002	<0.002	<0.002	-	-
Magnesium (Dis.Filt) mg/l			2.42	<0.036	24.2	<0.36	-	-
Manganese			0.0118	<0.003	0.118	<0.03	-	-
Molybdenum			0.00985	<0.003	0.0985	<0.03	-	-
Nickel			0.00215	<0.0004	0.0215	<0.004	-	-
Selenium			<0.001	<0.001	<0.01	<0.01	-	-
Vanadium			<0.001	<0.001	<0.01	<0.01	-	-
Zinc			0.00203	<0.001	0.0203	<0.01	-	-
Chloride			<2	<2	<20	<20	-	-
Sulphate (soluble)			14.5	<2	145	<20	-	-
2.3.5 Trimethyl-Phenol by HPLC (W)			<0.003	<0.003	<0.03	<0.03	-	-
2-Isopropyl Phenol by HPLC (W)			<0.006	<0.006	<0.06	<0.06	-	-
Catechol by HPLC (W)			<0.01	<0.01	<0.1	<0.1	-	-
Cresols by HPLC (W)			<0.006	<0.006	<0.06	<0.06	-	-
Napthol by HPLC (W)			<0.01	<0.01	<0.1	<0.1	-	-
NG Total Speciated Phenols by HPLC (W)			<0.045	<0.045	<0.45	<0.45	-	-
Phenol by HPLC (W)			<0.002	<0.002	<0.02	<0.02	-	-
Resorcinol HPLC (W)			<0.01	<0.01	<0.1	<0.1	-	-
Xylenols by HPLC (W)			<0.008	<0.008	<0.08	<0.08	-	-
Leach Test Information								
Date Prepared		15-Apr-2021						
pH (pH Units)		8.12						
Conductivity (µS/cm)		247.00						
Temperature (°C)		21.50						
Volume Leachant (Litres)		0.883						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	18.8
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84.2
Particle Size <4mm	>95%		

Case

SDG	210413-81
Lab Sample Number(s)	24068743
Sampled Date	09-Apr-2021
Customer Sample Ref.	BH - PTR - 44 ES5
Depth (m)	1.40

[illegible]

Leach Test Information

Date Prepared	15-Apr-2021
pH (pH Units)	8.12
Conductivity (µS/cm)	247.00
Temperature (°C)	21.50
Volume Leachant (Litres)	0.883

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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Test Completion Dates

Lab Sample No(s)	24068739	24068740	24068743
Customer Sample Ref.	BH - PTR - 44	BH - PTR - 44	BH - PTR - 44
AGS Ref.	ES2	ES3	ES5
Depth	0.20	0.50	1.40
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	19-Apr-2021		19-Apr-2021
ANC at pH4 and ANC at pH 6	19-Apr-2021		
Anions by Kone (soil)	18-Apr-2021	19-Apr-2021	18-Apr-2021
Anions by Kone (w)	19-Apr-2021		19-Apr-2021
Asbestos ID in Solid Samples	16-Apr-2021	19-Apr-2021	19-Apr-2021
Boron Water Soluble	19-Apr-2021	19-Apr-2021	19-Apr-2021
CEN 10:1 Leachate (1 Stage)	15-Apr-2021		15-Apr-2021
CEN Readings	17-Apr-2021		17-Apr-2021
Chromium III	20-Apr-2021	20-Apr-2021	20-Apr-2021
Coronene	15-Apr-2021		
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021	16-Apr-2021	16-Apr-2021
Dissolved Metals by ICP-MS	21-Apr-2021		21-Apr-2021
Dissolved Organic/Inorganic Carbon	24-Apr-2021		24-Apr-2021
EPH by GCxGC-FID	16-Apr-2021		
EPH CWG GC (S)	16-Apr-2021	16-Apr-2021	16-Apr-2021
Fluoride	19-Apr-2021		19-Apr-2021
GRO by GC-FID (S)	16-Apr-2021	16-Apr-2021	15-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	20-Apr-2021	20-Apr-2021
Loss on Ignition in soils	19-Apr-2021		
Low Level Cyanide (W)	20-Apr-2021		20-Apr-2021
Low Level Hexavalent Chromium (w)	19-Apr-2021		19-Apr-2021
Mercury Dissolved	20-Apr-2021		19-Apr-2021
Metals in solid samples by OES	16-Apr-2021	20-Apr-2021	19-Apr-2021
Moisture at 105C	15-Apr-2021		15-Apr-2021
PAH 16 & 17 Calc	16-Apr-2021		
PAH by GCMS	16-Apr-2021	16-Apr-2021	16-Apr-2021
PCBs by GCMS	16-Apr-2021		
pH	15-Apr-2021	15-Apr-2021	15-Apr-2021
pH Value of Filtered Water	20-Apr-2021		20-Apr-2021
Phenols by HPLC (S)	16-Apr-2021	16-Apr-2021	16-Apr-2021
Phenols by HPLC (W)	20-Apr-2021		20-Apr-2021
Sample description	14-Apr-2021	14-Apr-2021	14-Apr-2021
Total Dissolved Solids	20-Apr-2021		
Total Organic Carbon	20-Apr-2021	20-Apr-2021	20-Apr-2021
Total Sulphur	20-Apr-2021	20-Apr-2021	20-Apr-2021
TPH CWG GC (S)	16-Apr-2021	16-Apr-2021	16-Apr-2021
VOC MS (S)	15-Apr-2021	15-Apr-2021	15-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2435	QC 2432
Ammoniacal Nitrogen as N	TM099	96.4 91.28 : 106.64	100.4 96.04 : 106.80

ANC at pH4 and ANC at pH 6

Component	Method Code	QC 2486
ANC pH_4 dry soil	TM182	107.04 82.79 : 130.38

Anions by Kone (soil)

Component	Method Code	QC 2433
Chloride (soluble)	TM243	145.6 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	159.35 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2445
Chloride	TM184	101.0 92.93 : 115.43
Sulphate (soluble)	TM184	104.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2400	QC 2405
Water Soluble Boron	TM222	109.5 84.00 : 111.00	93.0 84.00 : 111.00

Coronene

Component	Method Code	QC 2481
Coronene RAW	TM410	110.5 79.43 : 137.78

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Cyanide Comp/Free/Total/Thiocyanate						

Component	Method Code	QC 2461	QC 2471
Free Cyanide	TM153	98.22 79.00 : 115.00	98.91 79.00 : 115.00
Thiocyanate	TM153	98.08 94.09 : 113.89	97.44 94.09 : 113.89
Total Cyanide	TM153	95.1 73.07 : 107.47	93.71 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2463	QC 2447
Aluminium	TM152	109.67 90.78 : 110.89	100.0 94.21 : 111.52
Antimony	TM152	107.33 77.22 : 119.42	103.33 88.37 : 130.57
Arsenic	TM152	105.17 86.77 : 107.67	99.67 92.62 : 113.52
Barium	TM152	103.83 87.86 : 110.23	102.67 88.62 : 113.14
Beryllium	TM152	111.83 86.19 : 112.98	101.5 87.08 : 111.38
Bismuth	TM152	104.5 84.06 : 106.46	100.83 92.62 : 115.02
Borate	TM152	111.11 88.00 : 112.00	
Boron	TM152	111.33 83.92 : 114.90	101.67 86.31 : 120.88
Cadmium	TM152	102.83 88.89 : 106.69	98.67 93.85 : 111.65
Calcium	TM152	112.0 80.24 : 117.95	100.67 89.20 : 126.91
Chromium	TM152	107.33 83.22 : 110.16	99.83 92.50 : 113.03
Cobalt	TM152	106.17 82.49 : 112.36	99.5 85.01 : 114.87
Copper	TM152	107.33 83.14 : 113.00	100.5 89.87 : 119.73
Iron	TM152	108.0 88.40 : 109.24	98.67 93.02 : 113.86
Lead	TM152	105.83 83.71 : 109.58	101.33 91.11 : 116.98
Lithium	TM152	111.33 84.50 : 114.28	99.67 87.70 : 115.90
Magnesium	TM152	106.67 87.56 : 114.57	95.33 89.60 : 116.61
Manganese	TM152	108.5 90.01 : 108.72	98.67 93.97 : 112.46
Molybdenum	TM152	101.67 85.53 : 107.42	97.33 89.07 : 110.96
Nickel	TM152	106.33 88.05 : 106.42	99.83 93.70 : 112.15
Phosphorus	TM152	108.5 82.76 : 107.72	101.33 89.24 : 114.18
Potassium	TM152	107.33 88.45 : 106.42	98.0 93.20 : 115.55

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2463	QC 2447
Selenium	TM152	105.5 85.61 : 111.03	99.33 91.69 : 117.12
Silver	TM152	101.17 88.48 : 110.48	100.33 90.93 : 121.73
Sodium	TM152	107.33 88.32 : 106.30	95.33 92.42 : 113.24
Strontium	TM152	105.67 83.77 : 107.87	98.67 92.14 : 116.24
Tellurium	TM152	102.17 82.83 : 104.73	98.67 89.88 : 111.78
Thallium	TM152	97.83 77.47 : 113.87	92.33 82.43 : 113.83
Tin	TM152	105.33 87.36 : 109.55	103.67 94.62 : 107.79
Titanium	TM152	112.33 87.29 : 108.31	102.83 90.29 : 115.23
Tungsten	TM152	103.17 68.27 : 122.97	100.0 77.61 : 132.31
Uranium	TM152	102.67 82.46 : 105.16	97.83 86.97 : 115.76
Vanadium	TM152	109.5 88.43 : 114.30	102.83 89.61 : 115.48
Zinc	TM152	107.67 85.57 : 114.31	100.33 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2459
Dissolved Inorganic Carbon	TM090	115.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.17 96.13 : 109.53

EPH by GCxGC-FID

Component	Method Code	QC 2402
EPH >C10-C40 Raw	TM415	91.97 59.15 : 115.05

Fluoride

Component	Method Code	QC 2454
Fluoride	TM104	101.33 96.67 : 108.67

GRO by GC-FID (S)

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
GRO by GC-FID (S)						

Component	Method Code	QC 2454	QC 2416
QC	TM089	90.27 70.75 : 114.19	85.98 70.34 : 111.95

Component	Method Code	QC 2445	QC 2485
Hexavalent Chromium	TM151	108.0 92.00 : 111.20	104.0 92.00 : 111.20

Component	Method Code	QC 2489
Loss on Ignition	TM018	96.21 87.10 : 102.39

Component	Method Code	QC 2468
Free Cyanide - Low Level	TM279	78.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	98.5 81.83 : 110.45

Component	Method Code	QC 2457	QC 2486
Mercury Dissolved (CVAf)	TM183	112.0 69.30 : 128.70	109.0 69.30 : 128.70

Component	Method Code	QC 2400	QC 2484	QC 2436
Aluminium	TM181	104.42 77.46 : 123.98	84.42 73.56 : 108.85	83.89 73.56 : 108.85
Antimony	TM181	108.13 87.04 : 111.16	98.37 76.89 : 111.24	90.24 76.89 : 111.24
Arsenic	TM181	103.49 87.34 : 110.87	102.03 88.53 : 111.01	96.8 88.53 : 111.01
Barium	TM181	98.17 80.73 : 115.16	95.41 77.67 : 105.35	87.34 77.67 : 105.35

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES						

		QC 2400	QC 2484	QC 2436
Beryllium	TM181	101.49 89.47 : 112.97	102.24 85.44 : 109.61	94.78 85.44 : 109.61
Boron	TM181	92.55 76.57 : 104.15	87.39 73.51 : 104.66	86.25 73.51 : 104.66
Cadmium	TM181	98.35 78.94 : 102.43	94.24 77.67 : 104.12	89.3 77.67 : 104.12
Chromium	TM181	92.7 77.55 : 104.47	86.61 79.64 : 105.83	84.99 79.64 : 105.83
Cobalt	TM181	90.57 82.95 : 107.41	90.25 84.60 : 104.13	85.85 84.60 : 104.13
Copper	TM181	101.41 84.36 : 106.14	96.65 82.40 : 105.45	92.08 82.40 : 105.45
Iron	TM181	100.79 81.43 : 115.79	96.83 82.95 : 110.58	95.24 82.95 : 110.58
Lead	TM181	92.79 81.95 : 107.63	91.89 78.24 : 104.05	92.34 78.24 : 104.05
Manganese	TM181	109.44 94.29 : 119.51	106.94 94.29 : 119.51	103.33 94.29 : 119.51
Mercury	TM181	96.14 82.73 : 106.36	98.31 83.16 : 107.81	93.0 83.16 : 107.81
Molybdenum	TM181	100.82 86.61 : 111.07	99.18 87.11 : 106.87	92.18 87.11 : 106.87
Nickel	TM181	91.2 79.72 : 103.80	92.42 80.26 : 102.28	87.78 80.26 : 102.28
Phosphorus	TM181	112.93 92.65 : 125.47	108.69 94.56 : 124.28	102.42 94.56 : 124.28
Selenium	TM181	101.96 88.36 : 111.25	101.96 82.28 : 110.48	95.69 82.28 : 110.48
Strontium	TM181	97.33 78.06 : 99.91	91.54 79.13 : 102.79	88.42 79.13 : 102.79
Thallium	TM181	101.77 88.60 : 116.73	100.0 82.94 : 111.86	96.46 82.94 : 111.86
Tin	TM181	102.66 89.77 : 112.62	98.48 86.72 : 110.03	94.68 86.72 : 110.03
Titanium	TM181	87.79 66.29 : 105.96	87.02 66.23 : 102.06	79.39 66.23 : 102.06
Vanadium	TM181	98.17 75.51 : 108.87	98.53 86.19 : 109.45	93.04 86.19 : 109.45
Zinc	TM181	100.41 84.02 : 111.24	96.71 84.68 : 113.99	94.05 84.68 : 113.99

Component	Method Code	QC 2404	QC 2451
Acenaphthene	TM218	85.5 78.59 : 112.16	88.0 76.79 : 103.90
Acenaphthylene	TM218	84.0 75.11 : 109.01	85.0 78.40 : 108.66
Anthracene	TM218	81.0 73.99 : 113.85	89.0 70.90 : 109.22
Benz(a)anthracene	TM218	83.5 69.31 : 119.18	92.5 73.77 : 119.26
Benzo(a)pyrene	TM218	80.0 66.97 : 114.92	83.0 73.20 : 114.18

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210413-81	Client Reference:	B025563	Report Number:	595331	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
PAH by GCMS						

		QC 2404	QC 2451
Benzo(b)fluoranthene	TM218	83.0 67.41 : 114.46	84.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	80.0 62.92 : 114.36	80.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	84.5 69.98 : 116.49	85.5 75.98 : 116.59
Chrysene	TM218	85.0 69.86 : 114.50	90.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	80.0 64.54 : 115.22	82.0 69.17 : 115.30
Fluoranthene	TM218	80.0 72.56 : 111.70	87.0 75.88 : 112.84
Fluorene	TM218	84.0 79.13 : 111.49	87.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	93.0 61.22 : 113.25	85.0 70.26 : 117.95
Naphthalene	TM218	87.5 77.96 : 110.91	85.0 74.70 : 101.83
Phenanthrene	TM218	81.0 76.83 : 113.25	88.5 73.62 : 109.34
Pyrene	TM218	81.0 72.45 : 110.77	88.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2495
PCB congener 101	TM168	86.9 65.66 : 110.06
PCB congener 105	TM168	81.2 58.10 : 106.34
PCB congener 114	TM168	81.3 59.38 : 106.48
PCB congener 118	TM168	81.9 60.02 : 106.23
PCB congener 123	TM168	89.0 65.01 : 99.81
PCB congener 126	TM168	81.5 59.31 : 109.23
PCB congener 138	TM168	85.8 63.95 : 107.63
PCB congener 153	TM168	87.8 62.65 : 108.85
PCB congener 156	TM168	80.3 61.69 : 112.27
PCB congener 157	TM168	78.1 55.37 : 104.81
PCB congener 167	TM168	80.9 65.58 : 109.14
PCB congener 169	TM168	84.3 56.84 : 112.10
PCB congener 180	TM168	87.5 66.99 : 111.63
PCB congener 189	TM168	83.1 57.75 : 112.59

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210413-81	Client Reference:	B025563	Report Number:	595331	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
PCBs by GCMS						

		QC 2495
PCB congener 28	TM168	87.3 73.68 : 105.96
PCB congener 52	TM168	86.9 67.24 : 107.62
PCB congener 77	TM168	86.3 64.87 : 108.49
PCB congener 81	TM168	87.4 70.78 : 110.80

pH

Component	Method Code	QC 2492	QC 2464	QC 2483
pH	TM133	100.0 98.41 : 102.48	100.15 98.41 : 102.48	99.27 98.41 : 102.48

pH Value of Filtered Water

Component	Method Code	QC 2433	QC 2435
pH	TM256	100.0 99.33 : 102.54	100.4 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2456	QC 2484	QC 2487
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	55.19 70.71 : 116.42	56.49 70.71 : 116.42	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.78 64.54 : 117.79	48.54 64.54 : 117.79	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	51.57 74.40 : 108.98	52.4 74.40 : 108.98	50.52 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	53.64 69.44 : 122.18	54.97 69.44 : 122.18	52.98 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	52.08 76.56 : 106.38	52.71 76.56 : 106.38	51.46 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2471
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	99.61 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	99.34 76.60 : 126.28
Napthol by HPLC (W)	TM259	101.56 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Phenols by HPLC (W)						

		QC 2471
Xylenols by HPLC (W)	TM259	97.78 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2468
Total Dissolved Solids	TM123	99.5 97.30 : 100.92

Total Organic Carbon

Component	Method Code	QC 2464	QC 2493	QC 2426
Total Organic Carbon	TM132	101.95 87.02 : 113.45	100.0 87.02 : 113.45	105.47 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2429
Total Sulphur %	TM132	81.87 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2403
1,1,1,2-tetrachloroethane	TM116	108.8 86.59 : 118.97
1,1,1-Trichloroethane	TM116	107.4 86.26 : 117.53
1,1,2-Trichloroethane	TM116	97.4 75.16 : 112.70
1,1-Dichloroethane	TM116	113.4 83.27 : 122.16
1,2-Dichloroethane	TM116	109.8 89.30 : 133.10
1,4-Dichlorobenzene	TM116	116.8 82.59 : 123.23
2-Chlorotoluene	TM116	109.8 66.81 : 118.43
4-Chlorotoluene	TM116	105.2 65.88 : 114.76
Benzene	TM116	100.8 93.16 : 123.63
Carbon Disulphide	TM116	100.6 75.11 : 124.81

	CERTIFICATE OF ANALYSIS					Validated
	SDG:	210413-81	Client Reference:	B025563	Report Number:	595331
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
VOC MS (S)						

		QC 2403
Carbontetrachloride	TM116	120.2 82.35 : 126.46
Chlorobenzene	TM116	107.4 85.07 : 118.13
Chloroform	TM116	107.4 88.13 : 122.71
Chloromethane	TM116	117.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	108.4 78.27 : 128.90
Dibromomethane	TM116	98.4 77.47 : 121.29
Dichloromethane	TM116	114.6 87.89 : 134.72
Ethylbenzene	TM116	95.8 79.92 : 110.05
Hexachlorobutadiene	TM116	87.8 16.78 : 153.29
Isopropylbenzene	TM116	90.2 64.20 : 119.59
Naphthalene	TM116	111.8 79.29 : 125.59
o-Xylene	TM116	95.0 72.86 : 102.10
p/m-Xylene	TM116	87.8 74.06 : 106.47
Sec-Butylbenzene	TM116	98.0 44.71 : 117.87
Tetrachloroethene	TM116	102.2 77.82 : 125.00
Toluene	TM116	92.8 87.82 : 116.21
Trichloroethene	TM116	98.0 79.80 : 112.33
Trichlorofluoromethane	TM116	105.6 80.52 : 132.12
Vinyl Chloride	TM116	114.8 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

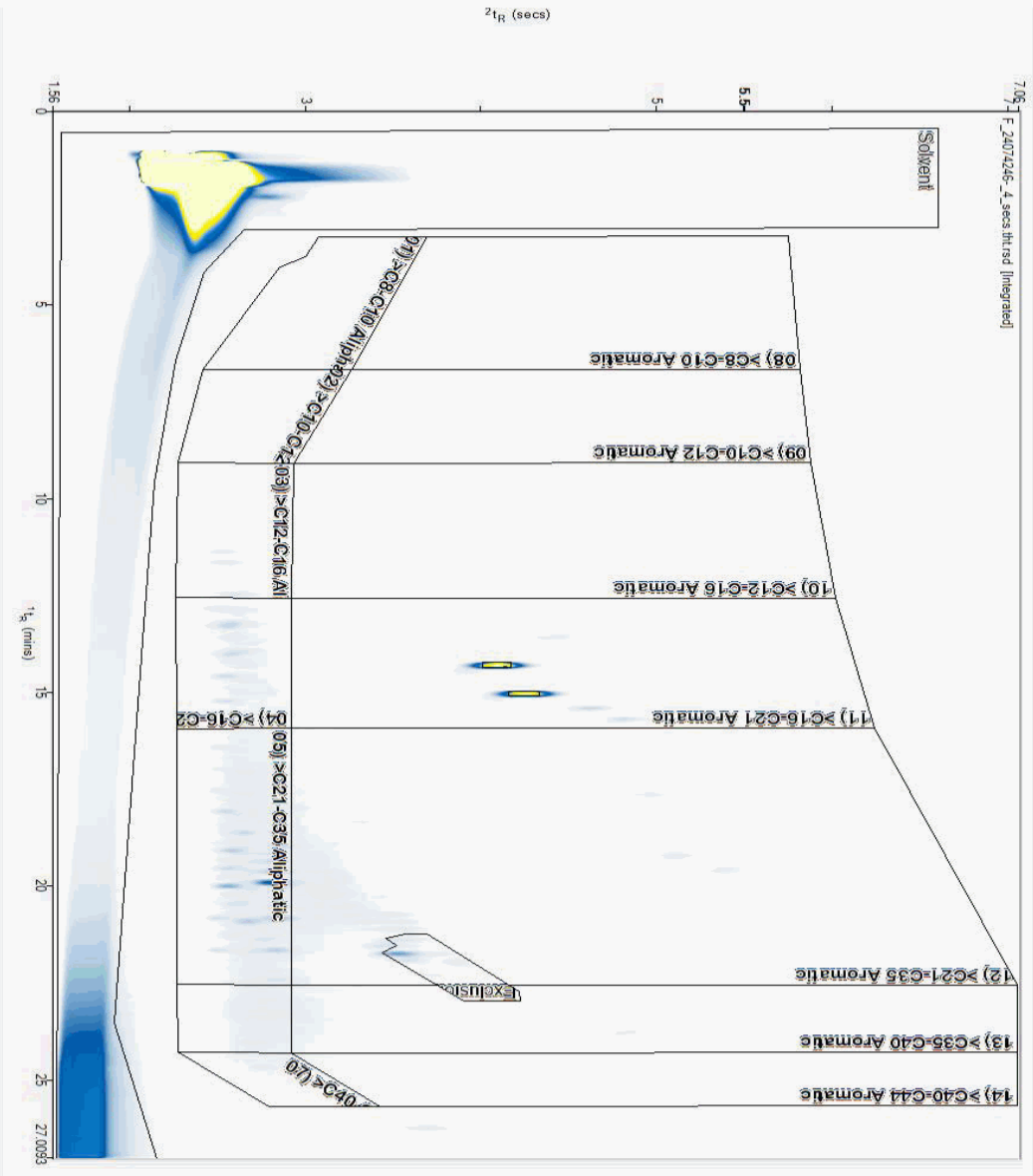
Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24074246 Depth : 1.40
Sample ID : BH - PTR - 44

ChromSpace LIMS export
Current batch
Sample Identity: F_24074246-4_secs.tht
Date Acquired : 16/04/21 01:43:44
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

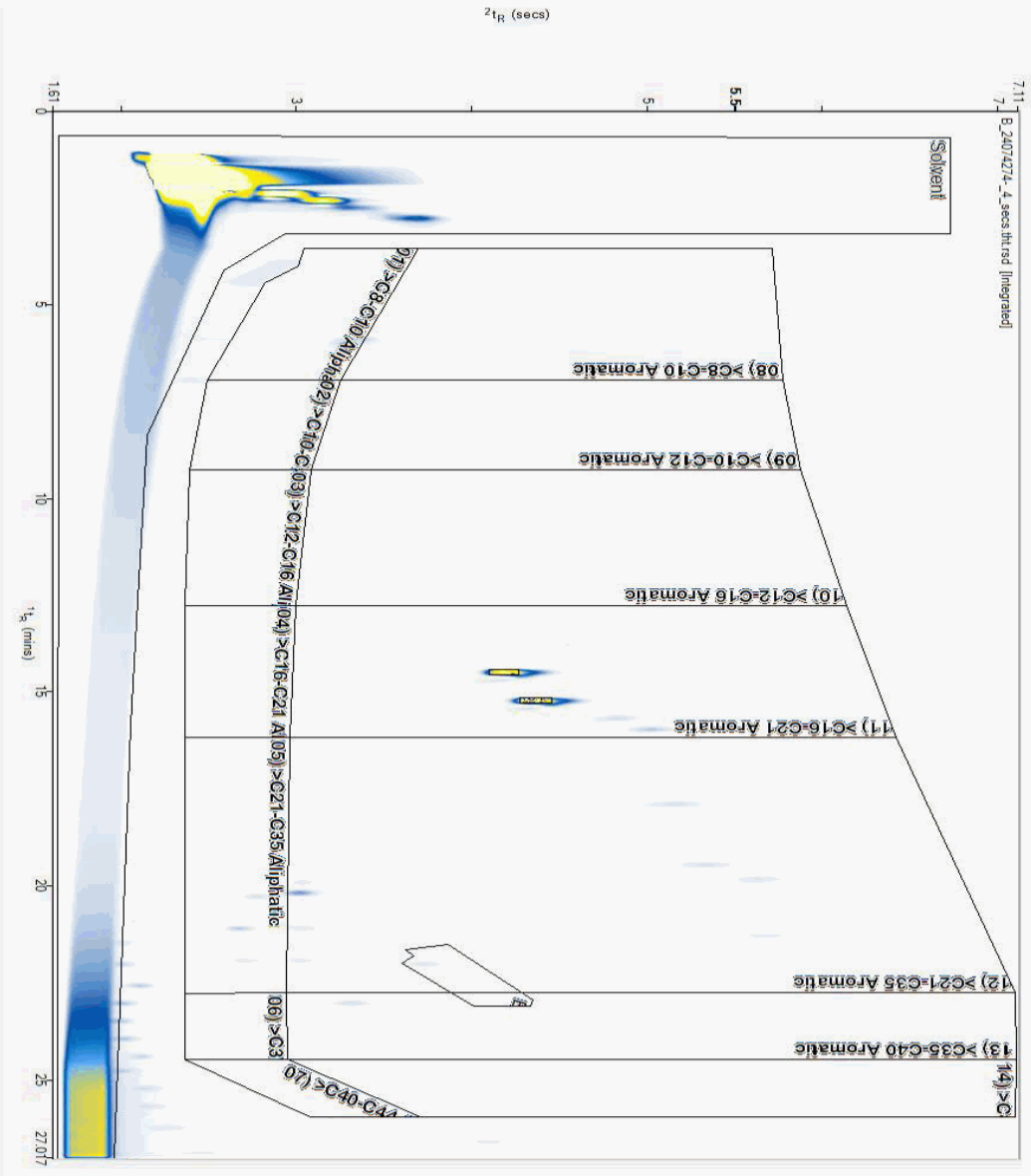
Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24074274 Depth : 0.50
Sample ID : BH - PTR - 44

ChromSpace LIMS export
Current batch
Sample Identity: B_24074274-4_secs.tht
Date Acquired : 16/04/21 04:52:38
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

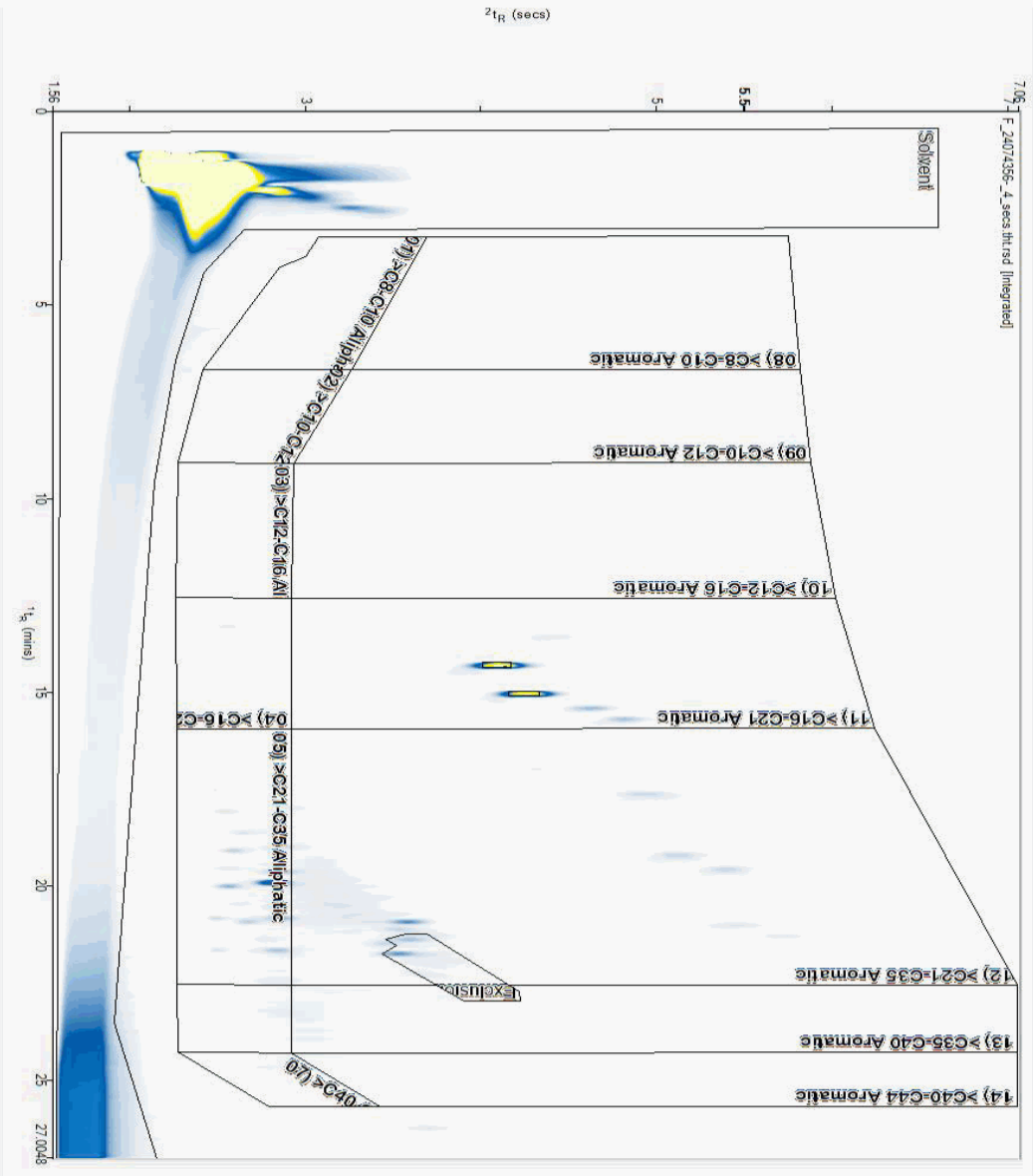
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SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24074356 Depth : 0.20
Sample ID : BH - PTR - 44

ChromSpace LIMS export
Current batch
Sample Identity: F_24074356-4_secs.tht
Date Acquired : 16/04/21 02:24:46
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

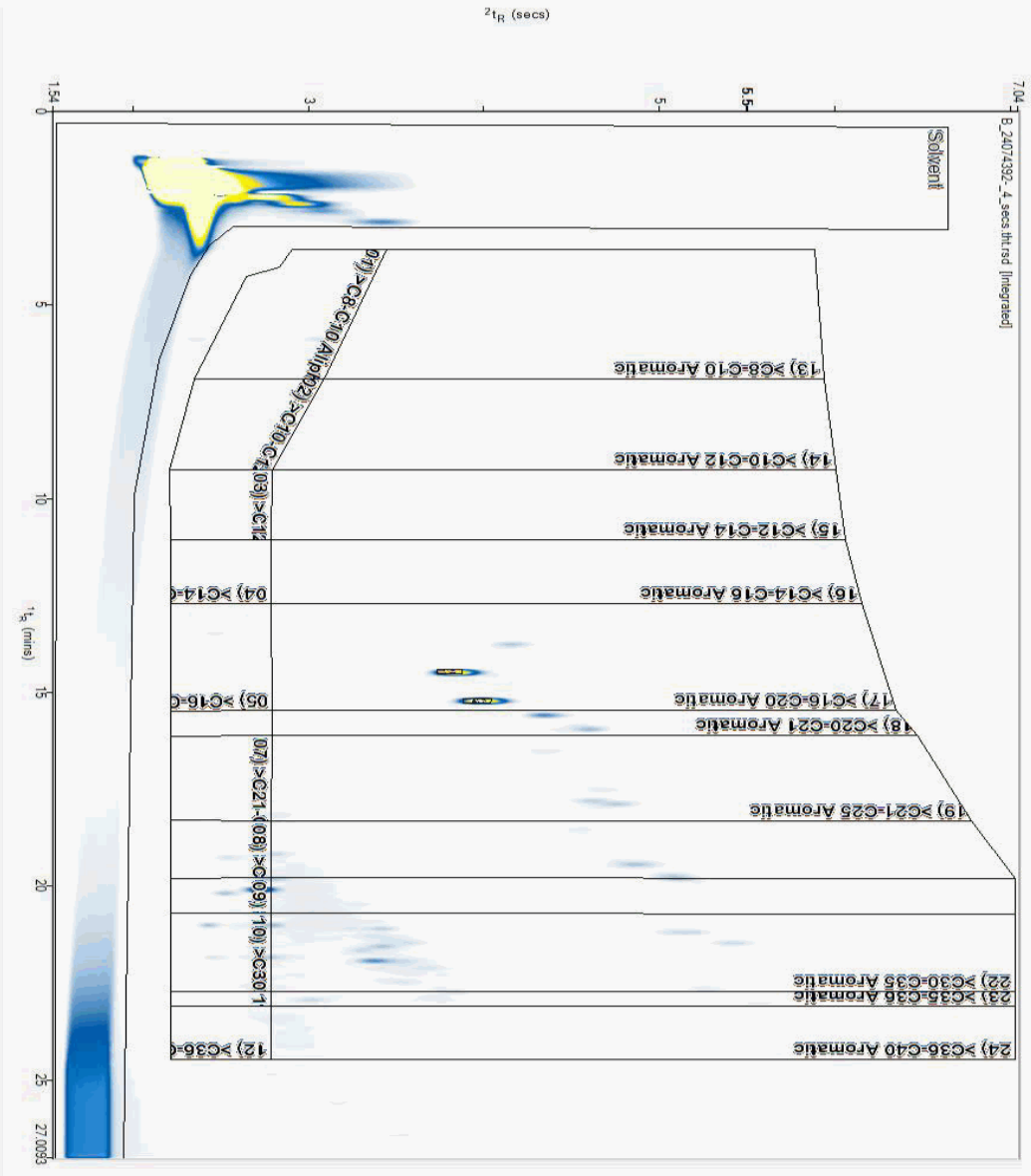
Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 24074392 Depth : 0.20
Sample ID : BH - PTR - 44

ChromSpace LIMS export
Current batch
Sample Identity: B_24074392-4_secs.tht
Date Acquired : 16/04/21 01:43:44
Units : ppm
Dilution : 0
CF :
Multiplier :





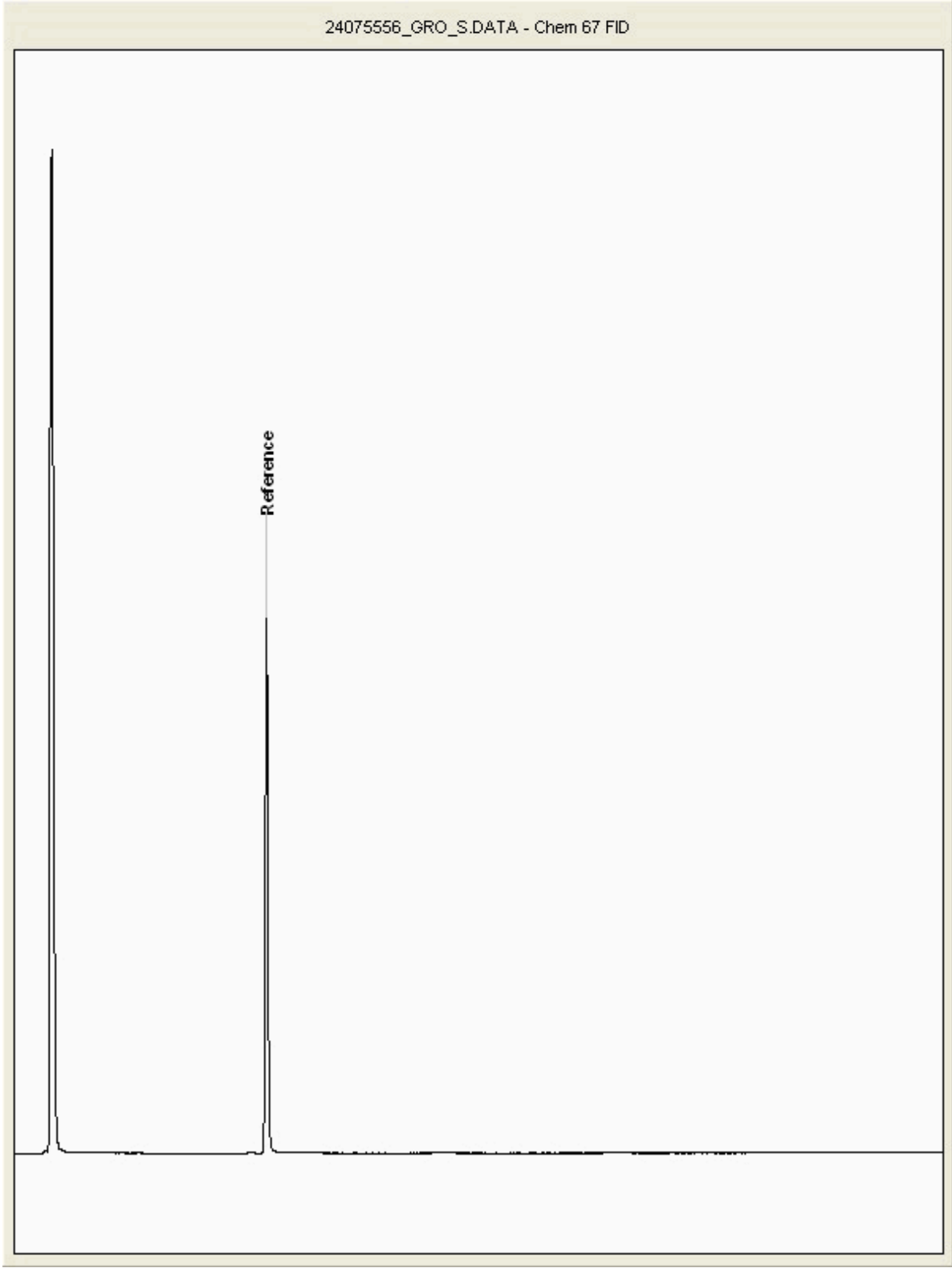
CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24075556 Depth : 0.20
Sample ID : BH - PTR - 44



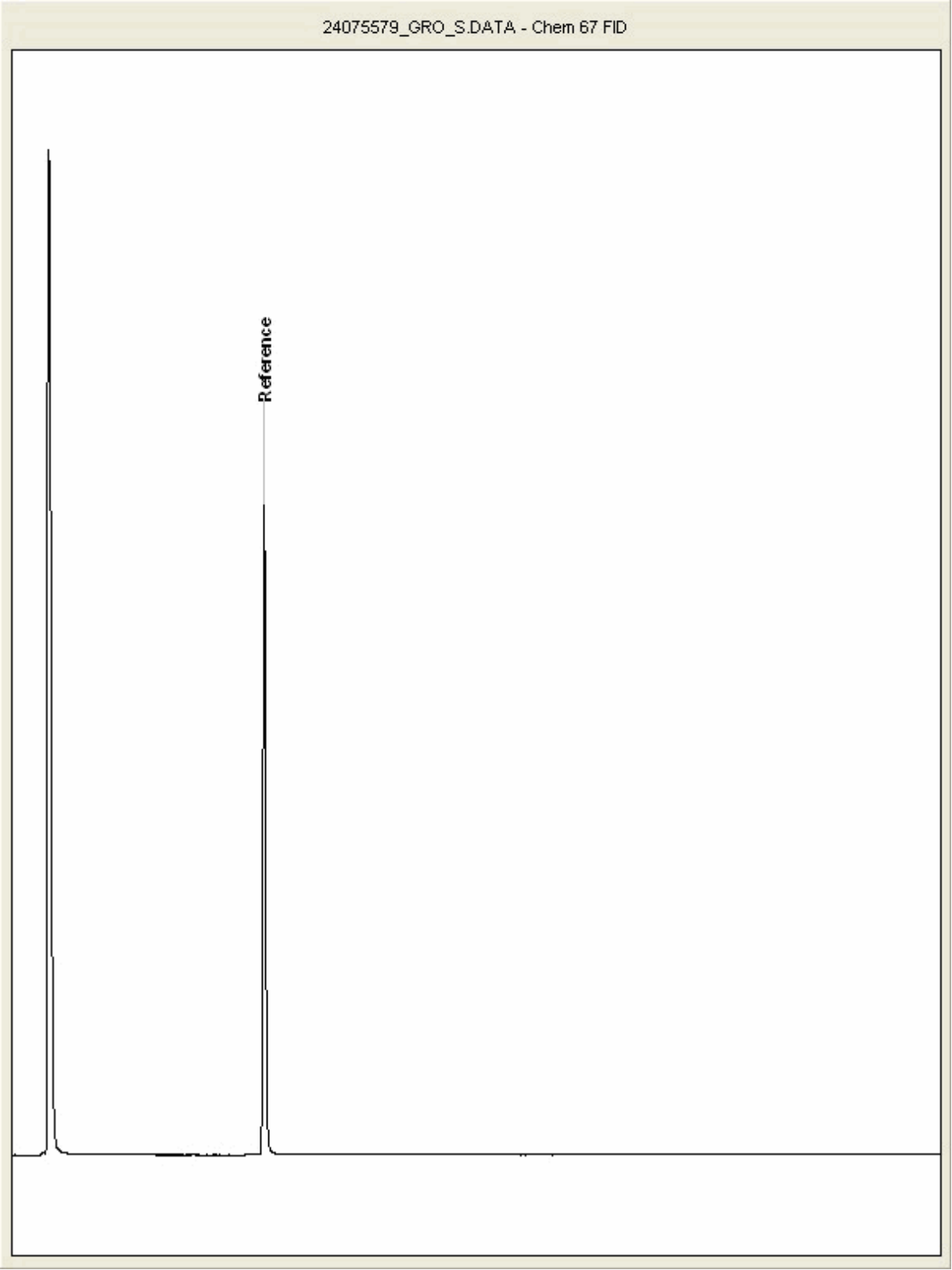
CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-81 Client Reference: B025563 Report Number: 595331
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24075579 Depth : 0.50
Sample ID : BH - PTR - 44



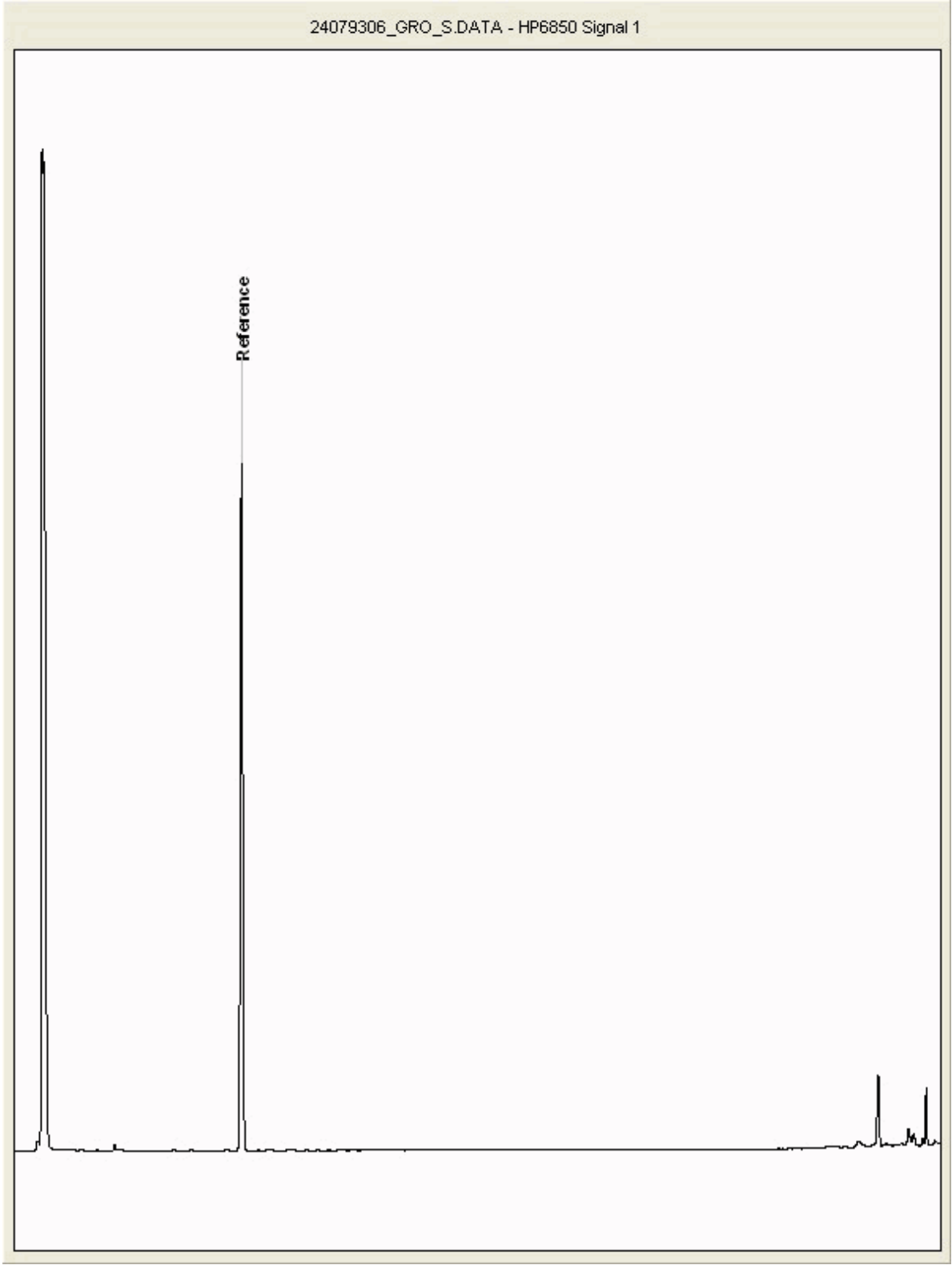
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24079306

Sample ID : BH - PTR - 44

Depth : 1.40



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 20 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210413-82
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 594808

We received 8 samples on Tuesday April 13, 2021 and 2 of these samples were scheduled for analysis which was completed on Tuesday April 20, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-82 Client Reference: B025563 Report Number: 594808
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24068845	TP - PTR - 09	ES1	0.10	09/04/2021
24068846	TP - PTR - 09	ES2	0.20	09/04/2021
24068847	TP - PTR - 09	ES6	0.50	09/04/2021
24068848	TP - PTR - 09	ES7	1.00	09/04/2021
24068849	TP - PTR - 11	ES1	0.10	09/04/2021
24068851	TP - PTR - 11	ES2	0.20	09/04/2021
24068852	TP - PTR - 11	ES6	0.50	09/04/2021
24068854	TP - PTR - 11	ES8	1.00	09/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-82Client Reference: B025563Report Number: 594808

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24068845		24068854	
	Customer Sample Reference		TP - PTR - 09		TP - PTR - 11	
	AGS Reference		ES1		ES8	
	Depth (m)		0.10		1.00	
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X		X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2		X		X
Chromium III	All	NDPs: 0 Tests: 2		X		X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X		X
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X		X
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Sample description	All	NDPs: 0 Tests: 2		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-82Client Reference: B025563Report Number: 594808

Location: Cambridge South East TraOrder Number: 7000964Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24068845		24068854	
	Customer Sample Reference		TP - PTR - 09		TP - PTR - 11	
	AGS Reference		ES1		ES8	
	Depth (m)		0.10		1.00	
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24068845	TP - PTR - 09	0.10	Dark Brown	Sandy Loam	Stones	Vegetation
24068854	TP - PTR - 11	1.00	Light Brown	Sandy Silt Loam	None	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP - PTR - 09	TP - PTR - 11				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.10	1.00				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		09/04/2021	09/04/2021				
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.		13/04/2021	13/04/2021				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210413-82	210413-82				
(F)	Trigger breach confirmed		24068845	24068854				
1-445@	Sample deviation (see appendix)		ES1	ES8				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	13	2.9				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	0.023	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0293	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0141	<0.002				
pH	1 pH Units	TM133	8.42	9.04				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	9.8	5.53				
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6				
Arsenic	<0.6 mg/kg	TM181	7.84	7.89				
Barium	<0.6 mg/kg	TM181	58.8	20.8				
Beryllium	<0.01 mg/kg	TM181	0.499	0.536				
Cadmium	<0.02 mg/kg	TM181	0.179	0.0291				
Chromium	<0.9 mg/kg	TM181	9.8	5.53				
Copper	<1.4 mg/kg	TM181	14.7	10.5				
Iron	<1000 mg/kg	TM181	13500	17700				
Lead	<0.7 mg/kg	TM181	23.2	11.7				
Manganese	<0.13 mg/kg	TM181	565	249				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.301	0.578				
Nickel	<0.2 mg/kg	TM181	14.6	12.5				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	22.9	15.5				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		TP - PTR - 09	TP - PTR - 11				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.10 Soil/Solid (S) 09/04/2021 . 13/04/2021 210413-82 24068845 ES1	1.00 Soil/Solid (S) 09/04/2021 . 13/04/2021 210413-82 24068854 ES8				
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116		103	105				
Toluene-d8**	%	TM116		96.3	101				
4-Bromofluorobenzene**	%	TM116		78.3	102				
Dichlorodifluoromethane	<6 µg/kg	TM116		<6 M	<6 M				
Chloromethane	<7 µg/kg	TM116		<7 #	<7 #				
Vinyl Chloride	<6 µg/kg	TM116		<6 M	<6 M				
Bromomethane	<10 µg/kg	TM116		<10 M	<10 M				
Chloroethane	<10 µg/kg	TM116		<10 M	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116		<6 M	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116		<10 #	<10 #				
Carbon Disulphide	<7 µg/kg	TM116		<7 M	<7 M				
Dichloromethane	<10 µg/kg	TM116		<10 #	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10 M	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116		<10 M	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116		<8 M	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116		<6 M	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116		<10	<10				
Bromochloromethane	<10 µg/kg	TM116		<10 M	<10 M				
Chloroform	<8 µg/kg	TM116		<8 M	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116		<7 M	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116		<10 M	<10 M				
Carbontetrachloride	<10 µg/kg	TM116		<10 M	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116		<5 M	<5 M				
Benzene	<9 µg/kg	TM116		<9 M	<9 M				
Trichloroethene	<9 µg/kg	TM116		<9 #	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116		<10 M	<10 M				
Dibromomethane	<9 µg/kg	TM116		<9 M	<9 M				
Bromodichloromethane	<7 µg/kg	TM116		<7 M	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116		<10 M	<10 M				
Toluene	<7 µg/kg	TM116		<7 M	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116		<10	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116		<10 M	<10 M				

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - PTR - 09E51 0.10 SOLID 09/04/2021 00:00:00 13/04/2021 13:30:00 210413-82 24068845 TM048	16/04/2021	Paul Poynton	-	Amosite (Brown) Asbestos Not Detected (#)	Chrysotile (White) Asbestos Not Detected (#)	Crocidolite (Blue) Asbestos Not Detected (#)	Fibrous Actinolite Not Detected (#)	Fibrous Anthophyllite Not Detected (#)	Fibrous Tremolite Not Detected (#)	Non-Asbestos Fibre Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - PTR - 11E58 1.00 SOLID 09/04/2021 00:00:00 13/04/2021 13:30:00 210413-82 24068854 TM048	19.04.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	24068845	24068854
Customer Sample Ref.	TP - PTR - 09	TP - PTR - 11
AGS Ref.	ES1	ES8
Depth	0.10	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	19-Apr-2021	18-Apr-2021
Asbestos ID in Solid Samples	16-Apr-2021	19-Apr-2021
Boron Water Soluble	19-Apr-2021	16-Apr-2021
Chromium III	20-Apr-2021	20-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2021	16-Apr-2021
EPH CWG GC (S)	16-Apr-2021	16-Apr-2021
GRO by GC-FID (S)	15-Apr-2021	15-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	20-Apr-2021
Metals in solid samples by OES	20-Apr-2021	19-Apr-2021
PAH by GCMS	16-Apr-2021	16-Apr-2021
pH	15-Apr-2021	15-Apr-2021
Phenols by HPLC (S)	16-Apr-2021	16-Apr-2021
Sample description	14-Apr-2021	14-Apr-2021
Total Organic Carbon	20-Apr-2021	19-Apr-2021
Total Sulphur	20-Apr-2021	19-Apr-2021
TPH CWG GC (S)	16-Apr-2021	16-Apr-2021
VOC MS (S)	15-Apr-2021	15-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2412	QC 2400
Water Soluble Boron	TM222	104.0 84.00 : 111.00	109.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2461	QC 2471
Free Cyanide	TM153	98.22 79.00 : 115.00	98.91 79.00 : 115.00
Thiocyanate	TM153	98.08 94.09 : 113.89	97.44 94.09 : 113.89
Total Cyanide	TM153	95.1 73.07 : 107.47	93.71 73.07 : 107.47

GRO by GC-FID (S)

Component	Method Code	QC 2406
QC	TM089	92.48 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2445	QC 2485
Hexavalent Chromium	TM151	108.0 92.00 : 111.20	104.0 92.00 : 111.20

Metals in solid samples by OES

Component	Method Code	QC 2488	QC 2436
Aluminium	TM181	92.04 73.56 : 108.85	83.89 73.56 : 108.85
Antimony	TM181	95.53 76.89 : 111.24	90.24 76.89 : 111.24
Arsenic	TM181	102.62 88.53 : 111.01	96.8 88.53 : 111.01
Barium	TM181	96.33 77.67 : 105.35	87.34 77.67 : 105.35
Beryllium	TM181	101.87 85.44 : 109.61	94.78 85.44 : 109.61
Boron	TM181	90.83 73.51 : 104.66	86.25 73.51 : 104.66
Cadmium	TM181	95.47 77.67 : 104.12	89.3 77.67 : 104.12

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210413-82	Client Reference:	B025563	Report Number:	594808	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2488	QC 2436
Chromium	TM181	86.82 79.64 : 105.83	84.99 79.64 : 105.83
Cobalt	TM181	90.88 84.60 : 104.13	85.85 84.60 : 104.13
Copper	TM181	95.95 82.40 : 105.45	92.08 82.40 : 105.45
Iron	TM181	92.86 82.95 : 110.58	95.24 82.95 : 110.58
Lead	TM181	91.44 78.24 : 104.05	92.34 78.24 : 104.05
Manganese	TM181	107.78 94.29 : 119.51	103.33 94.29 : 119.51
Mercury	TM181	97.34 83.16 : 107.81	93.0 83.16 : 107.81
Molybdenum	TM181	97.94 87.11 : 106.87	92.18 87.11 : 106.87
Nickel	TM181	93.15 80.26 : 102.28	87.78 80.26 : 102.28
Phosphorus	TM181	108.89 94.56 : 124.28	102.42 94.56 : 124.28
Selenium	TM181	100.39 82.28 : 110.48	95.69 82.28 : 110.48
Strontium	TM181	92.87 79.13 : 102.79	88.42 79.13 : 102.79
Thallium	TM181	100.88 82.94 : 111.86	96.46 82.94 : 111.86
Tin	TM181	98.48 86.72 : 110.03	94.68 86.72 : 110.03
Titanium	TM181	88.55 66.23 : 102.06	79.39 66.23 : 102.06
Vanadium	TM181	98.53 86.19 : 109.45	93.04 86.19 : 109.45
Zinc	TM181	99.59 84.68 : 113.99	94.05 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2404
Acenaphthene	TM218	85.5 78.59 : 112.16
Acenaphthylene	TM218	84.0 75.11 : 109.01
Anthracene	TM218	81.0 73.99 : 113.85
Benz(a)anthracene	TM218	83.5 69.31 : 119.18
Benzo(a)pyrene	TM218	80.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	83.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	80.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	84.5 69.98 : 116.49

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210413-82	Client Reference:	B025563	Report Number:	594808	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
PAH by GCMS						

		QC 2404
Chrysene	TM218	85.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	80.0 64.54 : 115.22
Fluoranthene	TM218	80.0 72.56 : 111.70
Fluorene	TM218	84.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	93.0 61.22 : 113.25
Naphthalene	TM218	87.5 77.96 : 110.91
Phenanthrene	TM218	81.0 76.83 : 113.25
Pyrene	TM218	81.0 72.45 : 110.77

pH

Component	Method Code	QC 2464	QC 2483
pH	TM133	100.15 98.41 : 102.48	99.27 98.41 : 102.48

Phenols by HPLC (S)

Component	Method Code	QC 2484	QC 2487
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	56.49 70.71 : 116.42	53.9 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 64.54 : 117.79	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	52.4 74.40 : 108.98	50.52 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	54.97 69.44 : 122.18	52.98 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	52.71 76.56 : 106.38	51.46 76.56 : 106.38

Total Organic Carbon

Component	Method Code	QC 2423	QC 2464
Total Organic Carbon	TM132	96.48 87.02 : 113.45	101.95 87.02 : 113.45

Total Sulphur

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210413-82	Client Reference:	B025563	Report Number:	594808	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2464	QC 2429			
Total Sulphur %	TM132	75.65 61.64 : 114.47	81.87 61.64 : 114.47			

VOC MS (S)			
Component	Method Code	QC 2473	QC 2418
1,1,1,2-tetrachloroethane	TM116	105.0 79.10 : 119.66	112.4 86.59 : 118.97
1,1,1-Trichloroethane	TM116	109.8 84.25 : 112.57	111.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	99.8 81.29 : 113.79	97.2 75.16 : 112.70
1,1-Dichloroethane	TM116	112.4 86.77 : 122.11	108.8 83.27 : 122.16
1,2-Dichloroethane	TM116	115.0 90.04 : 132.28	107.6 89.30 : 133.10
1,4-Dichlorobenzene	TM116	110.8 80.81 : 125.07	119.2 82.59 : 123.23
2-Chlorotoluene	TM116	104.4 73.13 : 114.13	115.6 66.81 : 118.43
4-Chlorotoluene	TM116	98.6 68.66 : 109.13	117.8 65.88 : 114.76
Benzene	TM116	105.8 84.29 : 112.22	97.8 93.16 : 123.63
Carbon Disulphide	TM116	101.6 75.11 : 124.81	108.4 75.11 : 124.81
Carbontetrachloride	TM116	111.8 82.35 : 126.46	119.4 82.35 : 126.46
Chlorobenzene	TM116	104.6 82.88 : 122.42	110.4 85.07 : 118.13
Chloroform	TM116	112.8 90.35 : 120.38	111.6 88.13 : 122.71
Chloromethane	TM116	114.0 67.89 : 143.51	129.0 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	109.8 78.27 : 128.90	103.4 78.27 : 128.90
Dibromomethane	TM116	101.0 76.00 : 120.73	94.2 77.47 : 121.29
Dichloromethane	TM116	117.4 92.27 : 134.36	113.0 87.89 : 134.72
Ethylbenzene	TM116	97.4 70.95 : 113.07	98.4 79.92 : 110.05
Hexachlorobutadiene	TM116	93.4 14.55 : 147.92	72.6 16.78 : 153.29
Isopropylbenzene	TM116	98.4 52.00 : 108.19	87.2 64.20 : 119.59
Naphthalene	TM116	105.8 80.29 : 135.77	106.4 79.29 : 125.59
o-Xylene	TM116	93.0 68.34 : 101.99	100.8 72.86 : 102.10

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210413-82	Client Reference:	B025563	Report Number:	594808	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2473	QC 2418			
p/m-Xylene	TM116	91.3 69.47 : 97.31	93.1 74.06 : 106.47			
Sec-Butylbenzene	TM116	110.4 27.03 : 135.73	87.8 44.71 : 117.87			
Tetrachloroethene	TM116	106.0 81.43 : 126.65	109.6 77.82 : 125.00			
Toluene	TM116	96.0 82.44 : 103.50	92.6 87.82 : 116.21			
Trichloroethene	TM116	103.8 79.80 : 112.33	96.6 79.80 : 112.33			
Trichlorofluoromethane	TM116	109.4 89.67 : 132.09	111.8 80.52 : 132.12			
Vinyl Chloride	TM116	118.4 69.66 : 136.55	126.2 74.57 : 146.88			

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

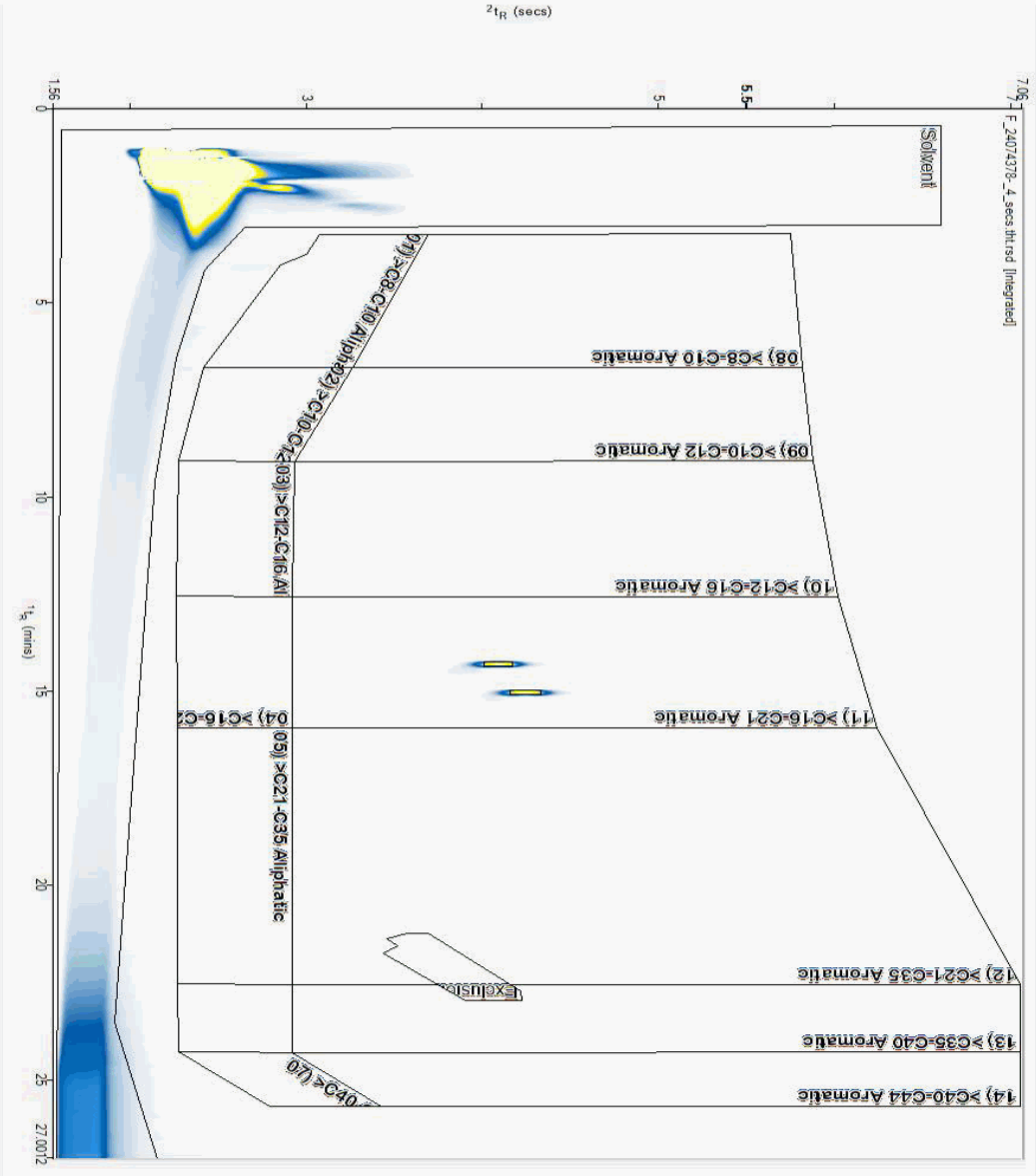
Validated

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24074378 Depth : 1.00
Sample ID : TP - PTR - 11

ChromSpace LIMS export
Current batch
Sample Identity: F_24074378-4_secs.tht
Date Acquired : 15/04/21 06:35:12
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

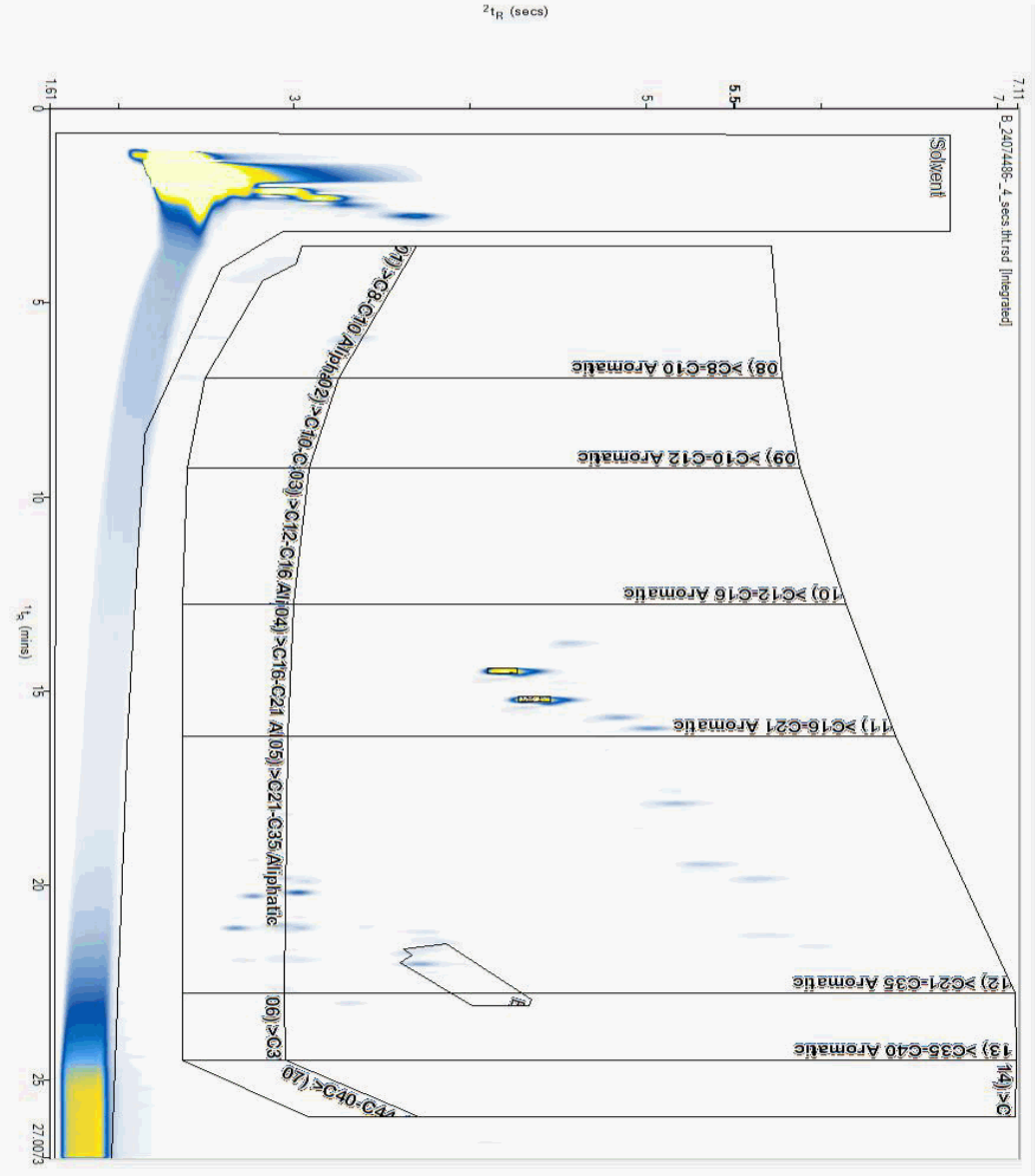
Validated

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24074486 Depth : 0.10
Sample ID : TP - PTR - 09

ChromSpace LIMS export
Current batch
Sample Identity: B_24074486-4_secs.tht
Date Acquired : 16/04/21 01:44:46
Units : ppm
Dilution : 0
CF :
Multiplier :





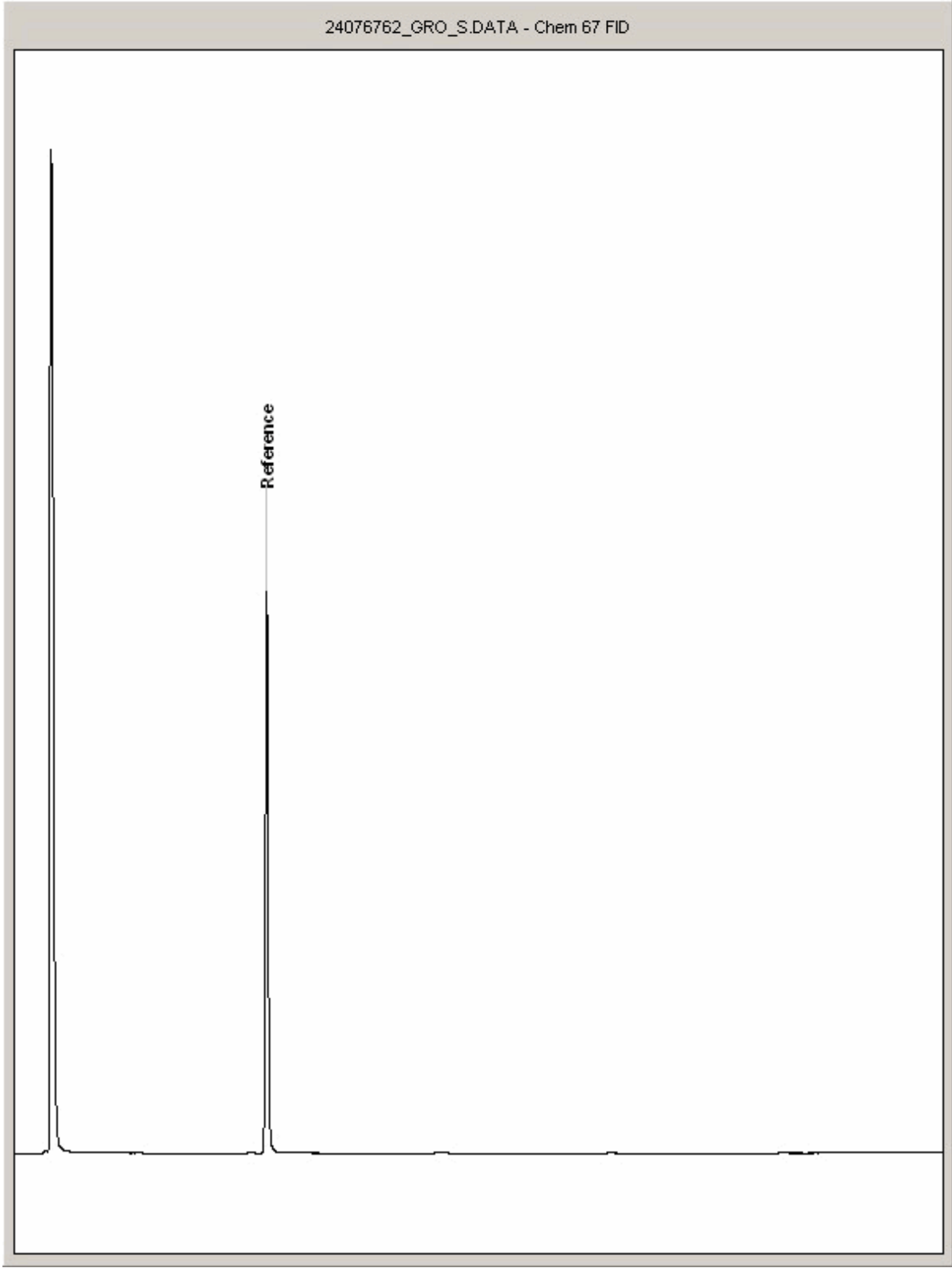
CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-82 Client Reference: B025563 Report Number: 594808
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24076762 Depth : 0.10
Sample ID : TP - PTR - 09



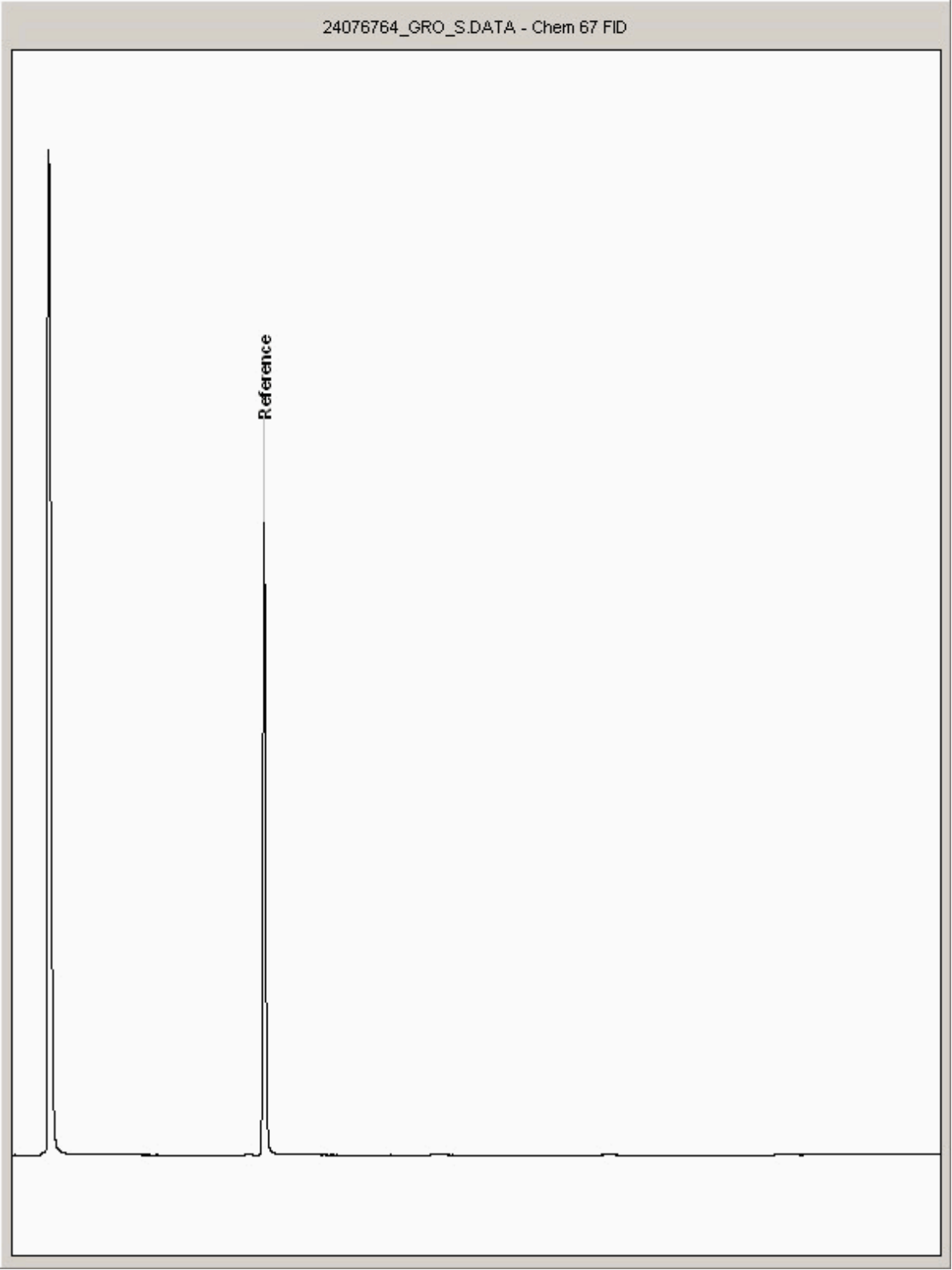
CERTIFICATE OF ANALYSIS

Validated

SDG: 210413-82 Client Reference: B025563 Report Number: 594808
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24076764 Depth : 1.00
Sample ID : TP - PTR - 11





CERTIFICATE OF ANALYSIS

SDG:	210413-82	Client Reference:	B025563	Report Number:	594808
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Hawarden

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CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	24 April 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210414-81
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	595345

We received 4 samples on Wednesday April 14, 2021 and 3 of these samples were scheduled for analysis which was completed on Saturday April 24, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 24/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24073530	BH - PTR - 43	ES1	0.10 - 0.10	12/04/2021
24073531	BH - PTR - 43	ES2	0.20 - 0.20	12/04/2021
24073532	BH - PTR - 43	ES3	0.50 - 0.50	12/04/2021
24073533	BH - PTR - 43	ES4	1.00 - 1.00	12/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
									60g VOC (ALE215)		S	
							0.10 - 0.10		60g VOC (ALE215)		S	
									250g Amber Jar (ALE210)		S	
									1kg TUB with Handle (ALE260)		S	
									250g Amber Jar (ALE215)		S	
									1kg TUB with Handle (ALE260)		S	
Ammonium Low	All	NDPs: 0 Tests: 2										
Anions by Kone (soil)	All	NDPs: 0 Tests: 3										
Anions by Kone (w)	All	NDPs: 0 Tests: 2										
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3										
Boron Water Soluble	All	NDPs: 0 Tests: 3										
CEN Readings	All	NDPs: 0 Tests: 2										
Chromium III	All	NDPs: 0 Tests: 5										
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3										
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2										
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2										
EPH CWG GC (S)	All	NDPs: 0 Tests: 3										
Fluoride	All	NDPs: 0 Tests: 2										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3										
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2										

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24073530			24073531			24073533		
	Customer Sample Reference		BH - PTR - 43			BH - PTR - 43			BH - PTR - 43		
	AGS Reference		ES1			ES2			ES4		
	Depth (m)		0.10 - 0.10			0.20 - 0.20			1.00 - 1.00		
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)
	Sample Type		S	S	S	S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2				X			X		
Mercury Dissolved	All	NDPs: 0 Tests: 2				X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 3		X			X			X	
pH	All	NDPs: 0 Tests: 3		X			X			X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 2				X			X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X			X			X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2				X			X		
Sample description	All	NDPs: 0 Tests: 3		X			X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 3		X			X			X	
Total Sulphur	All	NDPs: 0 Tests: 3		X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 3			X			X			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24073530	BH - PTR - 43	0.10 - 0.10	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24073531	BH - PTR - 43	0.20 - 0.20	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24073533	BH - PTR - 43	1.00 - 1.00	Dark Brown	Sandy Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH - PTR - 43	BH - PTR - 43	BH - PTR - 43				
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)		0.10 - 0.10 Soil/Solid (S) 12/04/2021 . 14/04/2021 210414-81 24073530 ES1	0.20 - 0.20 Soil/Solid (S) 12/04/2021 . 14/04/2021 210414-81 24073531 ES2	1.00 - 1.00 Soil/Solid (S) 12/04/2021 . 14/04/2021 210414-81 24073533 ES4				
Component	LOD/Units		Method						
Moisture Content Ratio (% of as received sample)	%		PM024	16	15	17			
Catechol	<0.01 mg/kg		TM062 (S)	<0.01	<0.01	<0.01			
Phenol	<0.01 mg/kg		TM062 (S)	<0.01 M	<0.01 M	<0.01 M			
Cresols	<0.01 mg/kg		TM062 (S)	0.0238 M	0.0118 M	<0.01 M			
Resorcinol	<0.05 mg/kg		TM062 (S)	<0.05	0.142	<0.05			
Xylenols	<0.015 mg/kg		TM062 (S)	<0.015 M	<0.015 M	<0.015 M			
1-Naphthol	<0.01 mg/kg		TM062 (S)	<0.01	<0.01	<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M	<0.06 M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	0.153	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0246	0.0488	0.0633				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0196 #	0.0155 #	0.0165 #				
pH	1 pH Units	TM133	8.31 M	8.52 M	8.69 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #				
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M	<1 M				
Chromium, Trivalent	<0.9 mg/kg	TM181	8.77	8.44	12.3				
Antimony	<0.6 mg/kg	TM181	<0.6 #	<0.6 #	1.66 #				
Arsenic	<0.6 mg/kg	TM181	8.42 M	18.5 M	17.9 M				
Barium	<0.6 mg/kg	TM181	55.1 #	61.1 #	170 #				
Beryllium	<0.01 mg/kg	TM181	0.476 M	0.473 M	1.02 M				
Cadmium	<0.02 mg/kg	TM181	0.215 M	0.252 M	0.09 M				
Chromium	<0.9 mg/kg	TM181	8.77 M	8.44 M	12.3 M				
Copper	<1.4 mg/kg	TM181	16.8 M	108 M	68 M				
Iron	<1000 mg/kg	TM181	13800 #	1570 #	19100 #				
Lead	<0.7 mg/kg	TM181	28.6 M	34.6 M	62 M				
Manganese	<0.13 mg/kg	TM181	315 M	324 M	352 M				
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	0.248 M				
Molybdenum	<0.1 mg/kg	TM181	0.35 #	0.49 #	0.85 #				
Nickel	<0.2 mg/kg	TM181	11.8 M	13.7 M	18.1 M				
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #				
Vanadium	<0.2 mg/kg	TM181	21 #	20.7 #	35.4 #				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH - PTR - 43					
#	ISO17025 accredited. mCERTS accredited.		0.10 - 0.10 Soil/Solid (S)	0.20 - 0.20 Soil/Solid (S)	1.00 - 1.00 Soil/Solid (S)			
M	Aqueous / settled sample.	Depth (m)						
aq	Disolved / filtered sample.	Sample Type						
dis.filt	Total / unfiltered sample.	Date Sampled	12/04/2021	12/04/2021	12/04/2021			
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.	Sampled Time						
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	14/04/2021	14/04/2021	14/04/2021			
**	Trigger breach confirmed	SDG Ref	210414-81	210414-81	210414-81			
(F)	Sample deviation (see appendix)	Lab Sample No.(s)	24073530	24073531	24073533			
1-44@	AGS Reference	ES1	ES2	ES4				
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	104	105	112			
Toluene-d8**	%	TM116	94.6	95.9	97.9			
4-Bromofluorobenzene**	%	TM116	79	79	82			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 M			
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #	<7 #			
Vinyl Chloride	<6 µg/kg	TM116	<6 M	<6 M	<6 M			
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 M			
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M	<8 M			
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M	<6 M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10	<10			
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Chloroform	<8 µg/kg	TM116	<8 M	<8 M	<8 M			
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M	<5 M			
Benzene	<9 µg/kg	TM116	<9 M	<9 M	<9 M			
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #	<9 #			
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M	<9 M			
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Toluene	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10	<10			
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			

VOC MS (S)

Results Legend		Customer Sample Ref.	BH - PTR - 43					
#	ISO17025 accredited. mCERTS accredited.		0.10 - 0.10 Soil/Solid (S)	0.20 - 0.20 Soil/Solid (S)	1.00 - 1.00 Soil/Solid (S)			
M	Aqueous / settled sample.	Depth (m)						
aq	Disolved / filtered sample.	Sample Type						
dis.filt	Total / unfiltered sample.	Date Sampled	12/04/2021	12/04/2021	12/04/2021			
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.	Sampled Time						
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	14/04/2021	14/04/2021	14/04/2021			
**	Trigger breach confirmed	SDG Ref	210414-81	210414-81	210414-81			
(F)	Sample deviation (see appendix)	Lab Sample No.(s)	24073530	24073531	24073533			
1-44@	AGS Reference	ES1	ES2	ES4				
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M	<5 M			
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M			
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M			
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Styrene	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #	<5 #			
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M	<16 M			
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M			
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M	<14 M			
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #			
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10	<10			
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M			
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M			
n-Butylbenzene	<11 µg/kg	TM116	<11	<11	<11			
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M			
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20	<20			
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20	<20			
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M	<13 M			

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

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CERTIFICATE OF ANALYSIS

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

Results Legend	
# ISO17025 accredited. M mCERTS accredited. * Subcontracted test.	
(F) Trigger breach confirmed 1-5&*\$@ Sample deviation (see appendix)	
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH - PTR - 43E51 0.10 - 0.10 SOLID 12/04/2021 00:00:00 14/04/2021 08:15:00 210414-81 24073530 TM048
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH - PTR - 43E52 0.20 - 0.20 SOLID 12/04/2021 00:00:00 14/04/2021 08:15:00 210414-81 24073531 TM048
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH - PTR - 43E54 1.00 - 1.00 SOLID 12/04/2021 00:00:00 14/04/2021 08:15:00 210414-81 24073533 TM048

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.108	Natural Moisture Content (%)	20.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	83
Particle Size <4mm	>95%		

Case

SDG	210414-81			
Lab Sample Number(s)	24073531			
Sampled Date	12-Apr-2021			
Customer Sample Ref.	BH - PTR - 43 ES2			
Depth (m)	0.20 - 0.20			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.016	<0.01	0.16	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.36	<3	63.6	<30	-	-	-
Fluoride	0.568	<0.5	5.68	<5	-	-	-
Mercury Dissolved (CVAF)	0.000014	<0.00001	0.00014	<0.0001	-	-	-
Arsenic	0.0013	<0.0005	0.013	<0.005	-	-	-
Barium	0.233	<0.0002	2.33	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0884	<0.01	0.884	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	24	<0.2	240	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00424	<0.0003	0.0424	<0.003	-	-	-
Lead	0.000956	<0.0002	0.00956	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.624	<0.036	6.24	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00817	<0.003	0.0817	<0.03	-	-	-
Nickel	0.00129	<0.0004	0.0129	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00145	<0.001	0.0145	<0.01	-	-	-
Zinc	0.0316	<0.001	0.316	<0.01	-	-	-
Chloride	2	<2	20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	16-Apr-2021
pH (pH Units)	8.24
Conductivity (µS/cm)	117.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.882



SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - I
Mass Sample taken (kg)	0.108	Natural Moisture Content (%)		20.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		83
Particle Size <4mm	>95%			

Case

SDG	210414-81			
Lab Sample Number(s)	24073531			
Sampled Date	12-Apr-2021			
Customer Sample Ref.	BH - PTR - 43 ES2			
Depth (m)	0.20 - 0.20			

[illegible]

Leach Test Information

Date Prepared	16-Apr-2021
pH (pH Units)	8.24
Conductivity (µS/cm)	117.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.882

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24073530	24073531	24073533
Customer Sample Ref.	BH - PTR - 43	BH - PTR - 43	BH - PTR - 43
AGS Ref.	ES1	ES2	ES4
Depth	0.10 - 0.10	0.20 - 0.20	1.00 - 1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low		21-Apr-2021	21-Apr-2021
Anions by Kone (soil)	20-Apr-2021	20-Apr-2021	20-Apr-2021
Anions by Kone (w)		19-Apr-2021	19-Apr-2021
Asbestos ID in Solid Samples	19-Apr-2021	19-Apr-2021	19-Apr-2021
Boron Water Soluble	20-Apr-2021	20-Apr-2021	20-Apr-2021
CEN 10:1 Leachate (1 Stage)		16-Apr-2021	16-Apr-2021
CEN Readings		17-Apr-2021	17-Apr-2021
Chromium III	20-Apr-2021	20-Apr-2021	21-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	19-Apr-2021	19-Apr-2021	19-Apr-2021
Dissolved Metals by ICP-MS		20-Apr-2021	20-Apr-2021
Dissolved Organic/Inorganic Carbon		24-Apr-2021	24-Apr-2021
EPH CWG GC (S)	19-Apr-2021	19-Apr-2021	19-Apr-2021
Fluoride		19-Apr-2021	19-Apr-2021
GRO by GC-FID (S)	16-Apr-2021	16-Apr-2021	16-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	20-Apr-2021	20-Apr-2021
Low Level Cyanide (W)		20-Apr-2021	20-Apr-2021
Low Level Hexavalent Chromium (w)		19-Apr-2021	19-Apr-2021
Mercury Dissolved		20-Apr-2021	20-Apr-2021
Metals in solid samples by OES	20-Apr-2021	20-Apr-2021	22-Apr-2021
Moisture at 105C		16-Apr-2021	16-Apr-2021
PAH by GCMS	20-Apr-2021	20-Apr-2021	20-Apr-2021
pH	16-Apr-2021	16-Apr-2021	16-Apr-2021
pH Value of Filtered Water		20-Apr-2021	20-Apr-2021
Phenols by HPLC (S)	19-Apr-2021	19-Apr-2021	19-Apr-2021
Phenols by HPLC (W)		20-Apr-2021	20-Apr-2021
Sample description	15-Apr-2021	15-Apr-2021	15-Apr-2021
Total Organic Carbon	20-Apr-2021	20-Apr-2021	20-Apr-2021
Total Sulphur	19-Apr-2021	19-Apr-2021	19-Apr-2021
TPH CWG GC (S)	19-Apr-2021	19-Apr-2021	19-Apr-2021
VOC MS (S)	19-Apr-2021	19-Apr-2021	19-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
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ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2470
Ammoniacal Nitrogen as N	TM099	99.4 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2477
Chloride (soluble)	TM243	135.75 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	156.54 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2445
Chloride	TM184	101.0 92.93 : 115.43
Sulphate (soluble)	TM184	104.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2457
Water Soluble Boron	TM222	103.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2462
Free Cyanide	TM153	91.88 79.00 : 115.00
Thiocyanate	TM153	100.0 94.09 : 113.89
Total Cyanide	TM153	95.8 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2469
Aluminium	TM152	106.33 90.78 : 110.89
Antimony	TM152	105.0 77.22 : 119.42
Arsenic	TM152	102.33 86.77 : 107.67



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Dissolved Metals by ICP-MS

		QC 2469
Barium	TM152	101.0 87.86 : 110.23
Beryllium	TM152	108.67 86.19 : 112.98
Bismuth	TM152	102.33 84.06 : 106.46
Borate	TM152	106.79 88.00 : 112.00
Boron	TM152	106.67 83.92 : 114.90
Cadmium	TM152	99.67 88.89 : 106.69
Calcium	TM152	108.67 80.24 : 117.95
Chromium	TM152	104.0 83.22 : 110.16
Cobalt	TM152	102.0 82.49 : 112.36
Copper	TM152	103.33 83.14 : 113.00
Iron	TM152	104.0 88.40 : 109.24
Lead	TM152	102.33 83.71 : 109.58
Lithium	TM152	107.83 84.50 : 114.28
Magnesium	TM152	102.67 87.56 : 114.57
Manganese	TM152	104.83 90.01 : 108.72
Molybdenum	TM152	97.67 85.53 : 107.42
Nickel	TM152	102.67 88.05 : 106.42
Phosphorus	TM152	104.5 82.76 : 107.72
Potassium	TM152	104.0 88.45 : 106.42
Selenium	TM152	103.17 85.61 : 111.03
Silver	TM152	98.83 88.48 : 110.48
Sodium	TM152	102.67 88.32 : 106.30
Strontium	TM152	101.67 83.77 : 107.87
Tellurium	TM152	99.33 82.83 : 104.73
Thallium	TM152	93.67 77.47 : 113.87
Tin	TM152	103.0 87.36 : 109.55
Titanium	TM152	111.33 87.29 : 108.31

Dissolved Metals by ICP-MS

		QC 2469
Tungsten	TM152	98.83 68.27 : 122.97
Uranium	TM152	99.17 82.46 : 105.16
Vanadium	TM152	105.5 88.43 : 114.30
Zinc	TM152	104.33 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2456
Dissolved Inorganic Carbon	TM090	103.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2471
EPH >C8-C40 Raw	TM414	92.64 67.87 : 120.05
Total Aliphatics Raw	TM414	98.55 66.68 : 120.89
Total Aromatics Raw	TM414	102.38 61.16 : 129.42

Fluoride

Component	Method Code	QC 2466
Fluoride	TM104	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2462
QC	TM089	93.04 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2485	QC 2497
Hexavalent Chromium	TM151	104.0 92.00 : 111.20	102.0 92.00 : 111.20

Hexavalent Chromium (s)

Low Level Cyanide (W)

Component	Method Code	QC 2468
Free Cyanide - Low Level	TM279	78.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	98.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2486	QC 2498
Mercury Dissolved (CVAf)	TM183	109.0 69.30 : 128.70	94.3 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2440	QC 2484	QC 2485
Aluminium	TM181	103.54 73.56 : 108.85	101.77 77.46 : 123.98	100.0 77.46 : 123.98
Antimony	TM181	90.24 76.89 : 111.24	104.88 87.04 : 111.16	101.22 87.04 : 111.16
Arsenic	TM181	95.93 88.53 : 111.01	105.52 87.34 : 110.87	101.74 87.34 : 110.87
Barium	TM181	90.73 77.67 : 105.35	105.5 80.73 : 115.16	99.08 80.73 : 115.16
Beryllium	TM181	94.78 85.44 : 109.61	105.97 89.47 : 112.97	96.64 89.47 : 112.97
Boron	TM181	85.1 73.51 : 104.66	94.27 76.57 : 104.15	95.13 76.57 : 104.15
Cadmium	TM181	91.36 77.67 : 104.12	95.47 78.94 : 102.43	98.77 78.94 : 102.43
Chromium	TM181	84.18 79.64 : 105.83	91.28 77.55 : 104.47	88.24 77.55 : 104.47
Cobalt	TM181	85.85 84.60 : 104.13	94.65 82.95 : 107.41	90.57 82.95 : 107.41
Copper	TM181	90.85 82.40 : 105.45	101.06 84.36 : 106.14	95.6 84.36 : 106.14
Iron	TM181	101.59 82.95 : 110.58	103.97 81.43 : 115.79	96.03 81.43 : 115.79
Lead	TM181	89.86 78.24 : 104.05	113.51 81.95 : 107.63	94.59 81.95 : 107.63
Manganese	TM181	102.5 94.29 : 119.51	115.56 94.29 : 119.51	104.44 94.29 : 119.51
Mercury	TM181	92.75 83.16 : 107.81	99.76 82.73 : 106.36	94.2 82.73 : 106.36
Molybdenum	TM181	92.59 87.11 : 106.87	102.47 86.61 : 111.07	98.35 86.61 : 111.07
Nickel	TM181	87.29 80.26 : 102.28	94.38 79.72 : 103.80	91.2 79.72 : 103.80

		CERTIFICATE OF ANALYSIS			Validated
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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES					

		QC 2440	QC 2484	QC 2485
Phosphorus	TM181	100.81 94.56 : 124.28	113.74 92.65 : 125.47	110.3 92.65 : 125.47
Selenium	TM181	95.69 82.28 : 110.48	107.84 88.36 : 111.25	103.14 88.36 : 111.25
Strontium	TM181	88.2 79.13 : 102.79	97.77 78.06 : 99.91	91.31 78.06 : 99.91
Thallium	TM181	95.58 82.94 : 111.86	105.75 88.60 : 116.73	100.88 88.60 : 116.73
Tin	TM181	96.58 86.72 : 110.03	102.66 89.77 : 112.62	97.72 89.77 : 112.62
Titanium	TM181	79.39 66.23 : 102.06	87.79 66.29 : 105.96	92.37 66.29 : 105.96
Vanadium	TM181	92.67 86.19 : 109.45	99.63 75.51 : 108.87	90.11 75.51 : 108.87
Zinc	TM181	93.84 84.68 : 113.99	105.54 84.02 : 111.24	100.41 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2422	QC 2437
Acenaphthene	TM218	84.0 76.79 : 103.90	86.5 78.59 : 112.16
Acenaphthylene	TM218	81.5 74.19 : 106.17	86.5 75.11 : 109.01
Anthracene	TM218	83.0 70.90 : 109.22	82.5 73.99 : 113.85
Benz(a)anthracene	TM218	85.0 73.77 : 119.26	82.0 69.31 : 119.18
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18	76.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58	79.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12	77.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59	82.5 69.98 : 116.49
Chrysene	TM218	85.0 74.82 : 114.18	79.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30	77.0 64.54 : 115.22
Fluoranthene	TM218	79.5 66.06 : 114.63	79.0 72.56 : 111.70
Fluorene	TM218	83.0 76.66 : 107.56	84.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95	98.0 61.22 : 113.25
Naphthalene	TM218	84.0 74.70 : 101.83	87.0 77.96 : 110.91
Phenanthrene	TM218	82.0 73.62 : 109.34	80.5 76.83 : 113.25
Pyrene	TM218	81.0 71.46 : 117.00	80.0 72.45 : 110.77

pH

		CERTIFICATE OF ANALYSIS			Validated
SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH					

Component	Method Code	QC 2418
pH	TM133	100.15 98.41 : 102.48

pH Value of Filtered Water

Component	Method Code	QC 2445	QC 2447
pH	TM256	101.07 99.33 : 102.54	101.07 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2479
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	55.19 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.2 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	52.19 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	55.63 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.87 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2471
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	99.61 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	99.34 76.60 : 126.28
Napthol by HPLC (W)	TM259	101.56 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	97.78 79.09 : 131.82

Total Sulphur

Component	Method Code	QC 2417
Total Sulphur %	TM132	93.78 61.64 : 114.47



CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
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VOC MS (S)

Component	Method Code	QC 2406
1,1,1,2-tetrachloroethane	TM116	100.4 84.84 : 116.25
1,1,1-Trichloroethane	TM116	100.2 73.73 : 118.05
1,1,2-Trichloroethane	TM116	93.4 77.12 : 116.04
1,1-Dichloroethane	TM116	100.8 74.46 : 129.15
1,2-Dichloroethane	TM116	108.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	99.8 83.64 : 126.18
2-Chlorotoluene	TM116	86.8 76.03 : 113.25
4-Chlorotoluene	TM116	81.2 66.90 : 112.46
Benzene	TM116	100.0 88.60 : 113.80
Carbon Disulphide	TM116	94.6 74.91 : 122.14
Carbontetrachloride	TM116	104.4 80.31 : 124.50
Chlorobenzene	TM116	100.4 83.81 : 114.18
Chloroform	TM116	105.2 87.40 : 122.49
Chloromethane	TM116	104.6 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	101.0 80.67 : 126.72
Dibromomethane	TM116	97.0 73.23 : 118.35
Dichloromethane	TM116	107.6 81.11 : 133.25
Ethylbenzene	TM116	88.6 75.92 : 110.41
Hexachlorobutadiene	TM116	54.2 12.82 : 152.73
Isopropylbenzene	TM116	71.0 55.79 : 97.59
Naphthalene	TM116	99.8 80.86 : 128.81
o-Xylene	TM116	86.8 69.99 : 108.74
p/m-Xylene	TM116	82.4 68.32 : 108.91
Sec-Butylbenzene	TM116	59.6 38.50 : 101.50
Tetrachloroethene	TM116	98.6 76.95 : 121.02
Toluene	TM116	91.6 74.24 : 107.42
Trichloroethene	TM116	95.6 85.28 : 109.36



CERTIFICATE OF ANALYSIS

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Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

VOC MS (S)

		QC 2406
Trichlorofluoromethane	TM116	101.8 84.55 : 133.27
Vinyl Chloride	TM116	104.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

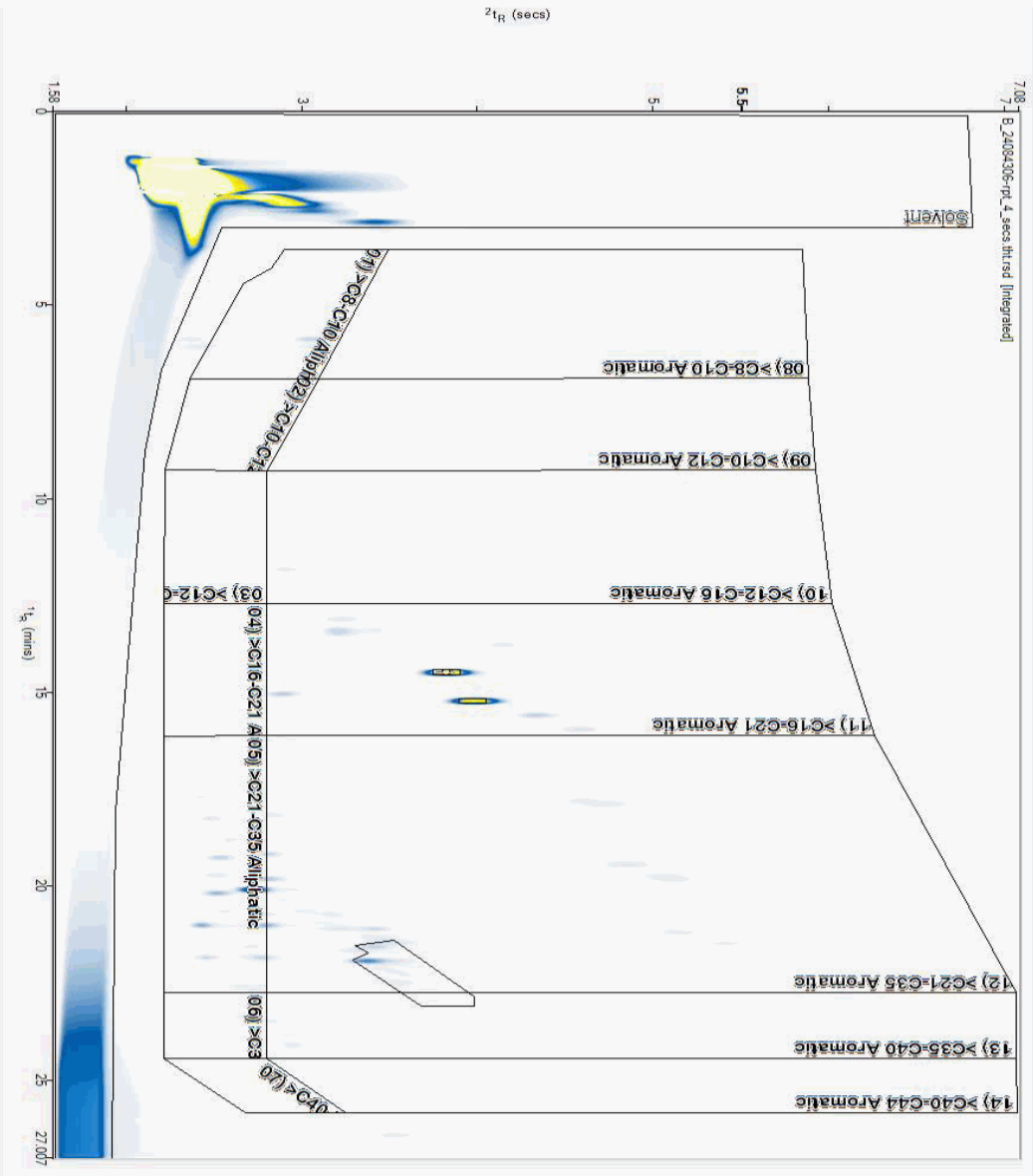
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24084306
Sample ID : BH - PTR - 43

Depth : 0.10 - 0.10

ChromSpace LIMS export
Current batch
Sample Identity: B_24084306-rpt_4_secs.tht
Date Acquired : 19/04/21 10:20:19
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

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SDG:	210414-81	Client Reference:	B025563	Report Number:	595345
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

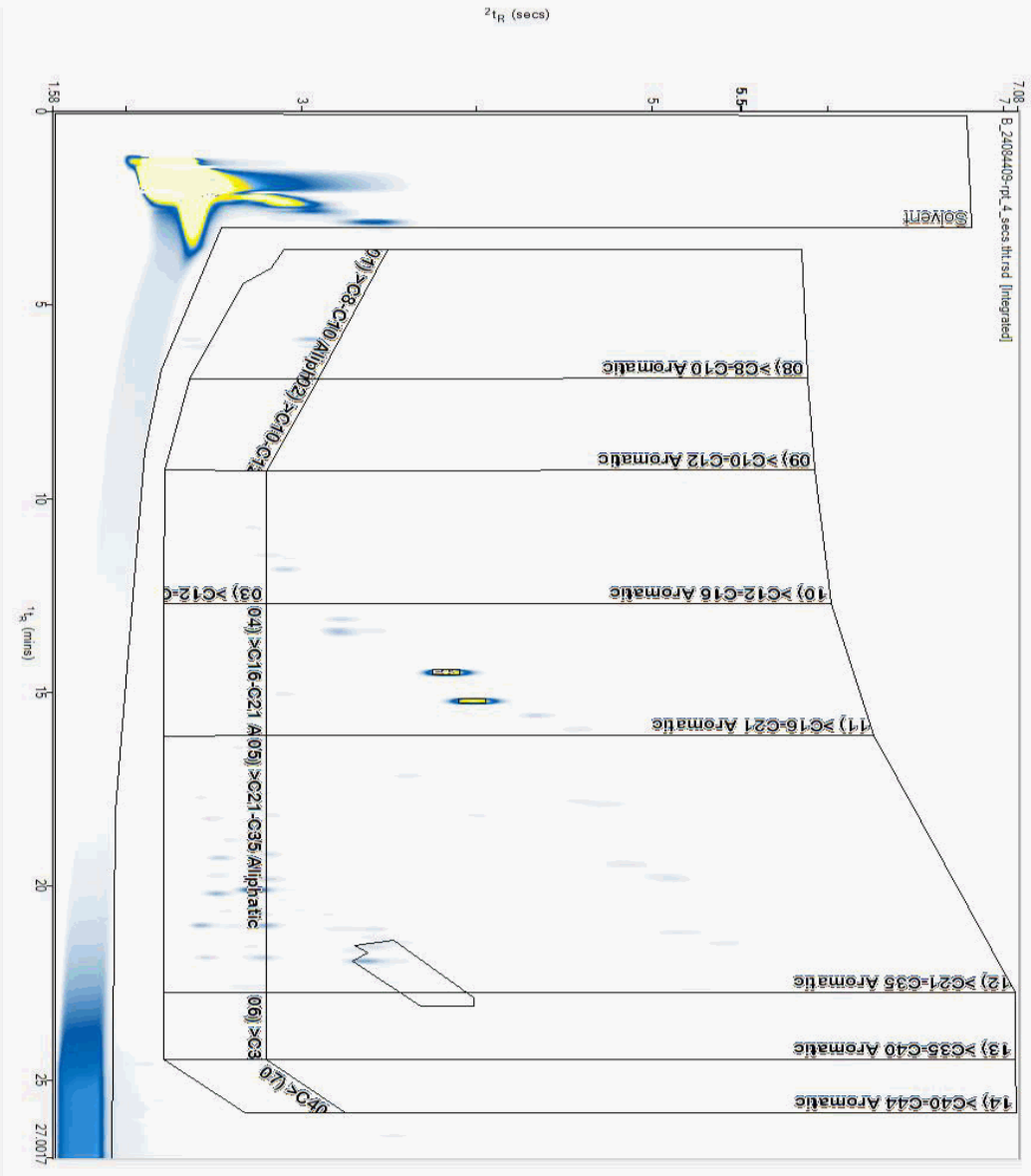
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24084409
Sample ID : BH - PTR - 43

Depth : 0.20 - 0.20

ChromSpace LIMS export
Current batch
Sample Identity: B_24084409-rpt_4_secs.tht
Date Acquired : 19/04/21 09:48:45
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24084527 Depth : 1.00 - 1.00
Sample ID : BH - PTR - 43



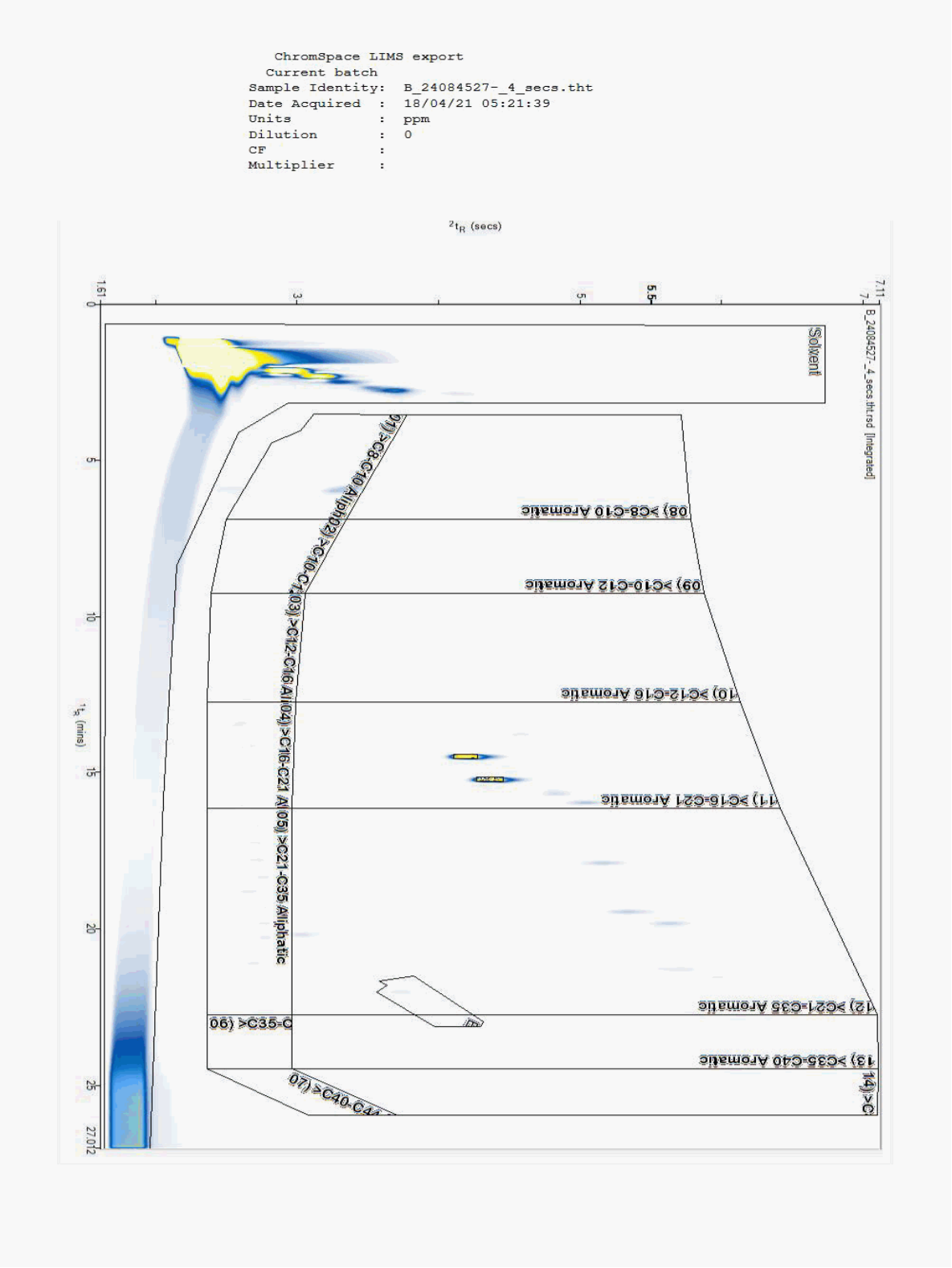
CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24085148 Depth : 1.00 - 1.00
Sample ID : BH - PTR - 43





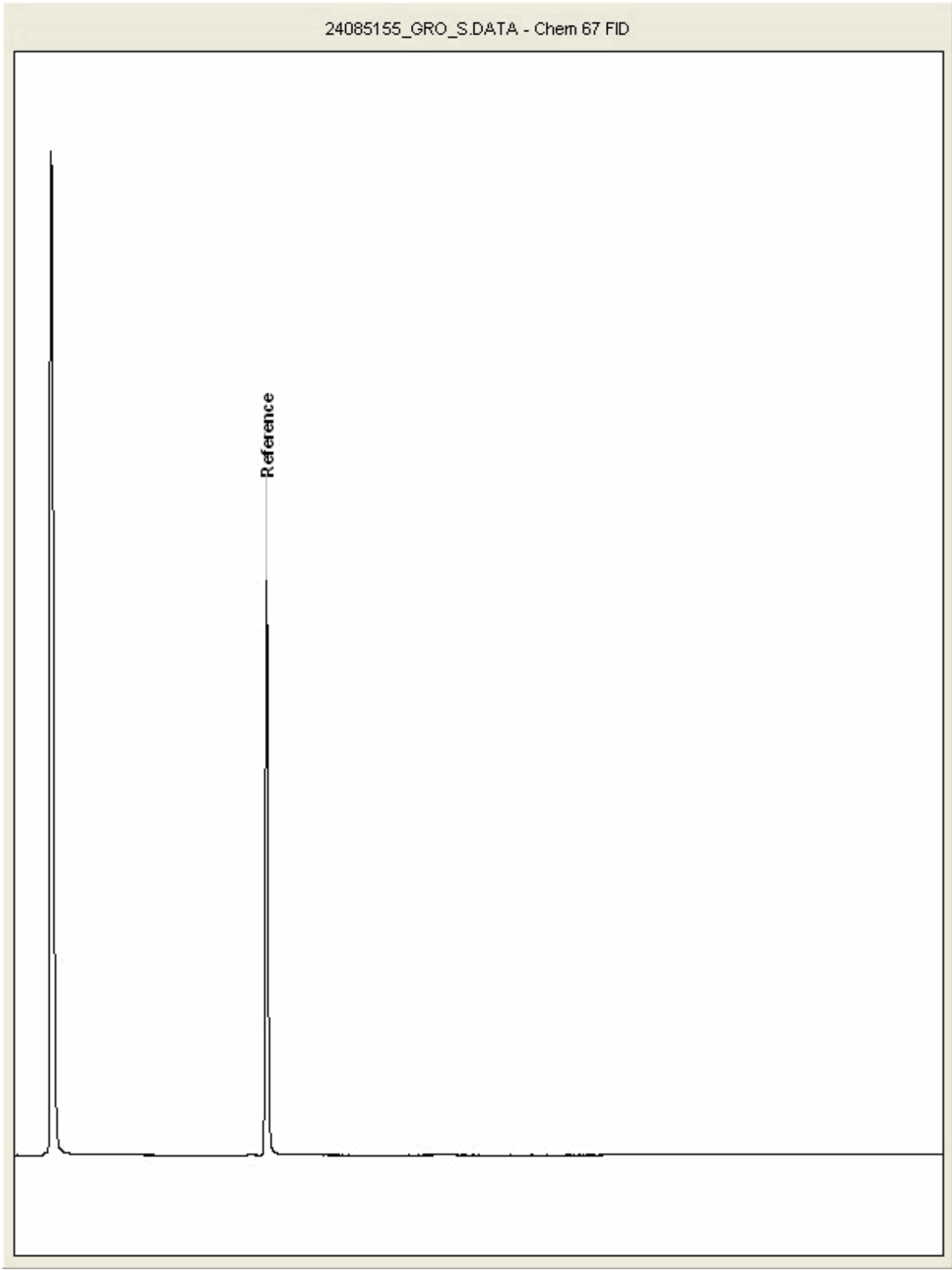
CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24085155 Depth : 0.10 - 0.10
Sample ID : BH - PTR - 43



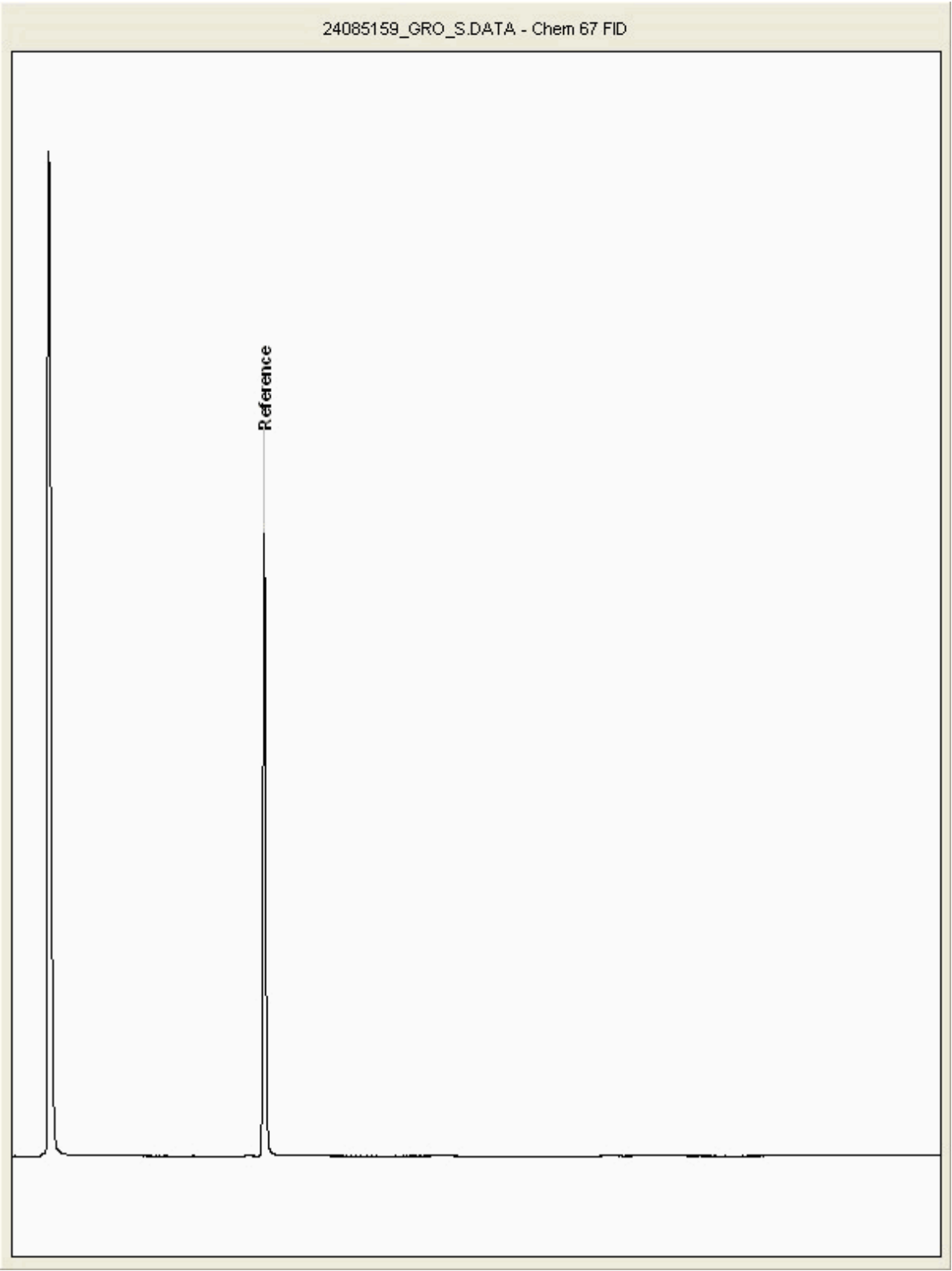
CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-81 Client Reference: B025563 Report Number: 595345
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24085159 Depth : 0.20 - 0.20
Sample ID : BH - PTR - 43





CERTIFICATE OF ANALYSIS

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Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

Attention: Richard Tonge

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CH5 3US

Tel: (01244) 528700

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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	25 April 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210414-88
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	595372

We received 6 samples on Wednesday April 14, 2021 and 2 of these samples were scheduled for analysis which was completed on Sunday April 25, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 25/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-88 Client Reference: B025563 Report Number: 595372
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24073784	TP - PTR - 07		0.00 - 0.10	12/04/2021
24073785	TP - PTR - 07		0.10 - 0.20	12/04/2021
24073786	TP - PTR - 07		0.50	12/04/2021
24073788	TP - PTR - 07		1.00	12/04/2021
24073789	TP - PTR - 07		1.50	12/04/2021
24073790	TP - PTR - 07	GW	3.00	12/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-88 Client Reference: B025563 Report Number: 595372
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24073785	24073786	TP - PTR - 07	0.10 - 0.20	0.50
						1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	60g VOC (ALE215)
Ammonium Low	All	NDPs: 0 Tests: 1				X				
Anions by Kone (soil)	All	NDPs: 0 Tests: 2					X			X
Anions by Kone (w)	All	NDPs: 0 Tests: 1				X				
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2				X			X	
Boron Water Soluble	All	NDPs: 0 Tests: 2					X			X
CEN Readings	All	NDPs: 0 Tests: 1				X				
Chromium III	All	NDPs: 0 Tests: 3				X	X			X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2					X			X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1				X				
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1				X				
EPH CWG GC (S)	All	NDPs: 0 Tests: 2					X			X
Fluoride	All	NDPs: 0 Tests: 1				X				
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2						X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2					X			X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1				X				

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24073785		24073786	
	Customer Sample Reference		TP - PTR - 07		TP - PTR - 07	
	AGS Reference					
	Depth (m)		0.10 - 0.20		0.50	
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Sample description	All	NDPs: 0 Tests: 2		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24073785	TP - PTR - 07	0.10 - 0.20	Dark Brown	Sandy Loam	Stones	Vegetation
24073786	TP - PTR - 07	0.50	Dark Brown	Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div><div># M aq diss.flit tot.unfit + "</div><div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5/6 Sample deviation (see appendix)</div></div>	Customer Sample Ref.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP - PTR - 07	TP - PTR - 07				
			0.10 - 0.20 Soil/Solid (S) 12/04/2021 . 14/04/2021 210414-88 24073785	0.50 Soil/Solid (S) 12/04/2021 . 14/04/2021 210414-88 24073786				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	13	9.9				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0273	0.0274				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00695 #	0.00712 #				
pH	1 pH Units	TM133	8.58 M	8.69 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #				
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M				
Chromium, Trivalent	<0.9 mg/kg	TM181	13.1	10.6				
Antimony	<0.6 mg/kg	TM181	0.686 #	0.675 #				
Arsenic	<0.6 mg/kg	TM181	6.35 M	5.64 M				
Barium	<0.6 mg/kg	TM181	66.6 #	57.9 #				
Beryllium	<0.01 mg/kg	TM181	0.297 M	0.233 M				
Cadmium	<0.02 mg/kg	TM181	0.0761 M	0.0922 M				
Chromium	<0.9 mg/kg	TM181	13.1 M	10.6 M				
Copper	<1.4 mg/kg	TM181	10.5 M	7.87 M				
Iron	<1000 mg/kg	TM181	13700 #	12500 #				
Lead	<0.7 mg/kg	TM181	4.91 M	3.14 M				
Manganese	<0.13 mg/kg	TM181	609 M	788 M				
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M				
Molybdenum	<0.1 mg/kg	TM181	0.171 #	0.138 #				
Nickel	<0.2 mg/kg	TM181	17 M	15.1 M				
Selenium	<1 mg/kg	TM181	<1 #	<1 #				
Vanadium	<0.2 mg/kg	TM181	20.1 #	17.4 #				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

ALS

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SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

Results Legend	
# ISO17025 accredited.	
M mCERTS accredited.	
* Subcontracted test.	Date of Analysis
(F) Trigger breach confirmed	Analysed By
1-5&*#@ Sample deviation (see appendix)	Comments
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	Amosite (Brown) Asbestos Chrysotile (White) Asbestos Crocidolite (Blue) Asbestos Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite Non-Asbestos Fibre
TP - PTR - 07 0.10 - 0.20 SOLID 12/04/2021 00:00:00 14/04/2021 08:15:00 210414-88 24073785 TM048	- Not Detected (#) Not Detected (#) Not Detected (#) Not Detected (#) Not Detected (#) Not Detected (#)
TP - PTR - 07 0.50 SOLID 12/04/2021 00:00:00 14/04/2021 08:15:00 210414-88 24073786 TM048	James Richards -

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:210414-88

Client Reference: B025563

Report Number: 595372

Location:Cambridge South East Tra

Order Number: 7000964

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.106

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport - F

17.4

85.2

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210414-88

24073785

12-Apr-2021

TP - PTR - 07

0.10 - 0.20

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Ammoniacal Nitrogen as N

0.011

<0.01

0.11

<0.1

-

-

-

Low Level Hexavalent Chromium

<0.003

<0.003

<0.03

<0.03

-

-

-

Chromium III (Low)

<0.003

<0.003

<0.03

<0.03

-

-

-

Complex Cyanide - Low Level

<0.005

<0.005

<0.05

<0.05

-

-

-

Free Cyanide - Low Level

<0.0025

<0.0025

<0.025

<0.025

-

-

-

Dissolved Organic Carbon

5.54

<3

55.4

<30

-

-

-

Fluoride

0.627

<0.5

6.27

<5

-

-

-

Mercury Dissolved (CVAf)

<0.00001

<0.00001

<0.0001

<0.0001

-

-

-

Arsenic

<0.0005

<0.0005

<0.005

<0.005

-

-

-

Barium

0.00261

<0.0002

0.0261

<0.002

-

-

-

Beryllium

<0.0001

<0.0001

<0.001

<0.001

-

-

-

Boron

0.024

<0.01

0.24

<0.1

-

-

-

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

-

-

-

Calcium (Dis.Filt) mg/l

20.9

<0.2

209

<2

-

-

-

Chromium

<0.001

<0.001

<0.01

<0.01

-

-

-

Copper

<0.0003

<0.0003

<0.003

<0.003

-

-

-

Lead

<0.0002

<0.0002

<0.002

<0.002

-

-

-

Magnesium (Dis.Filt) mg/l

0.452

<0.036

4.52

<0.36

-

-

-

Manganese

<0.003

<0.003

<0.03

<0.03

-

-

-

Molybdenum

<0.003

<0.003

<0.03

<0.03

-

-

-

Nickel

<0.0004

<0.0004

<0.004

<0.004

-

-

-

Selenium

<0.001

<0.001

<0.01

<0.01

-

-

-

Vanadium

<0.001

<0.001

<0.01

<0.01

-

-

-

Zinc

0.153

<0.001

1.53

<0.01

-

-

-

Chloride

<2

<2

<20

<20

-

-

-

Sulphate (soluble)

<2

<2

<20

<20

-

-

-

2,3,5 Trimethyl-Phenol by HPLC (W)

<0.003

<0.003

<0.03

<0.03

-

-

-

2-Isopropyl Phenol by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Catechol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Cresols by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Napthol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

NG Total Speciated Phenols by HPLC (W)

<0.045

<0.045

<0.45

<0.45

-

-

-

Phenol by HPLC (W)

<0.002

<0.002

<0.02

<0.02

-

-

-

Resorcinol HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Xylenols by HPLC (W)

<0.008

<0.008

<0.08

<0.08

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

19-Apr-2021

8.82

98.90

19.10

0.884

25/04/2021 09:09:46

09:09:07 25/04/2021

Page 14 of 30

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:210414-88

Client Reference: B025563

Report Number: 595372

Location:Cambridge South East Tra

Order Number: 7000964

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.106

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport - F

17.4

85.2

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210414-88

24073785

12-Apr-2021

TP - PTR - 07

0.10 - 0.20

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Hardness dissolved

54.1

<0.65

541

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.324

<0.019

3.24

<0.19

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

19-Apr-2021

8.82

98.90

19.10

0.884

25/04/2021 09:09:46

09:09:07 25/04/2021

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24073785	24073786
Customer Sample Ref.	TP - PTR - 07	TP - PTR - 07
AGS Ref.		
Depth	0.10 - 0.20	0.50
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	22-Apr-2021	
Anions by Kone (soil)	21-Apr-2021	20-Apr-2021
Anions by Kone (w)	20-Apr-2021	
Asbestos ID in Solid Samples	20-Apr-2021	20-Apr-2021
Boron Water Soluble	20-Apr-2021	20-Apr-2021
CEN 10:1 Leachate (1 Stage)	19-Apr-2021	
CEN Readings	20-Apr-2021	
Chromium III	22-Apr-2021	21-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	20-Apr-2021	20-Apr-2021
Dissolved Metals by ICP-MS	21-Apr-2021	
Dissolved Organic/Inorganic Carbon	25-Apr-2021	
EPH CWG GC (S)	20-Apr-2021	20-Apr-2021
Fluoride	21-Apr-2021	
GRO by GC-FID (S)	20-Apr-2021	20-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	21-Apr-2021
Low Level Cyanide (W)	22-Apr-2021	
Low Level Hexavalent Chromium (w)	21-Apr-2021	
Mercury Dissolved	22-Apr-2021	
Metals in solid samples by OES	22-Apr-2021	21-Apr-2021
Moisture at 105C	19-Apr-2021	
PAH by GCMS	21-Apr-2021	20-Apr-2021
pH	19-Apr-2021	19-Apr-2021
pH Value of Filtered Water	20-Apr-2021	
Phenols by HPLC (S)	19-Apr-2021	20-Apr-2021
Phenols by HPLC (W)	21-Apr-2021	
Sample description	18-Apr-2021	18-Apr-2021
Total Organic Carbon	23-Apr-2021	22-Apr-2021
Total Sulphur	20-Apr-2021	20-Apr-2021
TPH CWG GC (S)	20-Apr-2021	20-Apr-2021
VOC MS (S)	19-Apr-2021	19-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2435
Ammoniacal Nitrogen as N	TM099	100.4 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2474
Chloride (soluble)	TM243	125.39 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	146.26 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2457
Chloride	TM184	103.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2457	QC 2411
Water Soluble Boron	TM222	103.5 84.00 : 111.00	99.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2494
Free Cyanide	TM153	91.29 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89
Total Cyanide	TM153	96.5 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2436
Aluminium	TM152	99.0 90.78 : 110.89
Antimony	TM152	101.33 77.22 : 119.42
Arsenic	TM152	97.33 86.77 : 107.67



CERTIFICATE OF ANALYSIS

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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Dissolved Metals by ICP-MS

		QC 2436
Barium	TM152	99.17 87.86 : 110.23
Beryllium	TM152	99.67 86.19 : 112.98
Bismuth	TM152	96.17 84.06 : 106.46
Borate	TM152	101.85 88.00 : 112.00
Boron	TM152	101.67 83.92 : 114.90
Cadmium	TM152	97.67 88.89 : 106.69
Calcium	TM152	96.67 80.24 : 117.95
Chromium	TM152	97.83 83.22 : 110.16
Cobalt	TM152	97.33 82.49 : 112.36
Copper	TM152	96.33 83.14 : 113.00
Iron	TM152	98.0 88.40 : 109.24
Lead	TM152	97.0 83.71 : 109.58
Lithium	TM152	98.5 84.50 : 114.28
Magnesium	TM152	94.0 87.56 : 114.57
Manganese	TM152	98.5 90.01 : 108.72
Molybdenum	TM152	95.33 85.53 : 107.42
Nickel	TM152	97.5 88.05 : 106.42
Phosphorus	TM152	96.83 82.76 : 107.72
Potassium	TM152	96.67 88.45 : 106.42
Selenium	TM152	98.0 85.61 : 111.03
Silver	TM152	95.67 88.48 : 110.48
Sodium	TM152	94.67 88.32 : 106.30
Strontium	TM152	98.67 83.77 : 107.87
Tellurium	TM152	95.5 82.83 : 104.73
Thallium	TM152	94.17 77.47 : 113.87
Tin	TM152	100.0 87.36 : 109.55
Titanium	TM152	101.5 87.29 : 108.31

Dissolved Metals by ICP-MS

		QC 2436
Tungsten	TM152	98.0 68.27 : 122.97
Uranium	TM152	95.5 82.46 : 105.16
Vanadium	TM152	97.5 88.43 : 114.30
Zinc	TM152	98.0 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2415
Dissolved Inorganic Carbon	TM090	129.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.83 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2419
EPH >C8-C40 Raw	TM414	104.75 73.48 : 116.68
Total Aliphatics Raw	TM414	114.06 72.61 : 118.71
Total Aromatics Raw	TM414	96.35 63.37 : 122.69

Fluoride

Component	Method Code	QC 2427
Fluoride	TM104	103.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2409
QC	TM089	83.72 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2497	QC 2449
Hexavalent Chromium	TM151	102.0 92.00 : 111.20	102.0 92.00 : 111.20

Hexavalent Chromium (s)

Low Level Cyanide (W)

Component	Method Code	QC 2462
Free Cyanide - Low Level	TM279	81.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2438
Mercury Dissolved (CVAf)	TM183	104.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2420	QC 2467
Aluminium	TM181	93.81 77.46 : 123.98	100.88 77.46 : 123.98
Antimony	TM181	96.34 87.04 : 111.16	105.69 87.04 : 111.16
Arsenic	TM181	96.8 87.34 : 110.87	106.98 87.34 : 110.87
Barium	TM181	94.5 80.73 : 115.16	100.0 80.73 : 115.16
Beryllium	TM181	94.4 89.47 : 112.97	101.49 89.47 : 112.97
Boron	TM181	88.25 76.57 : 104.15	94.84 76.57 : 104.15
Cadmium	TM181	88.48 78.94 : 102.43	99.59 78.94 : 102.43
Chromium	TM181	85.8 77.55 : 104.47	91.28 77.55 : 104.47
Cobalt	TM181	86.16 82.95 : 107.41	92.77 82.95 : 107.41
Copper	TM181	92.78 84.36 : 106.14	100.7 84.36 : 106.14
Iron	TM181	94.44 81.43 : 115.79	102.38 81.43 : 115.79
Lead	TM181	92.79 81.95 : 107.63	96.17 81.95 : 107.63
Manganese	TM181	104.72 94.29 : 119.51	110.0 94.29 : 119.51
Mercury	TM181	91.06 82.73 : 106.36	97.58 82.73 : 106.36
Molybdenum	TM181	93.42 86.61 : 111.07	100.82 86.61 : 111.07
Nickel	TM181	87.04 79.72 : 103.80	94.87 79.72 : 103.80

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210414-88	Client Reference:	B025563	Report Number:	595372	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2420	QC 2467
Phosphorus	TM181	102.63 92.65 : 125.47	113.54 92.65 : 125.47
Selenium	TM181	98.43 88.36 : 111.25	103.53 88.36 : 111.25
Strontium	TM181	88.42 78.06 : 99.91	95.55 78.06 : 99.91
Thallium	TM181	96.46 88.60 : 116.73	104.87 88.60 : 116.73
Tin	TM181	94.68 89.77 : 112.62	104.56 89.77 : 112.62
Titanium	TM181	87.79 66.29 : 105.96	88.55 66.29 : 105.96
Vanadium	TM181	89.74 75.51 : 108.87	95.24 75.51 : 108.87
Zinc	TM181	95.48 84.02 : 111.24	103.49 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2422	QC 2470
Acenaphthene	TM218	84.0 76.79 : 103.90	86.5 76.79 : 103.90
Acenaphthylene	TM218	81.5 74.19 : 106.17	85.5 74.19 : 106.17
Anthracene	TM218	83.0 70.90 : 109.22	86.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.0 73.77 : 119.26	84.0 73.77 : 119.26
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18	83.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58	82.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12	78.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59	83.5 75.98 : 116.59
Chrysene	TM218	85.0 74.82 : 114.18	81.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30	77.0 69.17 : 115.30
Fluoranthene	TM218	79.5 66.06 : 114.63	82.0 66.06 : 114.63
Fluorene	TM218	83.0 76.66 : 107.56	86.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95	78.0 70.26 : 117.95
Naphthalene	TM218	84.0 74.70 : 101.83	84.0 74.70 : 101.83
Phenanthrene	TM218	82.0 73.62 : 109.34	85.5 73.62 : 109.34
Pyrene	TM218	81.0 71.46 : 117.00	81.0 71.46 : 117.00

pH

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210414-88	Client Reference:	B025563	Report Number:	595372	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
pH						

Component	Method Code	QC 2487
pH	TM133	99.85 97.51 : 101.32

pH Value of Filtered Water

Component	Method Code	QC 2468
pH	TM256	99.73 99.20 : 101.60

Phenols by HPLC (S)

Component	Method Code	QC 2492	QC 2414
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42	48.7 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79	41.52 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98	45.93 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18	47.68 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	47.19 76.56 : 106.38	46.87 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2411
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	89.87 82.77 : 126.51
Cresols by HPLC (W)	TM259	97.37 76.60 : 126.28
Napthol by HPLC (W)	TM259	99.61 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	96.2 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2446	QC 2411
Total Organic Carbon	TM132	102.34 87.02 : 113.45	101.17 87.02 : 113.45

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210414-88	Client Reference:	B025563	Report Number:	595372	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2425				
Total Sulphur %	TM132	97.93 61.64 : 114.47				

VOC MS (S)		
Component	Method Code	QC 2424
1,1,1,2-tetrachloroethane	TM116	100.0 84.84 : 116.25
1,1,1-Trichloroethane	TM116	99.6 73.73 : 118.05
1,1,2-Trichloroethane	TM116	104.0 77.12 : 116.04
1,1-Dichloroethane	TM116	105.6 74.46 : 129.15
1,2-Dichloroethane	TM116	112.0 92.38 : 131.65
1,4-Dichlorobenzene	TM116	97.8 83.64 : 126.18
2-Chlorotoluene	TM116	93.6 76.03 : 113.25
4-Chlorotoluene	TM116	89.8 66.90 : 112.46
Benzene	TM116	103.0 88.60 : 113.80
Carbon Disulphide	TM116	96.8 74.91 : 122.14
Carbontetrachloride	TM116	97.8 80.31 : 124.50
Chlorobenzene	TM116	102.6 83.81 : 114.18
Chloroform	TM116	105.4 87.40 : 122.49
Chloromethane	TM116	92.6 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	102.4 80.67 : 126.72
Dibromomethane	TM116	99.6 73.23 : 118.35
Dichloromethane	TM116	110.2 81.11 : 133.25
Ethylbenzene	TM116	93.0 75.92 : 110.41
Hexachlorobutadiene	TM116	64.4 12.82 : 152.73
Isopropylbenzene	TM116	82.6 55.79 : 97.59
Naphthalene	TM116	100.0 80.86 : 128.81
o-Xylene	TM116	92.0 69.99 : 108.74

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210414-88	Client Reference:	B025563	Report Number:	595372	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2424				
p/m-Xylene	TM116	88.6 68.32 : 108.91				
Sec-Butylbenzene	TM116	71.0 38.50 : 101.50				
Tetrachloroethene	TM116	98.4 76.95 : 121.02				
Toluene	TM116	95.0 74.24 : 107.42				
Trichloroethene	TM116	97.6 85.28 : 109.36				
Trichlorofluoromethane	TM116	93.4 84.55 : 133.27				
Vinyl Chloride	TM116	98.6 68.02 : 143.37				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

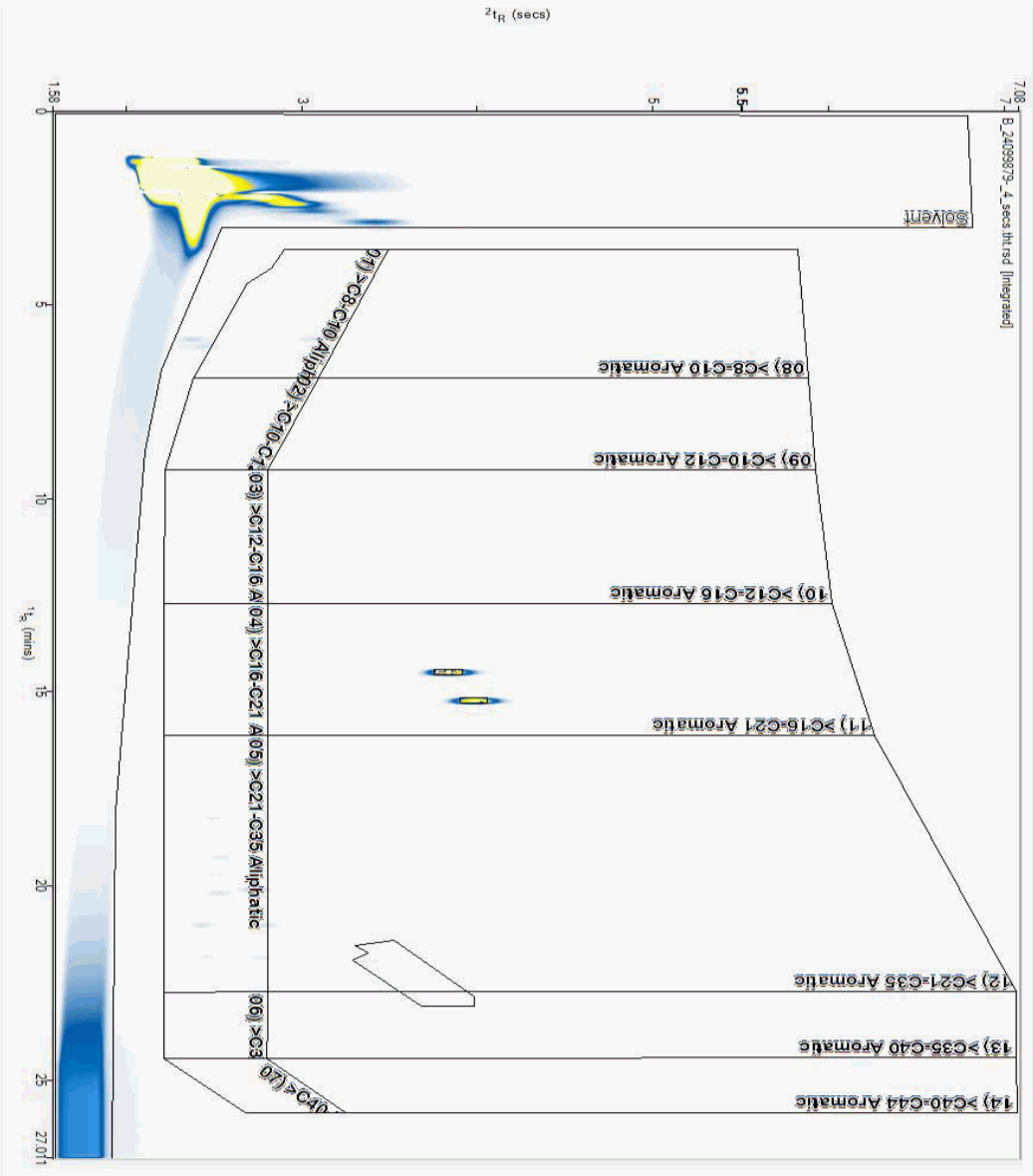
Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24099879 Depth : 0.50
Sample ID : TP - PTR - 07

ChromSpace LIMS export
Current batch
Sample Identity: B_24099879-4_secs.tht
Date Acquired : 19/04/21 06:46:58
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

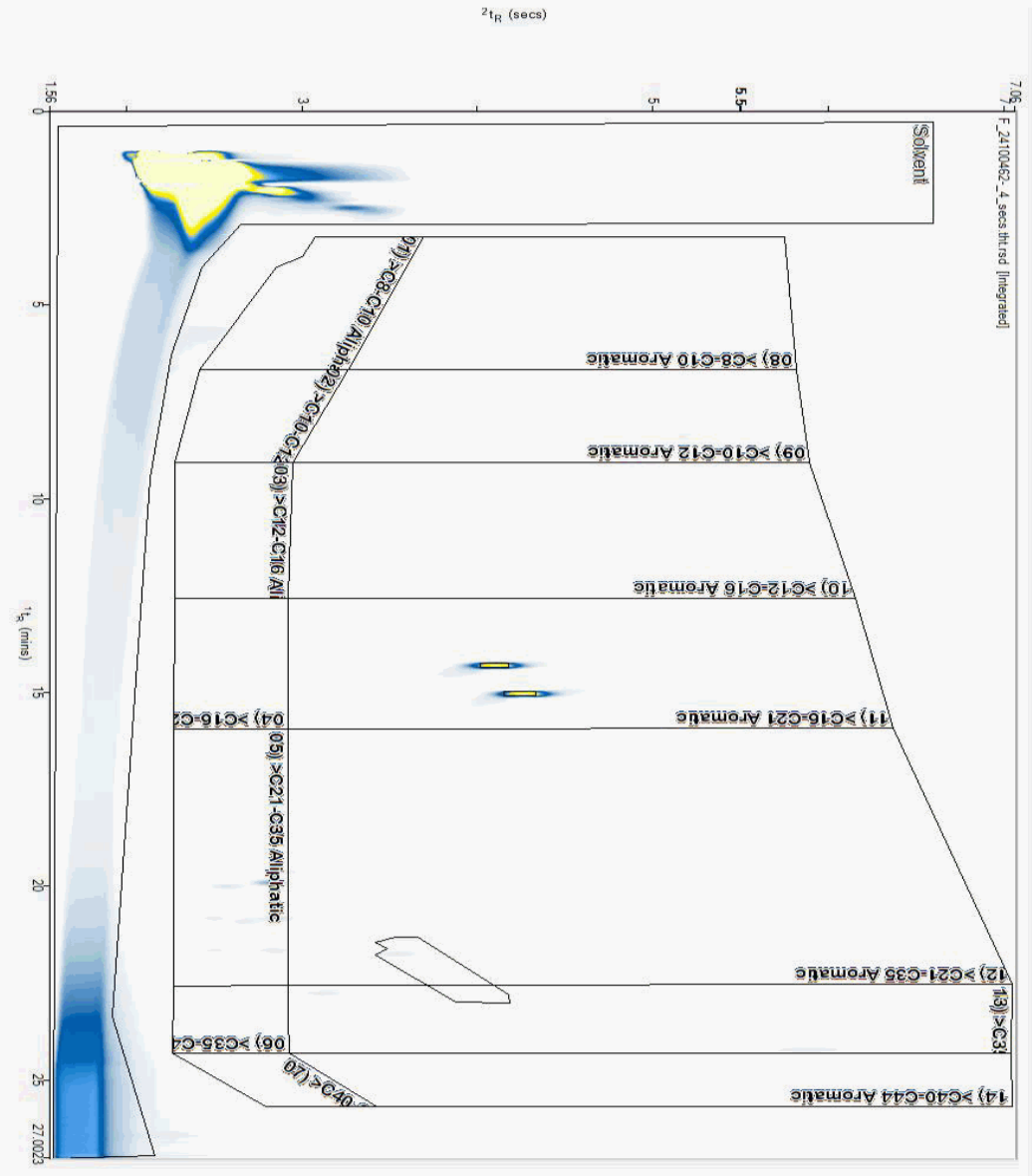
Validated

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24100462 Depth : 0.10 - 0.20
Sample ID : TP - PTR - 07

ChromSpace LIMS export
Current batch
Sample Identity: F_24100462-4_secs.tht
Date Acquired : 19/04/21 03:37:44
Units : ppm
Dilution : 0
CF :
Multiplier :





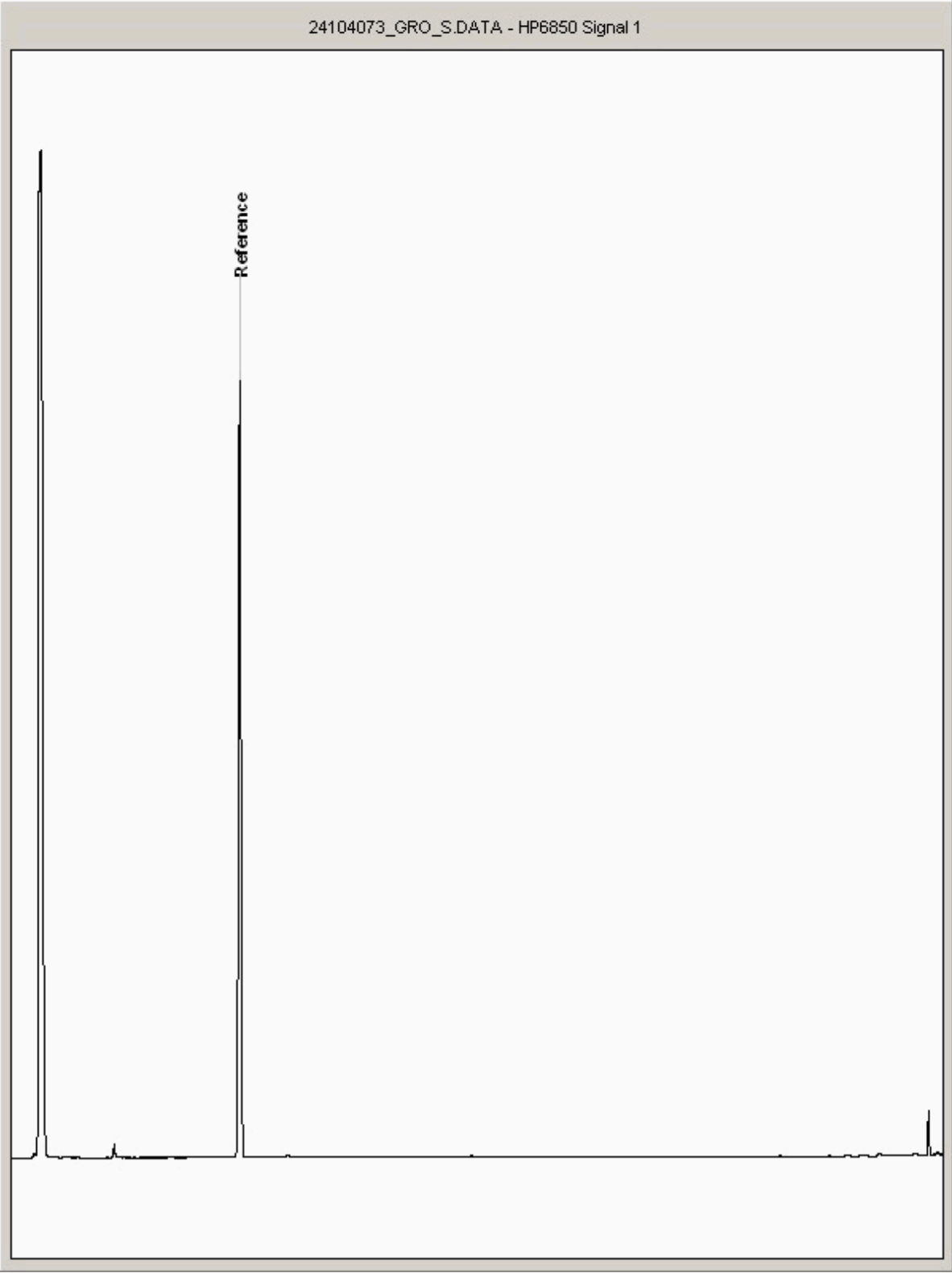
CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-88 Client Reference: B025563 Report Number: 595372
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24104073 Depth : 0.50
Sample ID : TP - PTR - 07



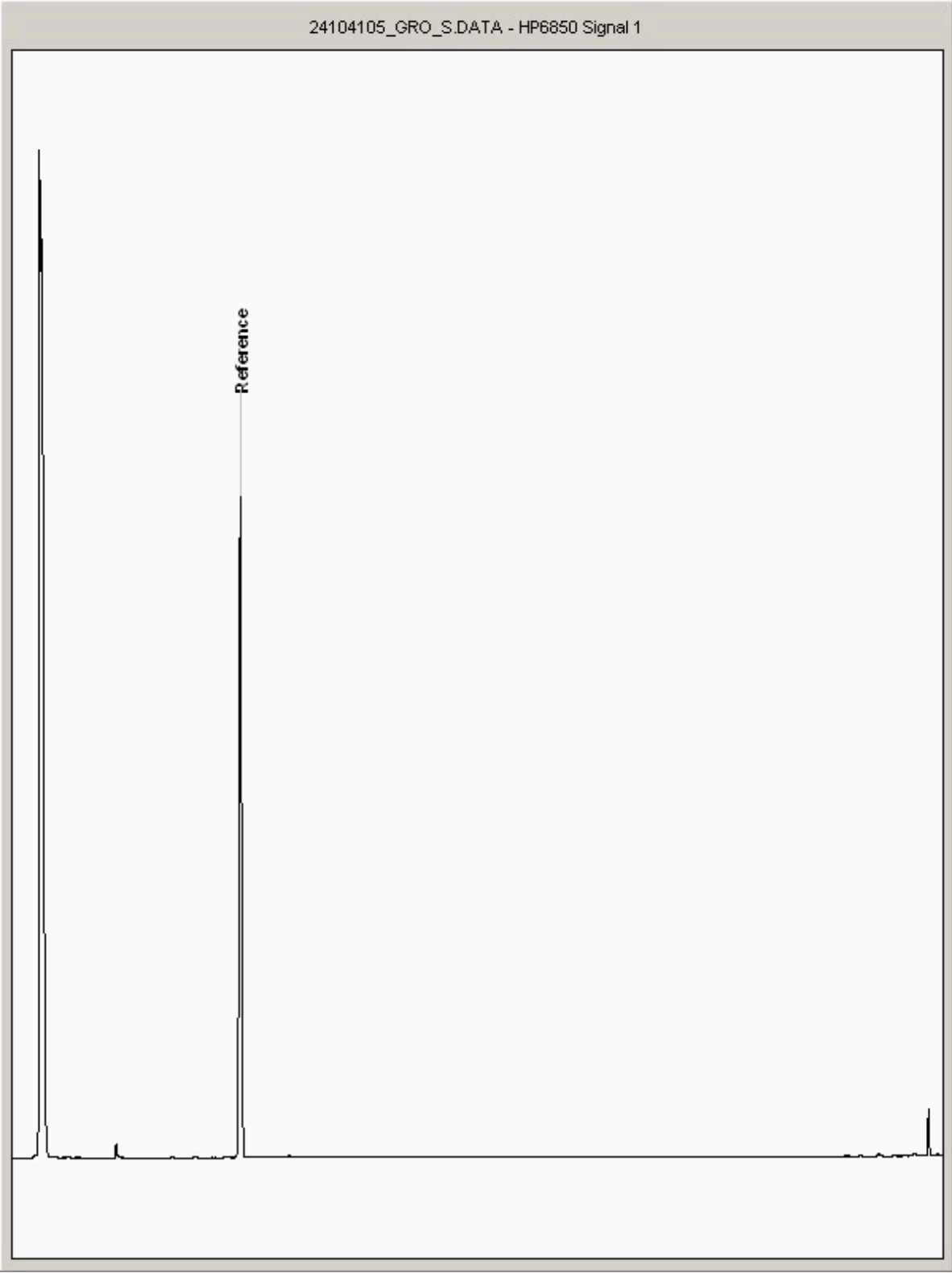
CERTIFICATE OF ANALYSIS

Validated

SDG: 210414-88 Client Reference: B025563 Report Number: 595372
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24104105 Depth : 0.10 - 0.20
Sample ID : TP - PTR - 07





CERTIFICATE OF ANALYSIS

SDG:	210414-88	Client Reference:	B025563	Report Number:	595372
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

25 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210415-99

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

595377

We received 4 samples on Thursday April 15, 2021 and 2 of these samples were scheduled for analysis which was completed on Sunday April 25, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 25/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:

210415-99

Client Reference:

B025563

Report Number:

595377

Location:

Cambridge South East Tra

Order Number:

7000964

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24082085	BH - PTR - 42	ES1	0.10	13/04/2021
24082086	BH - PTR - 42	ES2	0.20	13/04/2021
24082088	BH - PTR - 42	ES3	0.50	13/04/2021
24082089	BH - PTR - 42	ES4	1.00	13/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG:

210415-99

Client Reference:

B025563

Report Number:

595377

Location:

Cambridge South East Tra

Order Number:

7000964

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>
--

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other



CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-99 Client Reference: B025563 Report Number: 595377
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24082086		24082088	
	Customer Sample Reference		BH - PTR - 42		BH - PTR - 42	
	AGS Reference		ES2		ES3	
	Depth (m)		0.20		0.50	
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X		X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X		X	
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X		X	
Mercury Dissolved	All	NDPs: 0 Tests: 2	X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X		
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
PCBs by GCMS	All	NDPs: 0 Tests: 1		X		
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X		X	
Sample description	All	NDPs: 0 Tests: 2		X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-99 Client Reference: B025563 Report Number: 595377
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24082086		24082088	
	Customer Sample Reference		BH - PTR - 42		BH - PTR - 42	
	AGS Reference		ES2		ES3	
	Depth (m)		0.20		0.50	
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Total Dissolved Solids	All	NDPs: 0 Tests: 1		X		
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24082086	BH - PTR - 42	0.20	Dark Brown	Sandy Clay	Stones	Vegetation
24082088	BH - PTR - 42	0.50	Dark Brown	Sandy Clay	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH - PTR - 42	BH - PTR - 42				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH - PTR - 42	BH - PTR - 42				
M	mCERTS accredited.		0.20	0.50				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		13/04/2021	13/04/2021				
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.		15/04/2021	15/04/2021				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210415-99	210415-99				
(F)	Trigger breach confirmed		24082086	24082088				
1-445@	Sample deviation (see appendix)		ES2	ES3				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	15	15				
Loss on ignition	<0.7 %	TM018	5.03	M				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	M			
Cresols	<0.01 mg/kg	TM062 (S)	0.0118	<0.01	M			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	M			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Organic Carbon, Total	<0.2 %	TM132	1.05		M			
Sulphur, Total	<0.02 %	TM132	0.0249	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0105	0.00735	#	#		
pH	1 pH Units	TM133	8.42	8.5	M	M		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	#	#		
Cyanide, Free	<1 mg/kg	TM153	<1	<1	M	M		
PCB congener 28	<3 µg/kg	TM168	<3		M			
PCB congener 52	<3 µg/kg	TM168	<3		M			
PCB congener 101	<3 µg/kg	TM168	<3		M			
PCB congener 118	<3 µg/kg	TM168	<3		M			
PCB congener 138	<3 µg/kg	TM168	<3		M			
PCB congener 153	<3 µg/kg	TM168	<3		M			
PCB congener 180	<3 µg/kg	TM168	<3		M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21					
Chromium, Trivalent	<0.9 mg/kg	TM181	13.1	25.7				
Antimony	<0.6 mg/kg	TM181	0.988	<0.6	#	#		
Arsenic	<0.6 mg/kg	TM181	9.08	17.2	M	M		
Barium	<0.6 mg/kg	TM181	48.8	66	#	#		
Beryllium	<0.01 mg/kg	TM181	0.331	0.698	M	M		
Cadmium	<0.02 mg/kg	TM181	0.0865	0.133	M	M		

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH - PTR - 42							
#	ISO17025 accredited.	Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)		0.20						0.50	
M	mCERTS accredited.			Soil/Solid (S)						Soil/Solid (S)	
aq	Aqueous / settled sample.			13/04/2021						13/04/2021	
diss.filt				.						.	
tot.unfilt				15/04/2021						15/04/2021	
*				210415-99						210415-99	
**				24082086						24082088	
(F)				ES2						ES3	
1-4*5@											
Component		LOD/Units	Method								
Dibromofluoromethane**		%	TM116	105							
Toluene-d8**		%	TM116	95.5		100					
4-Bromofluorobenzene**		%	TM116	77.9		94.6					
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M		<6 M					
Chloromethane		<7 µg/kg	TM116	<7 #		<7 #					
Vinyl Chloride		<6 µg/kg	TM116	<6 M		<6 M					
Bromomethane		<10 µg/kg	TM116	<10 M		<10 M					
Chloroethane		<10 µg/kg	TM116	<10 M		<10 M					
Trichlorofluoromethane		<6 µg/kg	TM116	<6 M		<6 M					
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #		<10 #					
Carbon Disulphide		<7 µg/kg	TM116	<7 M		<7 M					
Dichloromethane		<10 µg/kg	TM116	<10 #		<10 #					
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M		<10 M					
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M		<10 M					
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M		<8 M					
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M		<6 M					
2,2-Dichloropropane		<10 µg/kg	TM116	<10		<10					
Bromochloromethane		<10 µg/kg	TM116	<10 M		<10 M					
Chloroform		<8 µg/kg	TM116	<8 M		<8 M					
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M		<7 M					
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M		<10 M					
Carbontetrachloride		<10 µg/kg	TM116	<10 M		<10 M					
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M		<5 M					
Benzene		<9 µg/kg	TM116	<9 M		<9 M					
Trichloroethene		<9 µg/kg	TM116	<9 #		<9 #					
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M		<10 M					
Dibromomethane		<9 µg/kg	TM116	<9 M		<9 M					
Bromodichloromethane		<7 µg/kg	TM116	<7 M		<7 M					
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M		<10 M					
Toluene		<7 µg/kg	TM116	<7 M		<7 M					
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10		<10					
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M		<10 M					

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	BH - PTR - 42		BH - PTR - 42					
# M aq diss.flit tot.unfit + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. " % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*5@ Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 13/04/2021 . 15/04/2021 210415-99 24082086 ES2	0.50 Soil/Solid (S) 13/04/2021 . 15/04/2021 210415-99 24082088 ES3					
Component	LOD/Units	Method								
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M						
Styrene	<10 µg/kg	TM116	<10 #	<10 #						
Bromoform	<10 µg/kg	TM116	<10 M	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20						
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M						



CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.108	Natural Moisture Content (%)	20.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	83
Particle Size <4mm	>95%		

Case

SDG	210415-99			
Lab Sample Number(s)	24082086			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH - PTR - 42 ES2			
Depth (m)	0.20			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.017	<0.01	0.17	<0.1	-	-	-
Low Level Hexavalent Chromium	0.00415	<0.003	0.0415	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Arsenic	0.00134	<0.0005	0.0134	<0.005	-	-	-
Barium	0.182	<0.0002	1.82	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0765	<0.01	0.765	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.2	<0.2	232	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Hardness dissolved	60.6	<0.65	606	<6.5	-	-	-
Iron (Dis.Filt) mg/l	1.55	<0.019	15.5	<0.19	-	-	-
Lead	0.000571	<0.0002	0.00571	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.627	<0.036	6.27	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00242	<0.0004	0.0242	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00114	<0.001	0.0114	<0.01	-	-	-
Zinc	0.0158	<0.001	0.158	<0.01	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.04
Conductivity (µS/cm)	121.00
Temperature (°C)	3.30
Volume Leachant (Litres)	0.882



SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.108	Natural Moisture Content (%)		20.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		82.7
Particle Size <4mm	>95%			

Case

SDG	210415-99			
Lab Sample Number(s)	24082088			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH - PTR - 42 ES3			
Depth (m)	0.50			

Eluate Analysis	C2		A2				
	Conc ⁿ in 10:1 eluate (mg/l)		10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.011	<0.01	0.11	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.38	<3	43.8	<30	-	-	-
Fluoride	0.828	<0.5	8.28	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.00357	<0.0002	0.0357	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0315	<0.01	0.315	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	26.3	<0.2	263	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.705	<0.036	7.05	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.00651	<0.003	0.0651	<0.03	-	-	-
Nickel	0.000449	<0.0004	0.00449	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	16.50
Conductivity (µS/cm)	125.00
Temperature (°C)	8.25
Volume Leachant (Litres)	0.882



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SDG:	210415-99	Client Reference:	B025563	Report Number:	595377
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.108	Natural Moisture Content (%)	20.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	82.7
Particle Size <4mm	>95%		

Case

SDG	210415-99
Lab Sample Number(s)	24082088
Sampled Date	13-Apr-2021
Customer Sample Ref.	BH - PTR - 42 ES3
Depth (m)	0.50

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	68.8	<0.65	688	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.875	<0.019	8.75	<0.19	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	16.50
Conductivity (µS/cm)	125.00
Temperature (°C)	8.25
Volume Leachant (Litres)	0.882

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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Test Completion Dates

Lab Sample No(s)	24082086	24082088
Customer Sample Ref.	BH - PTR - 42	BH - PTR - 42
AGS Ref.	ES2	ES3
Depth	0.20	0.50
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	22-Apr-2021	23-Apr-2021
ANC at pH4 and ANC at pH 6	22-Apr-2021	
Anions by Kone (soil)	20-Apr-2021	20-Apr-2021
Anions by Kone (w)	20-Apr-2021	20-Apr-2021
Asbestos ID in Solid Samples	20-Apr-2021	20-Apr-2021
Boron Water Soluble	20-Apr-2021	20-Apr-2021
CEN 10:1 Leachate (1 Stage)	19-Apr-2021	19-Apr-2021
CEN Readings	20-Apr-2021	20-Apr-2021
Chromium III	22-Apr-2021	22-Apr-2021
Coronene	20-Apr-2021	
Cyanide Comp/Free/Total/Thiocyanate	20-Apr-2021	20-Apr-2021
Dissolved Metals by ICP-MS	21-Apr-2021	21-Apr-2021
Dissolved Organic/Inorganic Carbon	25-Apr-2021	25-Apr-2021
EPH by GCxGC-FID	20-Apr-2021	
EPH CWG GC (S)	20-Apr-2021	20-Apr-2021
Fluoride	21-Apr-2021	21-Apr-2021
GRO by GC-FID (S)	19-Apr-2021	19-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	20-Apr-2021
Loss on Ignition in soils	22-Apr-2021	
Low Level Cyanide (W)	22-Apr-2021	22-Apr-2021
Low Level Hexavalent Chromium (w)	21-Apr-2021	21-Apr-2021
Mercury Dissolved	22-Apr-2021	22-Apr-2021
Metals in solid samples by OES	22-Apr-2021	22-Apr-2021
Moisture at 105C	19-Apr-2021	19-Apr-2021
PAH 16 & 17 Calc	22-Apr-2021	
PAH by GCMS	22-Apr-2021	20-Apr-2021
PCBs by GCMS	20-Apr-2021	
pH	19-Apr-2021	19-Apr-2021
pH Value of Filtered Water	20-Apr-2021	20-Apr-2021
Phenols by HPLC (S)	20-Apr-2021	19-Apr-2021
Phenols by HPLC (W)	21-Apr-2021	21-Apr-2021
Sample description	18-Apr-2021	18-Apr-2021
Total Dissolved Solids	22-Apr-2021	
Total Organic Carbon	23-Apr-2021	23-Apr-2021
Total Sulphur	20-Apr-2021	20-Apr-2021
TPH CWG GC (S)	20-Apr-2021	20-Apr-2021
VOC MS (S)	19-Apr-2021	19-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low			
Component	Method Code	QC 2435	QC 2463
Ammoniacal Nitrogen as N	TM099	100.4 96.04 : 106.80	99.6 96.04 : 106.80

ANC at pH4 and ANC at pH 6			
Component	Method Code	QC 2447	
ANC pH_4 dry soil	TM182	103.52 82.79 : 130.38	

Anions by Kone (w)			
Component	Method Code	QC 2457	
Chloride	TM184	103.0 92.93 : 115.43	
Sulphate (soluble)	TM184	102.4 90.53 : 113.03	

Boron Water Soluble			
Component	Method Code	QC 2411	
Water Soluble Boron	TM222	99.0 84.00 : 111.00	

Coronene			
Component	Method Code	QC 2464	
Coronene RAW	TM410	99.5 79.43 : 137.78	

Cyanide Comp/Free/Total/Thiocyanate			
Component	Method Code	QC 2494	QC 2402
Free Cyanide	TM153	91.29 79.00 : 115.00	98.81 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89	103.21 94.09 : 113.89
Total Cyanide	TM153	96.5 73.07 : 107.47	101.4 73.07 : 107.47



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Dissolved Metals by ICP-MS

Component	Method Code	QC 2436
Aluminium	TM152	99.0 90.78 : 110.89
Antimony	TM152	101.33 77.22 : 119.42
Arsenic	TM152	97.33 86.77 : 107.67
Barium	TM152	99.17 87.86 : 110.23
Beryllium	TM152	99.67 86.19 : 112.98
Bismuth	TM152	96.17 84.06 : 106.46
Borate	TM152	101.85 88.00 : 112.00
Boron	TM152	101.67 83.92 : 114.90
Cadmium	TM152	97.67 88.89 : 106.69
Calcium	TM152	96.67 80.24 : 117.95
Chromium	TM152	97.83 83.22 : 110.16
Cobalt	TM152	97.33 82.49 : 112.36
Copper	TM152	96.33 83.14 : 113.00
Iron	TM152	98.0 88.40 : 109.24
Lead	TM152	97.0 83.71 : 109.58
Lithium	TM152	98.5 84.50 : 114.28
Magnesium	TM152	94.0 87.56 : 114.57
Manganese	TM152	98.5 90.01 : 108.72
Molybdenum	TM152	95.33 85.53 : 107.42
Nickel	TM152	97.5 88.05 : 106.42
Phosphorus	TM152	96.83 82.76 : 107.72
Potassium	TM152	96.67 88.45 : 106.42
Selenium	TM152	98.0 85.61 : 111.03
Silver	TM152	95.67 88.48 : 110.48
Sodium	TM152	94.67 88.32 : 106.30
Strontium	TM152	98.67 83.77 : 107.87
Tellurium	TM152	95.5 82.83 : 104.73



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Dissolved Metals by ICP-MS

		QC 2436
Thallium	TM152	94.17 77.47 : 113.87
Tin	TM152	100.0 87.36 : 109.55
Titanium	TM152	101.5 87.29 : 108.31
Tungsten	TM152	98.0 68.27 : 122.97
Uranium	TM152	95.5 82.46 : 105.16
Vanadium	TM152	97.5 88.43 : 114.30
Zinc	TM152	98.0 85.57 : 114.31

Component	Method Code	QC 2415
Dissolved Inorganic Carbon	TM090	129.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.83 96.13 : 109.53

Component	Method Code	QC 2419
EPH >C8-C40 Raw	TM414	104.75 73.48 : 116.68
Total Aliphatics Raw	TM414	114.06 72.61 : 118.71
Total Aromatics Raw	TM414	96.35 63.37 : 122.69

Component	Method Code	QC 2463
Fluoride	TM104	104.0 96.67 : 108.67

Component	Method Code	QC 2468
QC	TM089	85.33 70.34 : 111.95

Hexavalent Chromium (s)

Hexavalent Chromium (s)

Component	Method Code	QC 2443
Hexavalent Chromium	TM151	106.0 92.00 : 111.20

Loss on Ignition in soils

Component	Method Code	QC 2429
Loss on Ignition	TM018	92.18 87.10 : 102.39

Low Level Cyanide (W)

Component	Method Code	QC 2462
Free Cyanide - Low Level	TM279	81.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2438
Mercury Dissolved (CVAf)	TM183	104.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2467
Aluminium	TM181	100.88 77.46 : 123.98
Antimony	TM181	105.69 87.04 : 111.16
Arsenic	TM181	106.98 87.34 : 110.87
Barium	TM181	100.0 80.73 : 115.16
Beryllium	TM181	101.49 89.47 : 112.97
Boron	TM181	94.84 76.57 : 104.15
Cadmium	TM181	99.59 78.94 : 102.43
Chromium	TM181	91.28 77.55 : 104.47

Metals in solid samples by OES

		QC 2467
Cobalt	TM181	92.77 82.95 : 107.41
Copper	TM181	100.7 84.36 : 106.14
Iron	TM181	102.38 81.43 : 115.79
Lead	TM181	96.17 81.95 : 107.63
Manganese	TM181	110.0 94.29 : 119.51
Mercury	TM181	97.58 82.73 : 106.36
Molybdenum	TM181	100.82 86.61 : 111.07
Nickel	TM181	94.87 79.72 : 103.80
Phosphorus	TM181	113.54 92.65 : 125.47
Selenium	TM181	103.53 88.36 : 111.25
Strontium	TM181	95.55 78.06 : 99.91
Thallium	TM181	104.87 88.60 : 116.73
Tin	TM181	104.56 89.77 : 112.62
Titanium	TM181	88.55 66.29 : 105.96
Vanadium	TM181	95.24 75.51 : 108.87
Zinc	TM181	103.49 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2422	QC 2402
Acenaphthene	TM218	84.0 76.79 : 103.90	91.0 73.47 : 109.80
Acenaphthylene	TM218	81.5 74.19 : 106.17	88.5 70.00 : 130.00
Anthracene	TM218	83.0 70.90 : 109.22	89.5 68.68 : 111.89
Benz(a)anthracene	TM218	85.0 73.77 : 119.26	98.0 68.12 : 118.39
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18	90.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58	88.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12	84.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59	93.0 73.10 : 117.03
Chrysene	TM218	85.0 74.82 : 114.18	96.5 69.58 : 115.47



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PAH by GCMS

		QC 2422	QC 2402
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30	86.0 67.32 : 121.35
Fluoranthene	TM218	79.5 66.06 : 114.63	94.5 75.16 : 117.28
Fluorene	TM218	83.0 76.66 : 107.56	89.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95	87.5 68.91 : 117.62
Naphthalene	TM218	84.0 74.70 : 101.83	84.0 72.12 : 106.18
Phenanthrene	TM218	82.0 73.62 : 109.34	94.5 69.01 : 113.72
Pyrene	TM218	81.0 71.46 : 117.00	94.0 64.28 : 115.75

PCBs by GCMS

Component	Method Code	QC 2466
PCB congener 101	TM168	74.2 65.66 : 110.06
PCB congener 105	TM168	71.4 58.10 : 106.34
PCB congener 114	TM168	70.9 59.38 : 106.48
PCB congener 118	TM168	70.5 60.02 : 106.23
PCB congener 123	TM168	81.8 65.01 : 99.81
PCB congener 126	TM168	70.8 59.31 : 109.23
PCB congener 138	TM168	73.2 63.95 : 107.63
PCB congener 153	TM168	74.1 62.65 : 108.85
PCB congener 156	TM168	68.4 61.69 : 112.27
PCB congener 157	TM168	65.4 55.37 : 104.81
PCB congener 167	TM168	69.4 65.58 : 109.14
PCB congener 169	TM168	71.4 56.84 : 112.10
PCB congener 180	TM168	73.3 66.99 : 111.63
PCB congener 189	TM168	70.5 57.75 : 112.59
PCB congener 28	TM168	78.6 73.68 : 105.96
PCB congener 52	TM168	76.0 67.24 : 107.62
PCB congener 77	TM168	73.1 64.87 : 108.49
PCB congener 81	TM168	74.8 70.78 : 110.80



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pH

Component	Method Code	QC 2487	QC 2455
pH	TM133	99.85 97.51 : 101.32	98.97 97.51 : 101.32

pH Value of Filtered Water

Component	Method Code	QC 2468
pH	TM256	99.73 99.20 : 101.60

Phenols by HPLC (S)

Component	Method Code	QC 2492	QC 2414
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42	48.7 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79	41.52 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98	45.93 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18	47.68 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	47.19 76.56 : 106.38	46.87 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2411
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	89.87 82.77 : 126.51
Cresols by HPLC (W)	TM259	97.37 76.60 : 126.28
Napthol by HPLC (W)	TM259	99.61 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	96.2 79.09 : 131.82

Total Dissolved Solids

Component	Method Code	QC 2440
Total Dissolved Solids	TM123	99.5 97.30 : 100.92

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SDG:	210415-99	Client Reference:	B025563	Report Number:	595377	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Organic Carbon						
Component	Method Code	QC 2436				
Total Organic Carbon	TM132	100.0 87.02 : 113.45				

Total Sulphur						
Component	Method Code	QC 2425				
Total Sulphur %	TM132	97.93 61.64 : 114.47				

VOC MS (S)						
Component	Method Code	QC 2432				
1,1,1,2-tetrachloroethane	TM116	102.4 79.10 : 119.66				
1,1,1-Trichloroethane	TM116	101.8 88.34 : 114.50				
1,1,2-Trichloroethane	TM116	97.8 81.29 : 113.79				
1,1-Dichloroethane	TM116	107.8 86.77 : 122.11				
1,2-Dichloroethane	TM116	109.2 90.04 : 132.28				
1,4-Dichlorobenzene	TM116	106.0 80.81 : 125.07				
2-Chlorotoluene	TM116	95.8 73.13 : 114.13				
4-Chlorotoluene	TM116	91.0 68.66 : 109.13				
Benzene	TM116	101.6 84.29 : 112.22				
Carbon Disulphide	TM116	101.6 75.11 : 124.81				
Carbontetrachloride	TM116	96.0 82.35 : 126.46				
Chlorobenzene	TM116	103.8 82.88 : 122.42				
Chloroform	TM116	106.6 90.35 : 120.38				
Chloromethane	TM116	101.6 67.89 : 143.51				
Cis-1,2-Dichloroethene	TM116	105.0 78.27 : 128.90				
Dibromomethane	TM116	91.0 76.00 : 120.73				
Dichloromethane	TM116	110.8 92.27 : 134.36				

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SDG:	210415-99	Client Reference:	B025563	Report Number:	595377	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2432				
Ethylbenzene	TM116	94.2 70.95 : 113.07				
Hexachlorobutadiene	TM116	110.6 14.55 : 147.92				
Isopropylbenzene	TM116	92.8 52.00 : 108.19				
Naphthalene	TM116	105.2 80.29 : 135.77				
o-Xylene	TM116	92.8 68.34 : 101.99				
p/m-Xylene	TM116	88.8 69.47 : 97.31				
Sec-Butylbenzene	TM116	83.8 27.03 : 135.73				
Tetrachloroethene	TM116	103.4 81.43 : 126.65				
Toluene	TM116	93.8 82.44 : 103.50				
Trichloroethene	TM116	96.0 79.80 : 112.33				
Trichlorofluoromethane	TM116	98.0 89.67 : 132.09				
Vinyl Chloride	TM116	109.4 69.66 : 136.55				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



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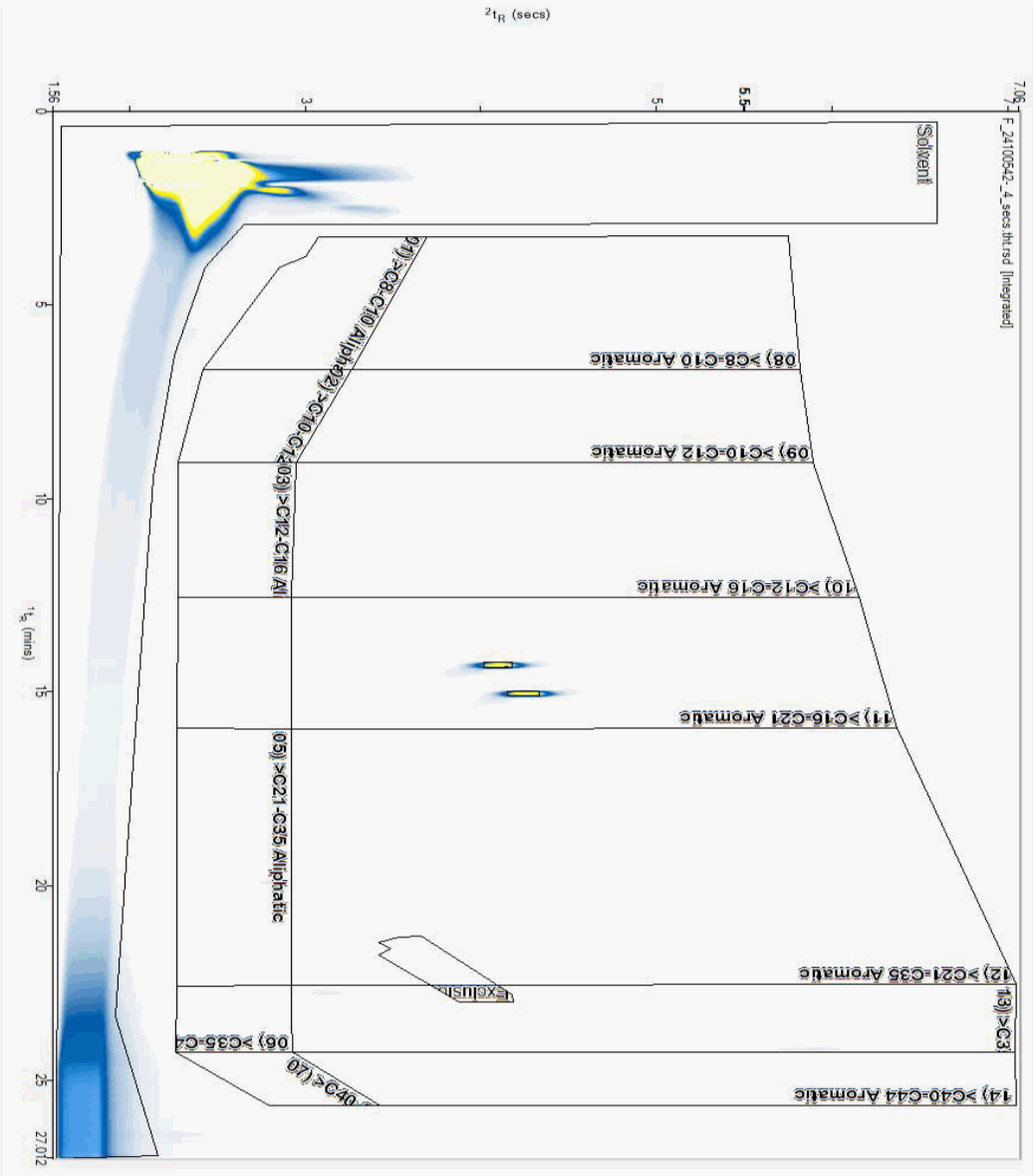
Validated

SDG: 210415-99 Client Reference: B025563 Report Number: 595377
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24100542 Depth : 0.50
Sample ID : BH - PTR - 42

ChromSpace LIMS export
Current batch
Sample Identity: F_24100542-4_secs.tht
Date Acquired : 19/04/21 04:40:50
Units : ppm
Dilution : 0
CF :
Multiplier :



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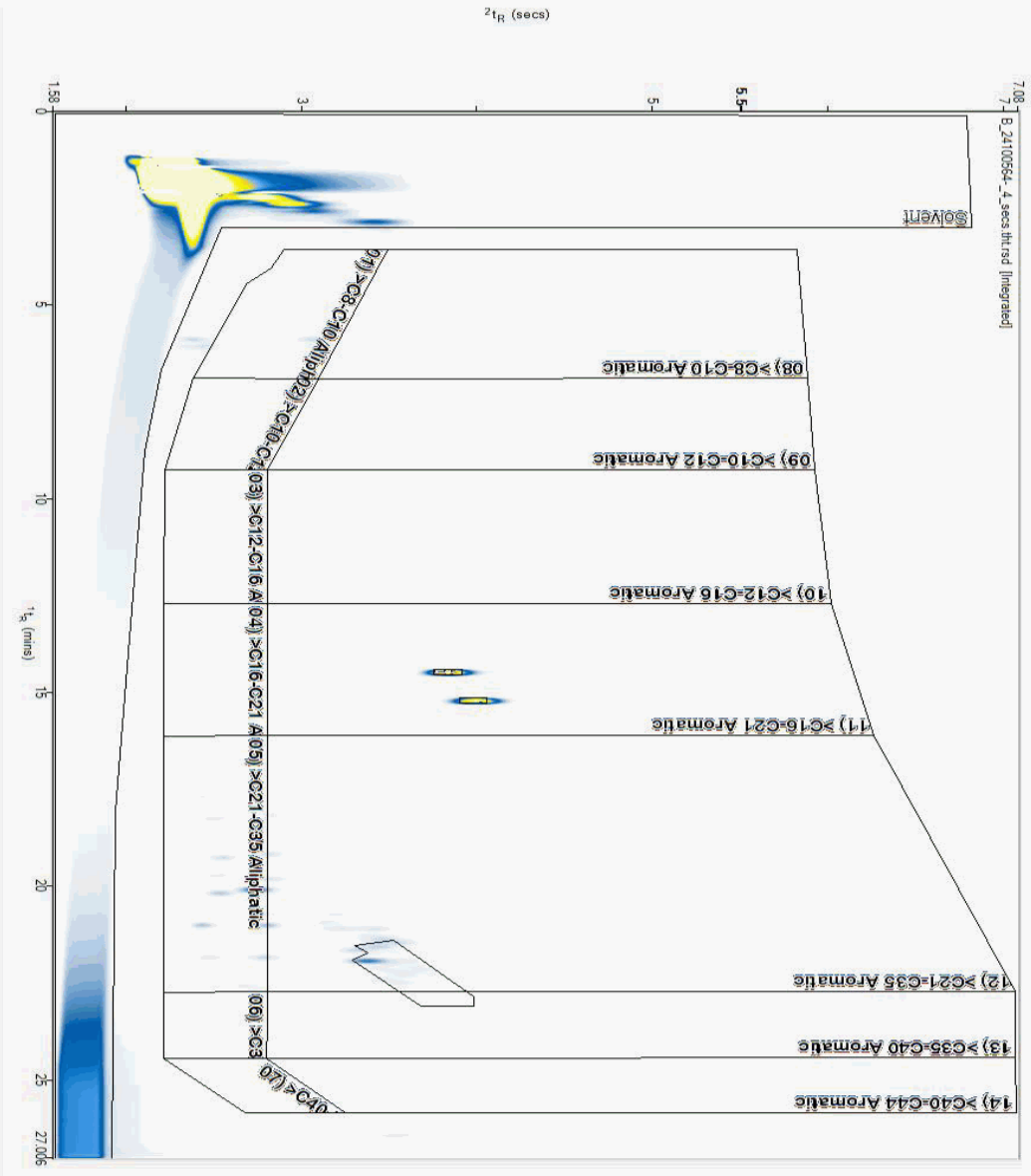
Validated

SDG: 210415-99 Client Reference: B025563 Report Number: 595377
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24100564 Depth : 0.20
Sample ID : BH - PTR - 42

ChromSpace LIMS export
Current batch
Sample Identity: B_24100564-4_secs.tht
Date Acquired : 19/04/21 08:53:15
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-99 Client Reference: B025563 Report Number: 595377
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID Sample No : 24100577 Depth : 0.20
Sample ID : BH - PTR - 42



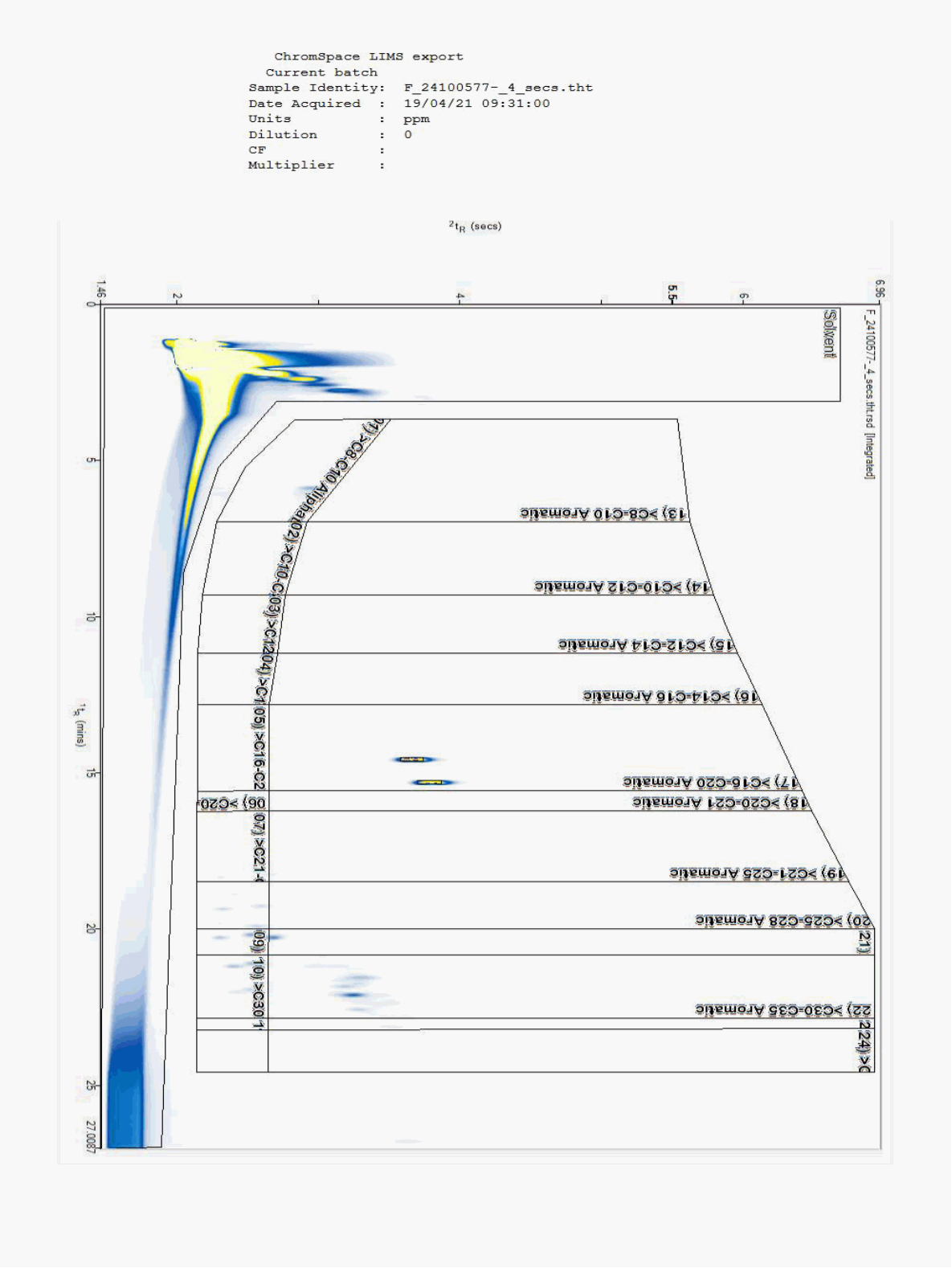
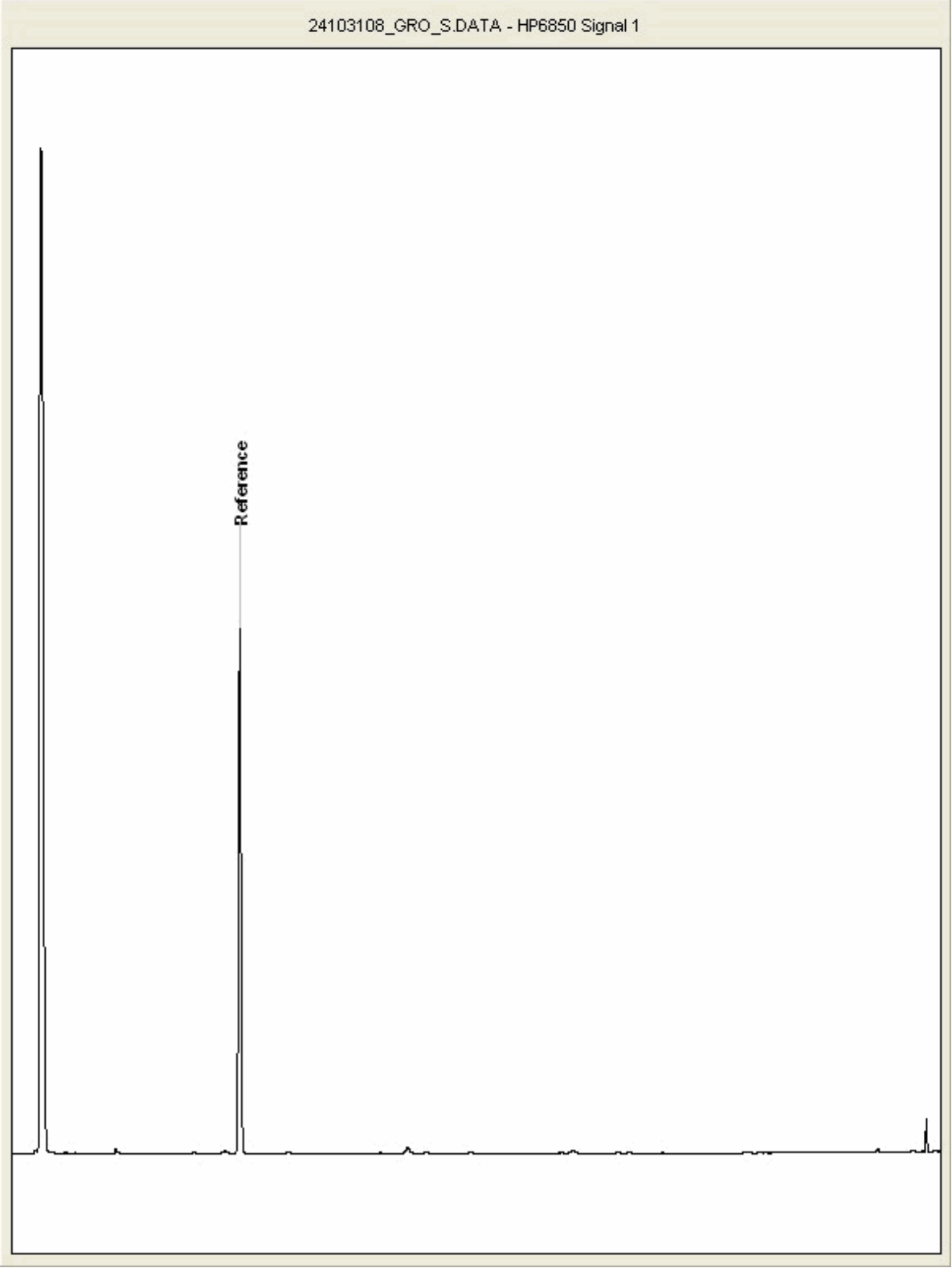
CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-99 Client Reference: B025563 Report Number: 595377
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103108 Depth : 0.50
Sample ID : BH - PTR - 42



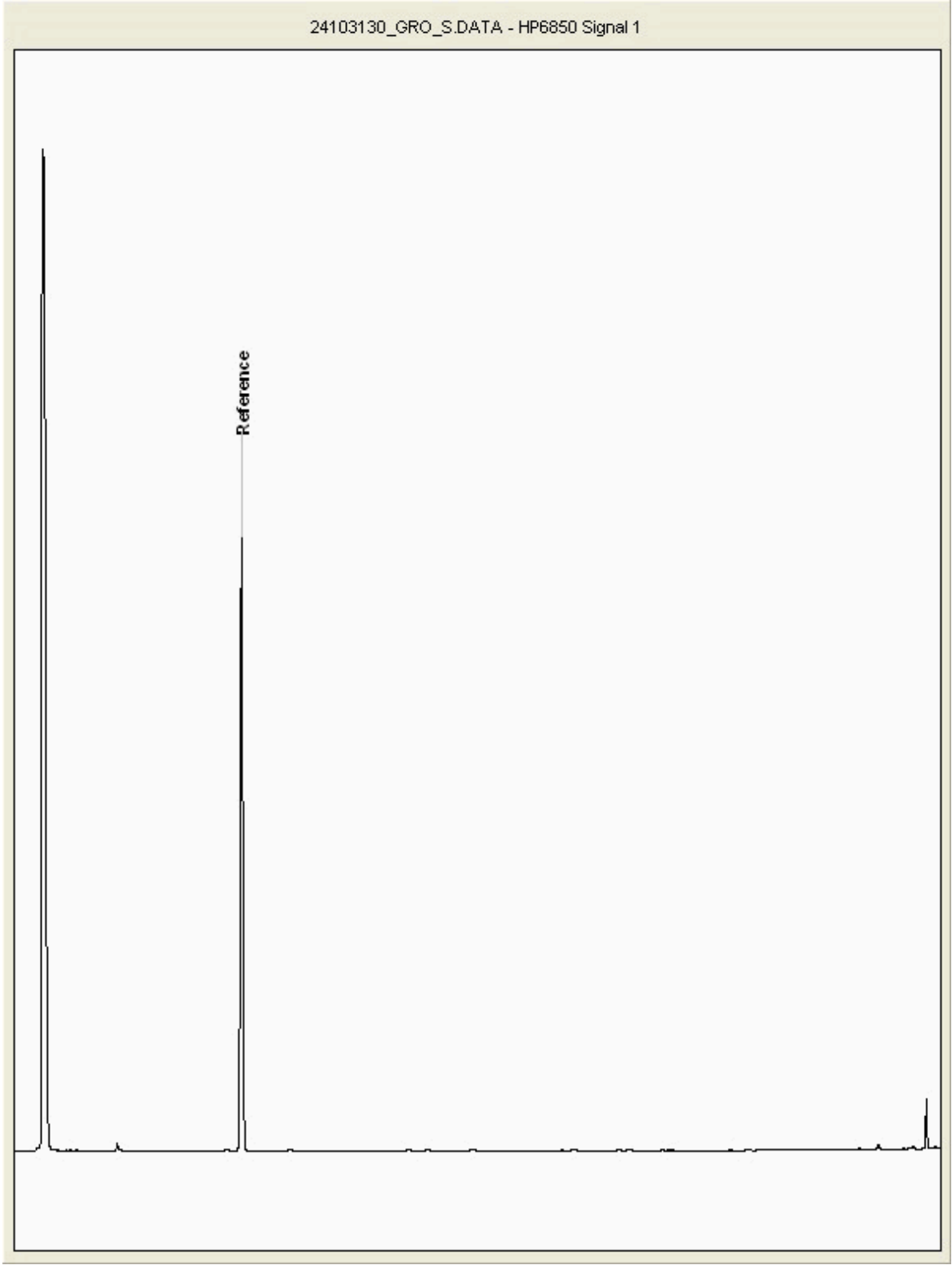
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24103130

Sample ID : BH - PTR - 42

Depth : 0.20



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



ALS Life Sciences Limited

Notification of NDPs (No determination possible)

SDG Number	210415-108	Location	Cambridge South East Transport - Phase 2
Client	H_WYG_LEE	Order No.	7000964
Client Reference	B025563		
Attention	Richard Tonge	Date Received	15/04/2021 11:56:58

Sample No	Sample Identity	Depth (m)	Test	Comment
24104466	BH PTR 44 A	2.20	Anions by Kone (soil)	Sample cannot be filtered
24104466	BH PTR 44 A	2.20	Kone Anions prep (s)	Sample cannot be filtered



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 25 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210415-108
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 595405

We received 7 samples on Thursday April 15, 2021 and 5 of these samples were scheduled for analysis which was completed on Sunday April 25, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24082959	BH PTR 44 A	ES6	2.20	13/04/2021
24082958	BH PTR 44 A	ES5	3.00	13/04/2021
24082962	BH PTR 44 A	ES7	4.00	13/04/2021
24082960	BH PTR 45 A	ES5	1.60	13/04/2021
24082961	BH PTR 45 A	ES6	2.30	13/04/2021
24082956	BH PTR 43 B	ES5	1.60	13/04/2021
24082957	BH PTR 43 B	ES6	1.90	13/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24082959	24082962	24082960	24082961	24082956
						BH PTR 44 A	BH PTR 44 A	BH PTR 45 A	BH PTR 45 A	BH PTR 43 B
						ES6	ES7	ES5	ES6	ES5
						2.20	4.00	1.60	2.30	1.60
						1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)
						S	S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 3				X		X		
Anions by Kone (soil)	All	NDPs: 1 Tests: 4				N				
Anions by Kone (w)	All	NDPs: 0 Tests: 3					X		X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 5				X		X		X
Boron Water Soluble	All	NDPs: 0 Tests: 5				X	X		X	X
CEN Readings	All	NDPs: 0 Tests: 3				X		X		
Chromium III	All	NDPs: 0 Tests: 8				X	X	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5				X	X		X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3				X		X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 3				X		X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 5				X	X		X	X
Fluoride	All	NDPs: 0 Tests: 3				X		X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 5					X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 5				X	X		X	X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 3				X		X		

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Lab Sample No(s)		24082959		24082962		24082960		24082961		24082956
	Customer Sample Reference		BH PTR 44 A		BH PTR 44 A		BH PTR 45 A		BH PTR 45 A		BH PTR 43 B
	AGS Reference		ES6		ES7		ES5		ES6		ES5
	Depth (m)		2.20		4.00		1.60		2.30		1.60
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)	1kg TUB with Hande (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Hande (ALE260)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3	X				X		X		
Mercury Dissolved	All	NDPs: 0 Tests: 3	X				X		X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 5		X		X		X		X	X
PAH by GCMS	All	NDPs: 0 Tests: 5		X		X		X		X	X
pH	All	NDPs: 0 Tests: 5		X		X		X		X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 3	X				X		X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 5		X		X		X		X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3	X				X		X		
Sample description	All	NDPs: 0 Tests: 5		X		X		X		X	X
Total Organic Carbon	All	NDPs: 0 Tests: 5		X		X		X		X	X
Total Sulphur	All	NDPs: 0 Tests: 5		X		X		X		X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 5		X		X		X		X	X
VOC MS (S)	All	NDPs: 0 Tests: 5			X		X		X		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24082959	BH PTR 44 A	2.20	Grey	Sandy Loam	Stones	None
24082962	BH PTR 44 A	4.00	Grey	Chalk	None	None
24082960	BH PTR 45 A	1.60	Dark Brown	Loamy Sand	Stones	None
24082961	BH PTR 45 A	2.30	White	Chalk	Stones	None
24082956	BH PTR 43 B	1.60	Dark Brown	Sandy Clay Loam	Stones	Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend			Customer Sample Ref.	BH PTR 44 A	BH PTR 44 A	BH PTR 45 A	BH PTR 45 A	BH PTR 43 B	
# M aq diss.flit tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4+5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		2.20 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082959 ES6	4.00 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082962 ES7	1.60 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082960 ES5	2.30 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082961 ES6	1.60 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082956 ES5	
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	21	18	11	14	19		
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01	<0.01		
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 #	<0.01 M	0.0116 #	<0.01 M		
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 #	<0.01 M	0.0116 #	<0.01 M		
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05	<0.05	<0.05		
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 #	<0.015 M	0.116 #	<0.015 M		
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 #	<0.01 M	<0.01 #	<0.01 M		
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 #	<0.01 M	<0.01 #	<0.01 M		
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 #	<0.015 M	0.0696 #	<0.015 M		
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 #	<0.06 M	0.209 #	<0.06 M		
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13	0.209	<0.13		
Sulphur, Total	<0.02 %	TM132	0.353	0.0269	<0.02	0.0233	0.151		
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0023 #	<0.002 #	0.00756 #	0.0281 #	0.00796 #		
pH	1 pH Units	TM133	10.2 M	8.66 #	8.47 M	8.69 #	8.5 M		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #		
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 #	<1 M	<1 #	<1 M		
Chromium, Trivalent	<0.9 mg/kg	TM181	4.83	1.69	11.3	2.03	13.9		
Antimony	<0.6 mg/kg	TM181	0.915 #	0.87 #	1.04 #	0.839 #	1.18 #		
Arsenic	<0.6 mg/kg	TM181	6.85 M	0.89 #	7.77 M	2.62 #	12.2 M		
Barium	<0.6 mg/kg	TM181	138 #	12.3 #	77.4 #	12.5 #	165 #		
Beryllium	<0.01 mg/kg	TM181	0.853 M	0.0647 #	0.784 M	0.0465 #	1.16 M		
Cadmium	<0.02 mg/kg	TM181	0.0411 M	0.0571 #	0.0895 M	0.0818 #	0.0755 M		
Chromium	<0.9 mg/kg	TM181	4.83 M	1.69 #	11.3 M	2.03 #	13.9 M		
Copper	<1.4 mg/kg	TM181	15.7 M	3.77 #	16.7 M	3.58 #	15.4 M		
Iron	<1000 mg/kg	TM181	12500 #	2000 #	19400 #	4370 #	21000 #		
Lead	<0.7 mg/kg	TM181	10.9 M	<0.7 #	12.4 M	1.29 #	27.1 M		
Manganese	<0.13 mg/kg	TM181	279 M	413 #	438 M	246 #	410 M		
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 #	<0.1 M	<0.1 #	<0.1 M		
Molybdenum	<0.1 mg/kg	TM181	1.27 #	<0.1 #	0.368 #	<0.1 #	0.845 #		
Nickel	<0.2 mg/kg	TM181	8.1 M	3.34 #	13.7 M	3.71 #	22.5 M		
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	<1 #	<1 #		
Vanadium	<0.2 mg/kg	TM181	25.3 #	1.87 #	29.9 #	4.92 #	35.2 #		



CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]



CERTIFICATE OF ANALYSIS

SDG: 210415-108

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 595405

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH PTR 44 A	BH PTR 44 A	BH PTR 45 A	BH PTR 45 A	BH PTR 43 B	
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.20 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082959 ES6	4.00 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082962 ES7	1.60 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082960 ES5	2.30 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082961 ES6	1.60 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082956 ES5	
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	109	104	107	105	114	
Toluene-d8**	%	TM116	97.7	99.4	90.3	99.3	97.3	
4-Bromofluorobenzene**	%	TM116	95.5	103	76.3	102	86.6	
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 #	<6 M	<6 #	<6 M	
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #	<7 #	<7 #	<7 #	
Vinyl Chloride	<6 µg/kg	TM116	<6 M	<6 #	<6 M	<6 #	<6 M	
Bromomethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Chloroethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 #	<6 M	<6 #	<6 M	
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
Carbon Disulphide	<7 µg/kg	TM116	<7 M	15.2 #	<7 M	<7 #	<7 M	
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 #	<8 M	<8 #	<8 M	
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 #	<6 M	<6 #	<6 M	
2,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Chloroform	<8 µg/kg	TM116	<8 M	<8 #	<8 M	<8 #	<8 M	
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 #	<7 M	<7 #	<7 M	
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 #	<5 M	<5 #	<5 M	
Benzene	<9 µg/kg	TM116	<9 M	<9 #	<9 M	<9 #	<9 M	
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #	<9 #	
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 #	<9 M	<9 #	<9 M	
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 #	<7 M	<7 #	<7 M	
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Toluene	<7 µg/kg	TM116	<7 M	<7 #	<7 M	<7 #	<7 M	
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	



CERTIFICATE OF ANALYSIS

SDG: 210415-108

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 595405

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH PTR 44 A	BH PTR 44 A	BH PTR 45 A	BH PTR 45 A	BH PTR 43 B	
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.20 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082959 ES6	4.00 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082962 ES7	1.60 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082960 ES5	2.30 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082961 ES6	1.60 Soil/Solid (S) 13/04/2021 15/04/2021 210415-108 24082956 ES5	
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 #	<7 M	<7 #	<7 M	
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 #	<5 M	<5 #	<5 M	
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 #	<5 M	<5 #	<5 M	
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 #	<4 M	<4 #	<4 M	
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
o-Xylene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Styrene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
Bromoform	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #	<5 #	<5 #	<5 #	
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 #	<16 M	<16 #	<16 M	
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 #	<9 M	<9 #	<9 M	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 #	<8 M	<8 #	<8 M	
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 #	<14 M	<14 #	<14 M	
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #	<9 #	
sec-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 #	<8 M	<8 #	<8 M	
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 #	<5 M	<5 #	<5 M	
n-Butylbenzene	<11 µg/kg	TM116	<11 M	<11 #	<11 M	<11 #	<11 M	
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 #	<10 M	<10 #	<10 M	
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 #	<14 M	<14 #	<14 M	
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20 M	<20 #	<20 M	<20 #	<20 M	
Hexachlorobutadiene	<20 µg/kg	TM116	<20 M	<20 #	<20 M	<20 #	<20 M	
Naphthalene	<13 µg/kg	TM116	<13 M	<13 #	44.2 M	<13 #	<13 M	

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.114	Natural Moisture Content (%)	27
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	78.7
Particle Size <4mm	>95%		

Case

SDG	210415-108			
Lab Sample Number(s)	24082959			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH PTR 44 A ES6			
Depth (m)	2.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.447	<0.01	4.47	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	23.8	<3	238	<30	-	-	-
Fluoride	1.04	<0.5	10.4	<5	-	-	-
Mercury Dissolved (CVAF)	0.0000456	<0.00001	0.000456	<0.0001	-	-	-
Arsenic	0.0144	<0.0005	0.144	<0.005	-	-	-
Barium	0.526	<0.0002	5.26	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.38	<0.01	3.8	<0.1	-	-	-
Cadmium	0.00012	<0.00008	0.0012	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	6.09	<0.2	60.9	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.0142	<0.0003	0.142	<0.003	-	-	-
Lead	0.00698	<0.0002	0.0698	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	1.03	<0.036	10.3	<0.36	-	-	-
Manganese	0.0207	<0.003	0.207	<0.03	-	-	-
Molybdenum	0.036	<0.003	0.36	<0.03	-	-	-
Nickel	0.00954	<0.0004	0.0954	<0.004	-	-	-
Selenium	0.00589	<0.001	0.0589	<0.01	-	-	-
Vanadium	0.0167	<0.001	0.167	<0.01	-	-	-
Zinc	0.0507	<0.001	0.507	<0.01	-	-	-
Chloride	32	<2	320	<20	-	-	-
Sulphate (soluble)	158	<2	1580	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.35
Conductivity (µS/cm)	862.00
Temperature (°C)	12.70
Volume Leachant (Litres)	0.876

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - I
Mass Sample taken (kg)	0.114	Natural Moisture Content (%)	27	
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	78.7	
Particle Size <4mm	>95%			

Case

SDG	210415-108			
Lab Sample Number(s)	24082959			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH PTR 44 A ES6			
Depth (m)	2.20			

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Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.35
Conductivity (µS/cm)	862.00
Temperature (°C)	12.70
Volume Leachant (Litres)	0.876

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)	15.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	86.3
Particle Size <4mm	>95%		

Case

SDG	210415-108			
Lab Sample Number(s)	24082960			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH PTR 45 A ES5			
Depth (m)	1.60			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.025	<0.01	0.25	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	7.17	<3	71.7	<30	-	-	-
Fluoride	1.15	<0.5	11.5	<5	-	-	-
Mercury Dissolved (CVAF)	0.0000116	<0.00001	0.000116	<0.0001	-	-	-
Arsenic	0.00136	<0.0005	0.0136	<0.005	-	-	-
Barium	0.187	<0.0002	1.87	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.11	<0.01	1.1	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	22.9	<0.2	229	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.000909	<0.0002	0.00909	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.915	<0.036	9.15	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00104	<0.0004	0.0104	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00155	<0.001	0.0155	<0.01	-	-	-
Zinc	0.0204	<0.001	0.204	<0.01	-	-	-
Chloride	2.6	<2	26	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	5.80
Conductivity (µS/cm)	153.00
Temperature (°C)	6.20
Volume Leachant (Litres)	0.885

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)	15.9	
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	86.3	
Particle Size <4mm	>95%			

Case

SDG	210415-108			
Lab Sample Number(s)	24082960			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH PTR 45 A ES5			
Depth (m)	1.60			

Eluate Analysis	C₂ Conc ⁿ in 10:1 eluate (mg/l)		A₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	61.1	<0.65	611	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.144	<0.019	1.44	<0.19	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	5.80
Conductivity (µS/cm)	153.00
Temperature (°C)	6.20
Volume Leachant (Litres)	0.885

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.2
Particle Size <4mm	>95%		

Case

SDG	210415-108			
Lab Sample Number(s)	24082961			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH PTR 45 A ES6			
Depth (m)	2.30			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.014	<0.01	0.14	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Barium	0.0032	<0.0002	0.032	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0151	<0.01	0.151	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	10.3	<0.2	103	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.588	<0.036	5.88	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	3.2	<2	32	<20	-	-	-
Sulphate (soluble)	4.3	<2	43	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.41
Conductivity (µS/cm)	64.10
Temperature (°C)	18.70
Volume Leachant (Litres)	0.884

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.2
Particle Size <4mm	>95%		

Case

SDG	210415-108			
Lab Sample Number(s)	24082961			
Sampled Date	13-Apr-2021			
Customer Sample Ref.	BH PTR 45 A ES6			
Depth (m)	2.30			

[illegible]

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.41
Conductivity (µS/cm)	64.10
Temperature (°C)	18.70
Volume Leachant (Litres)	0.884

25/04/2021 15:23:39



CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Notification of NDPs (No determination possible)

Date Received : 15/04/2021 11:56:58

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
24082959	BH PTR 44 A	2.20	Anions by Kone (soil)	Sample cannot be filtered



CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24082959	24082962	24082960	24082961	24082956
Customer Sample Ref.	BH PTR 44 A	BH PTR 44 A	BH PTR 45 A	BH PTR 45 A	BH PTR 43 B
AGS Ref.	ES6	ES7	ES5	ES6	ES5
Depth	2.20	4.00	1.60	2.30	1.60
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	23-Apr-2021		22-Apr-2021	23-Apr-2021	
Anions by Kone (soil)		20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
Anions by Kone (w)	23-Apr-2021		23-Apr-2021	23-Apr-2021	
Asbestos ID in Solid Samples	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
Boron Water Soluble	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
CEN 10:1 Leachate (1 Stage)	19-Apr-2021		19-Apr-2021	19-Apr-2021	
CEN Readings	20-Apr-2021		20-Apr-2021	20-Apr-2021	
Chromium III	23-Apr-2021	21-Apr-2021	23-Apr-2021	23-Apr-2021	21-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
Dissolved Metals by ICP-MS	23-Apr-2021		23-Apr-2021	23-Apr-2021	
Dissolved Organic/Inorganic Carbon	25-Apr-2021		25-Apr-2021	25-Apr-2021	
EPH CWG GC (S)	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
Fluoride	22-Apr-2021		22-Apr-2021	22-Apr-2021	
GRO by GC-FID (S)	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	19-Apr-2021
Hexavalent Chromium (s)	20-Apr-2021	21-Apr-2021	20-Apr-2021	21-Apr-2021	21-Apr-2021
Low Level Cyanide (W)	22-Apr-2021		22-Apr-2021	22-Apr-2021	
Low Level Hexavalent Chromium (w)	22-Apr-2021		22-Apr-2021	22-Apr-2021	
Mercury Dissolved	22-Apr-2021		22-Apr-2021	22-Apr-2021	
Metals in solid samples by OES	21-Apr-2021	21-Apr-2021	21-Apr-2021	21-Apr-2021	21-Apr-2021
Moisture at 105C	19-Apr-2021		19-Apr-2021	19-Apr-2021	
PAH by GCMS	20-Apr-2021	21-Apr-2021	20-Apr-2021	21-Apr-2021	20-Apr-2021
pH	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021
pH Value of Filtered Water	21-Apr-2021		21-Apr-2021	21-Apr-2021	
Phenols by HPLC (S)	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
Phenols by HPLC (W)	22-Apr-2021		22-Apr-2021	22-Apr-2021	
Sample description	17-Apr-2021	17-Apr-2021	17-Apr-2021	17-Apr-2021	17-Apr-2021
Total Organic Carbon	22-Apr-2021	22-Apr-2021	22-Apr-2021	22-Apr-2021	22-Apr-2021
Total Sulphur	22-Apr-2021	22-Apr-2021	22-Apr-2021	22-Apr-2021	22-Apr-2021
TPH CWG GC (S)	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021	20-Apr-2021
VOC MS (S)	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low			
Component	Method Code	QC 2435	QC 2463
Ammoniacal Nitrogen as N	TM099	100.4 96.04 : 106.80	99.6 96.04 : 106.80

Anions by Kone (w)			
Component	Method Code	QC 2479	
Chloride	TM184	94.4 91.40 : 109.10	
Sulphate (soluble)	TM184	96.0 91.99 : 109.30	

Boron Water Soluble			
Component	Method Code	QC 2457	
Water Soluble Boron	TM222	103.5 84.00 : 111.00	

Cyanide Comp/Free/Total/Thiocyanate			
Component	Method Code	QC 2402	
Free Cyanide	TM153	98.81 79.00 : 115.00	
Thiocyanate	TM153	103.21 94.09 : 113.89	
Total Cyanide	TM153	101.4 73.07 : 107.47	

Dissolved Metals by ICP-MS			
Component	Method Code	QC 2463	QC 2421
Aluminium	TM152	108.0 90.78 : 110.89	100.67 90.78 : 110.89
Antimony	TM152	107.17 77.22 : 119.42	102.33 77.22 : 119.42
Arsenic	TM152	105.67 86.77 : 107.67	98.5 86.77 : 107.67
Barium	TM152	107.17 87.86 : 110.23	99.33 87.86 : 110.23
Beryllium	TM152	108.83 86.19 : 112.98	102.83 86.19 : 112.98
Bismuth	TM152	106.17 84.06 : 106.46	96.83 84.06 : 106.46
Borate	TM152	111.11 88.00 : 112.00	103.7 88.00 : 112.00

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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Dissolved Metals by ICP-MS						

		QC 2463	QC 2421
Boron	TM152	110.67 83.92 : 114.90	103.67 83.92 : 114.90
Cadmium	TM152	105.67 88.89 : 106.69	98.83 88.89 : 106.69
Calcium	TM152	104.0 80.24 : 117.95	98.0 80.24 : 117.95
Chromium	TM152	105.67 83.22 : 110.16	97.83 83.22 : 110.16
Cobalt	TM152	105.33 82.49 : 112.36	97.67 82.49 : 112.36
Copper	TM152	105.83 83.14 : 113.00	97.5 83.14 : 113.00
Iron	TM152	106.67 88.40 : 109.24	98.0 88.40 : 109.24
Lead	TM152	104.67 83.71 : 109.58	96.83 83.71 : 109.58
Lithium	TM152	108.5 84.50 : 114.28	102.5 84.50 : 114.28
Magnesium	TM152	103.33 87.56 : 114.57	96.0 87.56 : 114.57
Manganese	TM152	106.5 90.01 : 108.72	99.17 90.01 : 108.72
Molybdenum	TM152	103.0 85.53 : 107.42	94.83 85.53 : 107.42
Nickel	TM152	105.83 88.05 : 106.42	98.0 88.05 : 106.42
Phosphorus	TM152	106.5 82.76 : 107.72	100.33 82.76 : 107.72
Potassium	TM152	104.67 88.45 : 106.42	98.67 88.45 : 106.42
Selenium	TM152	104.83 85.61 : 111.03	96.17 85.61 : 111.03
Silver	TM152	105.17 88.48 : 110.48	95.33 88.48 : 110.48
Sodium	TM152	104.0 88.32 : 106.30	96.67 88.32 : 106.30
Strontium	TM152	103.67 83.77 : 107.87	98.33 83.77 : 107.87
Tellurium	TM152	101.5 82.83 : 104.73	97.5 82.83 : 104.73
Thallium	TM152	103.67 77.47 : 113.87	92.83 77.47 : 113.87
Tin	TM152	107.83 87.36 : 109.55	100.17 87.36 : 109.55
Titanium	TM152	110.33 87.29 : 108.31	104.0 87.29 : 108.31
Tungsten	TM152	104.83 68.27 : 122.97	97.83 68.27 : 122.97
Uranium	TM152	103.33 82.46 : 105.16	95.33 82.46 : 105.16
Vanadium	TM152	106.67 88.43 : 114.30	103.83 88.43 : 114.30
Zinc	TM152	106.67 85.57 : 114.31	99.33 85.57 : 114.31

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210415-108	Client Reference:	B025563	Report Number:	595405	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Dissolved Organic/Inorganic Carbon						

Component	Method Code	QC 2415	QC 2466
Dissolved Inorganic Carbon	TM090	129.5 93.58 : 112.28	102.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.83 96.13 : 109.53	103.83 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2419
EPH >C8-C40 Raw	TM414	104.75 73.48 : 116.68
Total Aliphatics Raw	TM414	114.06 72.61 : 118.71
Total Aromatics Raw	TM414	96.35 63.37 : 122.69

Fluoride

Component	Method Code	QC 2456
Fluoride	TM104	104.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2468	QC 2409
QC	TM089	85.33 70.34 : 111.95	83.72 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2443	QC 2449
Hexavalent Chromium	TM151	106.0 92.00 : 111.20	102.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2462
Free Cyanide - Low Level	TM279	81.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.5 81.83 : 110.45

Mercury Dissolved

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210415-108	Client Reference:	B025563	Report Number:	595405	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Mercury Dissolved						
Component	Method Code	QC 2414				
Mercury Dissolved (CVAf)	TM183	110.0 69.30 : 128.70				

Metals in solid samples by OES		
Component	Method Code	QC 2420
Aluminium	TM181	93.81 77.46 : 123.98
Antimony	TM181	96.34 87.04 : 111.16
Arsenic	TM181	96.8 87.34 : 110.87
Barium	TM181	94.5 80.73 : 115.16
Beryllium	TM181	94.4 89.47 : 112.97
Boron	TM181	88.25 76.57 : 104.15
Cadmium	TM181	88.48 78.94 : 102.43
Chromium	TM181	85.8 77.55 : 104.47
Cobalt	TM181	86.16 82.95 : 107.41
Copper	TM181	92.78 84.36 : 106.14
Iron	TM181	94.44 81.43 : 115.79
Lead	TM181	92.79 81.95 : 107.63
Manganese	TM181	104.72 94.29 : 119.51
Mercury	TM181	91.06 82.73 : 106.36
Molybdenum	TM181	93.42 86.61 : 111.07
Nickel	TM181	87.04 79.72 : 103.80
Phosphorus	TM181	102.63 92.65 : 125.47
Selenium	TM181	98.43 88.36 : 111.25
Strontium	TM181	88.42 78.06 : 99.91
Thallium	TM181	96.46 88.60 : 116.73
Tin	TM181	94.68 89.77 : 112.62
Titanium	TM181	87.79 66.29 : 105.96

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210415-108	Client Reference:	B025563	Report Number:	595405	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						
		QC 2420				
Vanadium	TM181	89.74 75.51 : 108.87				
Zinc	TM181	95.48 84.02 : 111.24				

PAH by GCMS			
Component	Method Code	QC 2422	QC 2470
Acenaphthene	TM218	84.0 76.79 : 103.90	86.5 76.79 : 103.90
Acenaphthylene	TM218	81.5 74.19 : 106.17	85.5 74.19 : 106.17
Anthracene	TM218	83.0 70.90 : 109.22	86.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.0 73.77 : 119.26	84.0 73.77 : 119.26
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18	83.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58	82.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12	78.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59	83.5 75.98 : 116.59
Chrysene	TM218	85.0 74.82 : 114.18	81.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30	77.0 69.17 : 115.30
Fluoranthene	TM218	79.5 66.06 : 114.63	82.0 66.06 : 114.63
Fluorene	TM218	83.0 76.66 : 107.56	86.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95	78.0 70.26 : 117.95
Naphthalene	TM218	84.0 74.70 : 101.83	84.0 74.70 : 101.83
Phenanthrene	TM218	82.0 73.62 : 109.34	85.5 73.62 : 109.34
Pyrene	TM218	81.0 71.46 : 117.00	81.0 71.46 : 117.00

pH		
Component	Method Code	QC 2455
pH	TM133	98.97 97.51 : 101.32

pH Value of Filtered Water

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	SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH Value of Filtered Water						

Component	Method Code	QC 2468
pH	TM256	101.34 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2492
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	47.19 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2484
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	91.78 82.77 : 126.51
Cresols by HPLC (W)	TM259	97.37 76.60 : 126.28
Napthol by HPLC (W)	TM259	97.66 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	95.25 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2446
Total Organic Carbon	TM132	102.34 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2484
Total Sulphur %	TM132	92.23 61.64 : 114.47

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	SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
VOC MS (S)						

Component	Method Code	QC 2424	QC 2432
1,1,1,2-tetrachloroethane	TM116	100.0 84.84 : 116.25	102.4 79.10 : 119.66
1,1,1-Trichloroethane	TM116	99.6 73.73 : 118.05	101.8 88.34 : 114.50
1,1,2-Trichloroethane	TM116	104.0 77.12 : 116.04	97.8 81.29 : 113.79
1,1-Dichloroethane	TM116	105.6 74.46 : 129.15	107.8 86.77 : 122.11
1,2-Dichloroethane	TM116	112.0 92.38 : 131.65	109.2 90.04 : 132.28
1,4-Dichlorobenzene	TM116	97.8 83.64 : 126.18	106.0 80.81 : 125.07
2-Chlorotoluene	TM116	93.6 76.03 : 113.25	95.8 73.13 : 114.13
4-Chlorotoluene	TM116	89.8 66.90 : 112.46	91.0 68.66 : 109.13
Benzene	TM116	103.0 88.60 : 113.80	101.6 84.29 : 112.22
Carbon Disulphide	TM116	96.8 74.91 : 122.14	101.6 75.11 : 124.81
Carbontetrachloride	TM116	97.8 80.31 : 124.50	96.0 82.35 : 126.46
Chlorobenzene	TM116	102.6 83.81 : 114.18	103.8 82.88 : 122.42
Chloroform	TM116	105.4 87.40 : 122.49	106.6 90.35 : 120.38
Chloromethane	TM116	92.6 65.89 : 136.93	101.6 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	102.4 80.67 : 126.72	105.0 78.27 : 128.90
Dibromomethane	TM116	99.6 73.23 : 118.35	91.0 76.00 : 120.73
Dichloromethane	TM116	110.2 81.11 : 133.25	110.8 92.27 : 134.36
Ethylbenzene	TM116	93.0 75.92 : 110.41	94.2 70.95 : 113.07
Hexachlorobutadiene	TM116	64.4 12.82 : 152.73	110.6 14.55 : 147.92
Isopropylbenzene	TM116	82.6 55.79 : 97.59	92.8 52.00 : 108.19
Naphthalene	TM116	100.0 80.86 : 128.81	105.2 80.29 : 135.77
o-Xylene	TM116	92.0 69.99 : 108.74	92.8 68.34 : 101.99
p/m-Xylene	TM116	88.6 68.32 : 108.91	88.8 69.47 : 97.31
Sec-Butylbenzene	TM116	71.0 38.50 : 101.50	83.8 27.03 : 135.73
Tetrachloroethene	TM116	98.4 76.95 : 121.02	103.4 81.43 : 126.65
Toluene	TM116	95.0 74.24 : 107.42	93.8 82.44 : 103.50
Trichloroethene	TM116	97.6 85.28 : 109.36	96.0 79.80 : 112.33



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VOC MS (S)

		QC 2424	QC 2432
Trichlorofluoromethane	TM116	93.4	98.0
		84.55 : 133.27	89.67 : 132.09
Vinyl Chloride	TM116	98.6	109.4
		68.02 : 143.37	69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



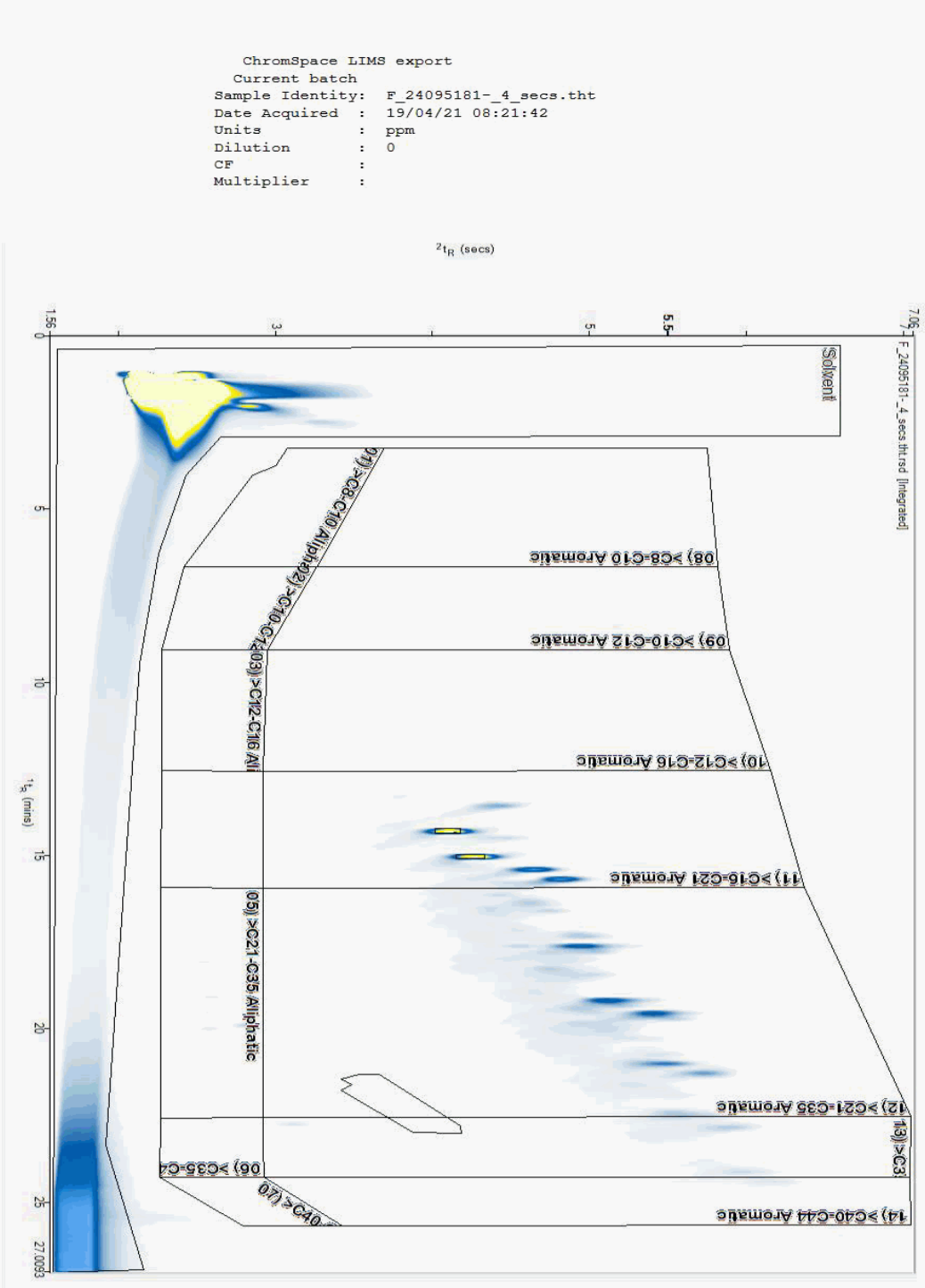
CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24095181	Depth :	1.60
		Sample ID :	BH PTR 45 A		





CERTIFICATE OF ANALYSIS

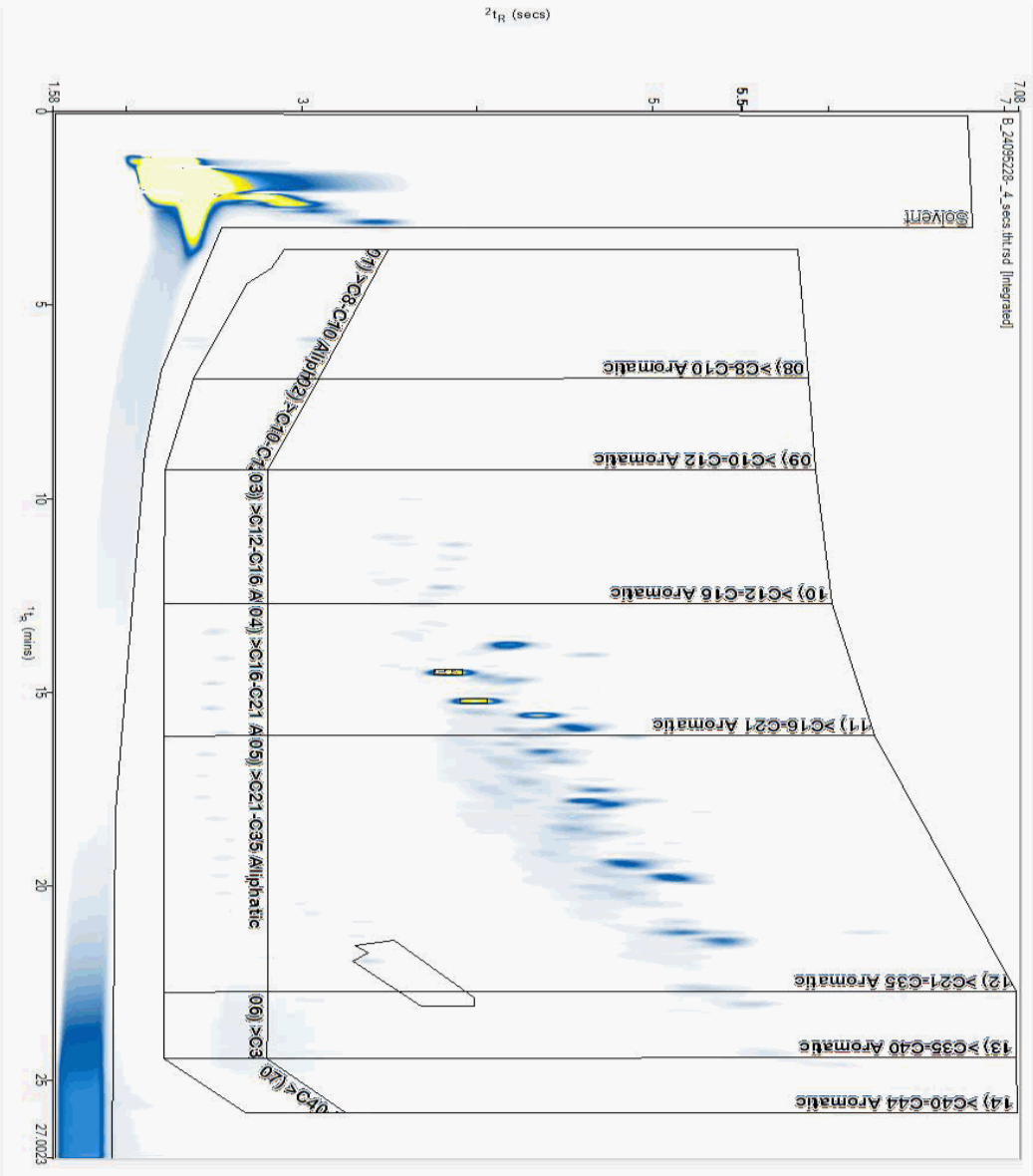
Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24095228 Depth : 2.30
Sample ID : BH PTR 45 A

ChromSpace LIMS export
Current batch
Sample Identity: B_24095228-4_secs.tht
Date Acquired : 20/04/21 12:31:17
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

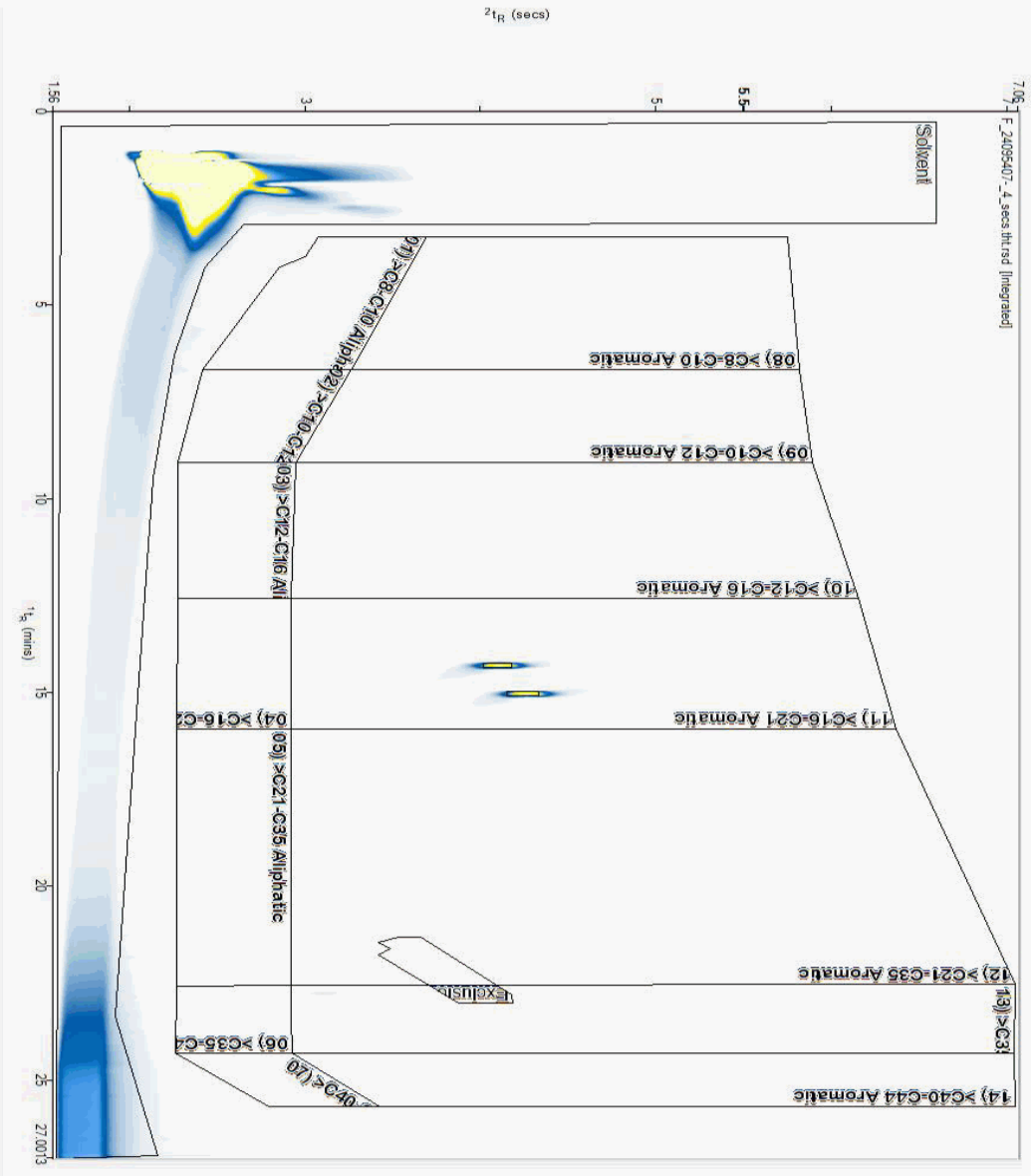
Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24095407 Depth : 4.00
Sample ID : BH PTR 44 A

ChromSpace LIMS export
Current batch
Sample Identity: F_24095407-4_secs.tht
Date Acquired : 19/04/21 05:43:55
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

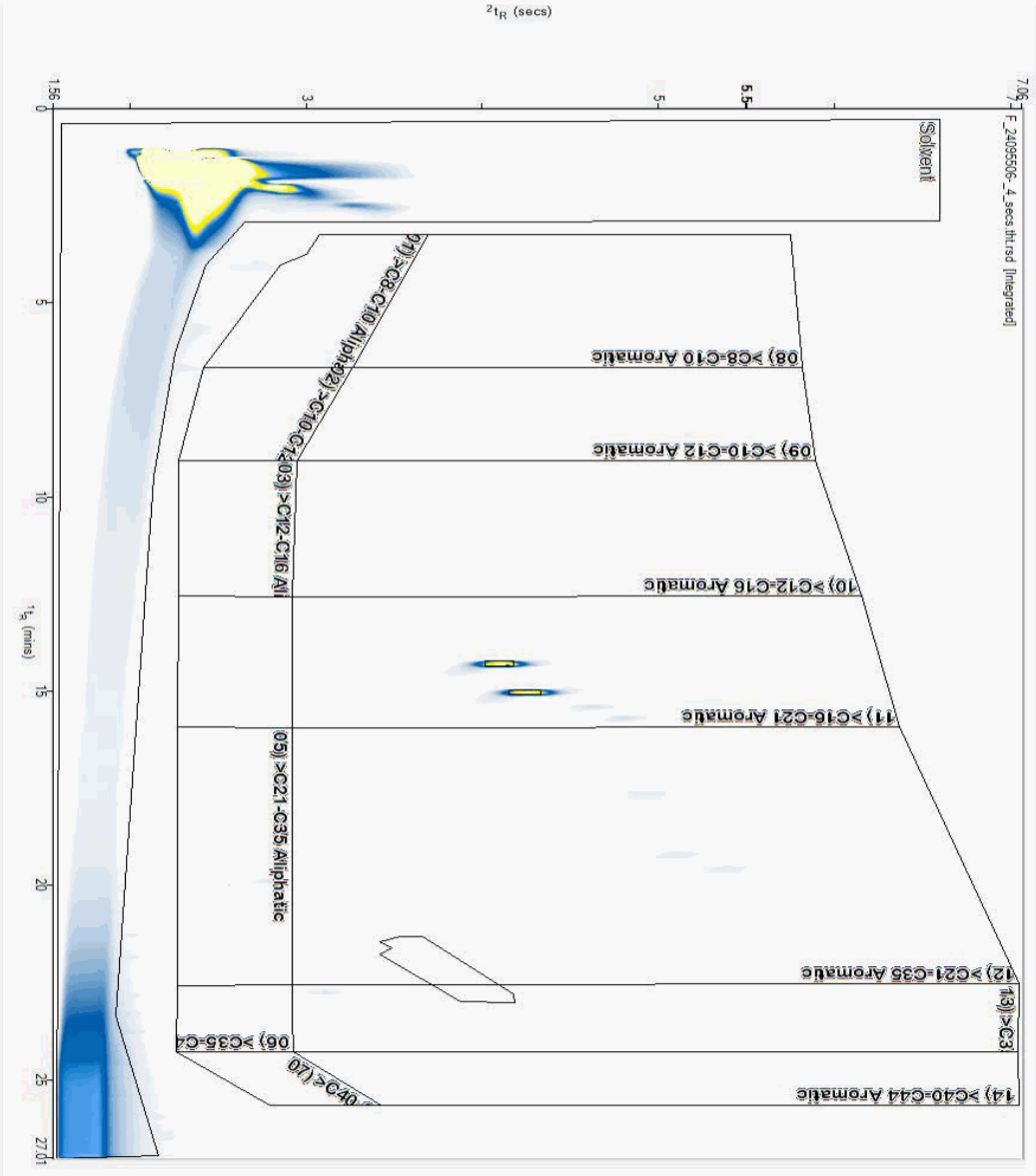
Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24095506 Depth : 1.60
Sample ID : BH PTR 43 B

ChromSpace LIMS export
Current batch
Sample Identity: F_24095506-_4_secs.tht
Date Acquired : 19/04/21 07:18:34
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

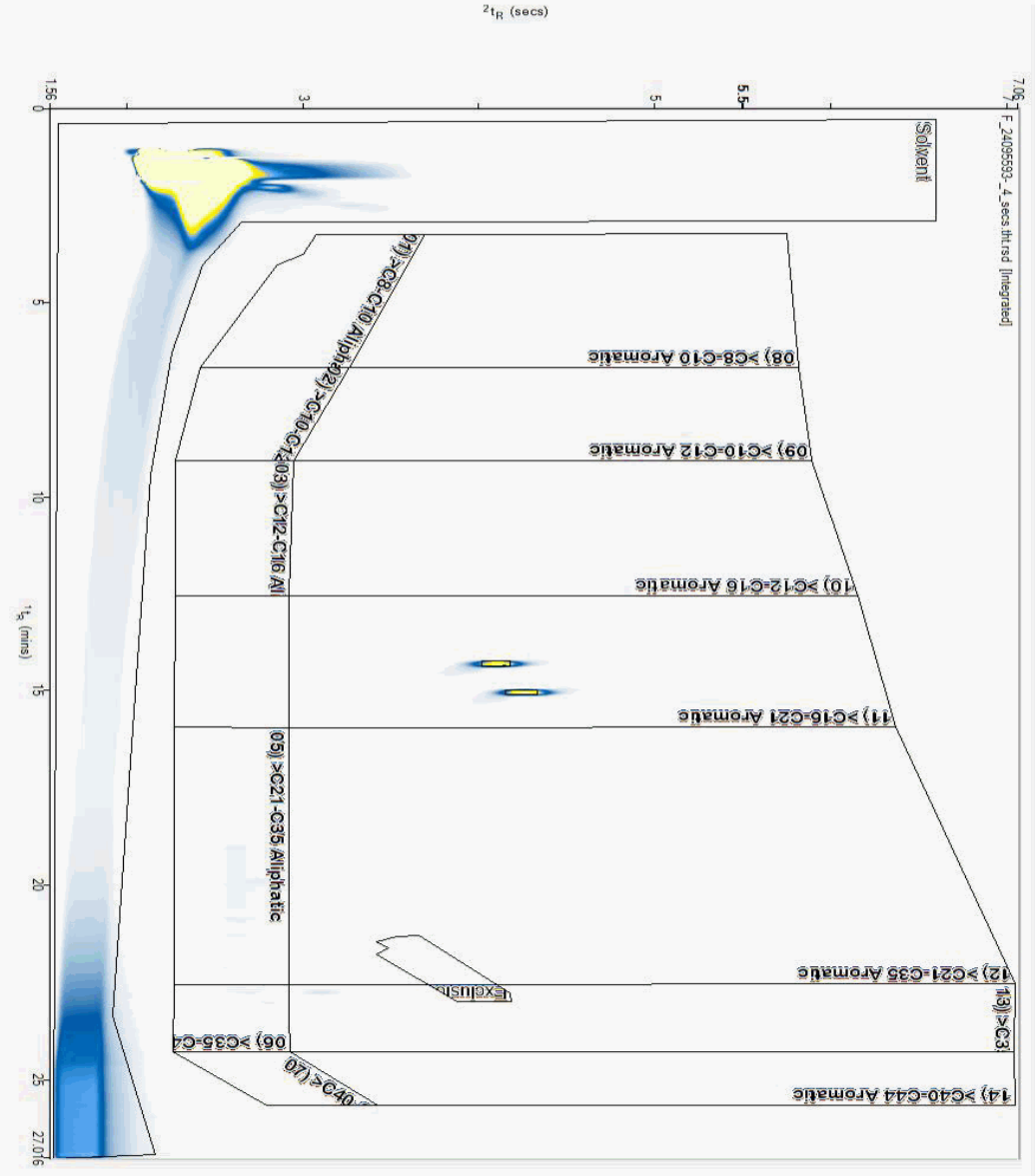
Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24095593 Depth : 2.20
Sample ID : BH PTR 44 A

ChromSpace LIMS export
Current batch
Sample Identity: F_24095593-_4_secs.tht
Date Acquired : 19/04/21 06:15:26
Units : ppm
Dilution : 0
CF :
Multiplier :





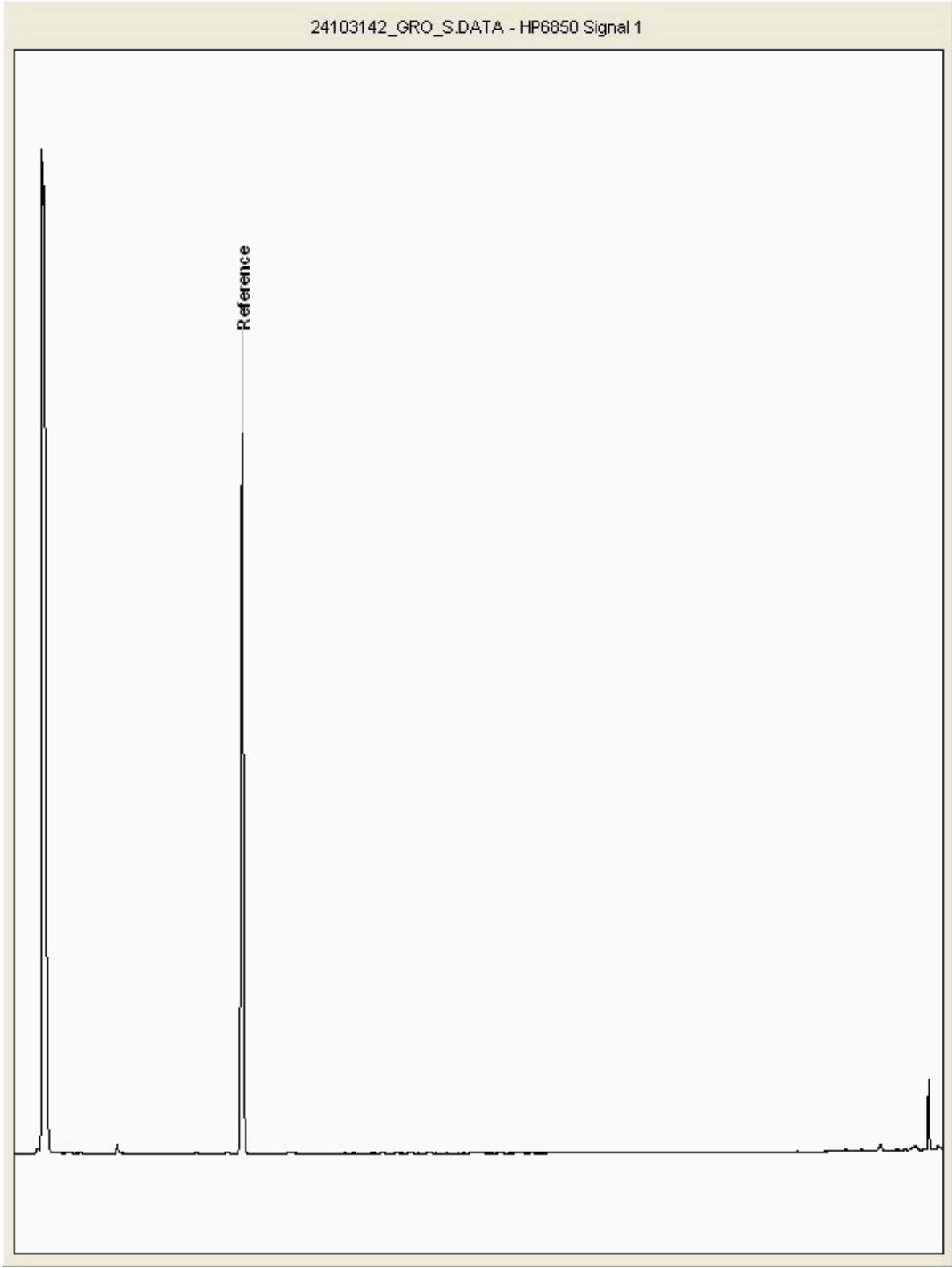
CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103142 Depth : 1.60
Sample ID : BH PTR 43 B



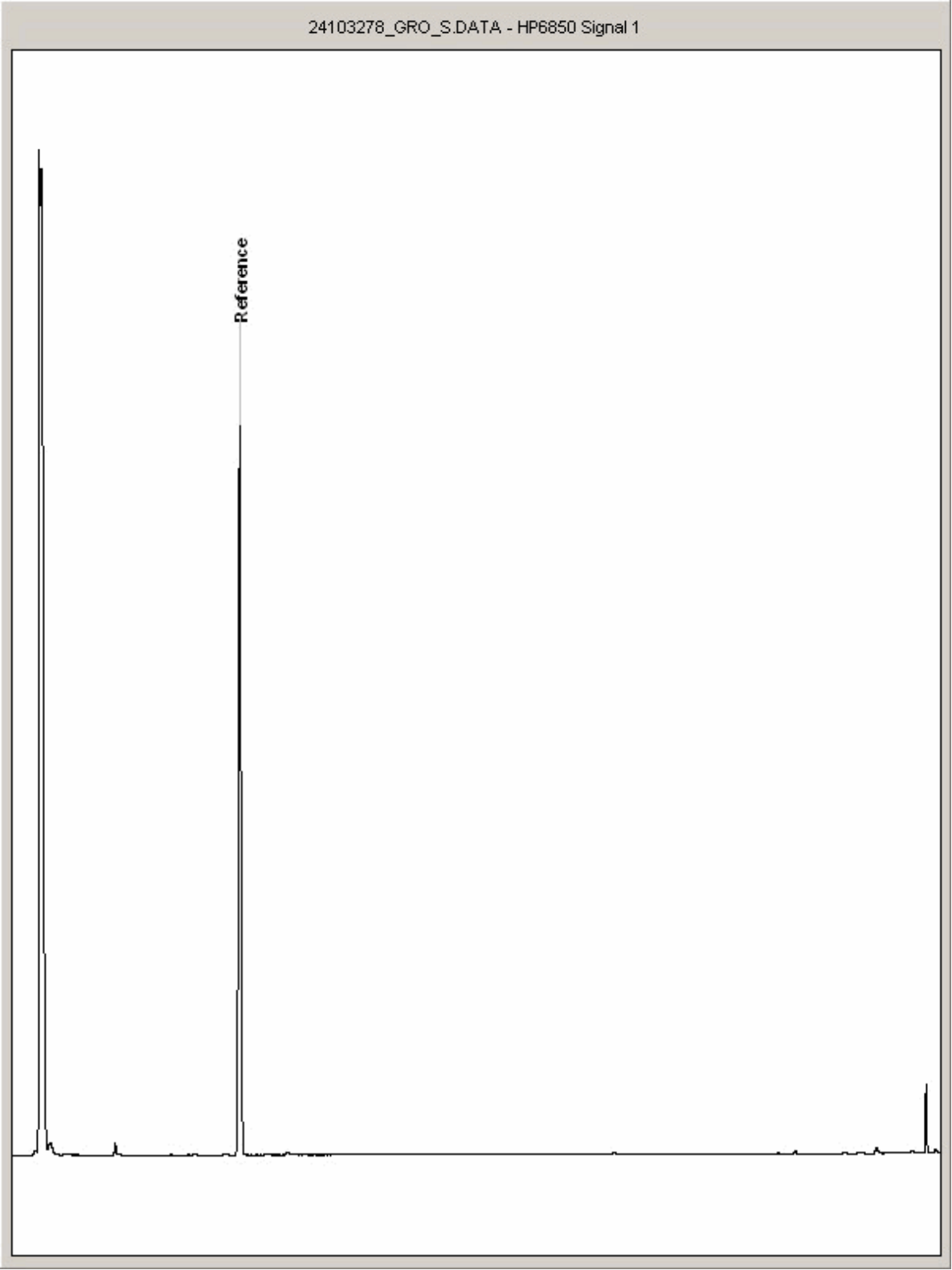
CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103278 Depth : 2.20
Sample ID : BH PTR 44 A





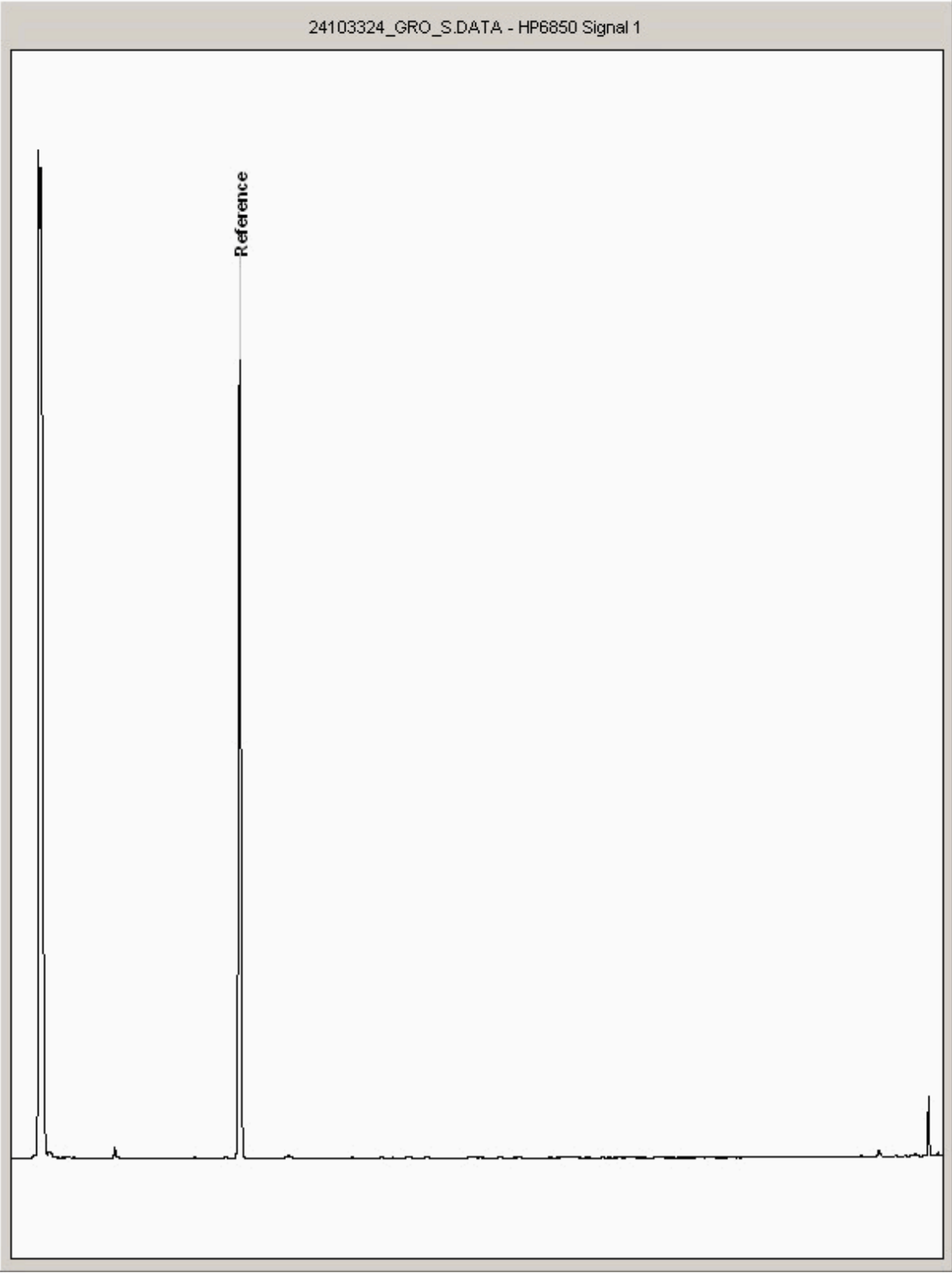
CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103324 Depth : 2.30
Sample ID : BH PTR 45 A



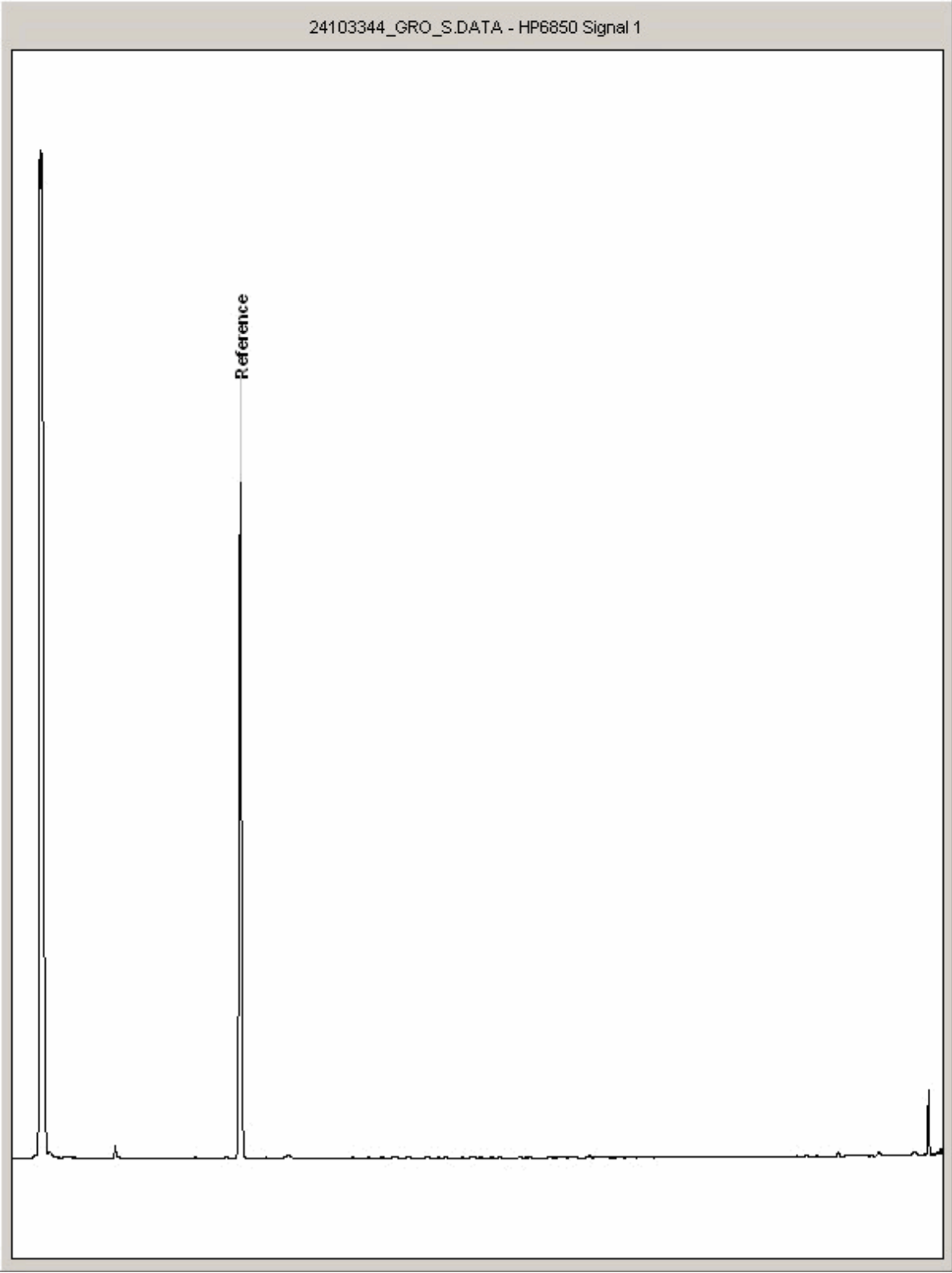
CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-108	Client Reference:	B025563	Report Number:	595405
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103344 Depth : 1.60
Sample ID : BH PTR 45 A





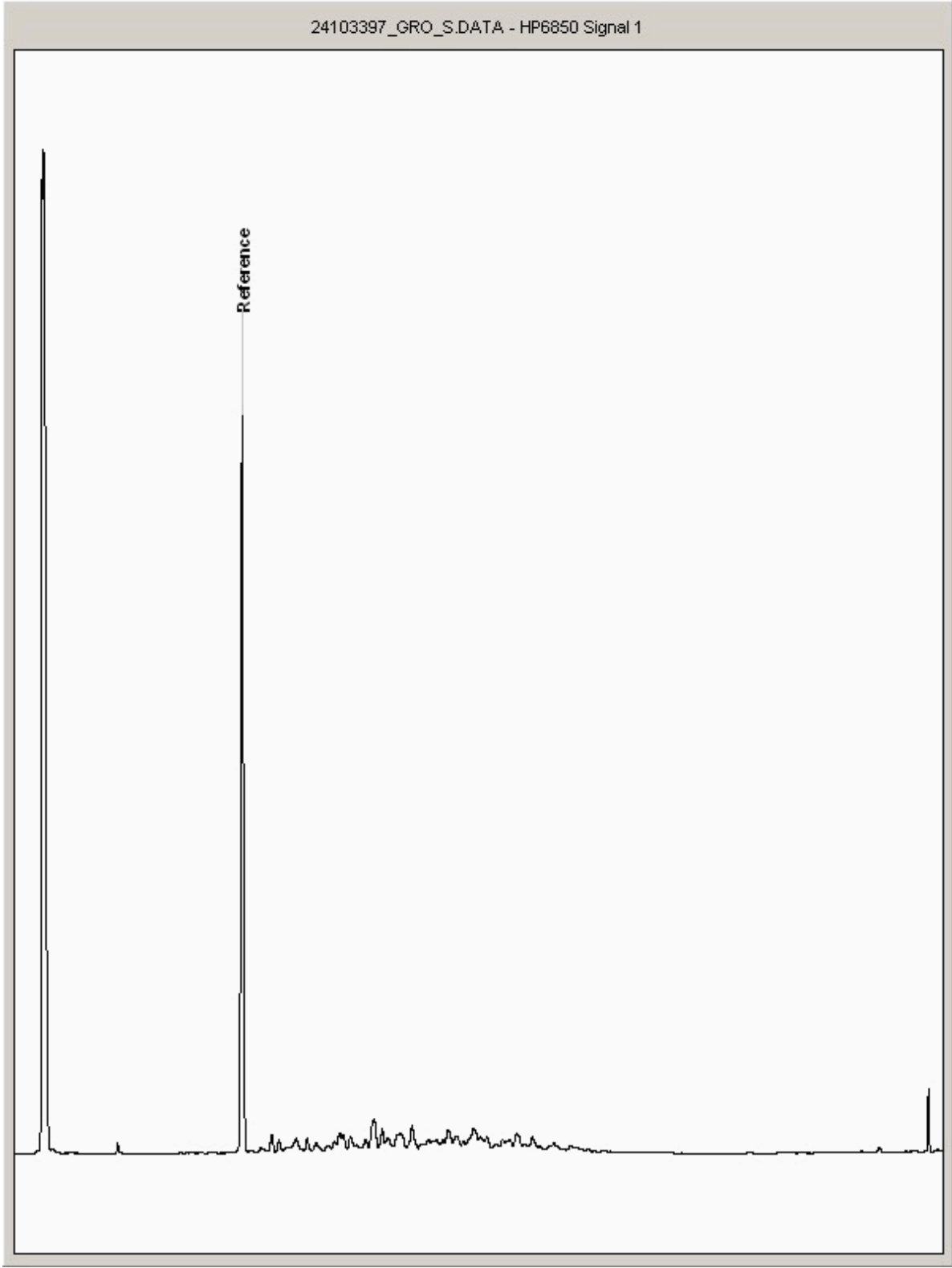
CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103397 Depth : 4.00
Sample ID : BH PTR 44 A



CERTIFICATE OF ANALYSIS

SDG: 210415-108 Client Reference: B025563 Report Number: 595405
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210415-120
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 595432

We received 8 samples on Thursday April 15, 2021 and 2 of these samples were scheduled for analysis which was completed on Monday April 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210415-120 Client Reference: B025563 Report Number: 595432
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24083807	TP - PTR - 37	ES1	0.10	13/04/2021
24083808	TP - PTR - 37	ES2	0.20	13/04/2021
24083809	TP - PTR - 37	ES3	0.50	13/04/2021
24083810	TP - PTR - 37	ES4	1.00	13/04/2021
24083803	TP - PTR - 40	ES1	0.10	13/04/2021
24083804	TP - PTR - 40	ES2	0.20	13/04/2021
24083805	TP - PTR - 40	ES3	0.50	13/04/2021
24083806	TP - PTR - 40	ES4	1.00	13/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24083809		24083806	
	Customer Sample Reference		TP - PTR - 37		TP - PTR - 40	
	AGS Reference		ES3		ES4	
	Depth (m)		0.50		1.00	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2	X		X	
Chromium III	All	NDPs: 0 Tests: 2	X		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X		X	
PAH by GCMS	All	NDPs: 0 Tests: 2	X		X	
pH	All	NDPs: 0 Tests: 2	X		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X		X	
Sample description	All	NDPs: 0 Tests: 1	X			
Total Organic Carbon	All	NDPs: 0 Tests: 2	X		X	
Total Sulphur	All	NDPs: 0 Tests: 2	X		X	

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24083809		24083806	
	Customer Sample Reference		TP - PTR - 37		TP - PTR - 40	
	AGS Reference		ES3		ES4	
	Depth (m)		0.50		1.00	
	Container		1kg TUB with Handle (ALE260)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X	
VOC MS (S)	All	NDPs: 0 Tests: 2		X		X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24083809	TP - PTR - 37	0.50	Light Brown	Chalk	Stones	Vegetation
24083806	TP - PTR - 40	1.00	Light Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP - PTR - 37	TP - PTR - 40				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.50	1.00				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		13/04/2021	13/04/2021				
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.		15/04/2021	15/04/2021				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210415-120	210415-120				
(F)	Trigger breach confirmed		24083809	24083806				
1-445@	Sample deviation (see appendix)		ES3	ES4				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	7.5	9.7				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	0.0108	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	<0.002				
pH	1 pH Units	TM133	8.88	9				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	6	6.15				
Antimony	<0.6 mg/kg	TM181	0.69	0.884				
Arsenic	<0.6 mg/kg	TM181	9.52	5.76				
Barium	<0.6 mg/kg	TM181	11.6	19.5				
Beryllium	<0.01 mg/kg	TM181	0.024	0.0638				
Cadmium	<0.02 mg/kg	TM181	0.03	0.0488				
Chromium	<0.9 mg/kg	TM181	6	6.15				
Copper	<1.4 mg/kg	TM181	4.2	3.26				
Iron	<1000 mg/kg	TM181	12900	9690				
Lead	<0.7 mg/kg	TM181	1.39	0.762				
Manganese	<0.13 mg/kg	TM181	181	225				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.378	0.237				
Nickel	<0.2 mg/kg	TM181	8.59	6.71				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	17.5	13.6				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.		TP - PTR - 37		TP - PTR - 40					
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 Soil/Solid (S) 13/04/2021 . 15/04/2021 210415-120 24083809 ES3	1.00 Soil/Solid (S) 13/04/2021 . 15/04/2021 210415-120 24083806 ES4							
** (F) 1-456	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)											
Component	LOD/Units	Method										
Dibromofluoromethane**	%	TM116	106	105								
Toluene-d8**	%	TM116	99.9	100								
4-Bromofluorobenzene**	%	TM116	103	99.7								
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 #	<6 M								
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #								
Vinyl Chloride	<6 µg/kg	TM116	<6 #	<6 M								
Bromomethane	<10 µg/kg	TM116	<10 #	<10 M								
Chloroethane	<10 µg/kg	TM116	<10 #	<10 M								
Trichlorofluorormethane	<6 µg/kg	TM116	<6 #	<6 M								
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #								
Carbon Disulphide	<7 µg/kg	TM116	<7 #	<7 M								
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #								
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 #	<10 M								
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 M								
1,1-Dichloroethane	<8 µg/kg	TM116	<8 #	<8 M								
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 #	<6 M								
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10								
Bromochloromethane	<10 µg/kg	TM116	<10 #	<10 M								
Chloroform	<8 µg/kg	TM116	<8 #	<8 M								
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 #	<7 M								
1,1-Dichloropropene	<10 µg/kg	TM116	<10 #	<10 M								
Carbontetrachloride	<10 µg/kg	TM116	<10 #	<10 M								
1,2-Dichloroethane	<5 µg/kg	TM116	<5 #	<5 M								
Benzene	<9 µg/kg	TM116	<9 #	<9 M								
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #								
1,2-Dichloropropane	<10 µg/kg	TM116	<10 #	<10 M								
Dibromomethane	<9 µg/kg	TM116	<9 #	<9 M								
Bromodichloromethane	<7 µg/kg	TM116	<7 #	<7 M								
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 #	<10 M								
Toluene	<7 µg/kg	TM116	<7 #	<7 M								
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10								
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 #	<10 M								

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP - PTR - 37	TP - PTR - 40				
# M aq diss.flit tot.unflit + ** (F) 1-4+5@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 #	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 #	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 #	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 #	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 #	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 #	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 #	<10 M				
Styrene	<10 µg/kg	TM116	<10 #	<10 #				
Bromoform	<10 µg/kg	TM116	<10 #	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 #	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 #	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 #	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 #	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 #	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 #	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 #	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 #	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 #	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 #	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 #	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 #	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20				
Naphthalene	<13 µg/kg	TM116	<13 #	<13 M				



CERTIFICATE OF ANALYSIS

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - PTR - 37E53 0.50 SOLID 13/04/2021 00:00:00 15/04/2021 08:15:00 210415-120 24083809 TM048	20/04/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - PTR - 40E54 1.00 SOLID 13/04/2021 00:00:00 15/04/2021 08:15:00 210415-120 24083806 TM048	21/04/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24083809	24083806
Customer Sample Ref.	TP - PTR - 37	TP - PTR - 40
AGS Ref.	ES3	ES4
Depth	0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	23-Apr-2021	23-Apr-2021
Asbestos ID in Solid Samples	20-Apr-2021	21-Apr-2021
Boron Water Soluble	22-Apr-2021	22-Apr-2021
Chromium III	23-Apr-2021	21-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	22-Apr-2021	20-Apr-2021
EPH CWG GC (S)	21-Apr-2021	21-Apr-2021
GRO by GC-FID (S)	21-Apr-2021	22-Apr-2021
Hexavalent Chromium (s)	21-Apr-2021	21-Apr-2021
Metals in solid samples by OES	23-Apr-2021	26-Apr-2021
PAH by GCMS	21-Apr-2021	21-Apr-2021
pH	19-Apr-2021	20-Apr-2021
Phenols by HPLC (S)	21-Apr-2021	21-Apr-2021
Sample description	18-Apr-2021	19-Apr-2021
Total Organic Carbon	23-Apr-2021	23-Apr-2021
Total Sulphur	23-Apr-2021	23-Apr-2021
TPH CWG GC (S)	21-Apr-2021	22-Apr-2021
VOC MS (S)	21-Apr-2021	20-Apr-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2460	QC 2484
Chloride (soluble)	TM243	139.38 80.93 : 111.66	137.82 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	156.07 70.00 : 130.00	150.47 70.00 : 130.00

Boron Water Soluble

Component	Method Code	QC 2493	QC 2421
Water Soluble Boron	TM222	98.5 84.00 : 111.00	98.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2494	QC 2402
Free Cyanide	TM153	91.29 79.00 : 115.00	98.81 79.00 : 115.00
Thiocyanate	TM153	98.72 94.09 : 113.89	103.21 94.09 : 113.89
Total Cyanide	TM153	96.5 73.07 : 107.47	101.4 73.07 : 107.47

EPH CWG GC (S)

Component	Method Code	QC 2419	QC 2459
EPH >C8-C40 Raw	TM414	104.75 73.48 : 116.68	96.33 67.87 : 120.05
Total Aliphatics Raw	TM414	114.06 72.61 : 118.71	103.29 66.68 : 120.89
Total Aromatics Raw	TM414	96.35 63.37 : 122.69	100.49 61.16 : 129.42

GRO by GC-FID (S)

Component	Method Code	QC 2468	QC 2409
QC	TM089	85.33 70.34 : 111.95	83.72 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2460	QC 2449
Hexavalent Chromium	TM151	102.0 92.00 : 111.20	102.0 92.00 : 111.20

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES						

Component	Method Code	QC 2435	QC 2400	QC 2419
Aluminium	TM181	87.43 77.46 : 123.98	100.0 77.46 : 123.98	101.77 77.46 : 123.98
Antimony	TM181	108.13 87.04 : 111.16	102.44 87.04 : 111.16	105.28 87.04 : 111.16
Arsenic	TM181	101.16 87.34 : 110.87	99.71 87.34 : 110.87	104.94 87.34 : 110.87
Barium	TM181	96.33 80.73 : 115.16	99.08 80.73 : 115.16	100.0 80.73 : 115.16
Beryllium	TM181	96.64 89.47 : 112.97	95.52 89.47 : 112.97	107.09 89.47 : 112.97
Boron	TM181	80.8 76.57 : 104.15	92.84 76.57 : 104.15	93.7 76.57 : 104.15
Cadmium	TM181	97.94 78.94 : 102.43	93.0 78.94 : 102.43	96.3 78.94 : 102.43
Chromium	TM181	91.48 77.55 : 104.47	88.64 77.55 : 104.47	94.12 77.55 : 104.47
Cobalt	TM181	88.36 82.95 : 107.41	88.68 82.95 : 107.41	93.71 82.95 : 107.41
Copper	TM181	100.88 84.36 : 106.14	96.48 84.36 : 106.14	100.53 84.36 : 106.14
Iron	TM181	97.62 81.43 : 115.79	98.41 81.43 : 115.79	99.21 81.43 : 115.79
Lead	TM181	91.89 81.95 : 107.63	94.59 81.95 : 107.63	95.5 81.95 : 107.63
Manganese	TM181	106.94 94.29 : 119.51	107.78 94.29 : 119.51	116.39 94.29 : 119.51
Mercury	TM181	95.17 82.73 : 106.36	93.72 82.73 : 106.36	97.83 82.73 : 106.36
Molybdenum	TM181	98.35 86.61 : 111.07	97.12 86.61 : 111.07	100.0 86.61 : 111.07
Nickel	TM181	88.75 79.72 : 103.80	90.22 79.72 : 103.80	94.87 79.72 : 103.80
Phosphorus	TM181	107.07 92.65 : 125.47	109.49 92.65 : 125.47	115.35 92.65 : 125.47
Selenium	TM181	102.35 88.36 : 111.25	101.57 88.36 : 111.25	103.92 88.36 : 111.25
Strontium	TM181	92.43 78.06 : 99.91	90.87 78.06 : 99.91	100.22 78.06 : 99.91
Thallium	TM181	99.56 88.60 : 116.73	100.0 88.60 : 116.73	102.21 88.60 : 116.73
Tin	TM181	103.42 89.77 : 112.62	96.96 89.77 : 112.62	102.66 89.77 : 112.62
Titanium	TM181	69.92 66.29 : 105.96	88.55 66.29 : 105.96	89.31 66.29 : 105.96
Vanadium	TM181	91.58 75.51 : 108.87	91.21 75.51 : 108.87	105.13 75.51 : 108.87
Zinc	TM181	97.74 84.02 : 111.24	98.77 84.02 : 111.24	103.08 84.02 : 111.24

PAH by GCMS

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
PAH by GCMS						

Component	Method Code	QC 2422	QC 2470
Acenaphthene	TM218	84.0 76.79 : 103.90	86.5 76.79 : 103.90
Acenaphthylene	TM218	81.5 74.19 : 106.17	85.5 74.19 : 106.17
Anthracene	TM218	83.0 70.90 : 109.22	86.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.0 73.77 : 119.26	84.0 73.77 : 119.26
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18	83.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58	82.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12	78.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59	83.5 75.98 : 116.59
Chrysene	TM218	85.0 74.82 : 114.18	81.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30	77.0 69.17 : 115.30
Fluoranthene	TM218	79.5 66.06 : 114.63	82.0 66.06 : 114.63
Fluorene	TM218	83.0 76.66 : 107.56	86.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95	78.0 70.26 : 117.95
Naphthalene	TM218	84.0 74.70 : 101.83	84.0 74.70 : 101.83
Phenanthrene	TM218	82.0 73.62 : 109.34	85.5 73.62 : 109.34
Pyrene	TM218	81.0 71.46 : 117.00	81.0 71.46 : 117.00

pH

Component	Method Code	QC 2455	QC 2465
pH	TM133	98.97 97.51 : 101.32	99.12 98.41 : 102.48

Phenols by HPLC (S)

Component	Method Code	QC 2492	QC 2400
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79	43.27 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98	47.39 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18	50.33 69.44 : 122.18

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210415-120	Client Reference:	B025563	Report Number:	595432	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Phenols by HPLC (S)						

		QC 2492	QC 2400
Xylenols by HPLC (S)	TM062 (S)	47.19	48.12
		76.56 : 106.38	76.56 : 106.38

Total Organic Carbon			
Component	Method Code	QC 2436	
Total Organic Carbon	TM132	100.0	
		87.02 : 113.45	

Total Sulphur			
Component	Method Code	QC 2441	QC 2421
Total Sulphur %	TM132	92.75	106.74
		61.64 : 114.47	61.64 : 114.47

VOC MS (S)			
Component	Method Code	QC 2424	QC 2432
1,1,1,2-tetrachloroethane	TM116	100.0	102.4
		84.84 : 116.25	79.10 : 119.66
1,1,1-Trichloroethane	TM116	99.6	101.8
		73.73 : 118.05	88.34 : 114.50
1,1,2-Trichloroethane	TM116	104.0	97.8
		77.12 : 116.04	81.29 : 113.79
1,1-Dichloroethane	TM116	105.6	107.8
		74.46 : 129.15	86.77 : 122.11
1,2-Dichloroethane	TM116	112.0	109.2
		92.38 : 131.65	90.04 : 132.28
1,4-Dichlorobenzene	TM116	97.8	106.0
		83.64 : 126.18	80.81 : 125.07
2-Chlorotoluene	TM116	93.6	95.8
		76.03 : 113.25	73.13 : 114.13
4-Chlorotoluene	TM116	89.8	91.0
		66.90 : 112.46	68.66 : 109.13
Benzene	TM116	103.0	101.6
		88.60 : 113.80	84.29 : 112.22
Carbon Disulphide	TM116	96.8	101.6
		74.91 : 122.14	75.11 : 124.81
Carbontetrachloride	TM116	97.8	96.0
		80.31 : 124.50	82.35 : 126.46
Chlorobenzene	TM116	102.6	103.8
		83.81 : 114.18	82.88 : 122.42
Chloroform	TM116	105.4	106.6
		87.40 : 122.49	90.35 : 120.38
Chloromethane	TM116	92.6	101.6
		65.89 : 136.93	67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	102.4	105.0
		80.67 : 126.72	78.27 : 128.90

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210415-120	Client Reference:	B025563	Report Number:	595432	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						

		QC 2424	QC 2432
Dibromomethane	TM116	99.6	91.0
		73.23 : 118.35	76.00 : 120.73
Dichloromethane	TM116	110.2	110.8
		81.11 : 133.25	92.27 : 134.36
Ethylbenzene	TM116	93.0	94.2
		75.92 : 110.41	70.95 : 113.07
Hexachlorobutadiene	TM116	64.4	110.6
		12.82 : 152.73	14.55 : 147.92
Isopropylbenzene	TM116	82.6	92.8
		55.79 : 97.59	52.00 : 108.19
Naphthalene	TM116	100.0	105.2
		80.86 : 128.81	80.29 : 135.77
o-Xylene	TM116	92.0	92.8
		69.99 : 108.74	68.34 : 101.99
p/m-Xylene	TM116	88.6	88.8
		68.32 : 108.91	69.47 : 97.31
Sec-Butylbenzene	TM116	71.0	83.8
		38.50 : 101.50	27.03 : 135.73
Tetrachloroethene	TM116	98.4	103.4
		76.95 : 121.02	81.43 : 126.65
Toluene	TM116	95.0	93.8
		74.24 : 107.42	82.44 : 103.50
Trichloroethene	TM116	97.6	96.0
		85.28 : 109.36	79.80 : 112.33
Trichlorofluoromethane	TM116	93.4	98.0
		84.55 : 133.27	89.67 : 132.09
Vinyl Chloride	TM116	98.6	109.4
		68.02 : 143.37	69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

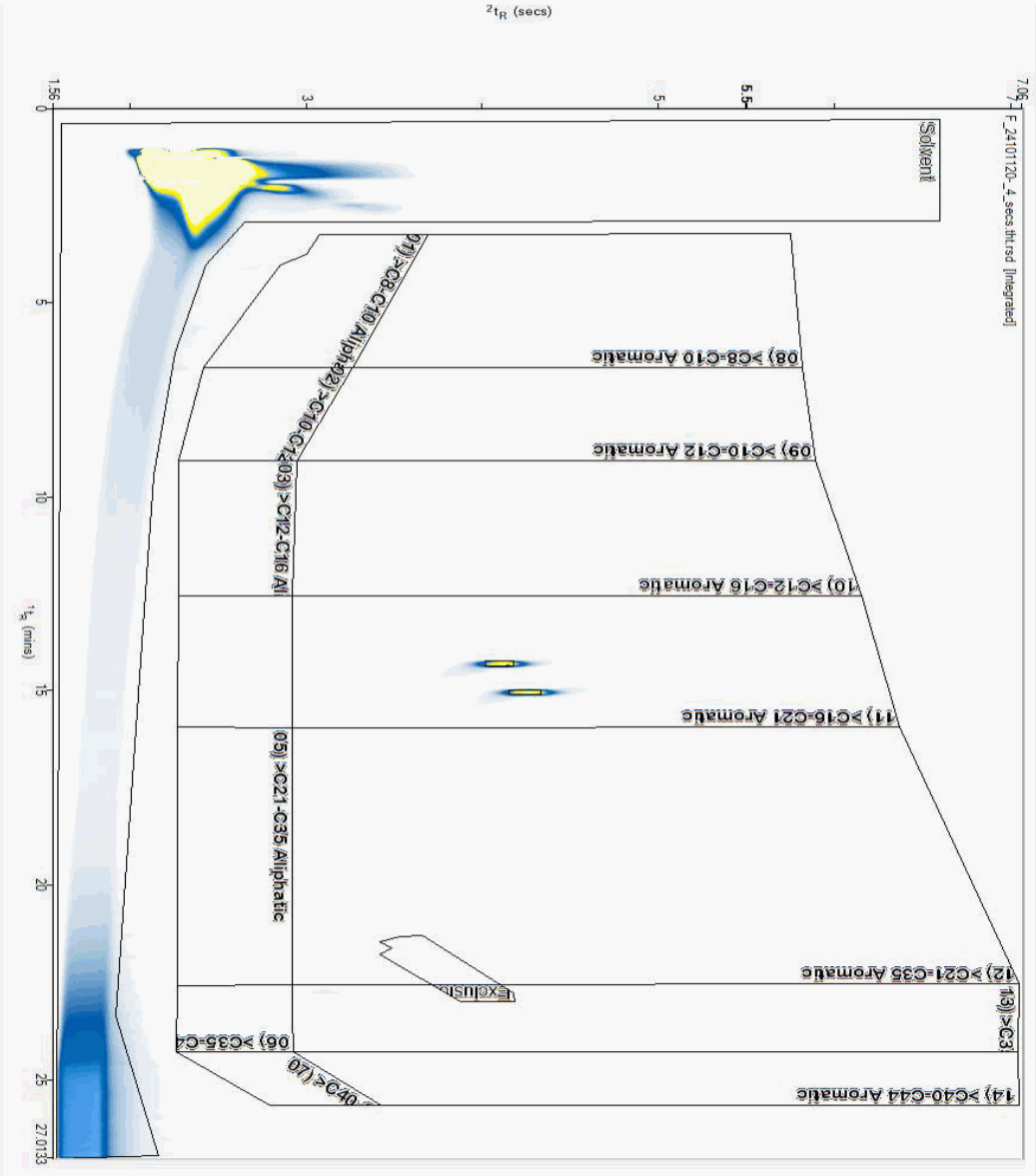
Validated

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24101120 Depth : 0.50
Sample ID : TP - PTR - 37

ChromSpace LIMS export
Current batch
Sample Identity: F_24101120-4_secs.tht
Date Acquired : 19/04/21 05:12:23
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

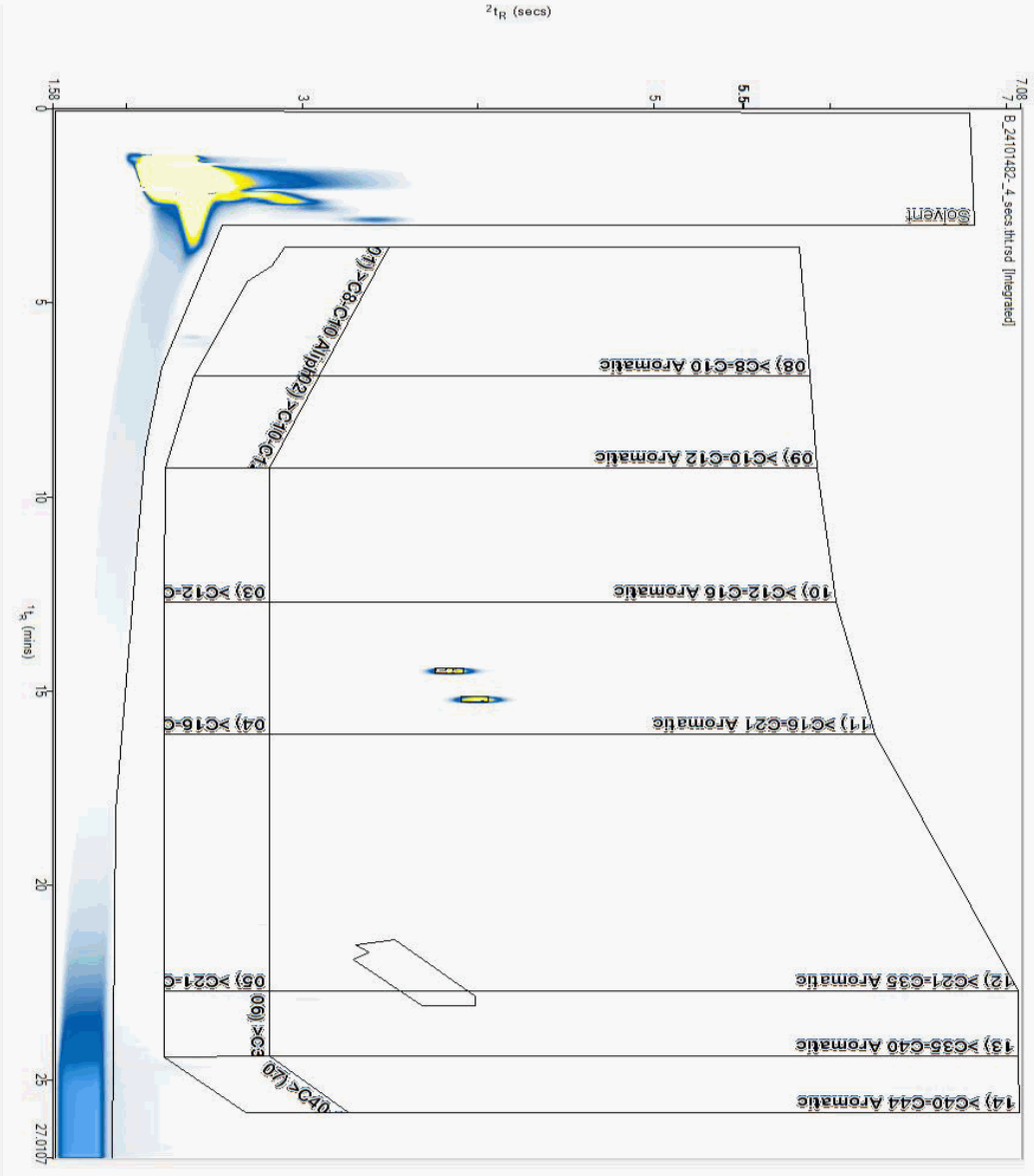
Validated

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24101482 Depth : 1.00
Sample ID : TP - PTR - 40

ChromSpace LIMS export
Current batch
Sample Identity: B_24101482-4_secs.tht
Date Acquired : 20/04/21 04:57:38
Units : ppm
Dilution : 0
CF :
Multiplier :





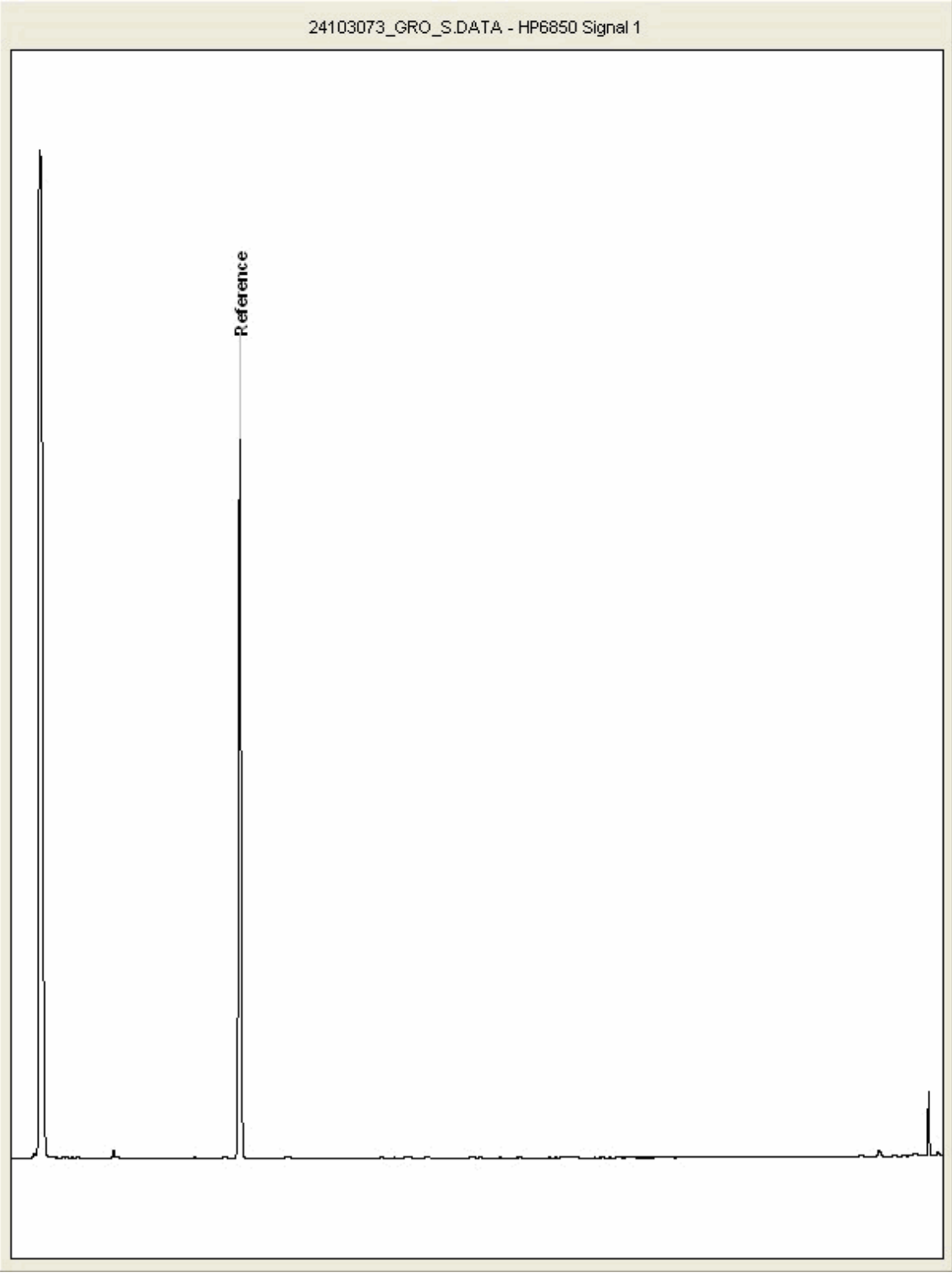
CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103073 Depth : 1.00
Sample ID : TP - PTR - 40



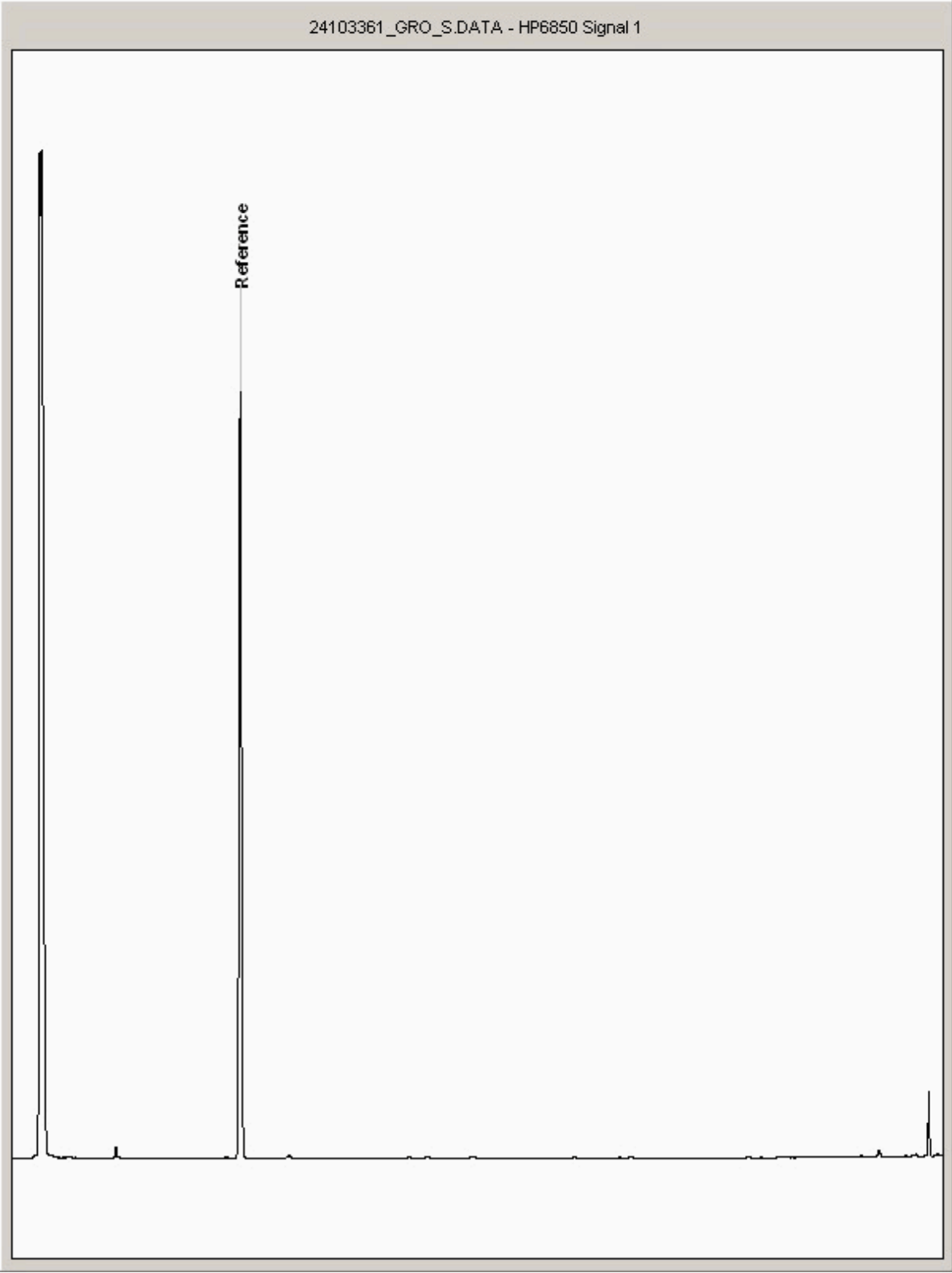
CERTIFICATE OF ANALYSIS

Validated

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24103361 Depth : 0.50
Sample ID : TP - PTR - 37





CERTIFICATE OF ANALYSIS

SDG:	210415-120	Client Reference:	B025563	Report Number:	595432
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
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LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

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CH5 3US

Tel: (01244) 528700

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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

25 April 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210416-89

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

595379

We received 9 samples on Friday April 16, 2021 and 2 of these samples were scheduled for analysis which was completed on Sunday April 25, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 25/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-89 Client Reference: B025563 Report Number: 595379
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24089385	TH04	W1	7.50	13/04/2021
24089380	TP - HRS - 01	ES1	0.00 - 0.10	14/04/2021
24089381	TP - HRS - 01	ES2	0.20 - 0.30	14/04/2021
24089382	TP - HRS - 01	ES3	0.50 - 0.60	14/04/2021
24089384	TP - HRS - 01	ES4	1.00 - 1.30	14/04/2021
24089374	TP - PTR - 13	ES1	0.00 - 0.10	14/04/2021
24089375	TP - PTR - 13	ES2	0.20 - 0.30	14/04/2021
24089376	TP - PTR - 13	ES3	0.50 - 0.60	14/04/2021
24089379	TP - PTR - 13	ES4	1.00 - 1.20	14/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-89 Client Reference: B025563 Report Number: 595379
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24089381	24089375
						TP - HRS - 01	TP - PTR - 13
Depth (m)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	ES2	ES2
						0.20 - 0.30	0.20 - 0.30
Container	Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	60g VOC (ALE215)	250g Amber Jar (ALE210)
						1kg TUB with Handle (ALE260)	60g VOC (ALE215)
Sample Type	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	S	S
						S	S
Ammonium Low	All	NDPs: 0 Tests: 2				X	X
Anions by Kone (soil)	All	NDPs: 0 Tests: 2				X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 2				X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2				X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2				X	X
CEN Readings	All	NDPs: 0 Tests: 2				X	X
Chromium III	All	NDPs: 0 Tests: 4				X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2				X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2				X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2				X	X
EPH CWG GC (S)	All	NDPs: 0 Tests: 2				X	X
Fluoride	All	NDPs: 0 Tests: 2				X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2				X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2				X	X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2				X	X

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24089381		24089375	
	Customer Sample Reference		TP - HRS - 01		TP - PTR - 13	
	AGS Reference		ES2		ES2	
	Depth (m)		0.20 - 0.30		0.20 - 0.30	
	Container		Hande (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X		X	
Mercury Dissolved	All	NDPs: 0 Tests: 2	X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X		X	
Sample description	All	NDPs: 0 Tests: 2		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24089381	TP - HRS - 01	0.20 - 0.30	Light Brown	Loamy Sand	Stones	Vegetation
24089375	TP - PTR - 13	0.20 - 0.30	Light Brown	Loamy Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref.	TP - HRS - 01	TP - PTR - 13				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
+	Subcontracted - refer to subcontractor report for accreditation status.							
..	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-456	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	12	14				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	0.0116				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0307	0.0327				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.011	0.0098				
pH	1 pH Units	TM133	8.48	8.51				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	10.7	9.44				
Antimony	<0.6 mg/kg	TM181	0.921	1.46				
Arsenic	<0.6 mg/kg	TM181	11.1	6.8				
Barium	<0.6 mg/kg	TM181	49.1	52.4				
Beryllium	<0.01 mg/kg	TM181	0.226	0.25				
Cadmium	<0.02 mg/kg	TM181	0.126	0.165				
Chromium	<0.9 mg/kg	TM181	10.7	9.44				
Copper	<1.4 mg/kg	TM181	13.8	11.1				
Iron	<1000 mg/kg	TM181	16500	9680				
Lead	<0.7 mg/kg	TM181	26.5	41.8				
Manganese	<0.13 mg/kg	TM181	428	889				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.485	0.232				
Nickel	<0.2 mg/kg	TM181	13.9	13.6				
Selenium	<1 mg/kg	TM181	<1	1.01				
Vanadium	<0.2 mg/kg	TM181	23	16.8				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

		Validated											
SDG:		210416-89		Client Reference:		B025563		Report Number:		595379			
Location:		Cambridge South East Tra		Order Number:		7000964		Superseded Report:					
VOC MS (S)													
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>			Customer Sample Ref.		TP - HRS - 01		TP - PTR - 13						
Depth (m)			0.20 - 0.30		0.20 - 0.30								
Sample Type			Soil/Solid (S)		Soil/Solid (S)								
Date Sampled			14/04/2021		14/04/2021								
Sampled Time													
Date Received			16/04/2021		16/04/2021								
SDG Ref			210416-89		210416-89								
Lab Sample No.(s)			24089381		24089375								
AGS Reference			ES2		ES2								
Component		LOD/Units	Method										
Dibromofluoromethane**		%	TM116	109		107							
Toluene-d8**		%	TM116	96.3		97.5							
4-Bromofluorobenzene**		%	TM116	82		83.8							
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M		<6 M							
Chloromethane		<7 µg/kg	TM116	<7 #		<7 #							
Vinyl Chloride		<6 µg/kg	TM116	<6 M		<6 M							
Bromomethane		<10 µg/kg	TM116	<10 M		<10 M							
Chloroethane		<10 µg/kg	TM116	<10 M		<10 M							
Trichlorofluorormethane		<6 µg/kg	TM116	<6 M		<6 M							
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #		<10 #							
Carbon Disulphide		<7 µg/kg	TM116	<7 M		<7 M							
Dichloromethane		<10 µg/kg	TM116	<10 #		<10 #							
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M		<10 M							
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M		<10 M							
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M		<8 M							
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M		<6 M							
2,2-Dichloropropane		<10 µg/kg	TM116	<10		<10							
Bromochloromethane		<10 µg/kg	TM116	<10 M		<10 M							
Chloroform		<8 µg/kg	TM116	<8 M		<8 M							
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M		<7 M							
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M		<10 M							
Carbontetrachloride		<10 µg/kg	TM116	<10 M		<10 M							
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M		<5 M							
Benzene		<9 µg/kg	TM116	<9 M		<9 M							
Trichloroethene		<9 µg/kg	TM116	<9 #		<9 #							
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M		<10 M							
Dibromomethane		<9 µg/kg	TM116	<9 M		<9 M							
Bromodichloromethane		<7 µg/kg	TM116	<7 M		<7 M							
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M		<10 M							
Toluene		<7 µg/kg	TM116	<7 M		<7 M							
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10		<10							
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M		<10 M							

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		Validated											
SDG:		210416-89		Client Reference:		B025563		Report Number:		595379			
Location:		Cambridge South East Tra		Order Number:		7000964		Superseded Report:					
VOC MS (S)													
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>			Customer Sample Ref.		TP - HRS - 01		TP - PTR - 13						
Depth (m)			0.20 - 0.30		0.20 - 0.30								
Sample Type			Soil/Solid (S)		Soil/Solid (S)								
Date Sampled			14/04/2021		14/04/2021								
Sampled Time													
Date Received			16/04/2021		16/04/2021								
SDG Ref			210416-89		210416-89								
Lab Sample No.(s)			24089381		24089375								
AGS Reference			ES2		ES2								
Component		LOD/Units	Method										
1,3-Dichloropropane		<7 µg/kg	TM116	<7 M		<7 M							
Tetrachloroethene		<5 µg/kg	TM116	<5 M		<5 M							
Dibromochloromethane		<10 µg/kg	TM116	<10 M		<10 M							
1,2-Dibromoethane		<10 µg/kg	TM116	<10 M		<10 M							
Chlorobenzene		<5 µg/kg	TM116	<5 M		<5 M							
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10 M		<10 M							
Ethylbenzene		<4 µg/kg	TM116	<4 M		<4 M							
p/m-Xylene		<10 µg/kg	TM116	<10 #		<10 #							
o-Xylene		<10 µg/kg	TM116	<10 M		<10 M							
Styrene		<10 µg/kg	TM116	<10 #		<10 #							
Bromoform		<10 µg/kg	TM116	<10 M		<10 M							
Isopropylbenzene		<5 µg/kg	TM116	<5 #		<5 #							
1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10 #		<10 #							
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16 M		<16 M							
Bromobenzene		<10 µg/kg	TM116	<10 M		<10 M							
Propylbenzene		<10 µg/kg	TM116	<10 M		<10 M							
2-Chlorotoluene		<9 µg/kg	TM116	<9 M		<9 M							
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8 M		<8 M							
4-Chlorotoluene		<10 µg/kg	TM116	<10 M		<10 M							
tert-Butylbenzene		<14 µg/kg	TM116	<14 M		<14 M							
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9 #		<9 #							
sec-Butylbenzene		<10 µg/kg	TM116	<10		<10							
4-Isopropyltoluene		<10 µg/kg	TM116	<10 M		<10 M							
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8 M		<8 M							
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5 M		<5 M							
n-Butylbenzene		<11 µg/kg	TM116	<11		<11							
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10 M		<10 M							
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14 M		<14 M							
Tert-amyl methyl ether		<10 µg/kg	TM116	<10 #		<10 #							
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20		<20							
Hexachlorobutadiene		<20 µg/kg	TM116	<20		<20							
Naphthalene		<13 µg/kg	TM116	<13 M		<13 M							

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-89

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 595379

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	TP - HRS - 01	TP - PTR - 13				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 - 0.30	0.20 - 0.30				
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		14/04/2021	14/04/2021				
diss.filt	Dissolved / filtered sample.		-	-				
tot.unfilt	Total / unfiltered sample.		16/04/2021	16/04/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210416-89	210416-89				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24089381	24089375				
(F)	Trigger breach confirmed		ES2	ES2				
1-44@	Sample deviation (see appendix)							
Component	LOD/Units		Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M				
Styrene	<10 µg/kg	TM116	<10 #	<10 #				
Bromoform	<10 µg/kg	TM116	<10 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20				
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M				

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SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.104	Natural Moisture Content (%)	16.8
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.6
Particle Size <4mm	>95%		

Case

SDG	210416-89			
Lab Sample Number(s)	24089375			
Sampled Date	14-Apr-2021			
Customer Sample Ref.	TP - PTR - 13 ES2			
Depth (m)	0.20 - 0.30			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.31	<3	63.1	<30	-	-	-
Fluoride	0.774	<0.5	7.74	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00134	<0.0005	0.0134	<0.005	-	-	-
Barium	0.00293	<0.0002	0.0293	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0203	<0.01	0.203	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	18.2	<0.2	182	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.000256	<0.0002	0.00256	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.313	<0.036	3.13	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000808	<0.0004	0.00808	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0019	<0.001	0.019	<0.01	-	-	-
Zinc	0.00313	<0.001	0.0313	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.16
Conductivity (µS/cm)	94.20
Temperature (°C)	21.10
Volume Leachant (Litres)	0.885



SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.104	Natural Moisture Content (%)		16.8
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		85.6
Particle Size <4mm	>95%			

Case

SDG	210416-89			
Lab Sample Number(s)	24089375			
Sampled Date	14-Apr-2021			
Customer Sample Ref.	TP - PTR - 13 ES2			
Depth (m)	0.20 - 0.30			

[illegible]

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	9.16
Conductivity (µS/cm)	94.20
Temperature (°C)	21.10
Volume Leachant (Litres)	0.885

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)		18.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		84.2
Particle Size <4mm	>95%			

Case

SDG	210416-89			
Lab Sample Number(s)	24089381			
Sampled Date	14-Apr-2021			
Customer Sample Ref.	TP - HRS - 01 ES2			
Depth (m)	0.20 - 0.30			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.016	<0.01	0.16	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.23	<3	62.3	<30	-	-	-
Fluoride	0.683	<0.5	6.83	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00446	<0.0005	0.0446	<0.005	-	-	-
Barium	0.00617	<0.0002	0.0617	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0309	<0.01	0.309	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.1	<0.2	231	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.000215	<0.0002	0.00215	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.579	<0.036	5.79	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00105	<0.0004	0.0105	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00262	<0.001	0.0262	<0.01	-	-	-
Zinc	0.00189	<0.001	0.0189	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	8.46
Conductivity (µS/cm)	133.00
Temperature (°C)	19.50
Volume Leachant (Litres)	0.883



SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	18.7
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84.2
Particle Size <4mm	>95%		

Case

SDG	210416-89			
Lab Sample Number(s)	24089381			
Sampled Date	14-Apr-2021			
Customer Sample Ref.	TP - HRS - 01 ES2			
Depth (m)	0.20 - 0.30			

[illegible]

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	8.46
Conductivity (µS/cm)	133.00
Temperature (°C)	19.50
Volume Leachant (Litres)	0.883

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	24089381	24089375
	TP - HRS - 01	TP - PTR - 13
	ES2	ES2
	0.20 - 0.30	0.20 - 0.30
AGS Ref.		
Depth		
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	22-Apr-2021	22-Apr-2021
Anions by Kone (soil)	20-Apr-2021	21-Apr-2021
Anions by Kone (w)	20-Apr-2021	20-Apr-2021
Asbestos ID in Solid Samples	20-Apr-2021	20-Apr-2021
Boron Water Soluble	20-Apr-2021	20-Apr-2021
CEN 10:1 Leachate (1 Stage)	19-Apr-2021	19-Apr-2021
CEN Readings	20-Apr-2021	20-Apr-2021
Chromium III	22-Apr-2021	22-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	20-Apr-2021	20-Apr-2021
Dissolved Metals by ICP-MS	21-Apr-2021	21-Apr-2021
Dissolved Organic/Inorganic Carbon	25-Apr-2021	25-Apr-2021
EPH CWG GC (S)	20-Apr-2021	20-Apr-2021
Fluoride	21-Apr-2021	21-Apr-2021
GRO by GC-FID (S)	20-Apr-2021	21-Apr-2021
Hexavalent Chromium (s)	21-Apr-2021	21-Apr-2021
Low Level Cyanide (W)	22-Apr-2021	22-Apr-2021
Low Level Hexavalent Chromium (w)	21-Apr-2021	21-Apr-2021
Mercury Dissolved	22-Apr-2021	22-Apr-2021
Metals in solid samples by OES	22-Apr-2021	22-Apr-2021
Moisture at 105C	19-Apr-2021	19-Apr-2021
PAH by GCMS	20-Apr-2021	20-Apr-2021
pH	19-Apr-2021	19-Apr-2021
pH Value of Filtered Water	21-Apr-2021	21-Apr-2021
Phenols by HPLC (S)	20-Apr-2021	20-Apr-2021
Phenols by HPLC (W)	21-Apr-2021	21-Apr-2021
Sample description	17-Apr-2021	17-Apr-2021
Total Organic Carbon	23-Apr-2021	23-Apr-2021
Total Sulphur	20-Apr-2021	20-Apr-2021
TPH CWG GC (S)	20-Apr-2021	21-Apr-2021
VOC MS (S)	20-Apr-2021	20-Apr-2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2435
Ammoniacal Nitrogen as N	TM099	100.4 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2474
Chloride (soluble)	TM243	125.39 83.05 : 116.28
Water Soluble Sulphate as SO4 2:1 Extract	TM243	146.26 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2457
Chloride	TM184	103.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2411
Water Soluble Boron	TM222	99.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2402
Free Cyanide	TM153	98.81 79.00 : 115.00
Thiocyanate	TM153	103.21 94.09 : 113.89
Total Cyanide	TM153	101.4 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2436
Aluminium	TM152	99.0 90.78 : 110.89
Antimony	TM152	101.33 77.22 : 119.42
Arsenic	TM152	97.33 86.77 : 107.67



CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Dissolved Metals by ICP-MS

		QC 2436
Barium	TM152	99.17 87.86 : 110.23
Beryllium	TM152	99.67 86.19 : 112.98
Bismuth	TM152	96.17 84.06 : 106.46
Borate	TM152	101.85 88.00 : 112.00
Boron	TM152	101.67 83.92 : 114.90
Cadmium	TM152	97.67 88.89 : 106.69
Calcium	TM152	96.67 80.24 : 117.95
Chromium	TM152	97.83 83.22 : 110.16
Cobalt	TM152	97.33 82.49 : 112.36
Copper	TM152	96.33 83.14 : 113.00
Iron	TM152	98.0 88.40 : 109.24
Lead	TM152	97.0 83.71 : 109.58
Lithium	TM152	98.5 84.50 : 114.28
Magnesium	TM152	94.0 87.56 : 114.57
Manganese	TM152	98.5 90.01 : 108.72
Molybdenum	TM152	95.33 85.53 : 107.42
Nickel	TM152	97.5 88.05 : 106.42
Phosphorus	TM152	96.83 82.76 : 107.72
Potassium	TM152	96.67 88.45 : 106.42
Selenium	TM152	98.0 85.61 : 111.03
Silver	TM152	95.67 88.48 : 110.48
Sodium	TM152	94.67 88.32 : 106.30
Strontium	TM152	98.67 83.77 : 107.87
Tellurium	TM152	95.5 82.83 : 104.73
Thallium	TM152	94.17 77.47 : 113.87
Tin	TM152	100.0 87.36 : 109.55
Titanium	TM152	101.5 87.29 : 108.31

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2436
Tungsten	TM152	98.0 68.27 : 122.97
Uranium	TM152	95.5 82.46 : 105.16
Vanadium	TM152	97.5 88.43 : 114.30
Zinc	TM152	98.0 85.57 : 114.31

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2415
Dissolved Inorganic Carbon	TM090	129.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.83 96.13 : 109.53

Fluoride

Component	Method Code	QC 2427	QC 2463
Fluoride	TM104	103.33 96.67 : 108.67	104.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2419	QC 2436
QC	TM089	90.63 70.75 : 114.19	93.56 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2449
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2462
Free Cyanide - Low Level	TM279	81.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.5 81.83 : 110.45

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Mercury Dissolved						

Component	Method Code	QC 2438
Mercury Dissolved (CVAF)	TM183	104.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2467
Aluminium	TM181	100.88 77.46 : 123.98
Antimony	TM181	105.69 87.04 : 111.16
Arsenic	TM181	106.98 87.34 : 110.87
Barium	TM181	100.0 80.73 : 115.16
Beryllium	TM181	101.49 89.47 : 112.97
Boron	TM181	94.84 76.57 : 104.15
Cadmium	TM181	99.59 78.94 : 102.43
Chromium	TM181	91.28 77.55 : 104.47
Cobalt	TM181	92.77 82.95 : 107.41
Copper	TM181	100.7 84.36 : 106.14
Iron	TM181	102.38 81.43 : 115.79
Lead	TM181	96.17 81.95 : 107.63
Manganese	TM181	110.0 94.29 : 119.51
Mercury	TM181	97.58 82.73 : 106.36
Molybdenum	TM181	100.82 86.61 : 111.07
Nickel	TM181	94.87 79.72 : 103.80
Phosphorus	TM181	113.54 92.65 : 125.47
Selenium	TM181	103.53 88.36 : 111.25
Strontium	TM181	95.55 78.06 : 99.91
Thallium	TM181	104.87 88.60 : 116.73
Tin	TM181	104.56 89.77 : 112.62
Titanium	TM181	88.55 66.29 : 105.96

Metals in solid samples by OES

		QC 2467
Vanadium	TM181	95.24 75.51 : 108.87
Zinc	TM181	103.49 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2422
Acenaphthene	TM218	84.0 76.79 : 103.90
Acenaphthylene	TM218	81.5 74.19 : 106.17
Anthracene	TM218	83.0 70.90 : 109.22
Benz(a)anthracene	TM218	85.0 73.77 : 119.26
Benzo(a)pyrene	TM218	85.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	82.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	84.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	84.5 75.98 : 116.59
Chrysene	TM218	85.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30
Fluoranthene	TM218	79.5 66.06 : 114.63
Fluorene	TM218	83.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	81.5 70.26 : 117.95
Naphthalene	TM218	84.0 74.70 : 101.83
Phenanthrene	TM218	82.0 73.62 : 109.34
Pyrene	TM218	81.0 71.46 : 117.00

pH

Component	Method Code	QC 2455
pH	TM133	98.97 97.51 : 101.32

pH Value of Filtered Water

pH Value of Filtered Water

Component	Method Code	QC 2462	QC 2464
pH	TM256	101.07 99.33 : 102.54	100.94 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2492
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	47.19 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2411
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	89.87 82.77 : 126.51
Cresols by HPLC (W)	TM259	97.37 76.60 : 126.28
Napthol by HPLC (W)	TM259	99.61 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	96.2 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2411	QC 2436
Total Organic Carbon	TM132	101.17 87.02 : 113.45	100.0 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2425
Total Sulphur %	TM132	97.93 61.64 : 114.47



CERTIFICATE OF ANALYSIS

Validated

SDG:210416-89

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

595379

VOC MS (S)

Component	Method Code	QC 2424
1,1,1,2-tetrachloroethane	TM116	98.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	100.2 86.26 : 117.53
1,1,2-Trichloroethane	TM116	102.6 75.16 : 112.70
1,1-Dichloroethane	TM116	104.6 83.27 : 122.16
1,2-Dichloroethane	TM116	107.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	111.8 82.59 : 123.23
2-Chlorotoluene	TM116	105.2 66.81 : 118.43
4-Chlorotoluene	TM116	102.8 65.88 : 114.76
Benzene	TM116	96.4 93.16 : 123.63
Carbon Disulphide	TM116	93.2 75.11 : 124.81
Carbontetrachloride	TM116	104.4 82.35 : 126.46
Chlorobenzene	TM116	100.0 85.07 : 118.13
Chloroform	TM116	104.2 88.13 : 122.71
Chloromethane	TM116	82.8 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	105.0 78.27 : 128.90
Dibromomethane	TM116	103.2 77.47 : 121.29
Dichloromethane	TM116	109.6 87.89 : 134.72
Ethylbenzene	TM116	88.6 79.92 : 110.05
Hexachlorobutadiene	TM116	67.2 16.78 : 153.29
Isopropylbenzene	TM116	79.8 64.20 : 119.59
Naphthalene	TM116	123.2 79.29 : 125.59
o-Xylene	TM116	88.4 72.86 : 102.10
p/m-Xylene	TM116	82.1 74.06 : 106.47
Sec-Butylbenzene	TM116	79.0 44.71 : 117.87
Tetrachloroethene	TM116	96.4 77.82 : 125.00
Toluene	TM116	93.6 87.82 : 116.21
Trichloroethene	TM116	94.6 79.80 : 112.33

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CERTIFICATE OF ANALYSIS

Validated

SDG:210416-89

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

595379

VOC MS (S)

		QC 2424
Trichlorofluoromethane	TM116	93.0 80.52 : 132.12
Vinyl Chloride	TM116	99.0 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .

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CERTIFICATE OF ANALYSIS

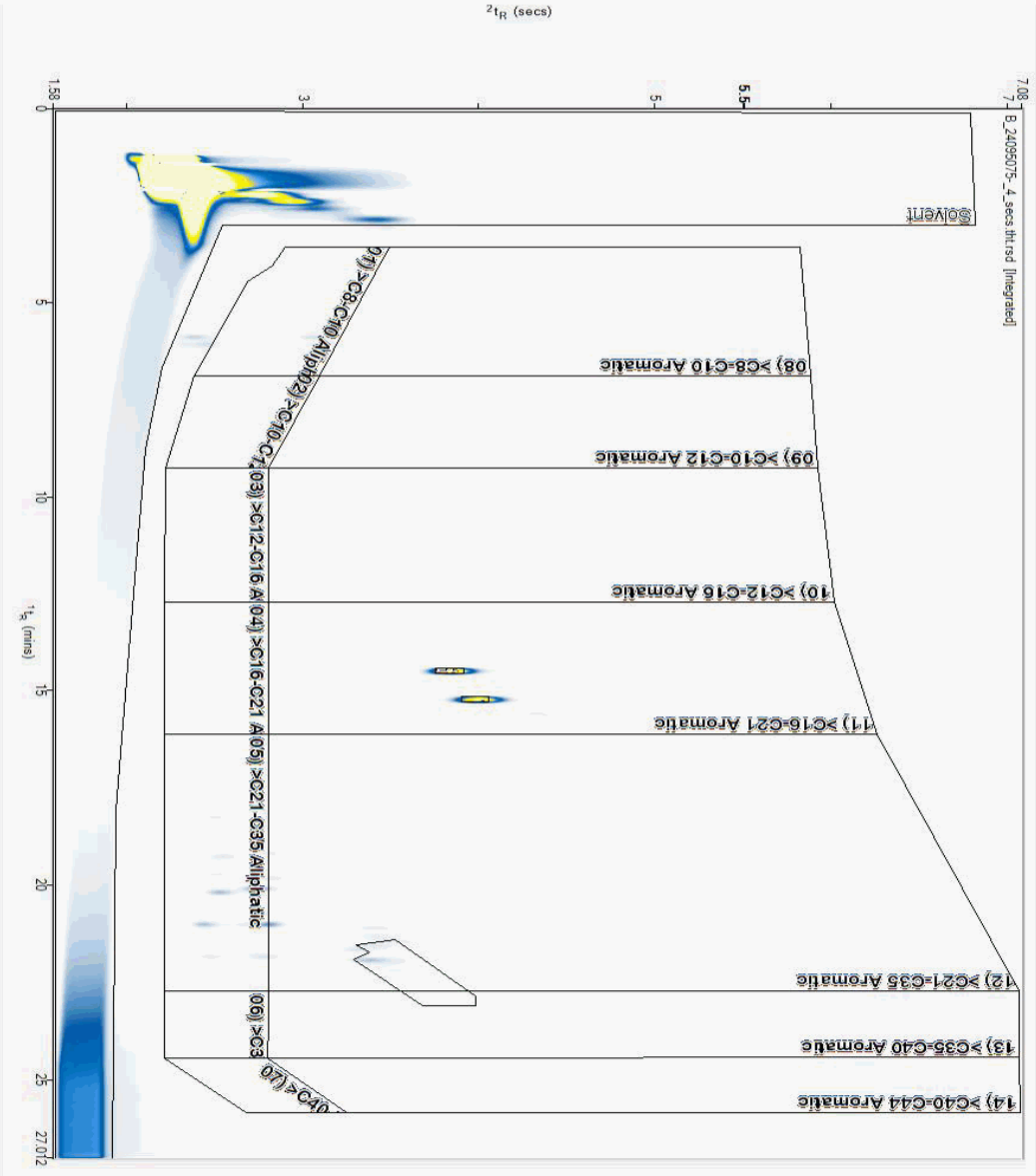
Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24095075 Depth : 0.20 - 0.30
Sample ID : TP - HRS - 01

ChromSpace LIMS export
Current batch
Sample Identity: B_24095075-4_secs.tht
Date Acquired : 19/04/21 09:24:44
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

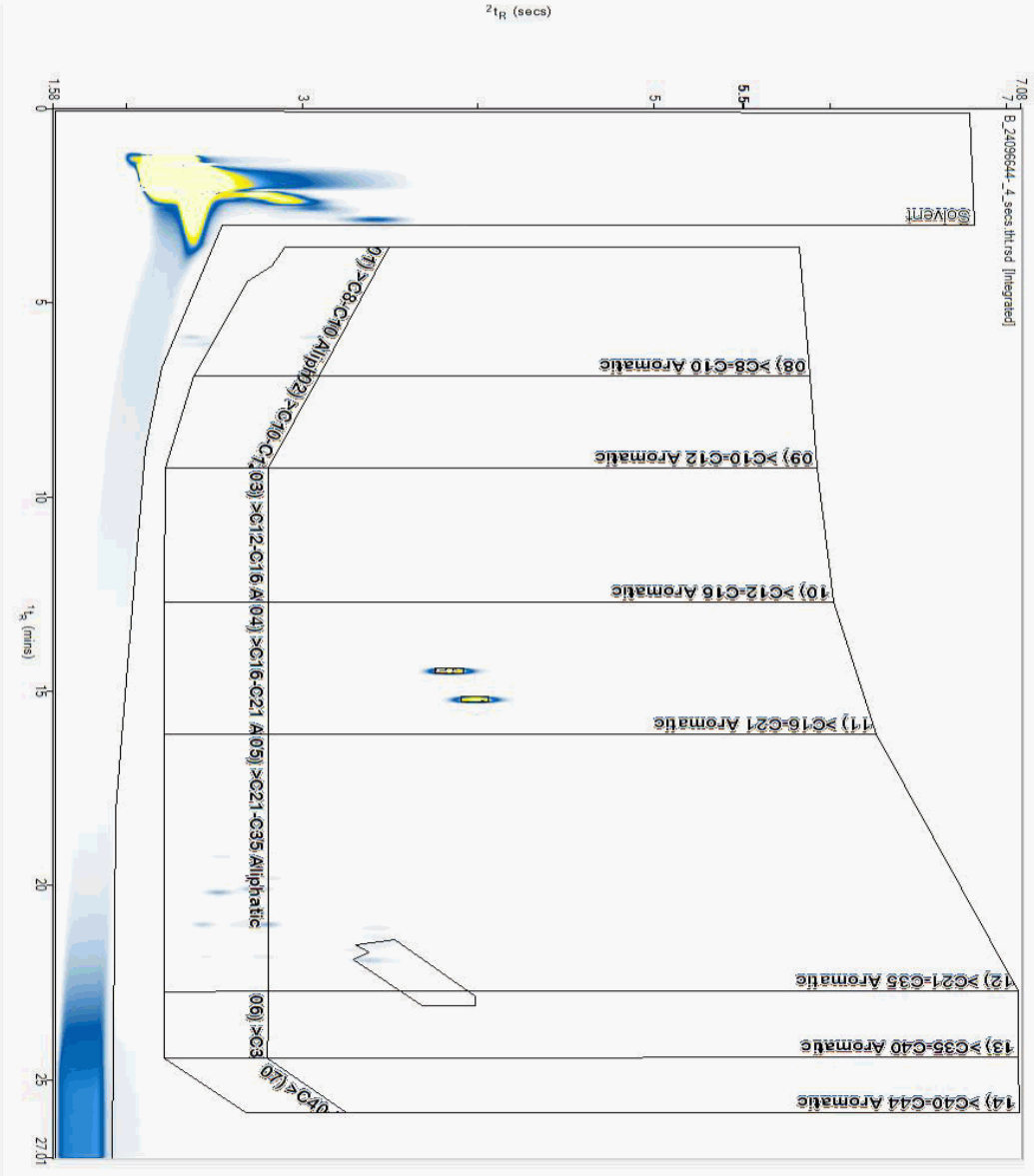
Validated

SDG:	210416-89	Client Reference:	B025563	Report Number:	595379
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24096644 Depth : 0.20 - 0.30
Sample ID : TP - PTR - 13

ChromSpace LIMS export
Current batch
Sample Identity: B_24096644-4_secs.tht
Date Acquired : 19/04/21 07:18:35
Units : ppm
Dilution : 0
CF :
Multiplier :





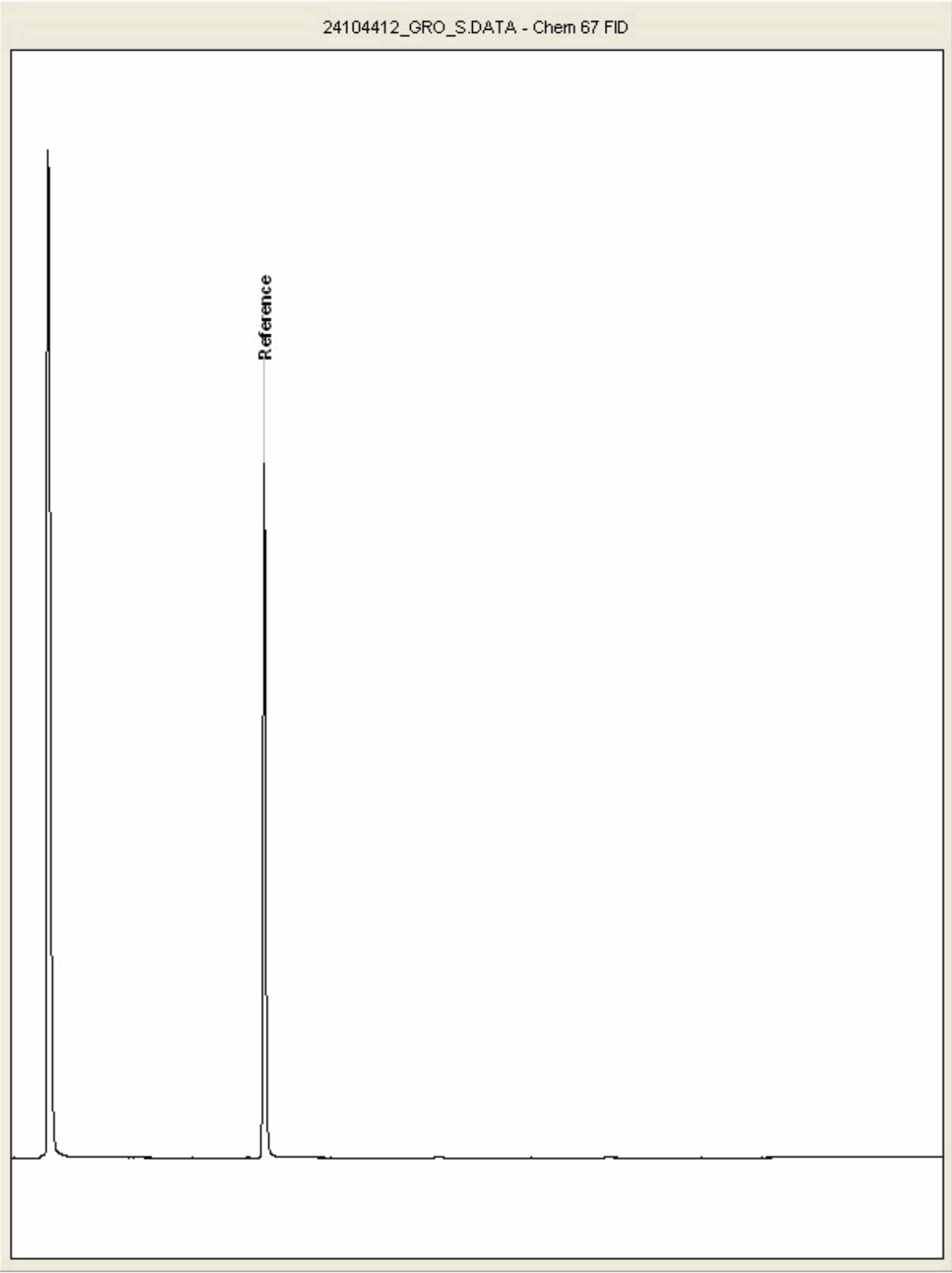
CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-89 Client Reference: B025563 Report Number: 595379
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24104412 Depth : 0.20 - 0.30
Sample ID : TP - HRS - 01



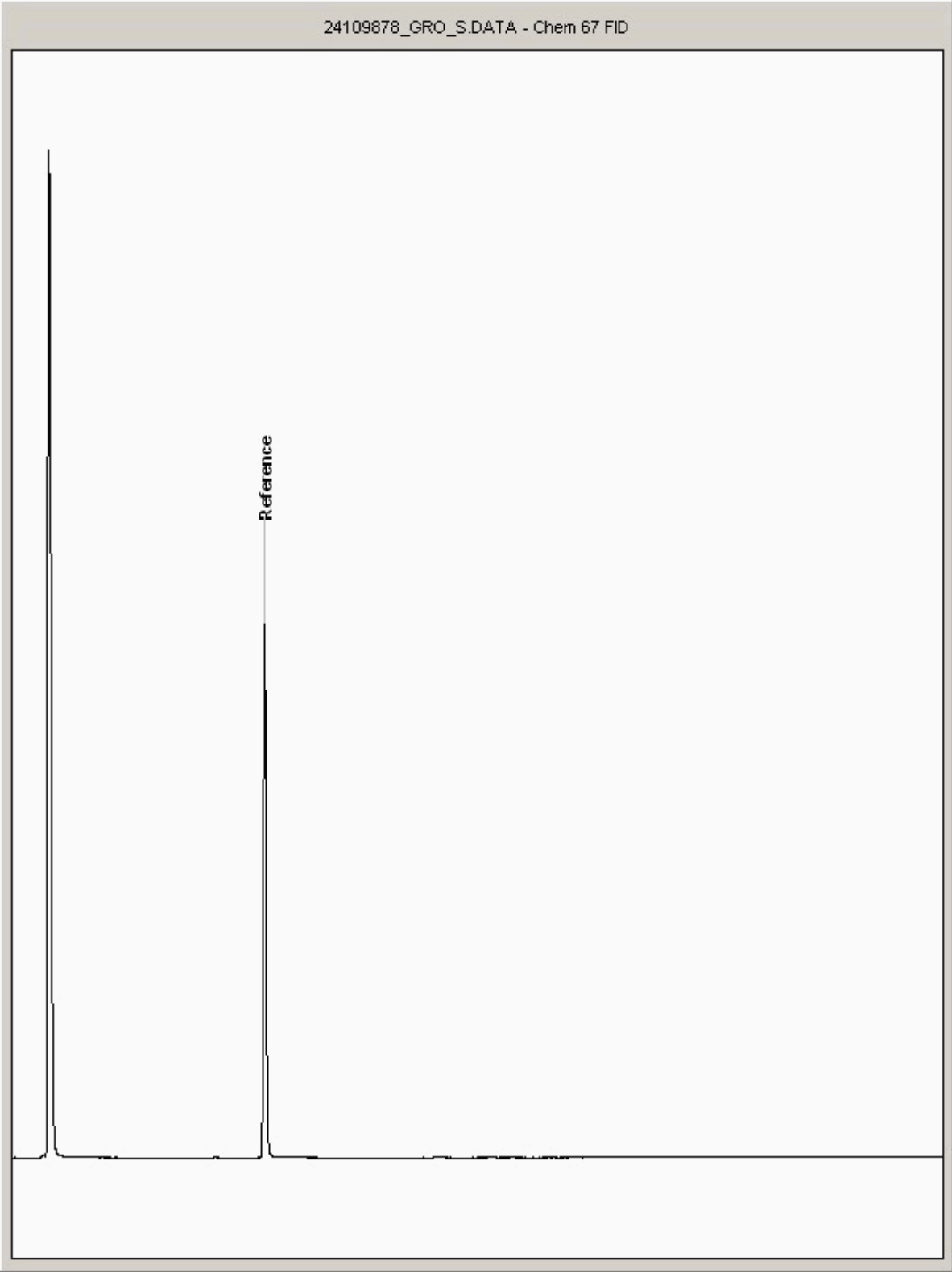
CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-89 Client Reference: B025563 Report Number: 595379
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24109878 Depth : 0.20 - 0.30
Sample ID : TP - PTR - 13





CERTIFICATE OF ANALYSIS

SDG: 210416-89 **Client Reference:** B025563 **Report Number:** 595379
Location: idge South East Transport - Ph: **Order Number:** 7000964 **Superseded Report:**

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 25 April 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210416-92
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 595380

We received 4 samples on Friday April 16, 2021 and 1 of these samples were scheduled for analysis which was completed on Sunday April 25, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 25/04/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-92 Client Reference: B025563 Report Number: 595380
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24089758	TP - PTR - 14	ES1	0.00 - 0.10	14/04/2021
24089759	TP - PTR - 14	ES2	0.20 - 0.30	14/04/2021
24089760	TP - PTR - 14	ES3	0.50 - 0.60	14/04/2021
24089762	TP - PTR - 14	ES4	1.00 - 1.10	14/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210416-92 Client Reference: B025563 Report Number: 595380
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24089758		
	Customer Sample Reference		TP - PTR - 14		
	AGS Reference		ES1		
	Depth (m)		0.00 - 0.10		
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24089758		
	Customer Sample Reference		TP - PTR - 14		
	AGS Reference		EST		
	Depth (m)		0.00 - 0.10		
	Container		1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24089758	TP - PTR - 14	0.00 - 0.10	Light Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unflit + "" (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>TP - PTR - 14</div> <div>0.00 - 0.10 Soil/Solid (S) 14/04/2021 . 16/04/2021 210416-92 24089758 ES1</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	13						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Sulphur, Total	<0.02 %	TM132	0.0291						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0112	#					
pH	1 pH Units	TM133	8.52	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
Chromium, Trivalent	<0.9 mg/kg	TM181	8.22						
Antimony	<0.6 mg/kg	TM181	0.775	#					
Arsenic	<0.6 mg/kg	TM181	5.74	M					
Barium	<0.6 mg/kg	TM181	55.6	#					
Beryllium	<0.01 mg/kg	TM181	0.199	M					
Cadmium	<0.02 mg/kg	TM181	0.17	M					
Chromium	<0.9 mg/kg	TM181	8.22	M					
Copper	<1.4 mg/kg	TM181	9.69	M					
Iron	<1000 mg/kg	TM181	10200	#					
Lead	<0.7 mg/kg	TM181	15.3	M					
Manganese	<0.13 mg/kg	TM181	853	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	0.223	#					
Nickel	<0.2 mg/kg	TM181	11.8	M					
Selenium	<1 mg/kg	TM181	<1	#					
Vanadium	<0.2 mg/kg	TM181	14.2	#					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	TP - PTR - 14					
#	ISO17025 accredited. mCERTS accredited.							
M	Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.10 Soil/Solid (S) 14/04/2021 . 16/04/2021 210416-92 24089758 ES1					
aq	Disolved / filtered sample.							
dis.filt	Total / unfiltered sample.							
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
**	Trigger breach confirmed							
(F)	Sample deviation (see appendix)							
1-44@								
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	109					
Toluene-d8**	%	TM116	95.2					
4-Bromofluorobenzene**	%	TM116	80.5					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	M				
Chloromethane	<7 µg/kg	TM116	<7	#				
Vinyl Chloride	<6 µg/kg	TM116	<6	M				
Bromomethane	<10 µg/kg	TM116	<10	M				
Chloroethane	<10 µg/kg	TM116	<10	M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6	M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10	#				
Carbon Disulphide	<7 µg/kg	TM116	<7	M				
Dichloromethane	<10 µg/kg	TM116	<10	#				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8	M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10	M				
Chloroform	<8 µg/kg	TM116	<8	M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10	M				
Carbontetrachloride	<10 µg/kg	TM116	<10	M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5	M				
Benzene	<9 µg/kg	TM116	<9	M				
Trichloroethene	<9 µg/kg	TM116	<9	#				
1,2-Dichloropropane	<10 µg/kg	TM116	<10	M				
Dibromomethane	<9 µg/kg	TM116	<9	M				
Bromodichloromethane	<7 µg/kg	TM116	<7	M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	M				
Toluene	<7 µg/kg	TM116	<7	M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	M				

VOC MS (S)

Results Legend		Customer Sample Ref.	TP - PTR - 14					
#	ISO17025 accredited. mCERTS accredited.							
M	Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.10 Soil/Solid (S) 14/04/2021 . 16/04/2021 210416-92 24089758 ES1					
aq	Disolved / filtered sample.							
dis.filt	Total / unfiltered sample.							
tot.unfilt	Subcontracted - refer to subcontractor report for accreditation status.							
*	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
**	Trigger breach confirmed							
(F)	Sample deviation (see appendix)							
1-44@								
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7	M				
Tetrachloroethene	<5 µg/kg	TM116	<5	M				
Dibromochloromethane	<10 µg/kg	TM116	<10	M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10	M				
Chlorobenzene	<5 µg/kg	TM116	<5	M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	M				
Ethylbenzene	<4 µg/kg	TM116	<4	M				
p/m-Xylene	<10 µg/kg	TM116	<10	#				
o-Xylene	<10 µg/kg	TM116	<10	M				
Styrene	<10 µg/kg	TM116	<10	#				
Bromoform	<10 µg/kg	TM116	<10	M				
Isopropylbenzene	<5 µg/kg	TM116	<5	#				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	#				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	M				
Bromobenzene	<10 µg/kg	TM116	<10	M				
Propylbenzene	<10 µg/kg	TM116	<10	M				
2-Chlorotoluene	<9 µg/kg	TM116	<9	M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	M				
4-Chlorotoluene	<10 µg/kg	TM116	<10	M				
tert-Butylbenzene	<14 µg/kg	TM116	<14	M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	#				
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10	M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	M				
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	#				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13	M				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)	16.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.8
Particle Size <4mm	>95%		

Case

SDG	210416-92			
Lab Sample Number(s)	24089758			
Sampled Date	14-Apr-2021			
Customer Sample Ref.	TP - PTR - 14 ES1			
Depth (m)	0.00 - 0.10			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.028	<0.01	0.28	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.84	<3	68.4	<30	-	-	-
Fluoride	<0.5	<0.5	<5	<5	-	-	-
Mercury Dissolved (CVAF)	0.0000135	<0.00001	0.000135	<0.0001	-	-	-
Arsenic	0.00201	<0.0005	0.0201	<0.005	-	-	-
Barium	0.181	<0.0002	1.81	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0895	<0.01	0.895	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.2	<0.2	232	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.00278	<0.0002	0.0278	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.512	<0.036	5.12	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00114	<0.0004	0.0114	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00395	<0.001	0.0395	<0.01	-	-	-
Zinc	0.0225	<0.001	0.225	<0.01	-	-	-
Chloride	2.9	<2	29	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	8.56
Conductivity (µS/cm)	137.00
Temperature (°C)	18.50
Volume Leachant (Litres)	0.885

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)	16.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.8
Particle Size <4mm	>95%		

Case

SDG	210416-92			
Lab Sample Number(s)	24089758			
Sampled Date	14-Apr-2021			
Customer Sample Ref.	TP - PTR - 14 ES1			
Depth (m)	0.00 - 0.10			

[illegible]

Leach Test Information

Date Prepared	19-Apr-2021
pH (pH Units)	8.56
Conductivity (µS/cm)	137.00
Temperature (°C)	18.50
Volume Leachant (Litres)	0.885

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24089758
Customer Sample Ref.	TP - PTR - 14
AGS Ref.	ES1
Depth	0.00 - 0.10
Type	Soil/Solid (S)
Ammonium Low	23-Apr-2021
Anions by Kone (soil)	20-Apr-2021
Anions by Kone (w)	23-Apr-2021
Asbestos ID in Solid Samples	20-Apr-2021
Boron Water Soluble	20-Apr-2021
CEN 10:1 Leachate (1 Stage)	19-Apr-2021
CEN Readings	20-Apr-2021
Chromium III	23-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	20-Apr-2021
Dissolved Metals by ICP-MS	23-Apr-2021
Dissolved Organic/Inorganic Carbon	25-Apr-2021
EPH CWG GC (S)	20-Apr-2021
Fluoride	22-Apr-2021
GRO by GC-FID (S)	20-Apr-2021
Hexavalent Chromium (s)	21-Apr-2021
Low Level Cyanide (W)	22-Apr-2021
Low Level Hexavalent Chromium (w)	22-Apr-2021
Mercury Dissolved	22-Apr-2021
Metals in solid samples by OES	21-Apr-2021
Moisture at 105C	19-Apr-2021
PAH by GCMS	22-Apr-2021
pH	19-Apr-2021
pH Value of Filtered Water	21-Apr-2021
Phenols by HPLC (S)	20-Apr-2021
Phenols by HPLC (W)	22-Apr-2021
Sample description	17-Apr-2021
Total Organic Carbon	22-Apr-2021
Total Sulphur	20-Apr-2021
TPH CWG GC (S)	20-Apr-2021
VOC MS (S)	20-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2463
Ammoniacal Nitrogen as N	TM099	99.6 96.04 : 106.80

Anions by Kone (w)

Component	Method Code	QC 2479
Chloride	TM184	94.4 91.40 : 109.10
Sulphate (soluble)	TM184	96.0 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2411
Water Soluble Boron	TM222	99.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2402
Free Cyanide	TM153	98.81 79.00 : 115.00
Thiocyanate	TM153	103.21 94.09 : 113.89
Total Cyanide	TM153	101.4 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2463	QC 2421
Aluminium	TM152	108.0 90.78 : 110.89	100.67 90.78 : 110.89
Antimony	TM152	107.17 77.22 : 119.42	102.33 77.22 : 119.42
Arsenic	TM152	105.67 86.77 : 107.67	98.5 86.77 : 107.67
Barium	TM152	107.17 87.86 : 110.23	99.33 87.86 : 110.23
Beryllium	TM152	108.83 86.19 : 112.98	102.83 86.19 : 112.98
Bismuth	TM152	106.17 84.06 : 106.46	96.83 84.06 : 106.46
Borate	TM152	111.11 88.00 : 112.00	103.7 88.00 : 112.00

Dissolved Metals by ICP-MS

		QC 2463	QC 2421
Boron	TM152	110.67 83.92 : 114.90	103.67 83.92 : 114.90
Cadmium	TM152	105.67 88.89 : 106.69	98.83 88.89 : 106.69
Calcium	TM152	104.0 80.24 : 117.95	98.0 80.24 : 117.95
Chromium	TM152	105.67 83.22 : 110.16	97.83 83.22 : 110.16
Cobalt	TM152	105.33 82.49 : 112.36	97.67 82.49 : 112.36
Copper	TM152	105.83 83.14 : 113.00	97.5 83.14 : 113.00
Iron	TM152	106.67 88.40 : 109.24	98.0 88.40 : 109.24
Lead	TM152	104.67 83.71 : 109.58	96.83 83.71 : 109.58
Lithium	TM152	108.5 84.50 : 114.28	102.5 84.50 : 114.28
Magnesium	TM152	103.33 87.56 : 114.57	96.0 87.56 : 114.57
Manganese	TM152	106.5 90.01 : 108.72	99.17 90.01 : 108.72
Molybdenum	TM152	103.0 85.53 : 107.42	94.83 85.53 : 107.42
Nickel	TM152	105.83 88.05 : 106.42	98.0 88.05 : 106.42
Phosphorus	TM152	106.5 82.76 : 107.72	100.33 82.76 : 107.72
Potassium	TM152	104.67 88.45 : 106.42	98.67 88.45 : 106.42
Selenium	TM152	104.83 85.61 : 111.03	96.17 85.61 : 111.03
Silver	TM152	105.17 88.48 : 110.48	95.33 88.48 : 110.48
Sodium	TM152	104.0 88.32 : 106.30	96.67 88.32 : 106.30
Strontium	TM152	103.67 83.77 : 107.87	98.33 83.77 : 107.87
Tellurium	TM152	101.5 82.83 : 104.73	97.5 82.83 : 104.73
Thallium	TM152	103.67 77.47 : 113.87	92.83 77.47 : 113.87
Tin	TM152	107.83 87.36 : 109.55	100.17 87.36 : 109.55
Titanium	TM152	110.33 87.29 : 108.31	104.0 87.29 : 108.31
Tungsten	TM152	104.83 68.27 : 122.97	97.83 68.27 : 122.97
Uranium	TM152	103.33 82.46 : 105.16	95.33 82.46 : 105.16
Vanadium	TM152	106.67 88.43 : 114.30	103.83 88.43 : 114.30
Zinc	TM152	106.67 85.57 : 114.31	99.33 85.57 : 114.31

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Organic/Inorganic Carbon						

Component	Method Code	QC 2415
Dissolved Inorganic Carbon	TM090	129.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.83 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2419
EPH >C8-C40 Raw	TM414	104.75 73.48 : 116.68
Total Aliphatics Raw	TM414	114.06 72.61 : 118.71
Total Aromatics Raw	TM414	96.35 63.37 : 122.69

Fluoride

Component	Method Code	QC 2456
Fluoride	TM104	104.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2419
QC	TM089	90.63 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2449
Hexavalent Chromium	TM151	102.0 92.00 : 111.20

Low Level Cyanide (W)

Component	Method Code	QC 2462
Free Cyanide - Low Level	TM279	81.0 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.5 81.83 : 110.45

Mercury Dissolved

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Mercury Dissolved						

Component	Method Code	QC 2414
Mercury Dissolved (CVAF)	TM183	110.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2420
Aluminium	TM181	93.81 77.46 : 123.98
Antimony	TM181	96.34 87.04 : 111.16
Arsenic	TM181	96.8 87.34 : 110.87
Barium	TM181	94.5 80.73 : 115.16
Beryllium	TM181	94.4 89.47 : 112.97
Boron	TM181	88.25 76.57 : 104.15
Cadmium	TM181	88.48 78.94 : 102.43
Chromium	TM181	85.8 77.55 : 104.47
Cobalt	TM181	86.16 82.95 : 107.41
Copper	TM181	92.78 84.36 : 106.14
Iron	TM181	94.44 81.43 : 115.79
Lead	TM181	92.79 81.95 : 107.63
Manganese	TM181	104.72 94.29 : 119.51
Mercury	TM181	91.06 82.73 : 106.36
Molybdenum	TM181	93.42 86.61 : 111.07
Nickel	TM181	87.04 79.72 : 103.80
Phosphorus	TM181	102.63 92.65 : 125.47
Selenium	TM181	98.43 88.36 : 111.25
Strontium	TM181	88.42 78.06 : 99.91
Thallium	TM181	96.46 88.60 : 116.73
Tin	TM181	94.68 89.77 : 112.62
Titanium	TM181	87.79 66.29 : 105.96

Metals in solid samples by OES

		QC 2420
Vanadium	TM181	89.74 75.51 : 108.87
Zinc	TM181	95.48 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2402
Acenaphthene	TM218	91.0 73.47 : 109.80
Acenaphthylene	TM218	88.5 70.00 : 130.00
Anthracene	TM218	89.5 68.68 : 111.89
Benz(a)anthracene	TM218	98.0 68.12 : 118.39
Benzo(a)pyrene	TM218	90.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	88.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	84.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	93.0 73.10 : 117.03
Chrysene	TM218	96.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	86.0 67.32 : 121.35
Fluoranthene	TM218	94.5 75.16 : 117.28
Fluorene	TM218	89.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	87.5 68.91 : 117.62
Naphthalene	TM218	84.0 72.12 : 106.18
Phenanthrene	TM218	94.5 69.01 : 113.72
Pyrene	TM218	94.0 64.28 : 115.75

pH

Component	Method Code	QC 2455
pH	TM133	98.97 97.51 : 101.32

pH Value of Filtered Water

pH Value of Filtered Water

Component	Method Code	QC 2468
pH	TM256	101.34 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2492
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.69 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	46.97 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	47.19 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2484
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	91.78 82.77 : 126.51
Cresols by HPLC (W)	TM259	97.37 76.60 : 126.28
Napthol by HPLC (W)	TM259	97.66 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	95.25 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2446
Total Organic Carbon	TM132	102.34 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2425
Total Sulphur %	TM132	97.93 61.64 : 114.47



CERTIFICATE OF ANALYSIS

Validated

SDG:210416-92

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

595380

VOC MS (S)

Component	Method Code	QC 2424
1,1,1,2-tetrachloroethane	TM116	98.0 86.59 : 118.97
1,1,1-Trichloroethane	TM116	100.2 86.26 : 117.53
1,1,2-Trichloroethane	TM116	102.6 75.16 : 112.70
1,1-Dichloroethane	TM116	104.6 83.27 : 122.16
1,2-Dichloroethane	TM116	107.0 89.30 : 133.10
1,4-Dichlorobenzene	TM116	111.8 82.59 : 123.23
2-Chlorotoluene	TM116	105.2 66.81 : 118.43
4-Chlorotoluene	TM116	102.8 65.88 : 114.76
Benzene	TM116	96.4 93.16 : 123.63
Carbon Disulphide	TM116	93.2 75.11 : 124.81
Carbontetrachloride	TM116	104.4 82.35 : 126.46
Chlorobenzene	TM116	100.0 85.07 : 118.13
Chloroform	TM116	104.2 88.13 : 122.71
Chloromethane	TM116	82.8 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	105.0 78.27 : 128.90
Dibromomethane	TM116	103.2 77.47 : 121.29
Dichloromethane	TM116	109.6 87.89 : 134.72
Ethylbenzene	TM116	88.6 79.92 : 110.05
Hexachlorobutadiene	TM116	67.2 16.78 : 153.29
Isopropylbenzene	TM116	79.8 64.20 : 119.59
Naphthalene	TM116	123.2 79.29 : 125.59
o-Xylene	TM116	88.4 72.86 : 102.10
p/m-Xylene	TM116	82.1 74.06 : 106.47
Sec-Butylbenzene	TM116	79.0 44.71 : 117.87
Tetrachloroethene	TM116	96.4 77.82 : 125.00
Toluene	TM116	93.6 87.82 : 116.21
Trichloroethene	TM116	94.6 79.80 : 112.33



CERTIFICATE OF ANALYSIS

Validated

SDG:210416-92

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

595380

VOC MS (S)

		QC 2424
Trichlorofluoromethane	TM116	93.0 80.52 : 132.12
Vinyl Chloride	TM116	99.0 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



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SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24095121 Depth : 0.00 - 0.10
Sample ID : TP - PTR - 14



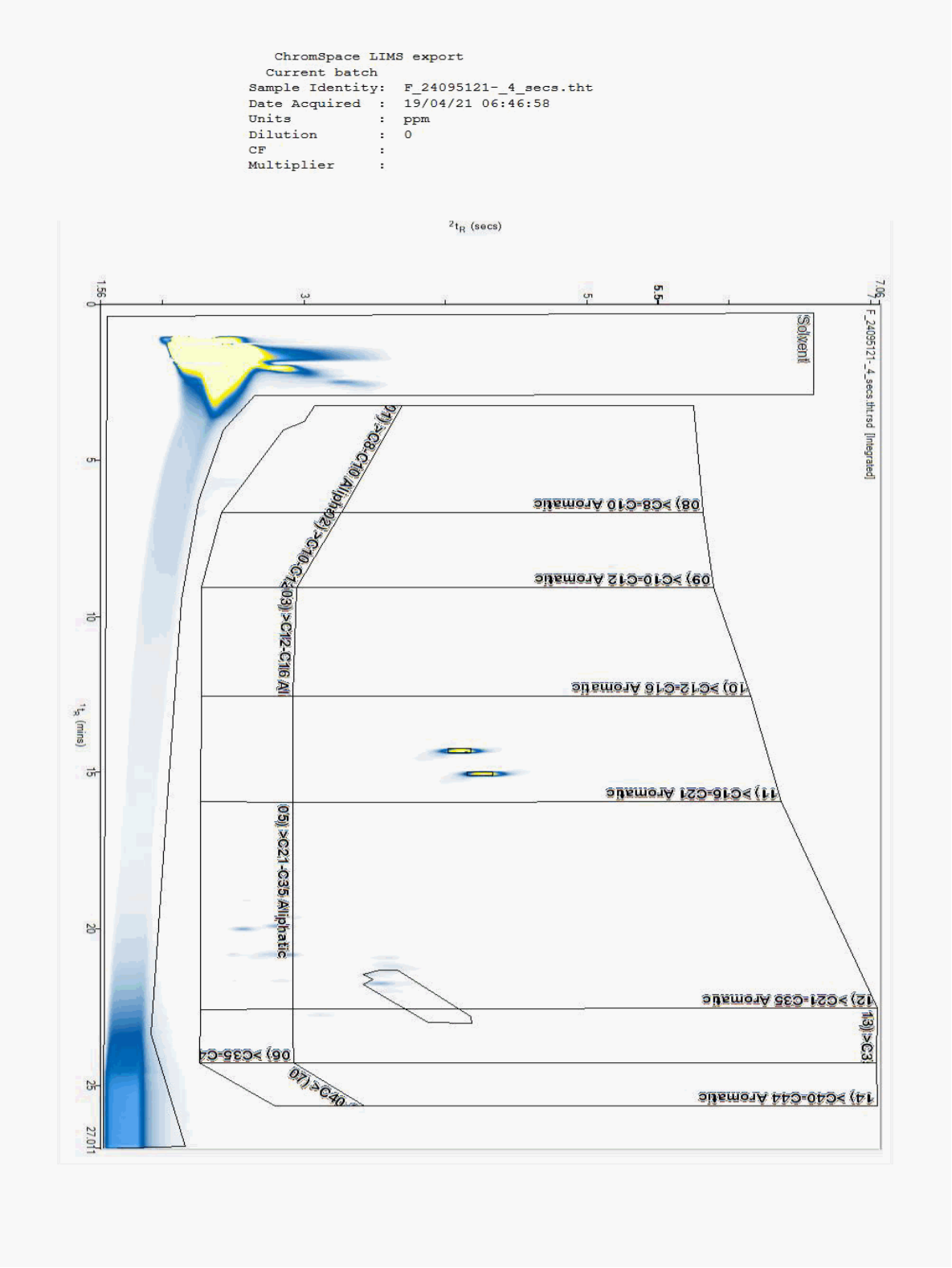
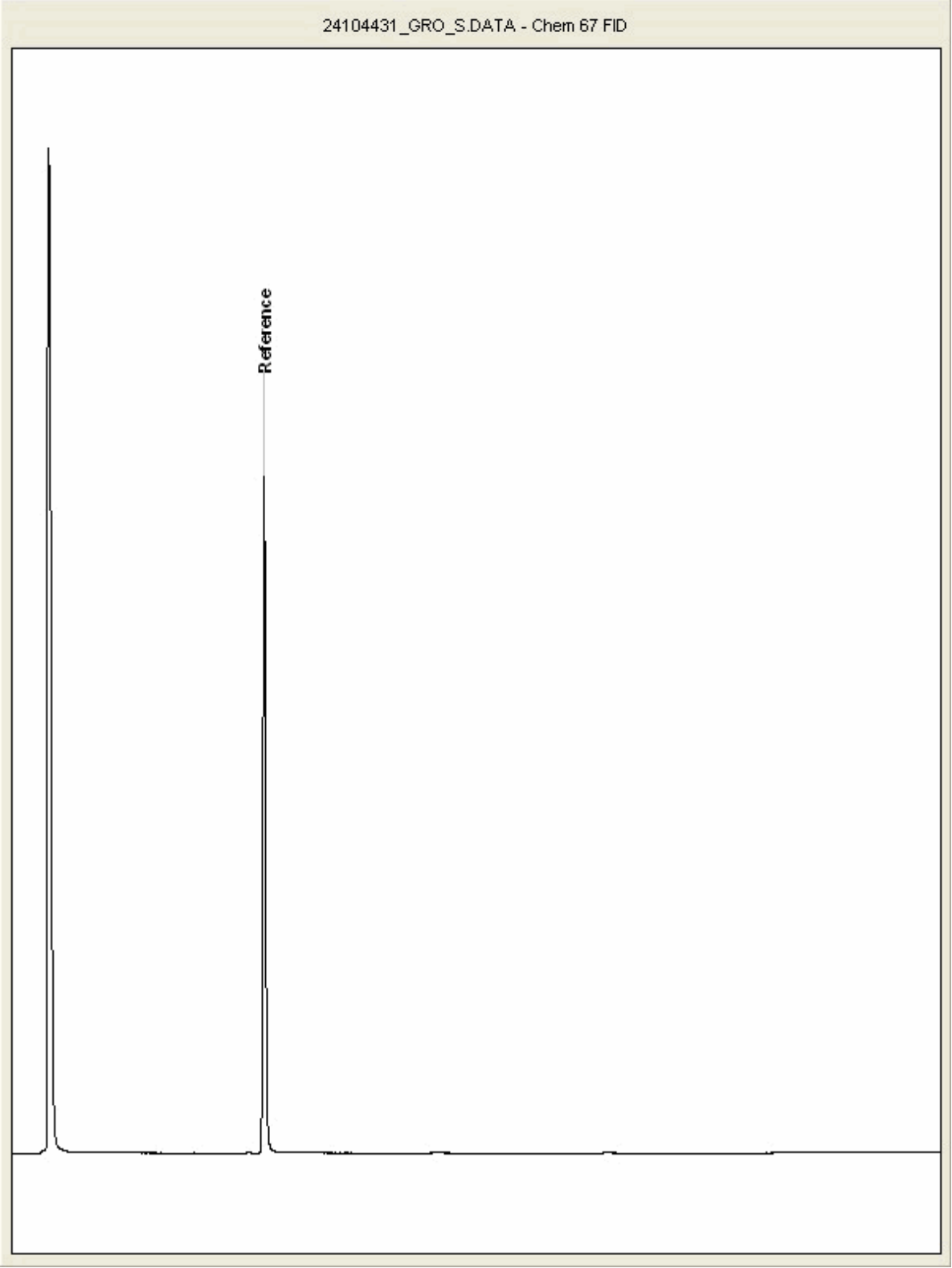
CERTIFICATE OF ANALYSIS

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SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24104431 Depth : 0.00 - 0.10
Sample ID : TP - PTR - 14





CERTIFICATE OF ANALYSIS

SDG:	210416-92	Client Reference:	B025563	Report Number:	595380
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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CH5 3US

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CERTIFICATE OF ANALYSIS

Date of report Generation:

04 May 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210422-166

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

596413

We received 14 samples on Thursday April 22, 2021 and 1 of these samples were scheduled for analysis which was completed on Tuesday May 04, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7

Version Issued: 04/05/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-166 Client Reference: B025563 Report Number: 596413
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24131660	TPTH-05	ES1		20/04/2021
24131662	TPTH-05	ES2		20/04/2021
24131663	TPTH-05	ES3		20/04/2021
24131665	TPTH-05	ES5		20/04/2021
24131666	TPTH-05	ES9		20/04/2021
24131667	TPTH-05	ES13	2.80	20/04/2021
24131655	TPTH-10	ES1	0.10	20/04/2021
24131656	TPTH-10	ES2	0.20	20/04/2021
24131657	TPTH-10	ES3	0.50	20/04/2021
24131659	TPTH-10	ES5	1.00	20/04/2021
24131649	TPTH-12	ES1	0.10	20/04/2021
24131651	TPTH-12	ES2	0.20	20/04/2021
24131653	TPTH-12	ES3	0.50	20/04/2021
24131654	TPTH-12	ES9	1.00	20/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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SDG: 210422-166 Client Reference: B025563 Report Number: 596413
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24131651		
	Customer Sample Reference		TPTH-12		
	AGS Reference		ES2		
	Depth (m)		0.20		
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)
	Sample Type		S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
CEN Readings	All	NDPs: 0 Tests: 1	X		
Chromium III	All	NDPs: 0 Tests: 2	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X		

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div>	Lab Sample No(s)		24131651			
	Customer Sample Reference		TPTH-12			
	AGS Reference		ES2			
	Depth (m)		0.20			
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	
	Sample Type		S	S	S	
	Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
	Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X		
PAH by GCMS	All	NDPs: 0 Tests: 1		X		
pH	All	NDPs: 0 Tests: 1		X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Sample description	All	NDPs: 0 Tests: 1		X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X		
Total Sulphur	All	NDPs: 0 Tests: 1		X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X		
VOC MS (S)	All	NDPs: 0 Tests: 1			X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24131651	TPTH-12	0.20	Dark Brown	Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

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SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.filt tot.unfilt + "" (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>TPTH-12</div> <div>0.20 Soil/Solid (S) 20/04/2021 . 22/04/2021 210422-166 24131651 ES2</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	5.3						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Sulphur, Total	<0.02 %	TM132	0.0248						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00837	#					
pH	1 pH Units	TM133	8.3	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
Chromium, Trivalent	<0.9 mg/kg	TM181	13.3						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	12.3	M					
Barium	<0.6 mg/kg	TM181	59.2	#					
Beryllium	<0.01 mg/kg	TM181	0.331	M					
Cadmium	<0.02 mg/kg	TM181	0.348	M					
Chromium	<0.9 mg/kg	TM181	13.3	M					
Copper	<1.4 mg/kg	TM181	9.68	M					
Iron	<1000 mg/kg	TM181	20700	#					
Lead	<0.7 mg/kg	TM181	17.4	M					
Manganese	<0.13 mg/kg	TM181	450	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	0.466	#					
Nickel	<0.2 mg/kg	TM181	14.6	M					
Selenium	<1 mg/kg	TM181	<1	#					
Vanadium	<0.2 mg/kg	TM181	26	#					



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SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

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SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

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SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

ALS

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SDG: 210422-166

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 596413

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	TPTH-12				
#	ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	106				
Toluene-d8**	%	TM116	94.8				
4-Bromofluorobenzene**	%	TM116	86.3				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				

16:31:40 04/05/2021

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ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-166

Location: Cambridge South East Tra

Client Reference: B025563

Order Number: 7000964

Report Number: 596413

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	TPTH-12				
#	ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20				
Naphthalene	<13 µg/kg	TM116	<13 M				

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TPTH-12				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		20/04/2021				
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		22/04/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210422-166				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24131651				
(F)	Trigger breach confirmed		ES2				
1-44@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20				
Naphthalene	<13 µg/kg	TM116	<13 M				

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VOC MS (S)

Results Legend		Customer Sample Ref.		TPTH-12					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 20/04/2021 . 22/04/2021 210422-166 24131651 ES2						
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4+5@	Sample deviation (see appendix)								
Component	LOD/Units								
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20	#					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20						
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02						
Sum of BTEX	<40 µg/kg	TM116	<40						
		</							

CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.097	Natural Moisture Content (%)	7.71
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	92.8
Particle Size <4mm	>95%		

Case

SDG	210422-166			
Lab Sample Number(s)	24131651			
Sampled Date	20-Apr-2021			
Customer Sample Ref.	TPTH-12 ES2			
Depth (m)	0.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.022	<0.01	0.22	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.86	<3	48.6	<30	-	-	-
Fluoride	0.646	<0.5	6.46	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00108	<0.0005	0.0108	<0.005	-	-	-
Barium	0.00292	<0.0002	0.0292	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0176	<0.01	0.176	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	18.2	<0.2	182	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00198	<0.0003	0.0198	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.513	<0.036	5.13	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000458	<0.0004	0.00458	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00108	<0.001	0.0108	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	23-Apr-2021
pH (pH Units)	8.31
Conductivity (µS/cm)	97.30
Temperature (°C)	22.10
Volume Leachant (Litres)	0.893

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.097	Natural Moisture Content (%)	7.71
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	92.8
Particle Size <4mm	>95%		

Case

SDG	210422-166			
Lab Sample Number(s)	24131651			
Sampled Date	20-Apr-2021			
Customer Sample Ref.	TPTH-12 ES2			
Depth (m)	0.20			

[illegible]

Leach Test Information

Date Prepared	23-Apr-2021
pH (pH Units)	8.31
Conductivity (µS/cm)	97.30
Temperature (°C)	22.10
Volume Leachant (Litres)	0.893

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24131651
Customer Sample Ref.	TPTH-12
AGS Ref.	ES2
Depth	0.20
Type	Soil/Solid (S)
Ammonium Low	04-May-2021
Anions by Kone (soil)	28-Apr-2021
Anions by Kone (w)	04-May-2021
Asbestos ID in Solid Samples	29-Apr-2021
Boron Water Soluble	28-Apr-2021
CEN 10:1 Leachate (1 Stage)	24-Apr-2021
CEN Readings	30-Apr-2021
Chromium III	30-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	29-Apr-2021
Dissolved Metals by ICP-MS	29-Apr-2021
Dissolved Organic/Inorganic Carbon	02-May-2021
EPH CWG GC (S)	29-Apr-2021
Fluoride	29-Apr-2021
GRO by GC-FID (S)	29-Apr-2021
Hexavalent Chromium (s)	30-Apr-2021
Low Level Cyanide (W)	30-Apr-2021
Low Level Hexavalent Chromium (w)	30-Apr-2021
Mercury Dissolved	29-Apr-2021
Metals in solid samples by OES	30-Apr-2021
Moisture at 105C	23-Apr-2021
PAH by GCMS	27-Apr-2021
pH	28-Apr-2021
pH Value of Filtered Water	28-Apr-2021
Phenols by HPLC (S)	28-Apr-2021
Phenols by HPLC (W)	29-Apr-2021
Sample description	23-Apr-2021
Total Organic Carbon	29-Apr-2021
Total Sulphur	27-Apr-2021
TPH CWG GC (S)	29-Apr-2021
VOC MS (S)	29-Apr-2021

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2435
Dissolved Inorganic Carbon	TM090	101.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.67 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2439
EPH >C8-C40 Raw	TM414	105.85 69.95 : 114.99
Total Aliphatics Raw	TM414	112.13 68.45 : 114.88
Total Aromatics Raw	TM414	120.53 67.31 : 129.37

Fluoride

Component	Method Code	QC 2482
Fluoride	TM104	104.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2425
QC	TM089	92.85 72.28 : 114.54

Low Level Cyanide (W)

Component	Method Code	QC 2443
Free Cyanide - Low Level	TM279	70.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2489
Mercury Dissolved (CVAf)	TM183	103.0 69.30 : 128.70

Metals in solid samples by OES

Metals in solid samples by OES

Component	Method Code	QC 2482	QC 2446
Aluminium	TM181	90.27 77.46 : 123.98	102.65 77.46 : 123.98
Antimony	TM181	88.21 87.04 : 111.16	91.87 87.04 : 111.16
Arsenic	TM181	90.41 87.34 : 110.87	104.07 87.34 : 110.87
Barium	TM181	94.5 80.73 : 115.16	104.59 80.73 : 115.16
Beryllium	TM181	90.67 89.47 : 112.97	104.48 89.47 : 112.97
Boron	TM181	88.25 76.57 : 104.15	95.7 76.57 : 104.15
Cadmium	TM181	83.13 78.94 : 102.43	95.88 78.94 : 102.43
Chromium	TM181	82.76 77.55 : 104.47	93.51 77.55 : 104.47
Cobalt	TM181	81.13 82.95 : 107.41	90.25 82.95 : 107.41
Copper	TM181	86.97 84.36 : 106.14	102.11 84.36 : 106.14
Iron	TM181	96.03 81.43 : 115.79	103.97 81.43 : 115.79
Lead	TM181	88.74 81.95 : 107.63	95.95 81.95 : 107.63
Manganese	TM181	97.5 94.29 : 119.51	121.67 94.29 : 119.51
Mercury	TM181	84.06 82.73 : 106.36	98.31 82.73 : 106.36
Molybdenum	TM181	87.24 86.61 : 111.07	99.18 86.61 : 111.07
Nickel	TM181	83.37 79.72 : 103.80	93.64 79.72 : 103.80
Phosphorus	TM181	103.64 92.65 : 125.47	116.16 92.65 : 125.47
Selenium	TM181	88.63 88.36 : 111.25	105.49 88.36 : 111.25
Strontium	TM181	85.52 77.99 : 108.06	96.44 77.99 : 108.06
Thallium	TM181	91.15 88.60 : 116.73	103.54 88.60 : 116.73
Tin	TM181	93.54 89.77 : 112.62	100.0 89.77 : 112.62
Titanium	TM181	83.97 66.29 : 105.96	90.08 66.29 : 105.96
Vanadium	TM181	88.64 75.51 : 108.87	97.8 75.51 : 108.87
Zinc	TM181	91.17 84.02 : 111.24	105.13 84.02 : 111.24

PAH by GCMS

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
PAH by GCMS						

Component	Method Code	QC 2458
Acenaphthene	TM218	87.5 78.59 : 112.16
Acenaphthylene	TM218	86.0 75.11 : 109.01
Anthracene	TM218	85.5 73.99 : 113.85
Benz(a)anthracene	TM218	103.0 69.31 : 119.18
Benzo(a)pyrene	TM218	100.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	96.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	95.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	98.5 69.98 : 116.49
Chrysene	TM218	96.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	95.0 64.54 : 115.22
Fluoranthene	TM218	83.5 72.56 : 111.70
Fluorene	TM218	87.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	92.5 61.22 : 113.25
Naphthalene	TM218	85.0 77.96 : 110.91
Phenanthrene	TM218	85.0 76.83 : 113.25
Pyrene	TM218	85.0 72.45 : 110.77

Component	Method Code	QC 2407
pH	TM133	99.12 97.51 : 101.32

Component	Method Code	QC 2405
pH	TM256	100.8 99.33 : 102.54

Phenols by HPLC (S)

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Phenols by HPLC (S)						

Component	Method Code	QC 2405
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	51.3 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.03 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	49.06 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	50.1 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2401
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	91.78 82.77 : 126.51
Cresols by HPLC (W)	TM259	98.03 76.60 : 126.28
Napthol by HPLC (W)	TM259	95.7 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	95.57 79.09 : 131.82

Component	Method Code	QC 2410
Total Organic Carbon	TM132	100.78 87.02 : 113.45

Component	Method Code	QC 2403
Total Sulphur %	TM132	108.81 61.64 : 114.47

Component	Method Code	QC 2432
1,1,1,2-tetrachloroethane	TM116	105.2 86.59 : 118.97
1,1,1-Trichloroethane	TM116	101.6 86.26 : 117.53
1,1,2-Trichloroethane	TM116	97.0 75.16 : 112.70



CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2432
1,1-Dichloroethane	TM116	106.6 83.27 : 122.16
1,2-Dichloroethane	TM116	100.6 89.30 : 133.10
1,4-Dichlorobenzene	TM116	116.2 82.59 : 123.23
2-Chlorotoluene	TM116	110.4 66.81 : 118.43
4-Chlorotoluene	TM116	107.8 65.88 : 114.76
Benzene	TM116	97.2 93.16 : 123.63
Carbon Disulphide	TM116	98.4 75.11 : 124.81
Carbontetrachloride	TM116	105.4 82.35 : 126.46
Chlorobenzene	TM116	108.2 85.07 : 118.13
Chloroform	TM116	107.4 88.13 : 122.71
Chloromethane	TM116	107.4 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	106.6 78.27 : 128.90
Dibromomethane	TM116	97.0 77.47 : 121.29
Dichloromethane	TM116	111.4 87.89 : 134.72
Ethylbenzene	TM116	95.4 79.92 : 110.05
Hexachlorobutadiene	TM116	69.6 16.78 : 153.29
Isopropylbenzene	TM116	86.0 64.20 : 119.59
Naphthalene	TM116	110.0 79.29 : 125.59
o-Xylene	TM116	92.8 72.86 : 102.10
p/m-Xylene	TM116	90.7 74.06 : 106.47
Sec-Butylbenzene	TM116	84.8 44.71 : 117.87
Tetrachloroethene	TM116	104.8 77.82 : 125.00
Toluene	TM116	92.2 87.82 : 116.21
Trichloroethene	TM116	97.4 79.80 : 112.33
Trichlorofluoromethane	TM116	97.8 80.52 : 132.12
Vinyl Chloride	TM116	104.0 74.57 : 146.88



CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



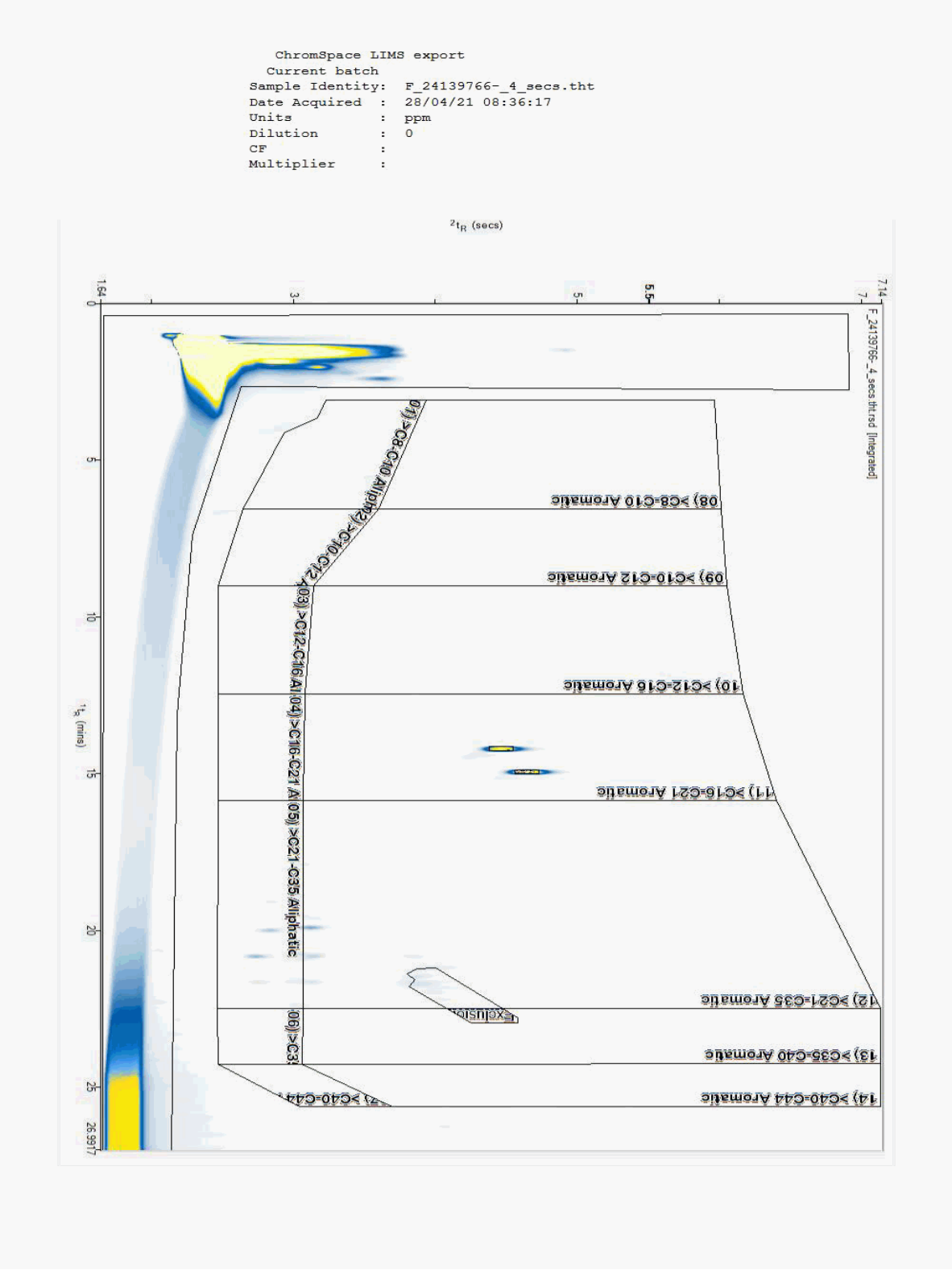
CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24139766 Depth : 0.20
Sample ID : TPTH-12



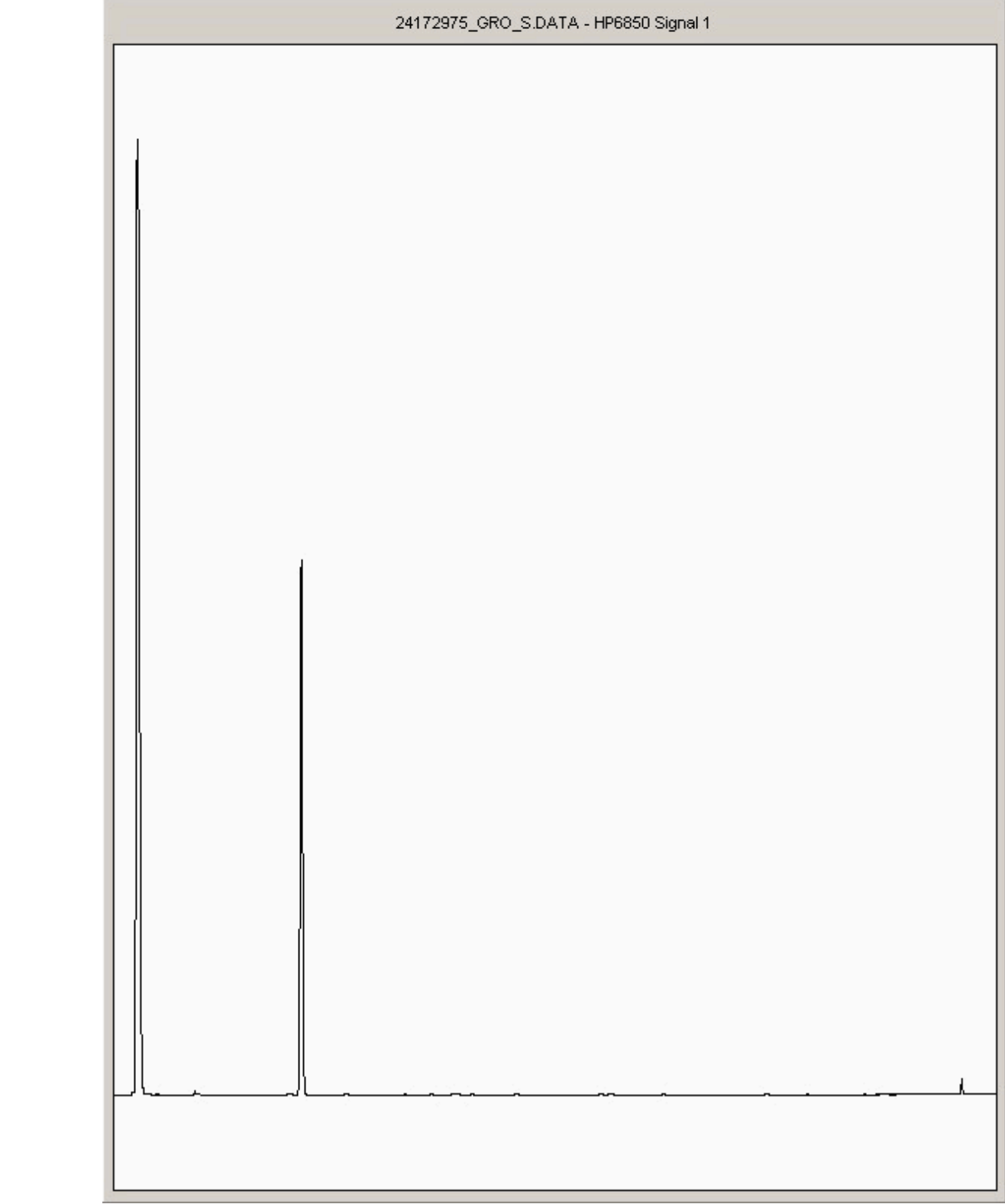
CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24172975 Depth : 0.20
Sample ID : TPTH-12





CERTIFICATE OF ANALYSIS

SDG:	210422-166	Client Reference:	B025563	Report Number:	596413
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

04 May 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210422-167

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

596414

We received 8 samples on Thursday April 22, 2021 and 4 of these samples were scheduled for analysis which was completed on Tuesday May 04, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7

Version Issued: 04/05/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24131795	TP - PTR - 32	ES1	0.10	20/04/2021
24131796	TP - PTR - 32	ES2	0.20	20/04/2021
24131797	TP - PTR - 32	ES3	0.50	20/04/2021
24131798	TP - PTR - 32	ES4	1.00	20/04/2021
24131799	TP - PTR - 36	ES1	0.10	20/04/2021
24131801	TP - PTR - 36	ES2	0.20	20/04/2021
24131802	TP - PTR - 36	ES3	0.50	20/04/2021
24131803	TP - PTR - 36	ES4	1.00	20/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24131797	24131798	24131802	24131803
						TP - PTR - 32	TP - PTR - 32	TP - PTR - 36	TP - PTR - 36
						ES3	ES4	ES3	ES4
						0.50	1.00	0.50	1.00
						60g VOC (ALE215)	60g VOC (ALE215)	60g VOC (ALE215)	60g VOC (ALE215)
						1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)
						S	S	S	S
						S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 2				X		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 4				X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 2				X		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4				X	X		X
Boron Water Soluble	All	NDPs: 0 Tests: 4				X	X		X
CEN Readings	All	NDPs: 0 Tests: 2				X		X	
Chromium III	All	NDPs: 0 Tests: 6				X	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4				X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2				X		X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2				X		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 4				X	X		X
Fluoride	All	NDPs: 0 Tests: 2				X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4				X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4				X	X	X	X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2				X		X	

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24131797		24131798		24131802		24131803	
	Customer Sample Reference		TP - PTR - 32		TP - PTR - 32		TP - PTR - 36		TP - PTR - 36	
	AGS Reference		ES3		ES4		ES3		ES4	
	Depth (m)		0.50		1.00		0.50		1.00	
	Container		60g VOC Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC Handle (ALE260)	1kg TUB with (ALE210)
	Sample Type		S	S	S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X				X			
Mercury Dissolved	All	NDPs: 0 Tests: 2	X				X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 4		X		X		X		X
PAH by GCMS	All	NDPs: 0 Tests: 4		X		X		X		X
pH	All	NDPs: 0 Tests: 4		X		X		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X				X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4		X		X		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X				X			
Sample description	All	NDPs: 0 Tests: 3		X		X		X		
Total Organic Carbon	All	NDPs: 0 Tests: 4		X		X		X		X
Total Sulphur	All	NDPs: 0 Tests: 4		X		X		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 4		X		X		X		X
VOC MS (S)	All	NDPs: 0 Tests: 4			X		X		X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24131797	TP - PTR - 32	0.50	Light Brown	Loamy Sand	Stones	Vegetation
24131798	TP - PTR - 32	1.00	Dark Brown	Sandy Clay	Stones	None
24131802	TP - PTR - 36	0.50	Dark Brown	Loamy Sand	Stones	N/A
24131803	TP - PTR - 36	1.00	Dark Brown	Loamy Sand	Vegetation	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

		CERTIFICATE OF ANALYSIS					Validated	
SDG: 210422-167		Client Reference: B025563		Report Number: 596414				
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:				

CERTIFICATE OF ANALYSIS

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SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP - PTR - 32		TP - PTR - 32		TP - PTR - 36		TP - PTR - 36			
#	ISO17025 accredited.		0.50		1.00		0.50		1.00			
M	mCERTS accredited.		Soil/Solid (S)		Soil/Solid (S)		Soil/Solid (S)		Soil/Solid (S)			
aq	Aqueous / settled sample.		20/04/2021		20/04/2021		20/04/2021		20/04/2021			
diss.filt	Dissolved / filtered sample.		15:00:00		15:00:00		17:00:00		17:00:00			
tot.unfilt	Total / unfiltered sample.		22/04/2021		22/04/2021		22/04/2021		22/04/2021			
+	Subcontracted - refer to subcontractor report for accreditation status.		210422-167		210422-167		210422-167		210422-167			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24131797		24131798		24131802		24131803			
(F)	Trigger breach confirmed											
1-4+5@	Sample deviation (see appendix)											
Component	LOD/Units	Method										
Dibromofluoromethane**	%	TM116	107		117		108		118			
Toluene-d8**	%	TM116	93.7		98.3		96.6		98.6			
4-Bromofluorobenzene**	%	TM116	83.6		92.4		98.1		95.1			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
Chloromethane	<7 µg/kg	TM116	<7 #		<7 #		<7 #		<7 #			
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M		<6 @ M		<6 @ M		<6 @ M			
Bromomethane	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Chloroethane	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #		<10 #		<10 #		<10 #			
Carbon Disulphide	<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
Dichloromethane	<10 µg/kg	TM116	<10 #		<10 #		<10 #		<10 #			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M		<8 M		<8 M		<8 M			
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M		<6 M		<6 M		<6 M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10		<10		<10		<10			
Bromochloromethane	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Chloroform	<8 µg/kg	TM116	<8 M		<8 M		<8 M		<8 M			
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Carbontetrachloride	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M		<5 M		<5 M		<5 M			
Benzene	<9 µg/kg	TM116	<9 M		<9 M		<9 M		<9 M			
Trichloroethene	<9 µg/kg	TM116	<9 #		<9 #		<9 #		<9 #			
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Dibromomethane	<9 µg/kg	TM116	<9 M		<9 M		<9 M		<9 M			
Bromodichloromethane	<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			
Toluene	<7 µg/kg	TM116	<7 M		<7 M		<7 M		<7 M			
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10		<10		<10		<10			
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M		<10 M		<10 M		<10 M			



CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	TP - PTR - 32	TP - PTR - 32	TP - PTR - 36	TP - PTR - 36		
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-45@	Sample deviation (see appendix)								
Component	LOD/Units	Method	AGS Reference						
1,3-Dichloropropane	<7 µg/kg	TM116		<7 M	<7 M	<7 M	<7 M		
Tetrachloroethene	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M		
Dibromochloromethane	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
1,2-Dibromoethane	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Chlorobenzene	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M		
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Ethylbenzene	<4 µg/kg	TM116		<4 M	<4 M	<4 M	<4 M		
p/m-Xylene	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Styrene	<10 µg/kg	TM116		<10 @ #	<10 @ #	<10 @ #	<10 @ #		
Bromoform	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Isopropylbenzene	<5 µg/kg	TM116		<5 #	<5 #	<5 #	<5 #		
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		
1,2,3-Trichloropropane	<16 µg/kg	TM116		<16 M	<16 M	<16 M	<16 M		
Bromobenzene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
Propylbenzene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
2-Chlorotoluene	<9 µg/kg	TM116		<9 M	<9 M	<9 M	<9 M		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8 M	<8 M	<8 M	<8 M		
4-Chlorotoluene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
tert-Butylbenzene	<14 µg/kg	TM116		<14 M	<14 M	<14 M	<14 M		
1,2,4-Trimethylbenzene	<9 µg/kg	TM116		<9 #	<9 #	<9 #	<9 #		
sec-Butylbenzene	<10 µg/kg	TM116		<10	<10	<10	<10		
4-Isopropyltoluene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8 M	<8 M	<8 M	<8 M		
1,4-Dichlorobenzene	<5 µg/kg	TM116		<5 M	<5 M	<5 M	<5 M		
n-Butylbenzene	<11 µg/kg	TM116		<11	<11	<11	<11		
1,2-Dichlorobenzene	<10 µg/kg	TM116		<10 M	<10 M	<10 M	<10 M		
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14 M	<14 M	<14 M	<14 M		
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 #	<10 #	<10 #	<10 #		
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20	<20	<20	<20		
Hexachlorobutadiene	<20 µg/kg	TM116		<20	<20	<20	<20		
Naphthalene	<13 µg/kg	TM116		<13 M	<13 M	<13 M	<13 M		

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

[illegible]

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24131797	24131798	24131802	24131803
Customer Sample Ref.	TP - PTR - 32	TP - PTR - 32	TP - PTR - 36	TP - PTR - 36
AGS Ref.	ES3	ES4	ES3	ES4
Depth	0.50	1.00	0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	04-May-2021		04-May-2021	
Anions by Kone (soil)	29-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
Anions by Kone (w)	04-May-2021		04-May-2021	
Asbestos ID in Solid Samples	28-Apr-2021	28-Apr-2021	26-Apr-2021	27-Apr-2021
Boron Water Soluble	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
CEN 10:1 Leachate (1 Stage)	26-Apr-2021		26-Apr-2021	
CEN Readings	30-Apr-2021		28-Apr-2021	
Chromium III	30-Apr-2021	30-Apr-2021	30-Apr-2021	30-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	28-Apr-2021	28-Apr-2021	28-Apr-2021	27-Apr-2021
Dissolved Metals by ICP-MS	29-Apr-2021		30-Apr-2021	
Dissolved Organic/Inorganic Carbon	02-May-2021		03-May-2021	
EPH CWG GC (S)	28-Apr-2021	28-Apr-2021	29-Apr-2021	29-Apr-2021
Fluoride	30-Apr-2021		29-Apr-2021	
GRO by GC-FID (S)	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
Hexavalent Chromium (s)	29-Apr-2021	30-Apr-2021	29-Apr-2021	30-Apr-2021
Low Level Cyanide (W)	30-Apr-2021		30-Apr-2021	
Low Level Hexavalent Chromium (w)	30-Apr-2021		30-Apr-2021	
Mercury Dissolved	29-Apr-2021		29-Apr-2021	
Metals in solid samples by OES	30-Apr-2021	30-Apr-2021	30-Apr-2021	30-Apr-2021
Moisture at 105C	26-Apr-2021		26-Apr-2021	
PAH by GCMS	27-Apr-2021	27-Apr-2021	27-Apr-2021	29-Apr-2021
pH	28-Apr-2021	28-Apr-2021	27-Apr-2021	27-Apr-2021
pH Value of Filtered Water	28-Apr-2021		30-Apr-2021	
Phenols by HPLC (S)	27-Apr-2021	28-Apr-2021	29-Apr-2021	29-Apr-2021
Phenols by HPLC (W)	29-Apr-2021		30-Apr-2021	
Sample description	24-Apr-2021	24-Apr-2021	24-Apr-2021	24-Apr-2021
Total Organic Carbon	30-Apr-2021	29-Apr-2021	29-Apr-2021	30-Apr-2021
Total Sulphur	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021
TPH CWG GC (S)	28-Apr-2021	28-Apr-2021	29-Apr-2021	29-Apr-2021
VOC MS (S)	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2470
Ammoniacal Nitrogen as N	TM099	100.6 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2401
Chloride (soluble)	TM243	154.92 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	159.35 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2454
Chloride	TM184	98.4 91.40 : 109.10
Sulphate (soluble)	TM184	100.0 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2458	QC 2434
Water Soluble Boron	TM222	100.5 84.00 : 111.00	100.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2427	QC 2449	QC 2461
Free Cyanide	TM153	98.81 79.00 : 115.00	92.38 79.00 : 115.00	106.93 79.00 : 115.00
Thiocyanate	TM153	102.56 94.09 : 113.89	97.44 94.09 : 113.89	112.18 94.09 : 113.89
Total Cyanide	TM153	100.7 73.07 : 107.47	97.2 73.07 : 107.47	113.29 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2405	QC 2440	QC 2458
Aluminium	TM152	102.33 94.21 : 111.52	97.33 90.98 : 111.82	104.33 94.21 : 111.52
Antimony	TM152	105.67 88.37 : 130.57	95.67 90.44 : 113.04	103.33 88.37 : 130.57
Arsenic	TM152	101.17 92.62 : 113.52	96.5 88.00 : 112.00	100.67 92.62 : 113.52

Dissolved Metals by ICP-MS

		QC 2405	QC 2440	QC 2458
Barium	TM152	104.5 88.62 : 113.14	96.17 90.20 : 111.19	101.5 88.62 : 113.14
Beryllium	TM152	104.17 87.08 : 111.38	97.83 87.77 : 113.97	105.17 87.08 : 111.38
Bismuth	TM152	103.17 92.62 : 115.02	99.17 91.90 : 112.20	103.17 92.62 : 115.02
Borate	TM152		99.38 88.00 : 112.00	
Boron	TM152	101.33 86.31 : 120.88	99.0 96.48 : 114.93	109.33 86.31 : 120.88
Cadmium	TM152	101.17 93.85 : 111.65	97.5 96.43 : 110.53	102.83 93.85 : 111.65
Calcium	TM152	101.33 89.20 : 126.91	99.33 81.38 : 119.09	104.67 89.20 : 126.91
Chromium	TM152	101.33 92.50 : 113.03	96.67 91.84 : 108.67	103.67 92.50 : 113.03
Cobalt	TM152	100.0 85.01 : 114.87	96.83 88.00 : 112.00	102.5 85.01 : 114.87
Copper	TM152	100.33 89.87 : 119.73	97.0 92.47 : 118.11	101.5 89.87 : 119.73
Iron	TM152	101.33 93.02 : 113.86	97.33 92.00 : 113.00	104.0 93.02 : 113.86
Lead	TM152	103.83 91.11 : 116.98	96.17 88.00 : 112.00	102.5 91.11 : 116.98
Lithium	TM152	101.67 87.70 : 115.90	98.17 91.62 : 113.12	105.0 87.70 : 115.90
Magnesium	TM152	99.33 89.60 : 116.61	97.33 93.14 : 107.91	102.67 89.60 : 116.61
Manganese	TM152	101.33 93.97 : 112.46	97.83 95.03 : 110.58	105.0 93.97 : 112.46
Molybdenum	TM152	101.5 89.07 : 110.96	93.67 88.00 : 112.00	99.0 89.07 : 110.96
Nickel	TM152	100.83 93.70 : 112.15	97.67 88.00 : 112.00	102.83 93.70 : 112.15
Phosphorus	TM152	99.5 89.24 : 114.18	97.83 88.00 : 112.00	104.33 89.24 : 114.18
Potassium	TM152	101.33 93.20 : 115.55	99.33 93.90 : 112.36	104.0 93.20 : 115.55
Selenium	TM152	100.33 91.69 : 117.12	96.67 91.58 : 115.98	101.5 91.69 : 117.12
Silver	TM152	100.33 90.93 : 121.73	93.67 88.80 : 122.30	101.67 90.93 : 121.73
Sodium	TM152	98.67 92.42 : 113.24	98.0 94.28 : 110.71	102.67 92.42 : 113.24
Strontium	TM152	103.0 92.14 : 116.24	95.0 88.00 : 112.00	102.67 92.14 : 116.24
Tellurium	TM152	99.33 89.88 : 111.78	96.17 93.32 : 114.66	101.17 89.88 : 111.78
Thallium	TM152	96.67 82.43 : 113.83	91.0 88.00 : 112.00	102.33 82.43 : 113.83
Tin	TM152	103.0 94.62 : 107.79	97.5 92.63 : 109.70	103.5 94.62 : 107.79
Titanium	TM152	103.33 90.29 : 115.23	101.67 95.58 : 111.68	104.17 90.29 : 115.23

Dissolved Metals by ICP-MS

		QC 2405	QC 2440	QC 2458
Tungsten	TM152	104.83 77.61 : 132.31	97.83 81.32 : 124.72	103.0 77.61 : 132.31
Uranium	TM152	100.83 86.97 : 115.76	93.5 88.00 : 112.00	101.0 86.97 : 115.76
Vanadium	TM152	103.83 89.61 : 115.48	95.5 88.00 : 112.00	98.0 89.61 : 115.48
Zinc	TM152	102.0 87.51 : 116.26	97.67 92.98 : 118.95	103.0 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2446	QC 2424
Dissolved Inorganic Carbon	TM090	101.67 93.58 : 112.28	101.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.33 96.13 : 109.53	103.67 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2402	QC 2439
EPH >C8-C40 Raw	TM414	83.78 69.95 : 114.99	105.85 69.95 : 114.99
Total Aliphatics Raw	TM414	88.82 68.45 : 114.88	112.13 68.45 : 114.88
Total Aromatics Raw	TM414	94.89 67.31 : 129.37	120.53 67.31 : 129.37

Fluoride

Component	Method Code	QC 2439	QC 2413
Fluoride	TM104	104.67 96.67 : 108.67	103.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2488
QC	TM089	90.04 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2458	QC 2470
Hexavalent Chromium	TM151	98.0 91.40 : 115.40	106.0 91.40 : 115.40

Hexavalent Chromium (s)

Low Level Cyanide (W)

Component	Method Code	QC 2443
Free Cyanide - Low Level	TM279	70.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2489	QC 2452
Mercury Dissolved (CVAf)	TM183	103.0 69.30 : 128.70	93.9 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2469	QC 2482	QC 2421	QC 2446
Aluminium	TM181	92.04 77.46 : 123.98	90.27 77.46 : 123.98	92.92 77.46 : 123.98	102.65 77.46 : 123.98
Antimony	TM181	88.62 87.04 : 111.16	88.21 87.04 : 111.16	100.81 87.04 : 111.16	91.87 87.04 : 111.16
Arsenic	TM181	95.06 87.34 : 110.87	90.41 87.34 : 110.87	98.84 87.34 : 110.87	104.07 87.34 : 110.87
Barium	TM181	86.42 80.73 : 115.16	94.5 80.73 : 115.16	90.0 80.73 : 115.16	104.59 80.73 : 115.16
Beryllium	TM181	94.78 89.47 : 112.97	90.67 89.47 : 112.97	92.54 89.47 : 112.97	104.48 89.47 : 112.97
Boron	TM181	86.25 76.57 : 104.15	88.25 76.57 : 104.15	91.12 76.57 : 104.15	95.7 76.57 : 104.15
Cadmium	TM181	85.19 78.94 : 102.43	83.13 78.94 : 102.43	91.36 78.94 : 102.43	95.88 78.94 : 102.43
Chromium	TM181	83.57 77.55 : 104.47	82.76 77.55 : 104.47	84.99 77.55 : 104.47	93.51 77.55 : 104.47
Cobalt	TM181	83.65 82.95 : 107.41	81.13 82.95 : 107.41	86.16 82.95 : 107.41	90.25 82.95 : 107.41
Copper	TM181	92.43 84.36 : 106.14	86.97 84.36 : 106.14	97.01 84.36 : 106.14	102.11 84.36 : 106.14
Iron	TM181	91.27 81.43 : 115.79	96.03 81.43 : 115.79	91.27 81.43 : 115.79	103.97 81.43 : 115.79
Lead	TM181	87.39 81.95 : 107.63	88.74 81.95 : 107.63	90.54 81.95 : 107.63	95.95 81.95 : 107.63
Manganese	TM181	103.61 94.29 : 119.51	97.5 94.29 : 119.51	107.5 94.29 : 119.51	121.67 94.29 : 119.51
Mercury	TM181	88.65 82.73 : 106.36	84.06 82.73 : 106.36	91.79 82.73 : 106.36	98.31 82.73 : 106.36
Molybdenum	TM181	90.12 86.61 : 111.07	87.24 86.61 : 111.07	95.88 86.61 : 111.07	99.18 86.61 : 111.07
Nickel	TM181	84.6 79.72 : 103.80	83.37 79.72 : 103.80	87.04 79.72 : 103.80	93.64 79.72 : 103.80

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210422-167	Client Reference:	B025563	Report Number:	596414	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2469	QC 2482	QC 2421	QC 2446
Phosphorus	TM181	105.25 92.65 : 125.47	103.64 92.65 : 125.47	110.71 92.65 : 125.47	116.16 92.65 : 125.47
Selenium	TM181	95.29 88.36 : 111.25	88.63 88.36 : 111.25	96.47 88.36 : 111.25	105.49 88.36 : 111.25
Strontium	TM181	89.76 77.99 : 108.06	85.52 77.99 : 108.06	91.09 77.99 : 108.06	96.44 77.99 : 108.06
Thallium	TM181	95.58 88.60 : 116.73	91.15 88.60 : 116.73	98.23 88.60 : 116.73	103.54 88.60 : 116.73
Tin	TM181	94.3 89.77 : 112.62	93.54 89.77 : 112.62	92.78 89.77 : 112.62	100.0 89.77 : 112.62
Titanium	TM181	80.15 66.29 : 105.96	83.97 66.29 : 105.96	83.97 66.29 : 105.96	90.08 66.29 : 105.96
Vanadium	TM181	90.84 75.51 : 108.87	88.64 75.51 : 108.87	89.74 75.51 : 108.87	97.8 75.51 : 108.87
Zinc	TM181	92.61 84.02 : 111.24	91.17 84.02 : 111.24	96.51 84.02 : 111.24	105.13 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2423	QC 2458	QC 2449
Acenaphthene	TM218	90.5 76.79 : 103.90	87.5 78.59 : 112.16	89.0 73.47 : 109.80
Acenaphthylene	TM218	89.5 74.19 : 106.17	86.0 75.11 : 109.01	87.5 70.00 : 130.00
Anthracene	TM218	93.5 70.90 : 109.22	85.5 73.99 : 113.85	86.5 68.68 : 111.89
Benz(a)anthracene	TM218	99.5 73.77 : 119.26	103.0 69.31 : 119.18	95.0 68.12 : 118.39
Benzo(a)pyrene	TM218	97.0 73.20 : 114.18	100.5 66.97 : 114.92	99.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	97.5 75.36 : 117.58	96.5 67.41 : 114.46	96.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	90.5 70.73 : 116.12	95.5 62.92 : 114.36	102.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	93.0 75.98 : 116.59	98.5 69.98 : 116.49	96.5 73.10 : 117.03
Chrysene	TM218	95.5 74.82 : 114.18	96.0 69.86 : 114.50	91.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	89.0 69.17 : 115.30	95.0 64.54 : 115.22	97.5 67.32 : 121.35
Fluoranthene	TM218	98.0 66.06 : 114.63	83.5 72.56 : 111.70	91.5 75.16 : 117.28
Fluorene	TM218	92.5 76.66 : 107.56	87.5 79.13 : 111.49	87.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	101.0 70.26 : 117.95	92.5 61.22 : 113.25	100.5 68.91 : 117.62
Naphthalene	TM218	84.0 74.70 : 101.83	85.0 77.96 : 110.91	87.5 72.12 : 106.18
Phenanthrene	TM218	94.0 73.62 : 109.34	85.0 76.83 : 113.25	88.0 69.01 : 113.72
Pyrene	TM218	97.5 71.46 : 117.00	85.0 72.45 : 110.77	91.0 64.28 : 115.75

pH

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210422-167	Client Reference:	B025563	Report Number:	596414	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
pH						

Component	Method Code	QC 2472	QC 2419	QC 2428
pH	TM133	100.0 98.41 : 102.48	100.15 98.41 : 102.48	98.97 97.51 : 101.32

pH Value of Filtered Water

Component	Method Code	QC 2499	QC 2403
pH	TM256	100.0 99.33 : 102.54	100.53 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2401	QC 2400	QC 2447
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 70.71 : 116.42	50.0 70.71 : 116.42	50.65 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	46.78 64.54 : 117.79	42.11 64.54 : 117.79	44.44 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	49.69 74.40 : 108.98	47.18 74.40 : 108.98	47.6 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.98 69.44 : 122.18	49.01 69.44 : 122.18	49.01 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	50.83 76.56 : 106.38	47.71 76.56 : 106.38	48.12 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2401	QC 2463
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	91.78 82.77 : 126.51	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	98.03 76.60 : 126.28	100.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	95.7 75.40 : 129.40	97.66 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	95.57 79.09 : 131.82	97.47 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2410	QC 2426
Total Organic Carbon	TM132	100.78 87.02 : 113.45	101.17 84.82 : 117.61

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210422-167	Client Reference:	B025563	Report Number:	596414	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2403				
Total Sulphur %	TM132	108.81 61.64 : 114.47				

VOC MS (S)		
Component	Method Code	QC 2494
1,1,1,2-tetrachloroethane	TM116	96.8 86.59 : 118.97
1,1,1-Trichloroethane	TM116	101.0 86.26 : 117.53
1,1,2-Trichloroethane	TM116	103.4 75.16 : 112.70
1,1-Dichloroethane	TM116	103.2 83.27 : 122.16
1,2-Dichloroethane	TM116	106.4 89.30 : 133.10
1,4-Dichlorobenzene	TM116	103.2 82.59 : 123.23
2-Chlorotoluene	TM116	94.8 66.81 : 118.43
4-Chlorotoluene	TM116	94.2 65.88 : 114.76
Benzene	TM116	96.0 93.16 : 123.63
Carbon Disulphide	TM116	96.8 75.11 : 124.81
Carbontetrachloride	TM116	105.2 82.35 : 126.46
Chlorobenzene	TM116	101.2 85.07 : 118.13
Chloroform	TM116	104.6 88.13 : 122.71
Chloromethane	TM116	91.6 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	106.8 78.27 : 128.90
Dibromomethane	TM116	107.0 77.47 : 121.29
Dichloromethane	TM116	113.6 87.89 : 134.72
Ethylbenzene	TM116	84.2 79.92 : 110.05
Hexachlorobutadiene	TM116	36.6 16.78 : 153.29
Isopropylbenzene	TM116	67.0 64.20 : 119.59
Naphthalene	TM116	97.8 79.29 : 125.59
o-Xylene	TM116	83.4 72.86 : 102.10

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210422-167	Client Reference:	B025563	Report Number:	596414	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2494				
p/m-Xylene	TM116	78.8 74.06 : 106.47				
Sec-Butylbenzene	TM116	50.2 44.71 : 117.87				
Tetrachloroethene	TM116	92.4 77.82 : 125.00				
Toluene	TM116	92.0 87.82 : 116.21				
Trichloroethene	TM116	96.4 79.80 : 112.33				
Trichlorofluoromethane	TM116	96.8 80.52 : 132.12				
Vinyl Chloride	TM116	102.2 74.57 : 146.88				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

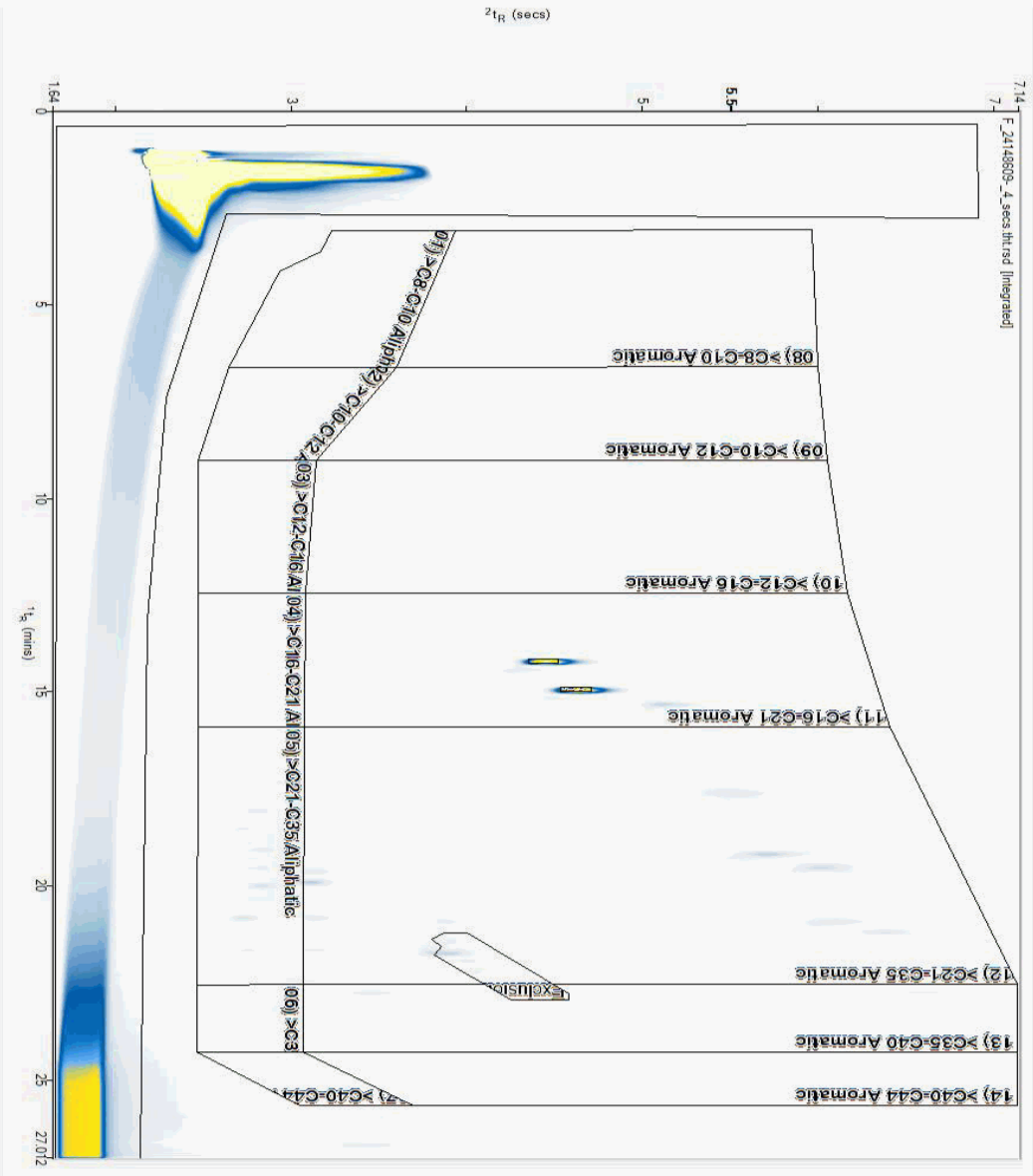
Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24148609 Depth : 1.00
Sample ID : TP - PTR - 32

ChromSpace LIMS export
Current batch
Sample Identity: F_24148609-4_secs.tht
Date Acquired : 27/04/21 11:41:40
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

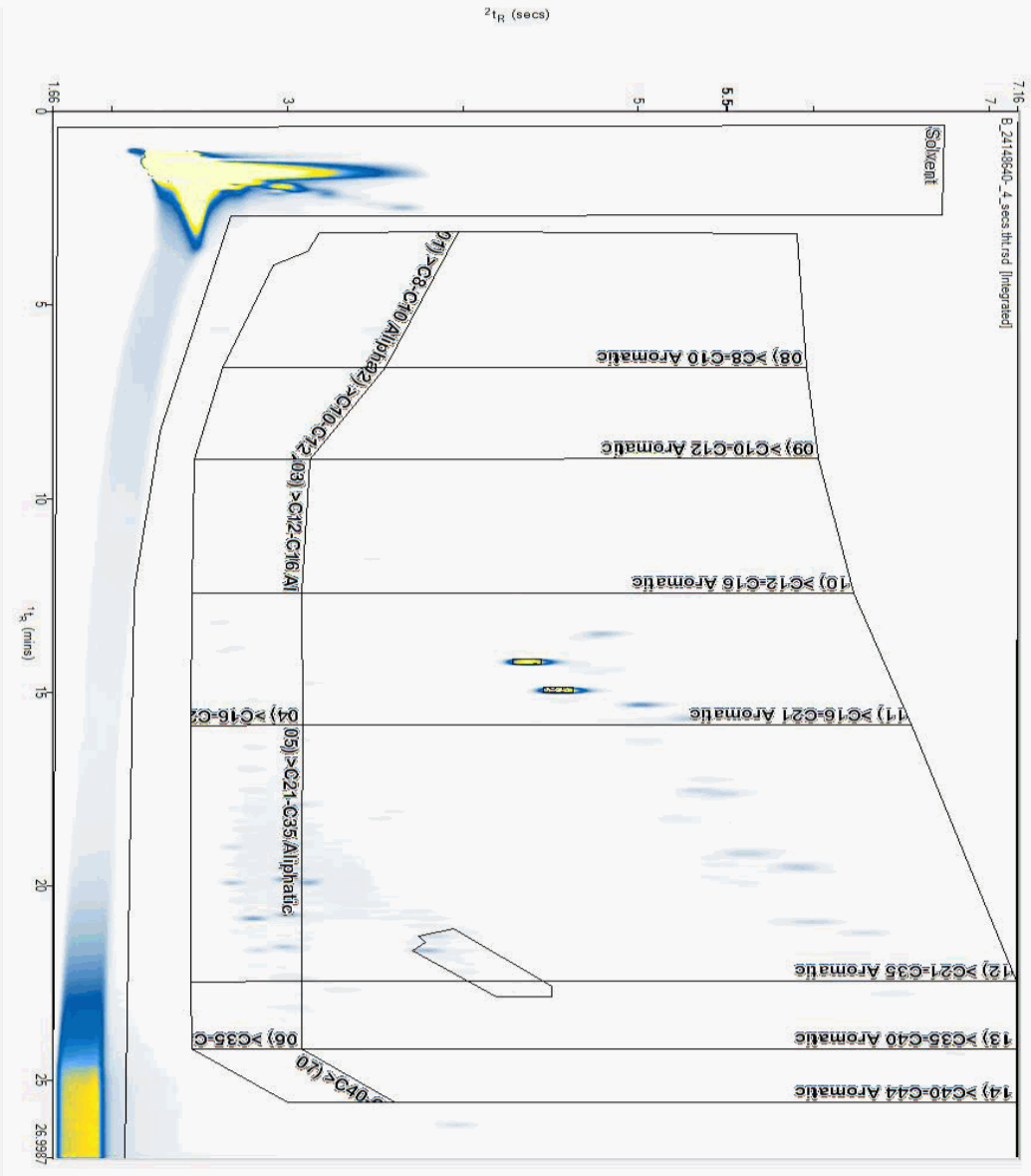
Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24148640 Depth : 0.50
Sample ID : TP - PTR - 32

ChromSpace LIMS export
Current batch
Sample Identity: B_24148640-4_secs.tht
Date Acquired : 28/04/21 12:12:19
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

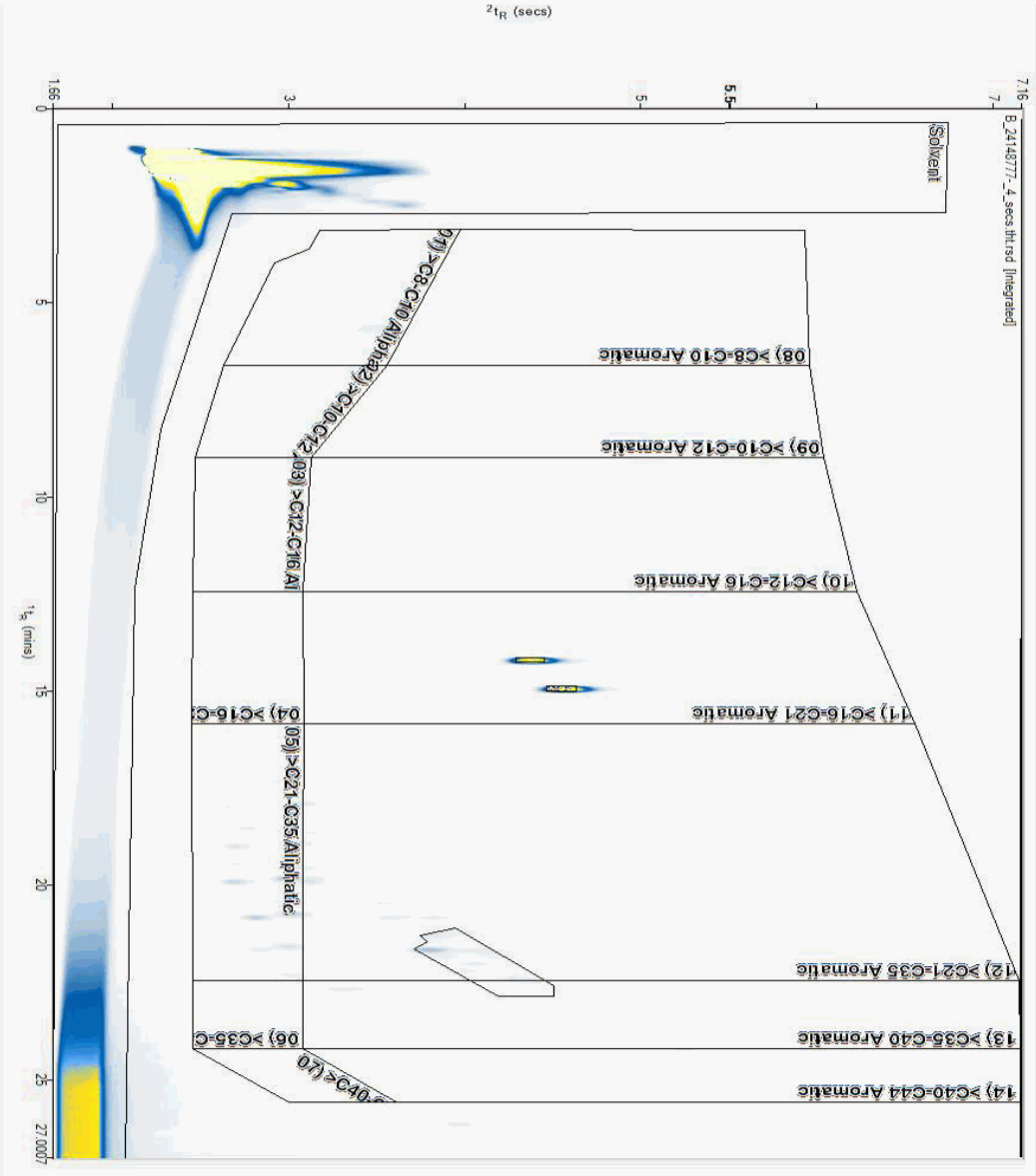
Validated

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24148777 Depth : 1.00
Sample ID : TP - PTR - 36

ChromSpace LIMS export
Current batch
Sample Identity: B_24148777-4_secs.tht
Date Acquired : 28/04/21 07:04:11
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

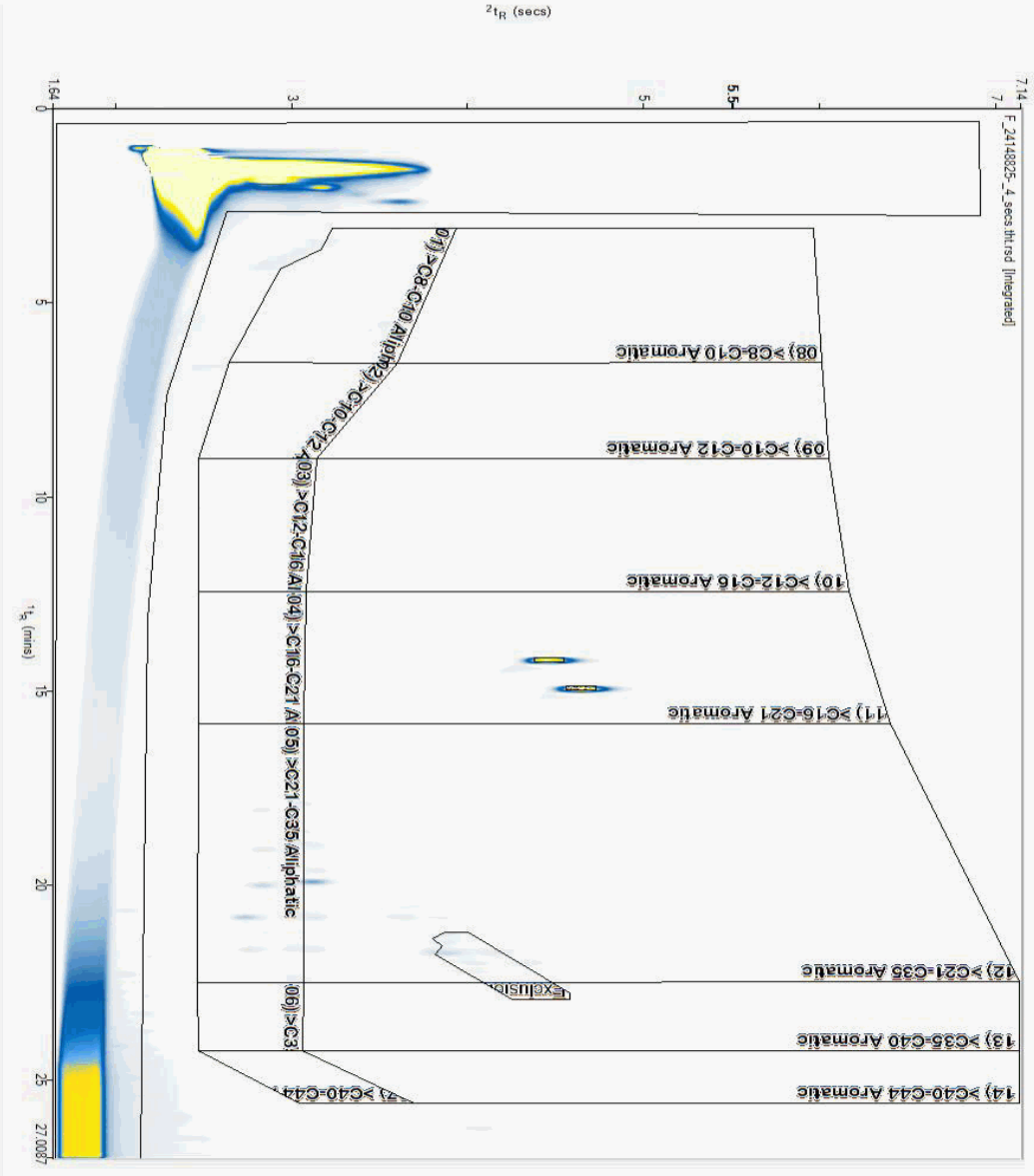
Validated

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24148825 Depth : 0.50
Sample ID : TP - PTR - 36

ChromSpace LIMS export
Current batch
Sample Identity: F_24148825-4_secs.tht
Date Acquired : 28/04/21 09:06:59
Units : ppm
Dilution : 0
CF :
Multiplier :





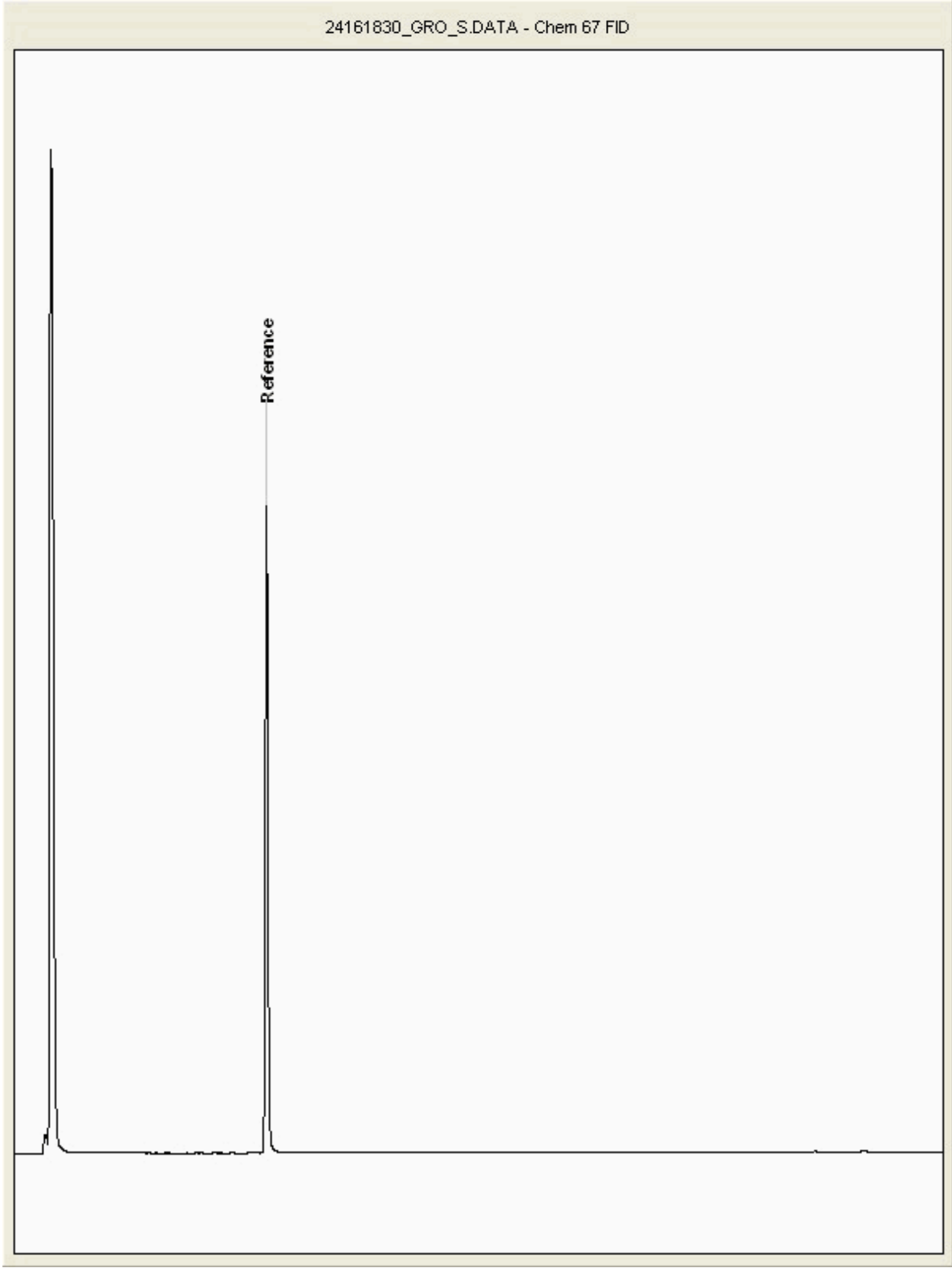
CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24161830 Depth : 1.00
Sample ID : TP - PTR - 32



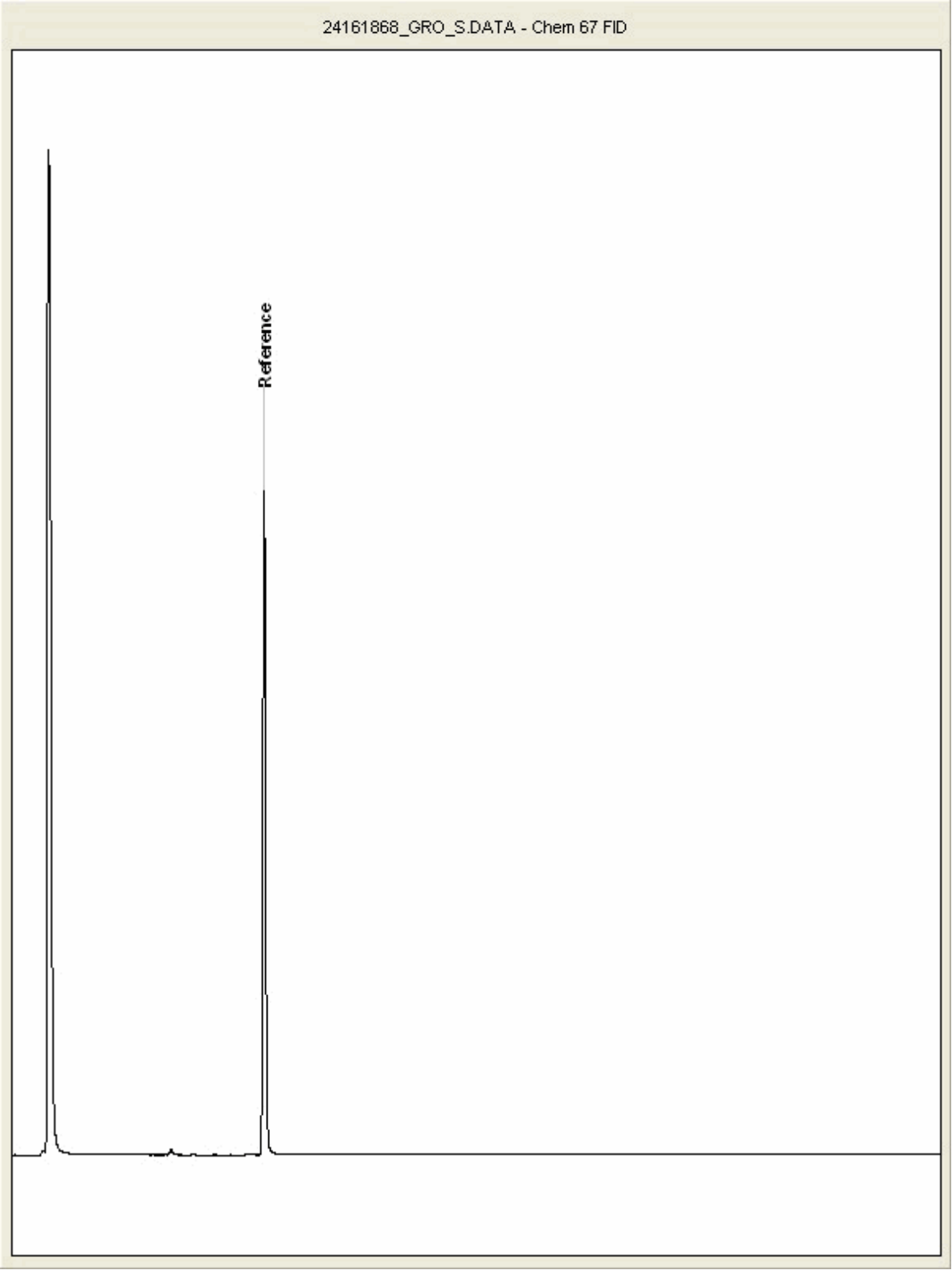
CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24161868 Depth : 0.50
Sample ID : TP - PTR - 32





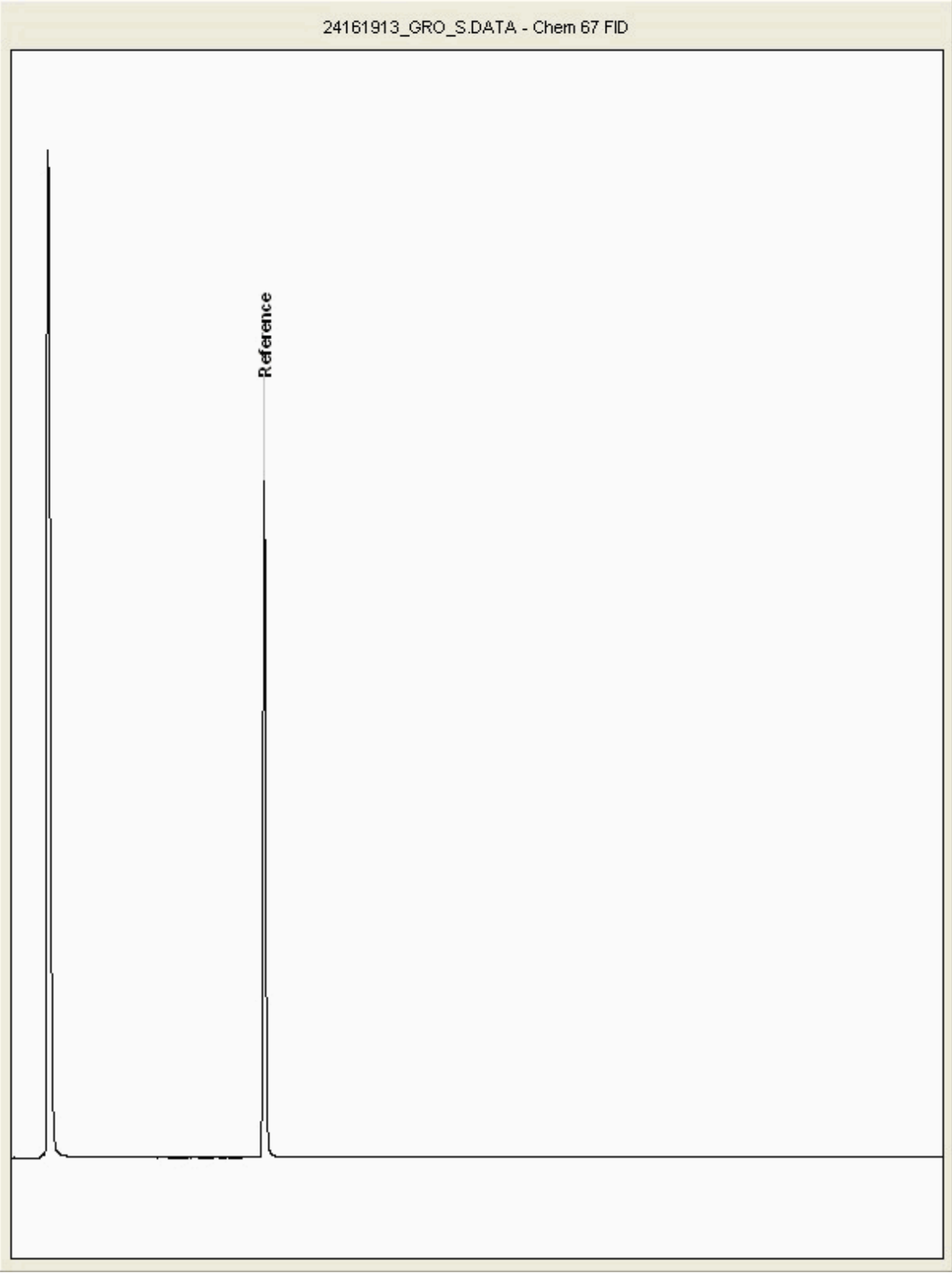
CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24161913 Depth : 0.50
Sample ID : TP - PTR - 36



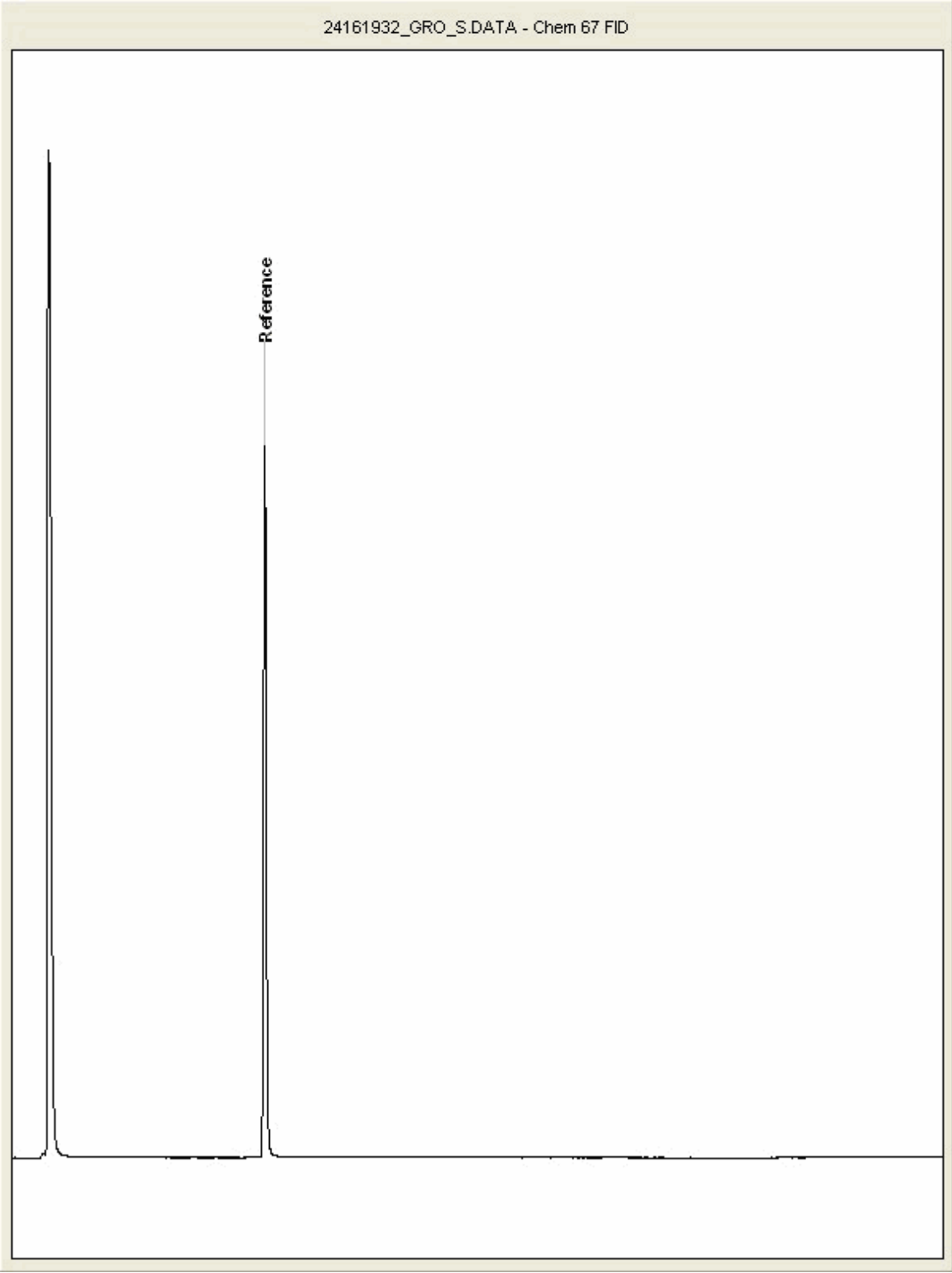
CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-167 Client Reference: B025563 Report Number: 596414
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24161932 Depth : 1.00
Sample ID : TP - PTR - 36





CERTIFICATE OF ANALYSIS

SDG:	210422-167	Client Reference:	B025563	Report Number:	596414
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Leeds
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LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

04 May 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210422-168

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

596421

We received 7 samples on Thursday April 22, 2021 and 3 of these samples were scheduled for analysis which was completed on Tuesday May 04, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-168 Client Reference: B025563 Report Number: 596421
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24132076	BH-PTR-42		1.40 - 1.50	21/04/2021
24132077	BH-PTR-42		1.90 - 2.00	21/04/2021
24132078	BH-PTR-42		2.20 - 2.30	21/04/2021
24132072	DCP-HRS-04		0.10	20/04/2021
24132073	DCP-HRS-04		0.20	20/04/2021
24132074	DCP-HRS-04		0.50	20/04/2021
24132075	DCP-HRS-04		1.00	20/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-168 Client Reference: B025563 Report Number: 596421
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend			Lab Sample No(s)			Customer Sample Reference			AGS Reference			Depth (m)			Container			Sample Type		
Test																				
No Determination Possible																				
Sample Types -																				
S - Soil/Solid																				
UNS - Unspecified Solid																				
GW - Ground Water																				
SW - Surface Water																				
LE - Land Leachate																				
PL - Prepared Leachate																				
PR - Process Water																				
SA - Saline Water																				
TE - Trade Effluent																				
TS - Treated Sewage																				
US - Untreated Sewage																				
RE - Recreational Water																				
DW - Drinking Water Non-regulatory																				
UNL - Unspecified Liquid																				
SL - Sludge																				
G - Gas																				
OTH - Other																				
Ammonium Low	All	NDPs: 0 Tests: 2	X																	
Anions by Kone (soil)	All	NDPs: 0 Tests: 3		X																
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X																	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X																	
Boron Water Soluble	All	NDPs: 0 Tests: 3		X																
CEN Readings	All	NDPs: 0 Tests: 2	X																	
Chromium III	All	NDPs: 0 Tests: 5	X	X																
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3		X																
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X																	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X																	
EPH CWG GC (S)	All	NDPs: 0 Tests: 3		X																
Fluoride	All	NDPs: 0 Tests: 2	X																	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3																		
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3		X																
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X																	

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24132076			24132077			24132078		
	Customer Sample Reference		BH-PTR-42			BH-PTR-42			BH-PTR-42		
	AGS Reference										
	Depth (m)		1.40 - 1.50			1.90 - 2.00			2.20 - 2.30		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S	S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X					X			
Mercury Dissolved	All	NDPs: 0 Tests: 2	X					X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 3		X			X			X	
pH	All	NDPs: 0 Tests: 3		X			X			X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X					X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X			X			X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X					X			
Sample description	All	NDPs: 0 Tests: 3		X			X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 3		X			X			X	
Total Sulphur	All	NDPs: 0 Tests: 3		X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 3			X			X			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24132076	BH-PTR-42	1.40 - 1.50	Dark Brown	Sandy Silt Loam	None	Stones
24132077	BH-PTR-42	1.90 - 2.00	Dark Brown	Sandy Clay	Vegetation	Stones
24132078	BH-PTR-42	2.20 - 2.30	Dark Brown	Sand	None	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

			CERTIFICATE OF ANALYSIS			Validated		
SDG: 210422-168			Client Reference: B025563			Report Number: 596421		
Location: Cambridge South East Tra			Order Number: 7000964			Superseded Report:		

CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-42	BH-PTR-42	BH-PTR-42			
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
M		Depth (m)	1.40 - 1.50 Soil/Solid (S)	1.90 - 2.00 Soil/Solid (S)	2.20 - 2.30 Soil/Solid (S)			
aq		Sample Type	21/04/2021	21/04/2021	21/04/2021			
diss.filt		Date Sampled						
tot.unfilt		Sampled Time						
*		Date Received	22/04/2021	22/04/2021	22/04/2021			
**		SDG Ref	210422-168	210422-168	210422-168			
(F)		Lab Sample No.(s)	24132076	24132077	24132078			
1-44@		AGS Reference						
Component		LOD/Units	Method					
Dibromofluoromethane**		%	TM116	103	109	107		
Toluene-d8**		%	TM116	93.7	97	95		
4-Bromofluorobenzene**		%	TM116	69.9	93.4	79.9		
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
Chloromethane		<7 µg/kg	TM116	<7 #	<7 #	<7 #		
Vinyl Chloride		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
Bromomethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Chloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Trichlorofluoromethane		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
Carbon Disulphide		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
Dichloromethane		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
2,2-Dichloropropane		<10 µg/kg	TM116	<10	<10	<10		
Bromochloromethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Chloroform		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Carbontetrachloride		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
Benzene		<9 µg/kg	TM116	<9 M	<9 M	<9 M		
Trichloroethene		<9 µg/kg	TM116	<9 #	<9 #	<9 #		
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Dibromomethane		<9 µg/kg	TM116	<9 M	<9 M	<9 M		
Bromodichloromethane		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Toluene		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10	<10	<10		
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		

VOC MS (S)

Results Legend		Customer Sample Ref.	BH-PTR-42	BH-PTR-42	BH-PTR-42			
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
M		Depth (m)	1.40 - 1.50 Soil/Solid (S)	1.90 - 2.00 Soil/Solid (S)	2.20 - 2.30 Soil/Solid (S)			
aq		Sample Type	21/04/2021	21/04/2021	21/04/2021			
diss.filt		Date Sampled						
tot.unfilt		Sampled Time						
*		Date Received	22/04/2021	22/04/2021	22/04/2021			
**		SDG Ref	210422-168	210422-168	210422-168			
(F)		Lab Sample No.(s)	24132076	24132077	24132078			
1-44@		AGS Reference						
Component		LOD/Units	Method					
1,3-Dichloropropane		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
Tetrachloroethene		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
Dibromochloromethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,2-Dibromoethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Chlorobenzene		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Ethylbenzene		<4 µg/kg	TM116	<4 M	<4 M	<4 M		
p/m-Xylene		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
o-Xylene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Styrene		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
Bromoform		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Isopropylbenzene		<5 µg/kg	TM116	<5 #	<5 #	<5 #		
1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16 M	<16 M	<16 M		
Bromobenzene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Propylbenzene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
2-Chlorotoluene		<9 µg/kg	TM116	<9 M	<9 M	<9 M		
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
4-Chlorotoluene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
tert-Butylbenzene		<14 µg/kg	TM116	<14 M	<14 M	<14 M		
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9 #	<9 #	<9 #		
sec-Butylbenzene		<10 µg/kg	TM116	<10	<10	<10		
4-Isopropyltoluene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
n-Butylbenzene		<11 µg/kg	TM116	<11	<11	<11		
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14 M	<14 M	<14 M		
Tert-amyl methyl ether		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20	<20	<20		
Hexachlorobutadiene		<20 µg/kg	TM116	<20	<20	<20		
Naphthalene		<13 µg/kg	TM116	<13 M	<13 M	<13 M		

CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.113	Natural Moisture Content (%)	25.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	79.9
Particle Size <4mm	>95%		

Case

SDG	210422-168			
Lab Sample Number(s)	24132076			
Sampled Date	21-Apr-2021			
Customer Sample Ref.	BH-PTR-42			
Depth (m)	1.40 - 1.50			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.015	<0.01	0.15	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.91	<3	49.1	<30	-	-	-
Fluoride	0.761	<0.5	7.61	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00185	<0.0005	0.0185	<0.005	-	-	-
Barium	0.288	<0.0002	2.88	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.109	<0.01	1.09	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	28	<0.2	280	<2	-	-	-
Chromium	0.0012	<0.001	0.012	<0.01	-	-	-
Copper	0.00374	<0.0003	0.0374	<0.003	-	-	-
Lead	0.00021	<0.0002	0.0021	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	2.26	<0.036	22.6	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	0.012	<0.003	0.12	<0.03	-	-	-
Nickel	0.00143	<0.0004	0.0143	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00121	<0.001	0.0121	<0.01	-	-	-
Zinc	0.00769	<0.001	0.0769	<0.01	-	-	-
Chloride	2.6	<2	26	<20	-	-	-
Sulphate (soluble)	12.4	<2	124	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	23-Apr-2021
pH (pH Units)	8.43
Conductivity (µS/cm)	160.00
Temperature (°C)	22.10
Volume Leachant (Litres)	0.878

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.113	Natural Moisture Content (%)	25.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	79.9
Particle Size <4mm	>95%		

Case

SDG	210422-168			
Lab Sample Number(s)	24132076			
Sampled Date	21-Apr-2021			
Customer Sample Ref.	BH-PTR-42			
Depth (m)	1.40 - 1.50			

[illegible]

Leach Test Information

Date Prepared	23-Apr-2021
pH (pH Units)	8.43
Conductivity (µS/cm)	160.00
Temperature (°C)	22.10
Volume Leachant (Litres)	0.878

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24132076	24132077	24132078
Customer Sample Ref.	BH-PTR-42	BH-PTR-42	BH-PTR-42
AGS Ref.			
Depth	1.40 - 1.50	1.90 - 2.00	2.20 - 2.30
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	04-May-2021		04-May-2021
Anions by Kone (soil)	28-Apr-2021	28-Apr-2021	28-Apr-2021
Anions by Kone (w)	04-May-2021		04-May-2021
Asbestos ID in Solid Samples	28-Apr-2021	26-Apr-2021	27-Apr-2021
Boron Water Soluble	30-Apr-2021	30-Apr-2021	30-Apr-2021
CEN 10:1 Leachate (1 Stage)	24-Apr-2021		24-Apr-2021
CEN Readings	30-Apr-2021		30-Apr-2021
Chromium III	30-Apr-2021	30-Apr-2021	30-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	27-Apr-2021	27-Apr-2021	28-Apr-2021
Dissolved Metals by ICP-MS	29-Apr-2021		29-Apr-2021
Dissolved Organic/Inorganic Carbon	02-May-2021		04-May-2021
EPH CWG GC (S)	27-Apr-2021	27-Apr-2021	27-Apr-2021
Fluoride	29-Apr-2021		29-Apr-2021
GRO by GC-FID (S)	28-Apr-2021	28-Apr-2021	28-Apr-2021
Hexavalent Chromium (s)	29-Apr-2021	30-Apr-2021	30-Apr-2021
Low Level Cyanide (W)	30-Apr-2021		30-Apr-2021
Low Level Hexavalent Chromium (w)	30-Apr-2021		30-Apr-2021
Mercury Dissolved	29-Apr-2021		29-Apr-2021
Metals in solid samples by OES	28-Apr-2021	28-Apr-2021	28-Apr-2021
Moisture at 105C	23-Apr-2021		23-Apr-2021
PAH by GCMS	29-Apr-2021	29-Apr-2021	30-Apr-2021
pH	28-Apr-2021	27-Apr-2021	28-Apr-2021
pH Value of Filtered Water	28-Apr-2021		28-Apr-2021
Phenols by HPLC (S)	28-Apr-2021	28-Apr-2021	28-Apr-2021
Phenols by HPLC (W)	29-Apr-2021		29-Apr-2021
Sample description	23-Apr-2021	23-Apr-2021	23-Apr-2021
Total Organic Carbon	30-Apr-2021	29-Apr-2021	30-Apr-2021
Total Sulphur	27-Apr-2021	27-Apr-2021	27-Apr-2021
TPH CWG GC (S)	28-Apr-2021	28-Apr-2021	28-Apr-2021
VOC MS (S)	28-Apr-2021	28-Apr-2021	28-Apr-2021

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2435	QC 2484
Dissolved Inorganic Carbon	TM090	101.67 93.58 : 112.28	99.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.67 96.13 : 109.53	101.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2482
Fluoride	TM104	104.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2468
QC	TM089	89.41 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2470
Hexavalent Chromium	TM151	106.0 91.40 : 115.40

Low Level Cyanide (W)

Component	Method Code	QC 2443
Free Cyanide - Low Level	TM279	70.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2489	QC 2445
Mercury Dissolved (CVAf)	TM183	103.0 69.30 : 128.70	90.8 69.30 : 128.70

Metals in solid samples by OES

Metals in solid samples by OES

Component	Method Code	QC 2418
Aluminium	TM181	99.12 77.46 : 123.98
Antimony	TM181	91.06 87.04 : 111.16
Arsenic	TM181	90.41 87.34 : 110.87
Barium	TM181	94.5 80.73 : 115.16
Beryllium	TM181	92.16 89.47 : 112.97
Boron	TM181	87.39 76.57 : 104.15
Cadmium	TM181	82.72 78.94 : 102.43
Chromium	TM181	84.99 77.55 : 104.47
Cobalt	TM181	81.76 82.95 : 107.41
Copper	TM181	88.2 84.36 : 106.14
Iron	TM181	96.03 81.43 : 115.79
Lead	TM181	83.11 81.95 : 107.63
Manganese	TM181	96.94 94.29 : 119.51
Mercury	TM181	85.27 82.73 : 106.36
Molybdenum	TM181	90.12 86.61 : 111.07
Nickel	TM181	84.11 79.72 : 103.80
Phosphorus	TM181	104.24 92.65 : 125.47
Selenium	TM181	90.98 88.36 : 111.25
Strontium	TM181	85.52 77.99 : 108.06
Thallium	TM181	91.59 88.60 : 116.73
Tin	TM181	90.11 89.77 : 112.62
Titanium	TM181	87.02 66.29 : 105.96
Vanadium	TM181	87.55 75.51 : 108.87
Zinc	TM181	93.02 84.02 : 111.24

PAH by GCMS

PAH by GCMS

Component	Method Code	QC 2417	QC 2474
Acenaphthene	TM218	85.0 76.79 : 103.90	86.5 76.79 : 103.90
Acenaphthylene	TM218	84.0 74.19 : 106.17	87.5 74.19 : 106.17
Anthracene	TM218	82.0 70.90 : 109.22	88.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.0 73.77 : 119.26	99.5 73.77 : 119.26
Benzo(a)pyrene	TM218	89.5 73.20 : 114.18	105.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	91.5 75.36 : 117.58	99.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	90.5 70.73 : 116.12	102.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	88.0 75.98 : 116.59	102.5 75.98 : 116.59
Chrysene	TM218	83.5 74.82 : 114.18	96.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	87.0 69.17 : 115.30	101.0 69.17 : 115.30
Fluoranthene	TM218	84.0 66.06 : 114.63	89.0 66.06 : 114.63
Fluorene	TM218	84.5 76.66 : 107.56	87.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	87.0 70.26 : 117.95	100.5 70.26 : 117.95
Naphthalene	TM218	84.5 74.70 : 101.83	84.5 74.70 : 101.83
Phenanthrene	TM218	85.0 73.62 : 109.34	87.5 73.62 : 109.34
Pyrene	TM218	84.0 71.46 : 117.00	90.0 71.46 : 117.00

pH

Component	Method Code	QC 2461	QC 2488	QC 2415
pH	TM133	100.44 98.41 : 102.48	100.29 98.41 : 102.48	98.53 97.51 : 101.32

pH Value of Filtered Water

Component	Method Code	QC 2497	QC 2403
pH	TM256	99.6 99.33 : 102.54	100.4 99.33 : 102.54

Phenols by HPLC (S)

Phenols by HPLC (S)

Component	Method Code	QC 2494	QC 2405
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 69.38 : 125.27	51.3 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.61 69.79 : 122.84	45.03 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	50.52 77.98 : 111.41	49.06 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	51.66 67.94 : 117.69	51.66 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	51.15 88.23 : 104.42	50.1 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2401
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	91.78 82.77 : 126.51
Cresols by HPLC (W)	TM259	98.03 76.60 : 126.28
Napthol by HPLC (W)	TM259	95.7 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	95.57 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2431	QC 2420
Total Organic Carbon	TM132	105.86 87.02 : 113.45	109.77 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2403
Total Sulphur %	TM132	108.81 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2489
1,1,1,2-tetrachloroethane	TM116	107.6 79.10 : 119.66
1,1,1-Trichloroethane	TM116	106.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	101.0 81.29 : 113.79



CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2489
1,1-Dichloroethane	TM116	113.4 86.77 : 122.11
1,2-Dichloroethane	TM116	114.6 90.04 : 132.28
1,4-Dichlorobenzene	TM116	100.8 80.81 : 125.07
2-Chlorotoluene	TM116	95.2 73.13 : 114.13
4-Chlorotoluene	TM116	89.2 68.66 : 109.13
Benzene	TM116	106.2 84.29 : 112.22
Carbon Disulphide	TM116	107.6 75.11 : 124.81
Carbontetrachloride	TM116	100.8 82.35 : 126.46
Chlorobenzene	TM116	108.0 82.88 : 122.42
Chloroform	TM116	112.2 90.35 : 120.38
Chloromethane	TM116	115.6 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	109.2 78.27 : 128.90
Dibromomethane	TM116	97.2 76.00 : 120.73
Dichloromethane	TM116	114.8 92.27 : 134.36
Ethylbenzene	TM116	98.2 70.95 : 113.07
Hexachlorobutadiene	TM116	57.8 14.55 : 147.92
Isopropylbenzene	TM116	91.6 52.00 : 108.19
Naphthalene	TM116	108.0 80.29 : 135.77
o-Xylene	TM116	97.2 68.34 : 101.99
p/m-Xylene	TM116	92.0 69.47 : 97.31
Sec-Butylbenzene	TM116	67.6 27.03 : 135.73
Tetrachloroethene	TM116	109.0 81.43 : 126.65
Toluene	TM116	96.8 82.44 : 103.50
Trichloroethene	TM116	101.0 79.80 : 112.33
Trichlorofluoromethane	TM116	106.4 89.67 : 132.09
Vinyl Chloride	TM116	121.0 69.66 : 136.55



CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

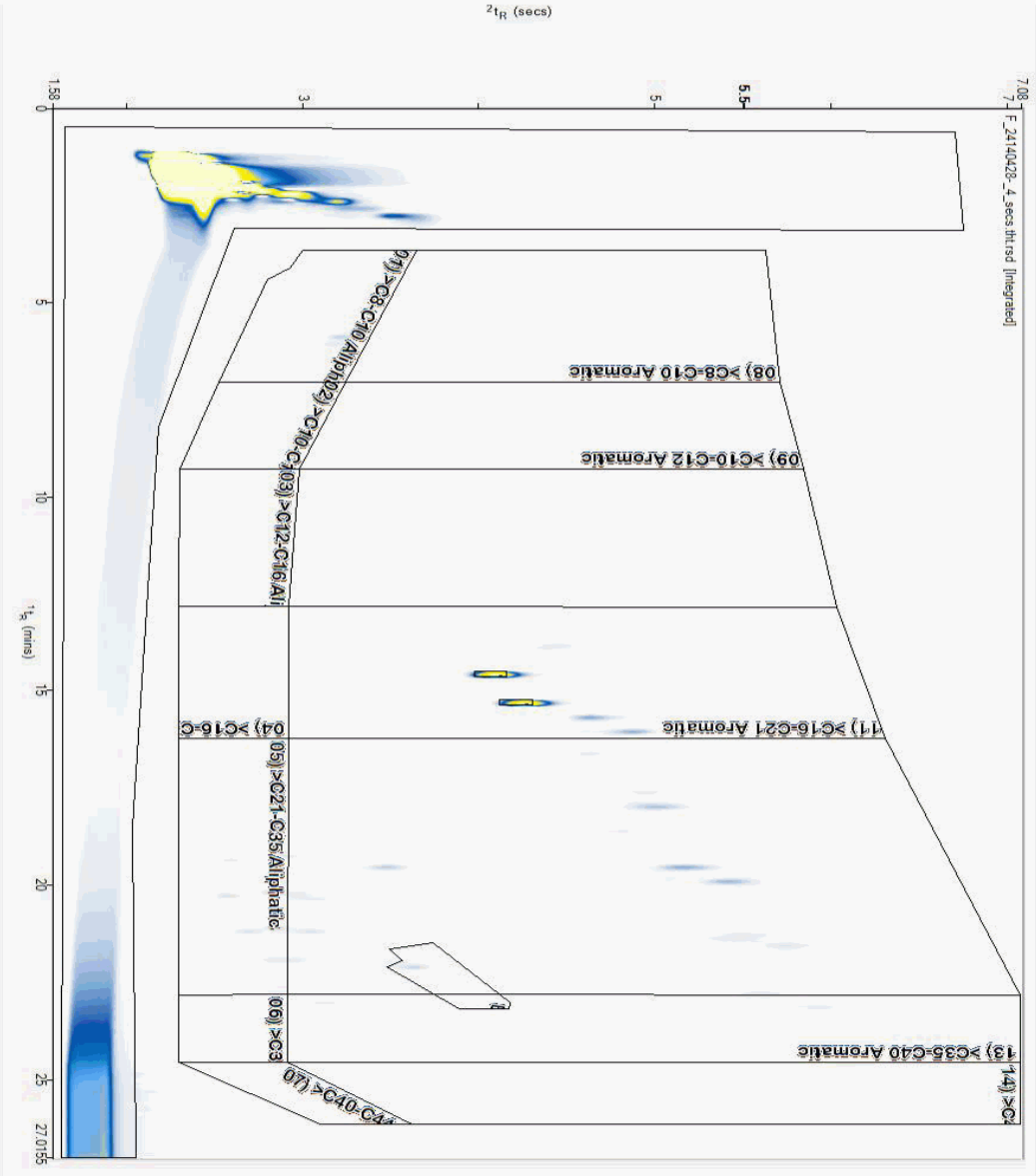
Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24140428 Depth : 1.90 - 2.00
Sample ID : BH-PTR-42

ChromSpace LIMS export
Current batch
Sample Identity: F_24140428-4_secs.tht
Date Acquired : 27/04/21 02:30:34
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

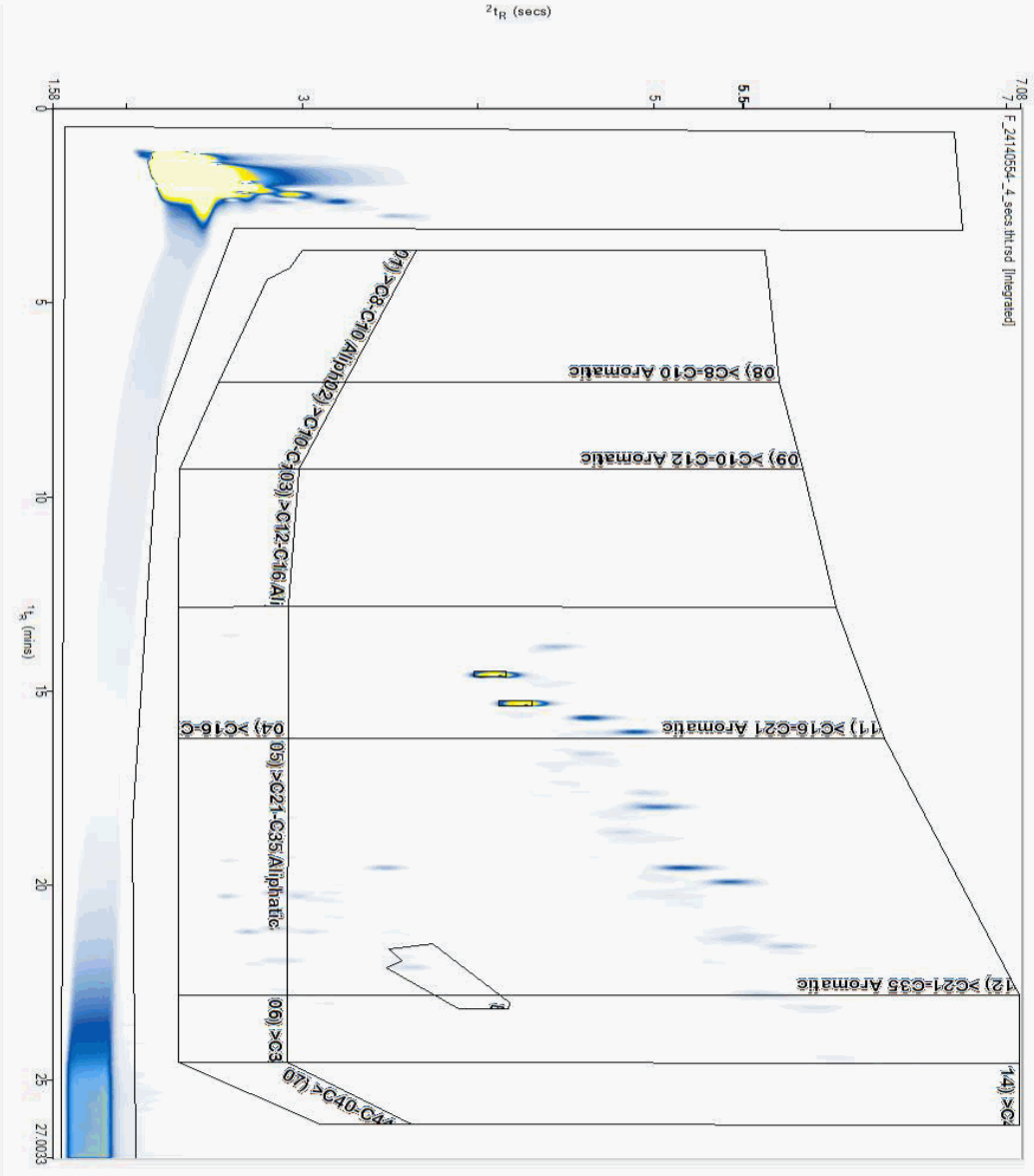
Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24140554 Depth : 2.20 - 2.30
Sample ID : BH-PTR-42

ChromSpace LIMS export
Current batch
Sample Identity: F_24140554-4_secs.tht
Date Acquired : 27/04/21 01:49:42
Units : ppm
Dilution : 0
CF :
Multiplier :





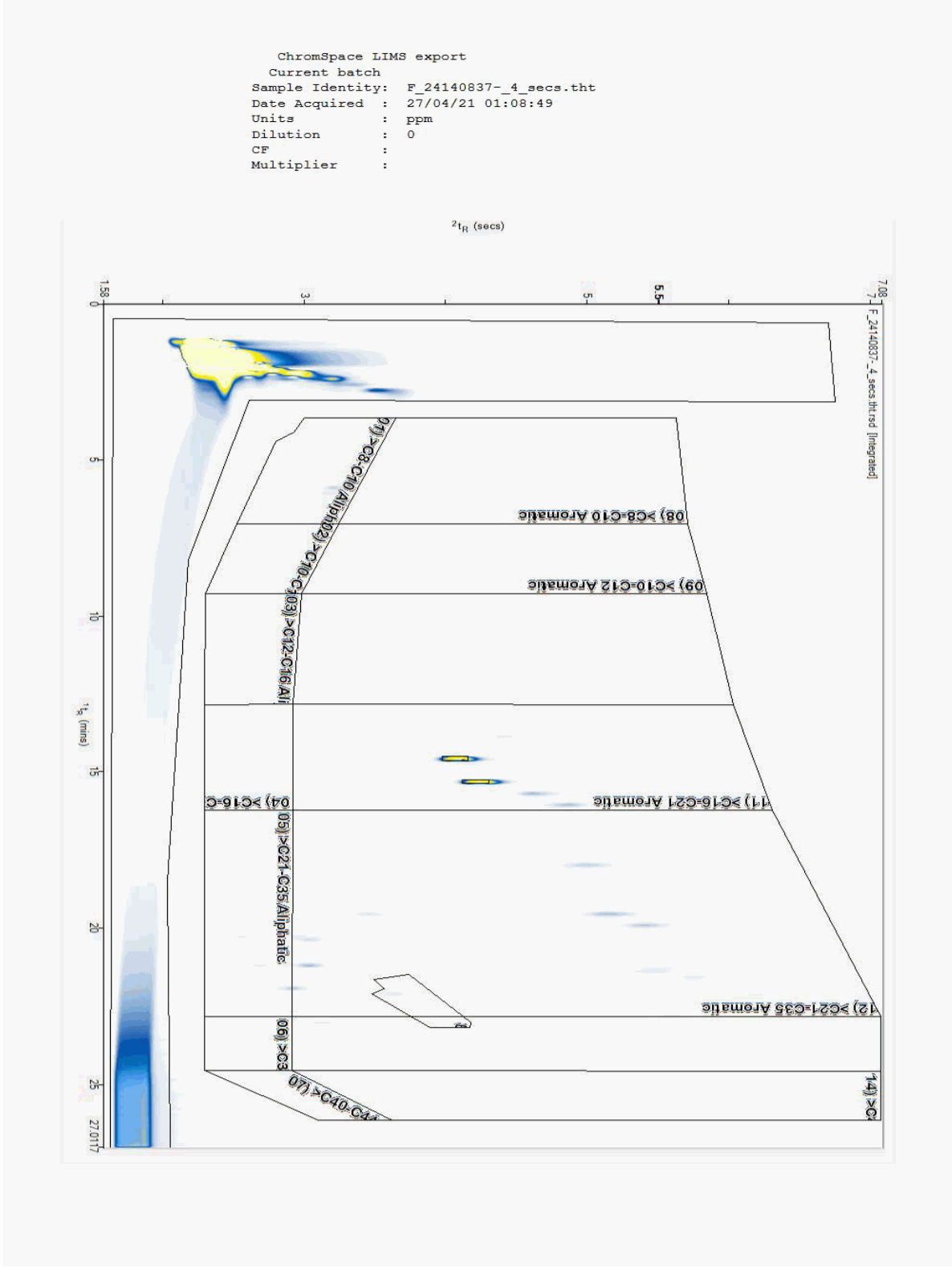
CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24140837 Depth : 1.40 - 1.50
Sample ID : BH-PTR-42



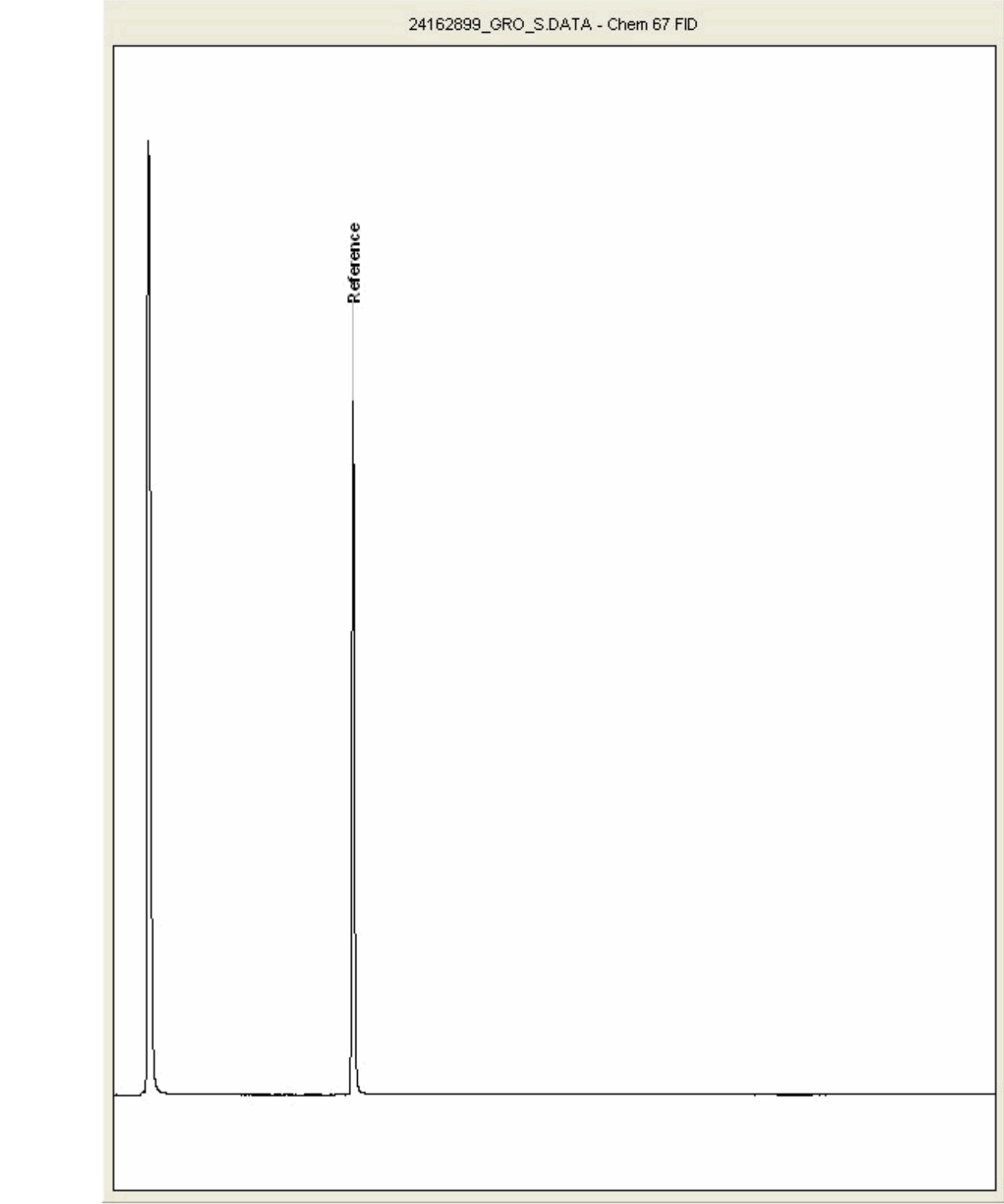
CERTIFICATE OF ANALYSIS

Validated

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24162899 Depth : 1.90 - 2.00
Sample ID : BH-PTR-42





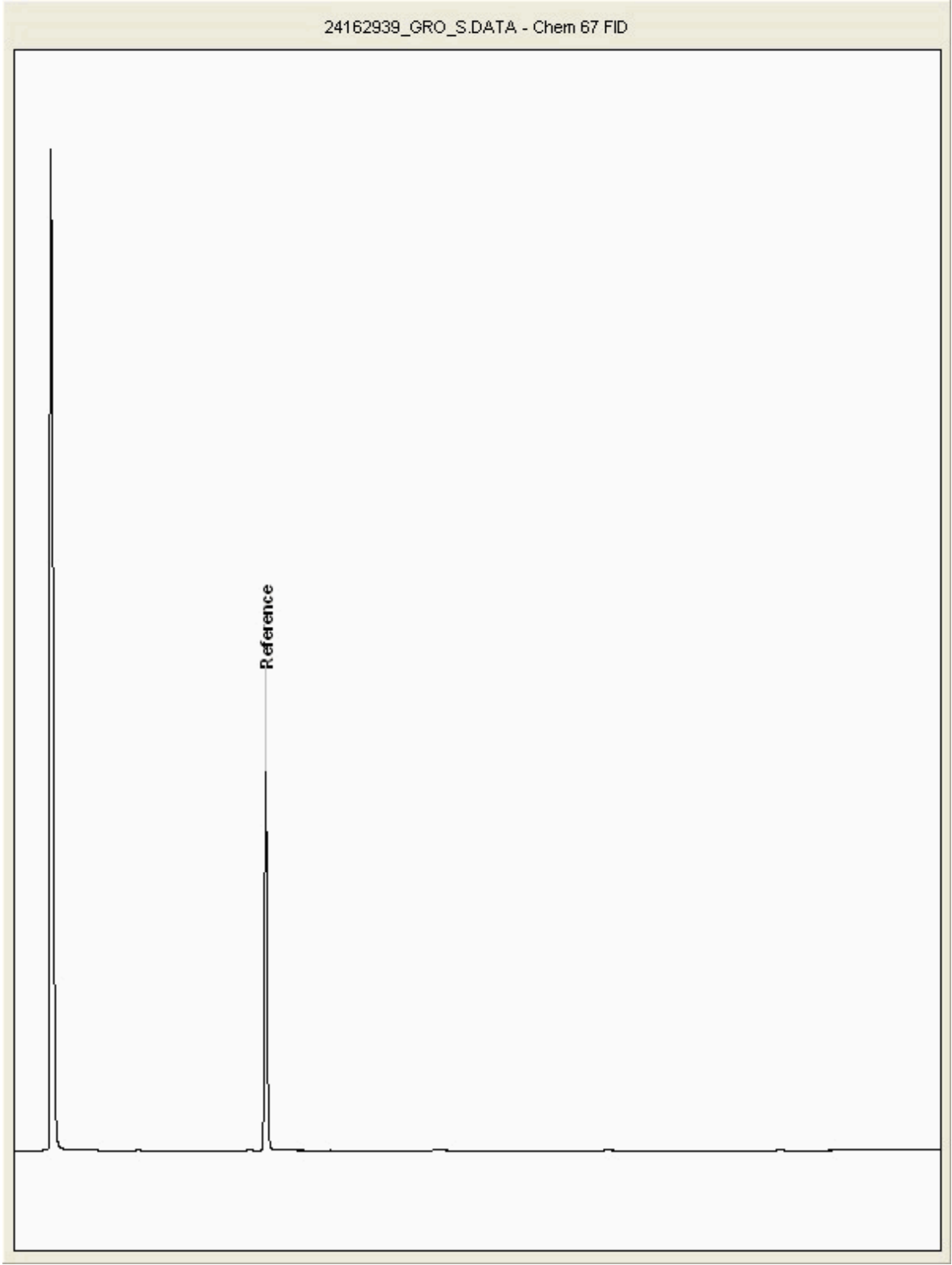
CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-168 Client Reference: B025563 Report Number: 596421
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24162939 Depth : 1.40 - 1.50
Sample ID : BH-PTR-42



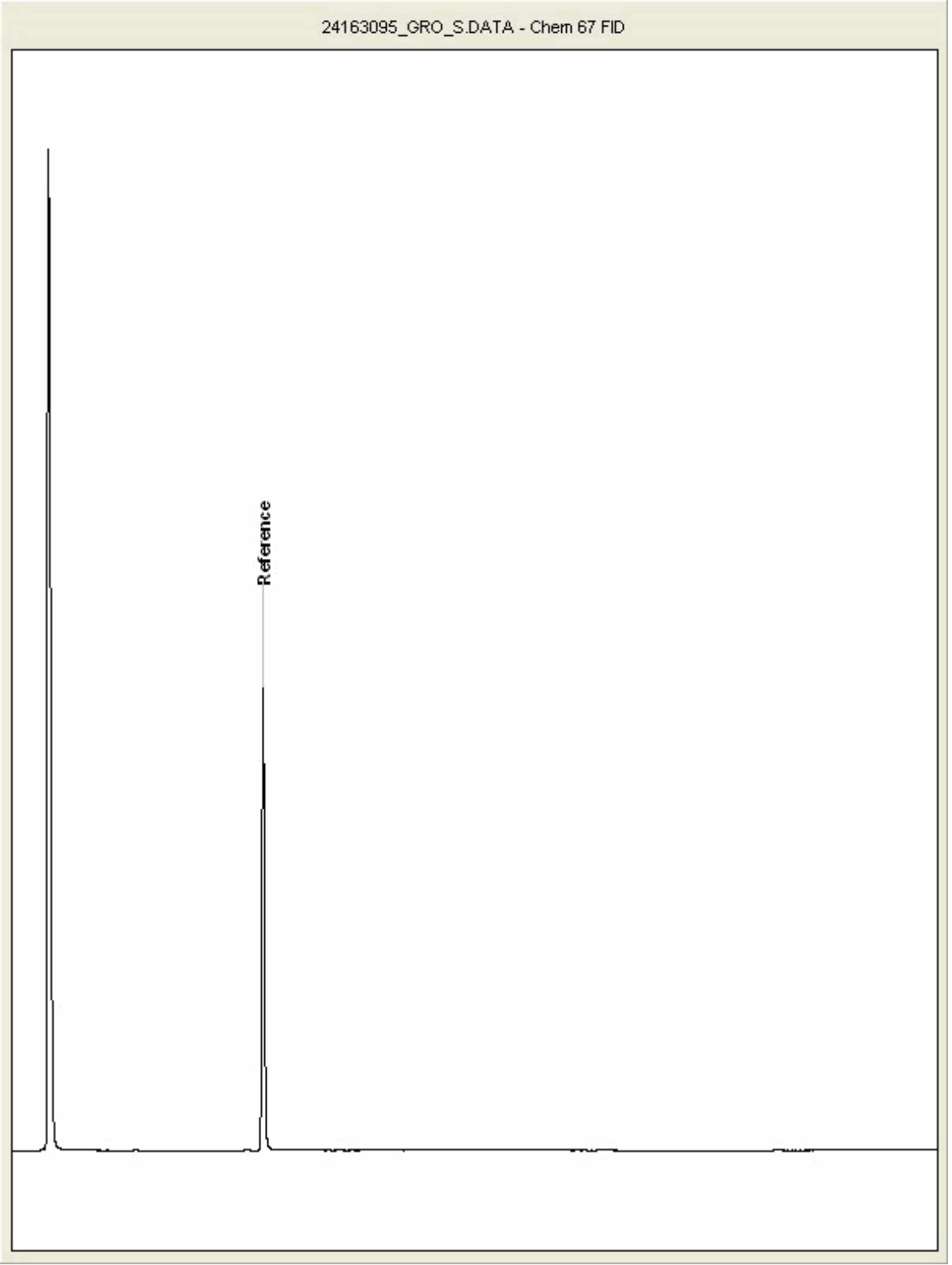
CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-168 Client Reference: B025563 Report Number: 596421
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24163095 Depth : 2.20 - 2.30
Sample ID : BH-PTR-42





CERTIFICATE OF ANALYSIS

SDG:	210422-168	Client Reference:	B025563	Report Number:	596421
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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CH5 3US

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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

04 May 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210423-134

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

596417

We received 10 samples on Friday April 23, 2021 and 3 of these samples were scheduled for analysis which was completed on Tuesday May 04, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7

Version Issued: 04/05/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24142415	TPBP-04	ES1	0.10	21/04/2021
24142416	TPBP-04	ES2	0.20	21/04/2021
24142417	TPBP-04	ES3	0.50	21/04/2021
24142419	TPBP-04	ES5	1.00	21/04/2021
24142420	TPBP-04	W9	1.50	21/04/2021
24142406	TPBP-05	ES1	0.10	21/04/2021
24142409	TPBP-05	ES2	0.20	21/04/2021
24142411	TPBP-05	ES3	0.50	21/04/2021
24142412	TPBP-05	ES6	1.00	21/04/2021
24142413	TPBP-05	ES8	1.20	21/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24142416	24142406	24142411
						TPBP-04	TPBP-05	TPBP-05
Ammonium Low	All	NDPs: 0 Tests: 2	0.20	0.10	0.50	ES2	ES1	ES3
						60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Anions by Kone (w)	All	NDPs: 0 Tests: 2	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Boron Water Soluble	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
CEN Readings	All	NDPs: 0 Tests: 2	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Chromium III	All	NDPs: 0 Tests: 5	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
EPH CWG GC (S)	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Fluoride	All	NDPs: 0 Tests: 2	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	S	S	S	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
						S	S	S

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24142416		24142406		24142411	
	Customer Sample Reference		TPBP-04		TPBP-05		TPBP-05	
	AGS Reference		ES2		ES1		ES3	
	Depth (m)		0.20		0.10		0.50	
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X		X			
Mercury Dissolved	All	NDPs: 0 Tests: 2	X		X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X		X		X
PAH by GCMS	All	NDPs: 0 Tests: 3		X		X		X
pH	All	NDPs: 0 Tests: 3		X		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X		X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X		X			
Sample description	All	NDPs: 0 Tests: 3		X		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 3		X		X		X
Total Sulphur	All	NDPs: 0 Tests: 3		X		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X		X
VOC MS (S)	All	NDPs: 0 Tests: 3			X		X	
								X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24142416	TPBP-04	0.20	Dark Brown	Sandy Clay	Stones	Vegetation
24142406	TPBP-05	0.10	Dark Brown	Loamy Sand	Stones	Vegetation
24142411	TPBP-05	0.50	Dark Brown	Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

		CERTIFICATE OF ANALYSIS						Validated	
SDG: 210423-134		Client Reference: B025563		Report Number: 596417					
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:					

SDG:	210423-134	Client Reference:	B025563	Report Number:	596417
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210423-134	Client Reference:	B025563	Report Number:	596417
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

VOC MS (S)

Results Legend		Customer Sample Ref.	TPBP-04	TPBP-05	TPBP-05			
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
M		Depth (m)	0.20 Soil/Solid (S) 21/04/2021	0.10 Soil/Solid (S) 21/04/2021	0.50 Soil/Solid (S) 21/04/2021			
aq		Sample Type						
diss.filt		Date Sampled						
tot.unfilt		Sampled Time						
*		Date Received						
**		SDG Ref						
(F)		Lab Sample No.(s)						
1-44@		AGS Reference						
Component		LOD/Units	Method					
Dibromofluoromethane**		%	TM116	106	105	104		
Toluene-d8**		%	TM116	94.6	95.1	99.8		
4-Bromofluorobenzene**		%	TM116	81.4	78.2	95.6		
Dichlorodifluoromethane		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
Chloromethane		<7 µg/kg	TM116	<7 #	<7 #	<7 #		
Vinyl Chloride		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
Bromomethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Chloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Trichlorofluoromethane		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
1,1-Dichloroethene		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
Carbon Disulphide		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
Dichloromethane		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
Methyl Tertiary Butyl Ether		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
trans-1,2-Dichloroethene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,1-Dichloroethane		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
cis-1,2-Dichloroethene		<6 µg/kg	TM116	<6 M	<6 M	<6 M		
2,2-Dichloropropane		<10 µg/kg	TM116	<10	<10	<10		
Bromochloromethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Chloroform		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
1,1,1-Trichloroethane		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
1,1-Dichloropropene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Carbontetrachloride		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,2-Dichloroethane		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
Benzene		<9 µg/kg	TM116	<9 M	<9 M	<9 M		
Trichloroethene		<9 µg/kg	TM116	<9 #	<9 #	<9 #		
1,2-Dichloropropane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Dibromomethane		<9 µg/kg	TM116	<9 M	<9 M	<9 M		
Bromodichloromethane		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
cis-1,3-Dichloropropene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Toluene		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
trans-1,3-Dichloropropene		<10 µg/kg	TM116	<10	<10	<10		
1,1,2-Trichloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		

VOC MS (S)

Results Legend		Customer Sample Ref.	TPBP-04	TPBP-05	TPBP-05			
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)							
M		Depth (m)	0.20 Soil/Solid (S) 21/04/2021	0.10 Soil/Solid (S) 21/04/2021	0.50 Soil/Solid (S) 21/04/2021			
aq		Sample Type						
diss.filt		Date Sampled						
tot.unfilt		Sampled Time						
*		Date Received						
**		SDG Ref						
(F)		Lab Sample No.(s)						
1-44@		AGS Reference						
Component		LOD/Units	Method					
1,3-Dichloropropane		<7 µg/kg	TM116	<7 M	<7 M	<7 M		
Tetrachloroethene		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
Dibromochloromethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,2-Dibromoethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Chlorobenzene		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
1,1,1,2-Tetrachloroethane		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Ethylbenzene		<4 µg/kg	TM116	<4 M	<4 M	<4 M		
p/m-Xylene		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
o-Xylene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Styrene		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
Bromoform		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Isopropylbenzene		<5 µg/kg	TM116	<5 #	<5 #	<5 #		
1,1,2,2-Tetrachloroethane		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
1,2,3-Trichloropropane		<16 µg/kg	TM116	<16 M	<16 M	<16 M		
Bromobenzene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
Propylbenzene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
2-Chlorotoluene		<9 µg/kg	TM116	<9 M	<9 M	<9 M		
1,3,5-Trimethylbenzene		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
4-Chlorotoluene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
tert-Butylbenzene		<14 µg/kg	TM116	<14 M	<14 M	<14 M		
1,2,4-Trimethylbenzene		<9 µg/kg	TM116	<9 #	<9 #	<9 #		
sec-Butylbenzene		<10 µg/kg	TM116	<10	<10	<10		
4-Isopropyltoluene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,3-Dichlorobenzene		<8 µg/kg	TM116	<8 M	<8 M	<8 M		
1,4-Dichlorobenzene		<5 µg/kg	TM116	<5 M	<5 M	<5 M		
n-Butylbenzene		<11 µg/kg	TM116	<11	<11	<11		
1,2-Dichlorobenzene		<10 µg/kg	TM116	<10 M	<10 M	<10 M		
1,2-Dibromo-3-chloropropane		<14 µg/kg	TM116	<14 M	<14 M	<14 M		
Tert-amyl methyl ether		<10 µg/kg	TM116	<10 #	<10 #	<10 #		
1,2,4-Trichlorobenzene		<20 µg/kg	TM116	<20	<20	<20		
Hexachlorobutadiene		<20 µg/kg	TM116	<20	<20	<20		
Naphthalene		<13 µg/kg	TM116	<13 M	<13 M	<13 M		

CERTIFICATE OF ANALYSIS

Validated

SDG:	210423-134	Client Reference:	B025563	Report Number:	596417
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.100	Natural Moisture Content (%)	11.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	89.7
Particle Size <4mm	>95%		

Case

SDG	210423-134			
Lab Sample Number(s)	24142406			
Sampled Date	21-Apr-2021			
Customer Sample Ref.	TPBP-05 ES1			
Depth (m)	0.10			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.024	<0.01	0.24	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	5.82	<3	58.2	<30	-	-	-
Fluoride	0.512	<0.5	5.12	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00149	<0.0005	0.0149	<0.005	-	-	-
Barium	0.0067	<0.0002	0.067	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0211	<0.01	0.211	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	25.7	<0.2	257	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.519	<0.036	5.19	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000956	<0.0004	0.00956	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.0486	<0.001	0.486	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	26-Apr-2021
pH (pH Units)	8.30
Conductivity (µS/cm)	140.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.890

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16:37:26 04/05/2021



CERTIFICATE OF ANALYSIS

Validated

SDG:	210423-134	Client Reference:	B025563	Report Number:	596417
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - F
Mass Sample taken (kg)	0.100	Natural Moisture Content (%)		11.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		89.7
Particle Size <4mm	>95%			

Case

SDG	210423-134			
Lab Sample Number(s)	24142406			
Sampled Date	21-Apr-2021			
Customer Sample Ref.	TPBP-05 ES1			
Depth (m)	0.10			

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	66.3	<0.65	663	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.126	<0.019	1.26	<0.19	-	-	-

Leach Test Information

Date Prepared	26-Apr-2021
pH (pH Units)	8.30
Conductivity (µS/cm)	140.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.890

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24142416	24142406	24142411
Customer Sample Ref.	TPBP-04	TPBP-05	TPBP-05
AGS Ref.	ES2	ES1	ES3
Depth	0.20	0.10	0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	04-May-2021	04-May-2021	
Anions by Kone (soil)	28-Apr-2021	29-Apr-2021	29-Apr-2021
Anions by Kone (w)	04-May-2021	04-May-2021	
Asbestos ID in Solid Samples	27-Apr-2021	28-Apr-2021	27-Apr-2021
Boron Water Soluble	30-Apr-2021	30-Apr-2021	30-Apr-2021
CEN 10:1 Leachate (1 Stage)	26-Apr-2021	26-Apr-2021	
CEN Readings	30-Apr-2021	28-Apr-2021	
Chromium III	30-Apr-2021	30-Apr-2021	30-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	28-Apr-2021	27-Apr-2021	27-Apr-2021
Dissolved Metals by ICP-MS	29-Apr-2021	29-Apr-2021	
Dissolved Organic/Inorganic Carbon	03-May-2021	03-May-2021	
EPH CWG GC (S)	28-Apr-2021	30-Apr-2021	29-Apr-2021
Fluoride	29-Apr-2021	29-Apr-2021	
GRO by GC-FID (S)	28-Apr-2021	30-Apr-2021	30-Apr-2021
Hexavalent Chromium (s)	29-Apr-2021	30-Apr-2021	29-Apr-2021
Low Level Cyanide (W)	30-Apr-2021	30-Apr-2021	
Low Level Hexavalent Chromium (w)	30-Apr-2021	30-Apr-2021	
Mercury Dissolved	29-Apr-2021	29-Apr-2021	
Metals in solid samples by OES	29-Apr-2021	30-Apr-2021	30-Apr-2021
Moisture at 105C	26-Apr-2021	26-Apr-2021	
PAH by GCMS	27-Apr-2021	27-Apr-2021	27-Apr-2021
pH	28-Apr-2021	28-Apr-2021	28-Apr-2021
pH Value of Filtered Water	30-Apr-2021	29-Apr-2021	
Phenols by HPLC (S)	28-Apr-2021	29-Apr-2021	29-Apr-2021
Phenols by HPLC (W)	30-Apr-2021	30-Apr-2021	
Sample description	24-Apr-2021	24-Apr-2021	24-Apr-2021
Total Organic Carbon	30-Apr-2021	30-Apr-2021	30-Apr-2021
Total Sulphur	29-Apr-2021	29-Apr-2021	29-Apr-2021
TPH CWG GC (S)	28-Apr-2021	30-Apr-2021	30-Apr-2021
VOC MS (S)	28-Apr-2021	29-Apr-2021	29-Apr-2021

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG:

210423-134

Client Reference:

B025563

Report Number:

596417

Location:

Cambridge South East Tra

Order Number:

7000964

Superseded Report:

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2464	QC 2470
Ammoniacal Nitrogen as N	TM099	99.4 96.04 : 106.80	100.6 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2499
Chloride (soluble)	TM243	145.08 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	157.94 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2454
Chloride	TM184	98.4 91.40 : 109.10
Sulphate (soluble)	TM184	100.0 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2463	QC 2440
Water Soluble Boron	TM222	99.5 84.00 : 111.00	101.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2427	QC 2449
Free Cyanide	TM153	98.81 79.00 : 115.00	92.38 79.00 : 115.00
Thiocyanate	TM153	102.56 94.09 : 113.89	97.44 94.09 : 113.89
Total Cyanide	TM153	100.7 73.07 : 107.47	97.2 73.07 : 107.47

Dissolved Metals by ICP-MS

Component	Method Code	QC 2461
Aluminium	TM152	99.67 90.98 : 111.82
Antimony	TM152	99.67 90.44 : 113.04
Arsenic	TM152	100.17 88.00 : 112.00

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210423-134

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Cambridge South East Tra

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7000964

Superseded Report:

Dissolved Metals by ICP-MS

		QC 2461
Barium	TM152	100.83 90.20 : 111.19
Beryllium	TM152	99.83 87.77 : 113.97
Bismuth	TM152	102.0 91.90 : 112.20
Borate	TM152	101.85 88.00 : 112.00
Boron	TM152	101.67 96.48 : 114.93
Cadmium	TM152	99.33 96.43 : 110.53
Calcium	TM152	102.0 81.38 : 119.09
Chromium	TM152	99.17 91.84 : 108.67
Cobalt	TM152	99.5 88.00 : 112.00
Copper	TM152	100.5 92.47 : 118.11
Iron	TM152	100.0 92.00 : 113.00
Lead	TM152	100.0 88.00 : 112.00
Lithium	TM152	102.17 91.62 : 113.12
Magnesium	TM152	100.67 93.14 : 107.91
Manganese	TM152	100.33 95.03 : 110.58
Molybdenum	TM152	97.83 88.00 : 112.00
Nickel	TM152	99.67 88.00 : 112.00
Phosphorus	TM152	101.67 88.00 : 112.00
Potassium	TM152	103.33 93.90 : 112.36
Selenium	TM152	99.83 91.58 : 115.98
Silver	TM152	100.0 88.80 : 122.30
Sodium	TM152	102.0 94.28 : 110.71
Strontium	TM152	100.67 88.00 : 112.00
Tellurium	TM152	99.83 93.32 : 114.66
Thallium	TM152	95.5 88.00 : 112.00
Tin	TM152	101.33 92.63 : 109.70
Titanium	TM152	104.83 95.58 : 111.68

Dissolved Metals by ICP-MS

		QC 2461
Tungsten	TM152	100.83 81.32 : 124.72
Uranium	TM152	98.5 88.00 : 112.00
Vanadium	TM152	100.83 88.00 : 112.00
Zinc	TM152	100.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2424
Dissolved Inorganic Carbon	TM090	101.5 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.67 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2440
EPH >C8-C40 Raw	TM414	94.92 70.16 : 114.99
Total Aliphatics Raw	TM414	100.73 68.59 : 115.04
Total Aromatics Raw	TM414	106.81 69.80 : 126.50

Fluoride

Component	Method Code	QC 2439
Fluoride	TM104	104.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2468
QC	TM089	89.41 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2433
Hexavalent Chromium	TM151	96.0 91.40 : 115.40

Hexavalent Chromium (s)

Low Level Cyanide (W)

Component	Method Code	QC 2443
Free Cyanide - Low Level	TM279	70.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	97.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2430
Mercury Dissolved (CVAf)	TM183	96.7 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2494	QC 2479	QC 2408
Aluminium	TM181	98.23 77.46 : 123.98	102.65 77.46 : 123.98	99.12 77.46 : 123.98
Antimony	TM181	96.34 87.04 : 111.16	102.44 87.04 : 111.16	102.03 87.04 : 111.16
Arsenic	TM181	96.8 87.34 : 110.87	100.58 87.34 : 110.87	100.0 87.34 : 110.87
Barium	TM181	95.41 80.73 : 115.16	97.25 80.73 : 115.16	100.0 80.73 : 115.16
Beryllium	TM181	100.75 89.47 : 112.97	101.49 89.47 : 112.97	99.25 89.47 : 112.97
Boron	TM181	89.4 76.57 : 104.15	96.56 76.57 : 104.15	92.26 76.57 : 104.15
Cadmium	TM181	92.59 78.94 : 102.43	93.0 78.94 : 102.43	92.18 78.94 : 102.43
Chromium	TM181	89.86 77.55 : 104.47	90.67 77.55 : 104.47	87.83 77.55 : 104.47
Cobalt	TM181	87.11 82.95 : 107.41	88.99 82.95 : 107.41	88.36 82.95 : 107.41
Copper	TM181	93.66 84.36 : 106.14	96.48 84.36 : 106.14	95.42 84.36 : 106.14
Iron	TM181	96.83 81.43 : 115.79	99.21 81.43 : 115.79	97.62 81.43 : 115.79
Lead	TM181	89.64 81.95 : 107.63	90.54 81.95 : 107.63	90.09 81.95 : 107.63
Manganese	TM181	109.17 94.29 : 119.51	115.56 94.29 : 119.51	112.22 94.29 : 119.51
Mercury	TM181	91.55 82.73 : 106.36	94.2 82.73 : 106.36	93.96 82.73 : 106.36
Molybdenum	TM181	95.47 86.61 : 111.07	97.12 86.61 : 111.07	97.53 86.61 : 111.07
Nickel	TM181	89.0 79.72 : 103.80	90.71 79.72 : 103.80	89.73 79.72 : 103.80

		CERTIFICATE OF ANALYSIS			Validated
SDG:	210423-134	Client Reference:	B025563	Report Number:	596417
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES					

		QC 2494	QC 2479	QC 2408
Phosphorus	TM181	111.92 92.65 : 125.47	109.9 92.65 : 125.47	113.94 92.65 : 125.47
Selenium	TM181	97.25 88.36 : 111.25	98.43 88.36 : 111.25	98.43 88.36 : 111.25
Strontium	TM181	93.54 77.99 : 108.06	98.0 77.99 : 108.06	93.76 77.99 : 108.06
Thallium	TM181	99.12 88.60 : 116.73	100.88 88.60 : 116.73	100.0 88.60 : 116.73
Tin	TM181	95.82 89.77 : 112.62	98.1 89.77 : 112.62	97.72 89.77 : 112.62
Titanium	TM181	86.26 66.29 : 105.96	90.08 66.29 : 105.96	83.97 66.29 : 105.96
Vanadium	TM181	97.07 75.51 : 108.87	100.73 75.51 : 108.87	94.87 75.51 : 108.87
Zinc	TM181	98.36 84.02 : 111.24	100.82 84.02 : 111.24	99.59 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2496	QC 2429	QC 2422
Acenaphthene	TM218	88.0 76.79 : 103.90	88.0 73.47 : 109.80	85.0 78.59 : 112.16
Acenaphthylene	TM218	85.5 74.19 : 106.17	88.0 70.00 : 130.00	85.0 75.11 : 109.01
Anthracene	TM218	84.5 70.90 : 109.22	88.5 68.68 : 111.89	84.0 73.99 : 113.85
Benz(a)anthracene	TM218	89.5 73.77 : 119.26	99.0 68.12 : 118.39	105.0 69.31 : 119.18
Benzo(a)pyrene	TM218	88.5 73.20 : 114.18	95.5 71.72 : 115.31	100.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	84.5 75.36 : 117.58	94.0 66.89 : 120.40	99.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	85.0 70.73 : 116.12	90.0 67.82 : 118.49	97.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	85.5 75.98 : 116.59	100.0 73.10 : 117.03	96.5 69.98 : 116.49
Chrysene	TM218	87.0 74.82 : 114.18	95.5 69.58 : 115.47	100.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	81.0 69.17 : 115.30	92.0 67.32 : 121.35	97.0 64.54 : 115.22
Fluoranthene	TM218	87.5 66.06 : 114.63	87.5 75.16 : 117.28	87.0 72.56 : 111.70
Fluorene	TM218	85.5 76.66 : 107.56	87.5 73.81 : 108.66	85.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	90.5 70.26 : 117.95	89.5 68.91 : 117.62	92.5 61.22 : 113.25
Naphthalene	TM218	86.0 74.70 : 101.83	86.0 72.12 : 106.18	80.5 77.96 : 110.91
Phenanthrene	TM218	86.0 73.62 : 109.34	89.0 69.01 : 113.72	85.0 76.83 : 113.25
Pyrene	TM218	87.0 71.46 : 117.00	89.5 64.28 : 115.75	87.0 72.45 : 110.77

pH

		CERTIFICATE OF ANALYSIS			Validated
SDG:	210423-134	Client Reference:	B025563	Report Number:	596417
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH					

Component	Method Code	QC 2425	QC 2442	QC 2428
pH	TM133	98.68 97.51 : 101.32	100.0 98.41 : 102.48	98.97 97.51 : 101.32

pH Value of Filtered Water

Component	Method Code	QC 2435	QC 2403
pH	TM256	100.27 99.33 : 102.54	100.53 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2476	QC 2480
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	50.0 70.71 : 116.42	50.0 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	44.44 64.54 : 117.79	43.27 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	47.6 74.40 : 108.98	48.23 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	50.99 69.44 : 122.18	49.67 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	49.27 76.56 : 106.38	49.17 88.23 : 104.42

Phenols by HPLC (W)

Component	Method Code	QC 2463
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	100.0 76.60 : 126.28
Napthol by HPLC (W)	TM259	97.66 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	97.47 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2496	QC 2430
Total Organic Carbon	TM132	110.55 87.02 : 113.45	103.91 84.82 : 117.61

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210423-134	Client Reference:	B025563	Report Number:	596417	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Total Sulphur						
Component	Method Code	QC 2483	QC 2417			
Total Sulphur %	TM132	92.23 61.64 : 114.47	96.89 61.64 : 114.47			

VOC MS (S)		
Component	Method Code	QC 2489
1,1,1,2-tetrachloroethane	TM116	107.6 79.10 : 119.66
1,1,1-Trichloroethane	TM116	106.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	101.0 81.29 : 113.79
1,1-Dichloroethane	TM116	113.4 86.77 : 122.11
1,2-Dichloroethane	TM116	114.6 90.04 : 132.28
1,4-Dichlorobenzene	TM116	100.8 80.81 : 125.07
2-Chlorotoluene	TM116	95.2 73.13 : 114.13
4-Chlorotoluene	TM116	89.2 68.66 : 109.13
Benzene	TM116	106.2 84.29 : 112.22
Carbon Disulphide	TM116	107.6 75.11 : 124.81
Carbontetrachloride	TM116	100.8 82.35 : 126.46
Chlorobenzene	TM116	108.0 82.88 : 122.42
Chloroform	TM116	112.2 90.35 : 120.38
Chloromethane	TM116	115.6 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	109.2 78.27 : 128.90
Dibromomethane	TM116	97.2 76.00 : 120.73
Dichloromethane	TM116	114.8 92.27 : 134.36
Ethylbenzene	TM116	98.2 70.95 : 113.07
Hexachlorobutadiene	TM116	57.8 14.55 : 147.92
Isopropylbenzene	TM116	91.6 52.00 : 108.19
Naphthalene	TM116	108.0 80.29 : 135.77
o-Xylene	TM116	97.2 68.34 : 101.99

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210423-134	Client Reference:	B025563	Report Number:	596417	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2489				
p/m-Xylene	TM116	92.0 69.47 : 97.31				
Sec-Butylbenzene	TM116	67.6 27.03 : 135.73				
Tetrachloroethene	TM116	109.0 81.43 : 126.65				
Toluene	TM116	96.8 82.44 : 103.50				
Trichloroethene	TM116	101.0 79.80 : 112.33				
Trichlorofluoromethane	TM116	106.4 89.67 : 132.09				
Vinyl Chloride	TM116	121.0 69.66 : 136.55				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

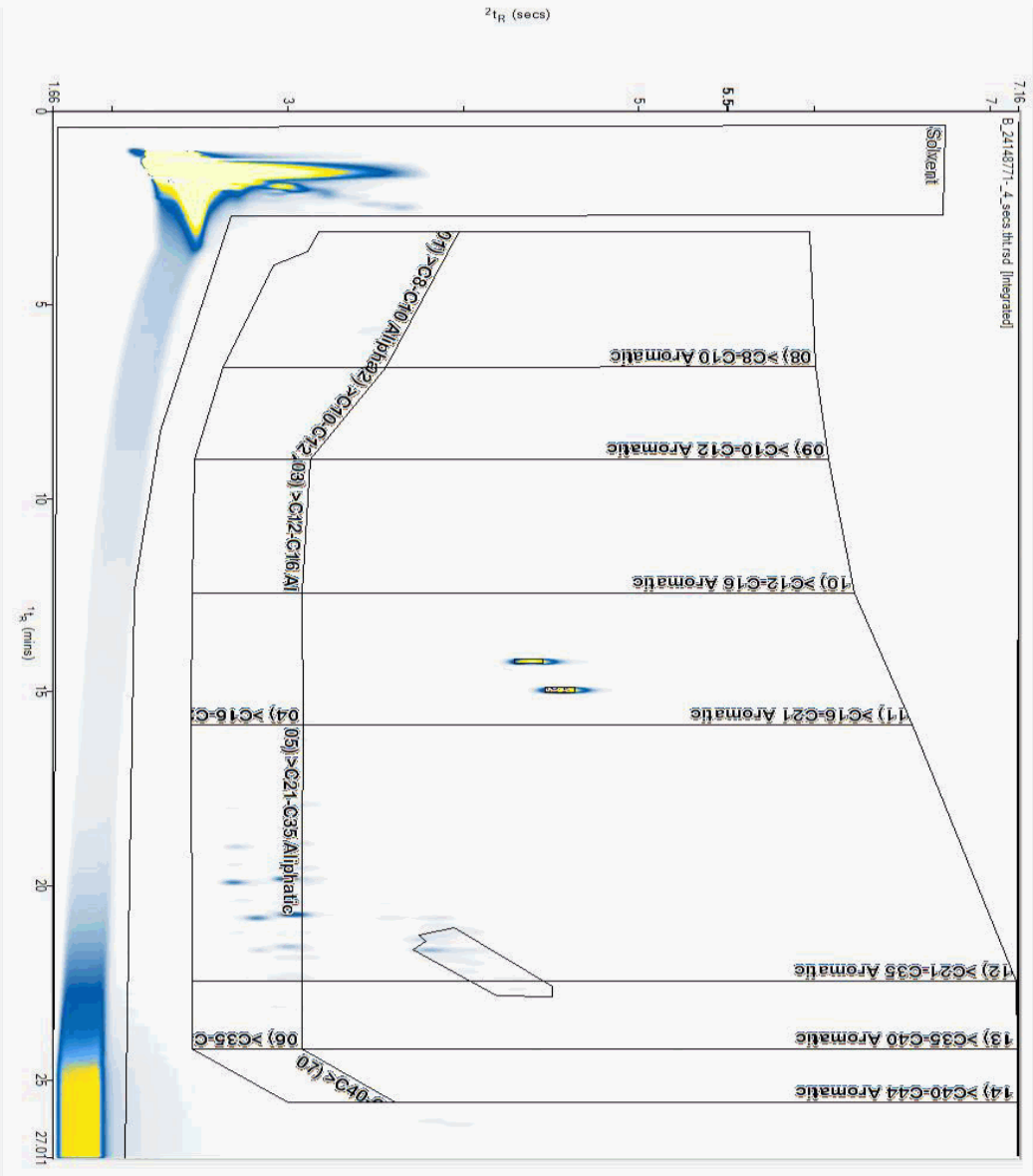
Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24148771 Depth : 0.10
Sample ID : TPBP-05

ChromSpace LIMS export
Current batch
Sample Identity: B_24148771-4_secs.tht
Date Acquired : 29/04/21 07:29:10
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

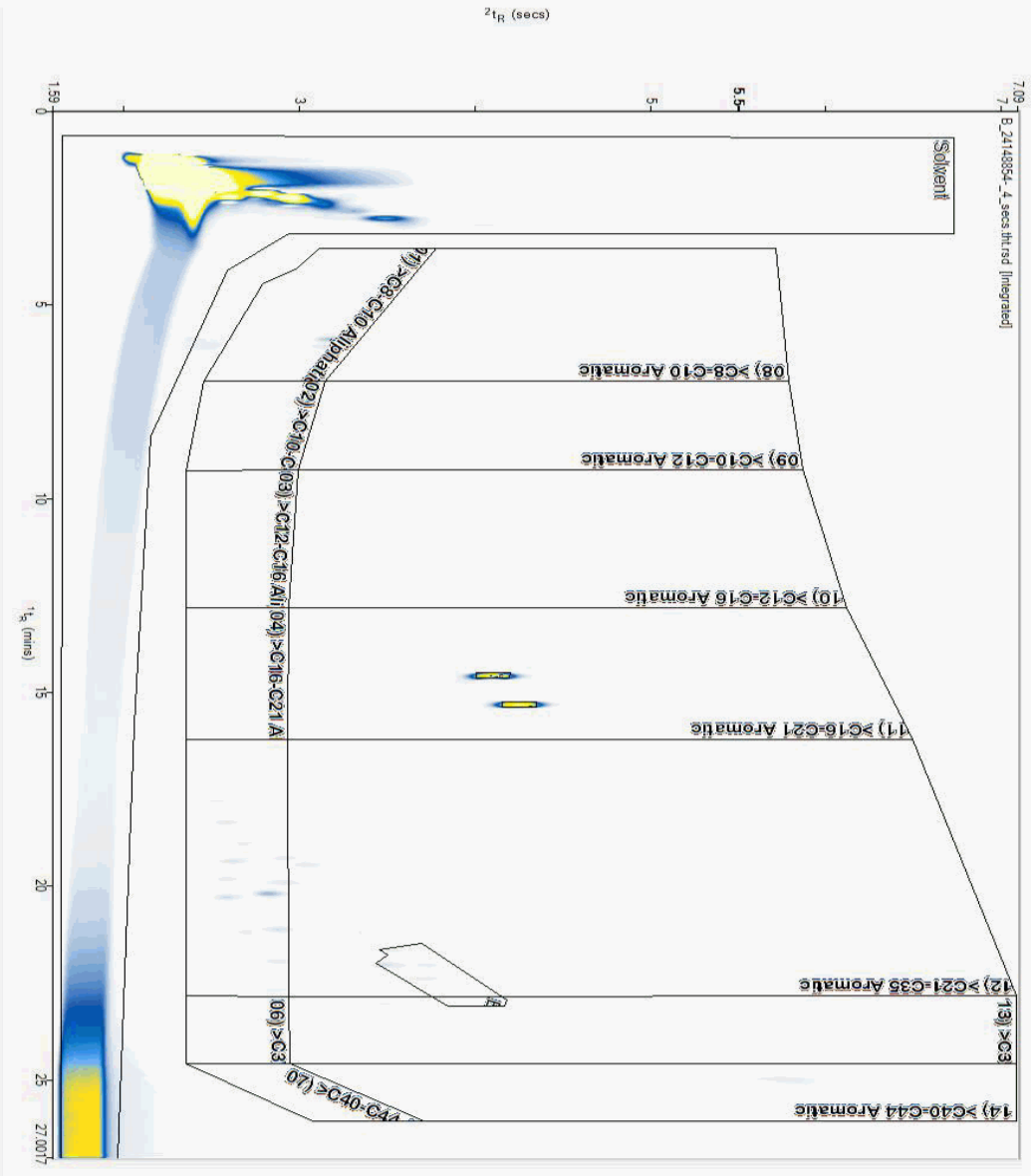
Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24148854 Depth : 0.20
Sample ID : TPBP-04

ChromSpace LIMS export
Current batch
Sample Identity: B_24148854-4_secs.tht
Date Acquired : 27/04/21 02:01:09
Units : ppm
Dilution : 0
CF :
Multiplier :





CERTIFICATE OF ANALYSIS

Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24150515 Depth : 0.50
Sample ID : TPBP-05



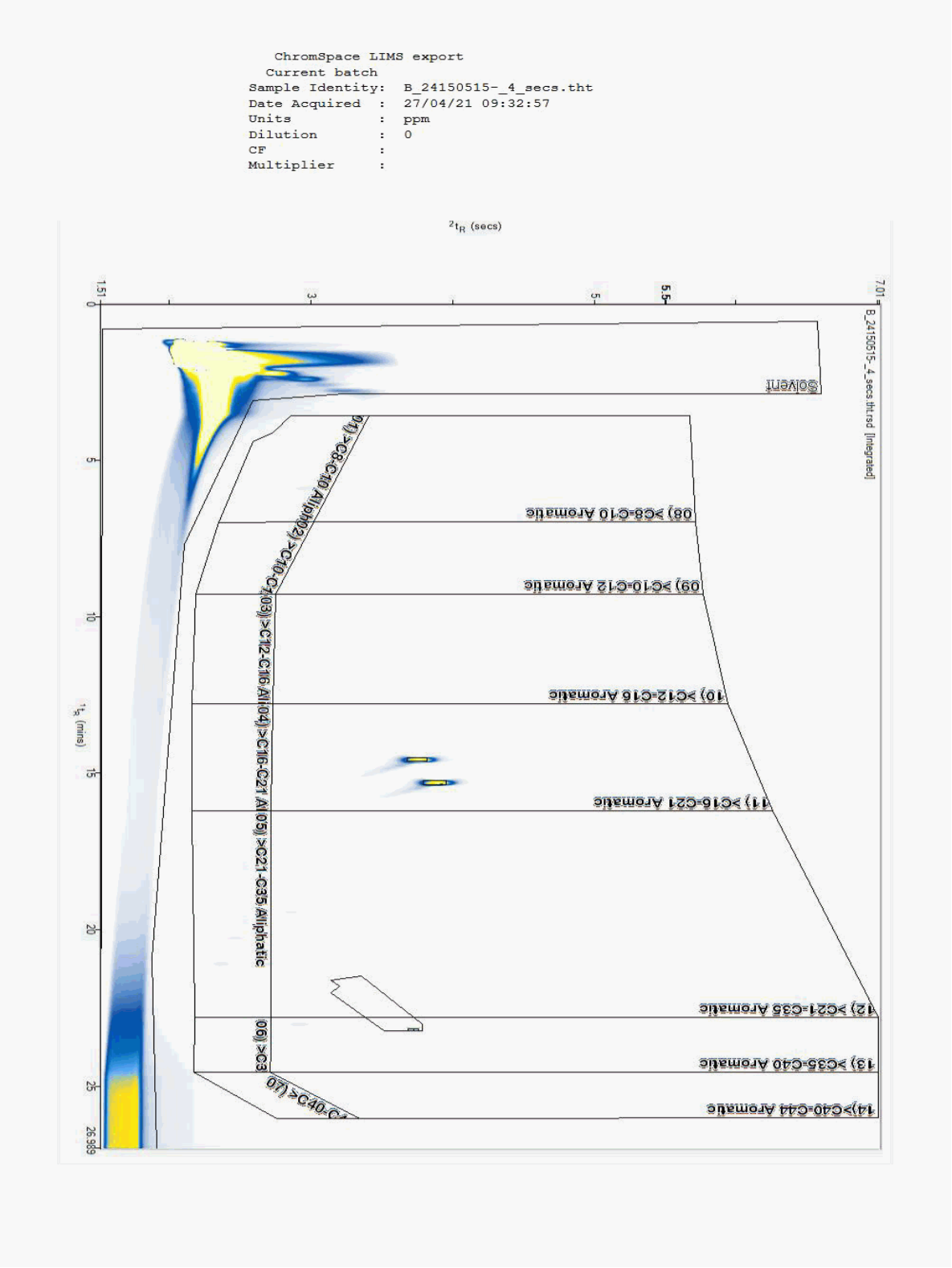
CERTIFICATE OF ANALYSIS

Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24162589 Depth : 0.20
Sample ID : TPBP-04





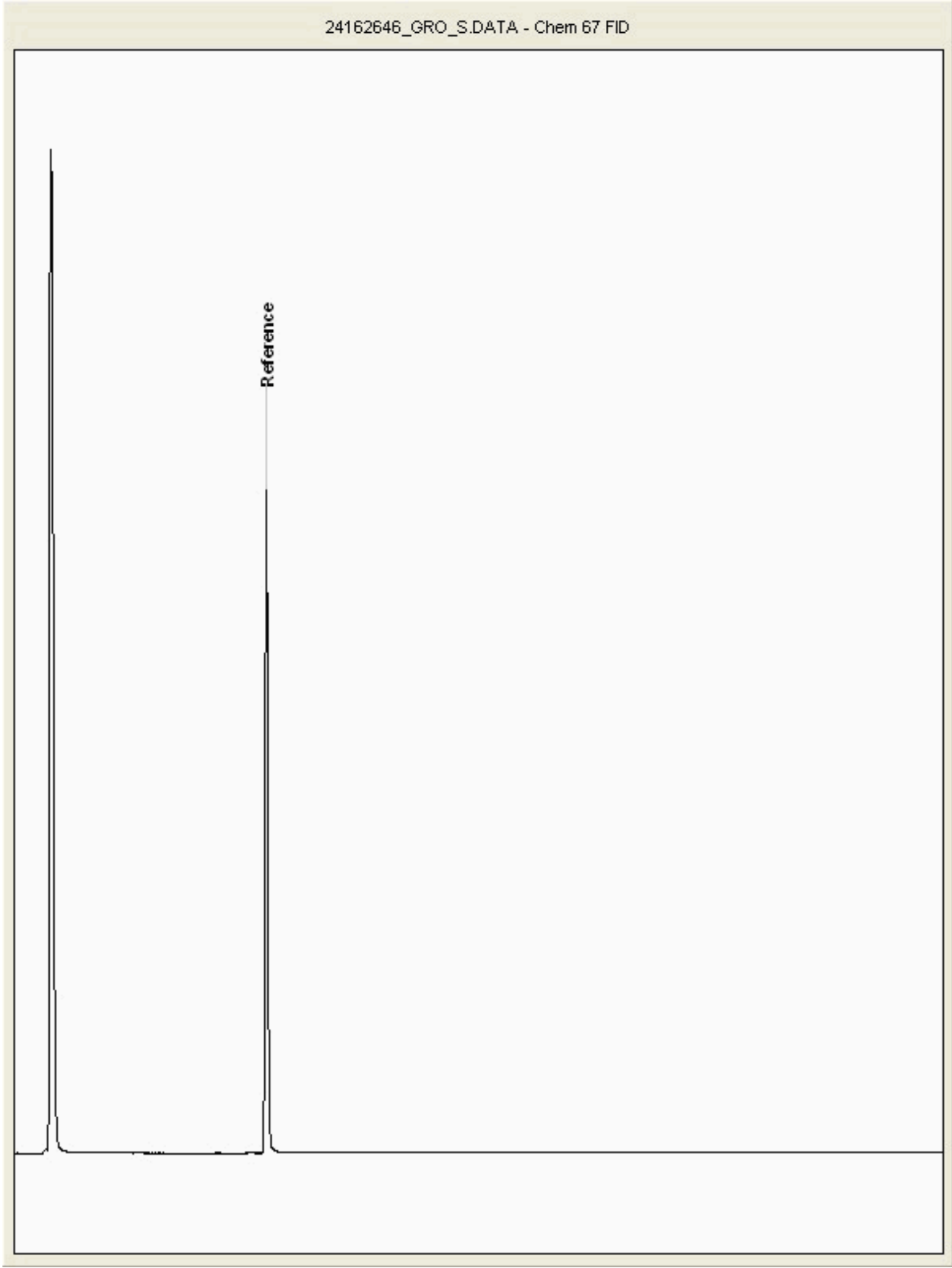
CERTIFICATE OF ANALYSIS

Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24162646 Depth : 0.50
Sample ID : TPBP-05



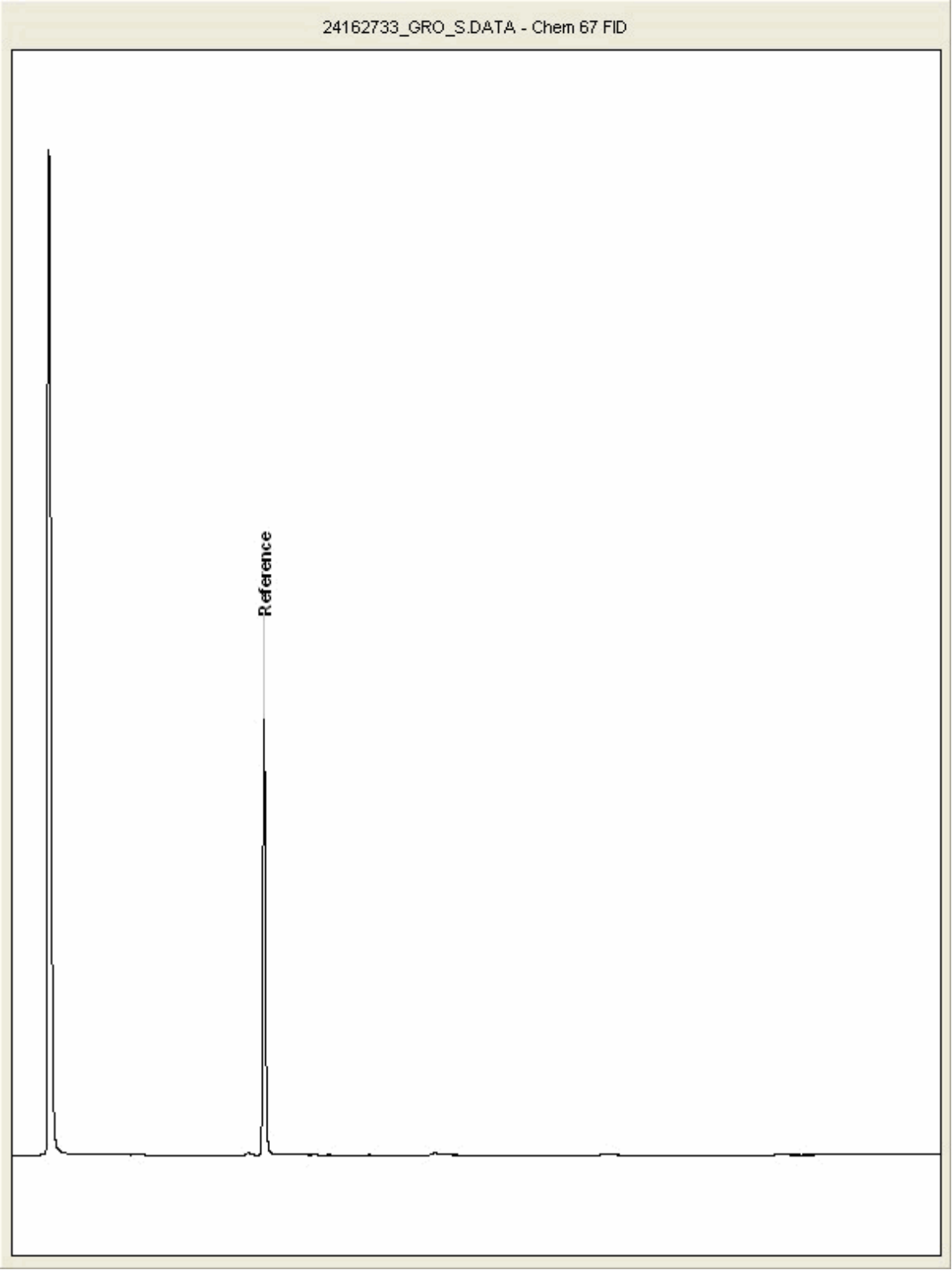
CERTIFICATE OF ANALYSIS

Validated

SDG: 210423-134 Client Reference: B025563 Report Number: 596417
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24162733 Depth : 0.10
Sample ID : TPBP-05





CERTIFICATE OF ANALYSIS

SDG: 210423-134 **Client Reference:** B025563 **Report Number:** 596417
Location: idge South East Transport - Ph: **Order Number:** 7000964 **Superseded Report:**

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Manor Road (off Manor Lane)

Hawarden

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CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:

05 May 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210427-33

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

596585

We received 8 samples on Monday April 26, 2021 and 1 of these samples were scheduled for analysis which was completed on Wednesday May 05, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 2.7

Version Issued: 05/05/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33 Client Reference: B025563 Report Number: 596585
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24157783	CPT-PTR-02		0.10	22/04/2021
24157784	CPT-PTR-02		0.20	22/04/2021
24157785	CPT-PTR-02		0.50	22/04/2021
24157786	CPT-PTR-02		1.00	22/04/2021
24157787	CPT-PTR-06		0.10	22/04/2021
24157788	CPT-PTR-06		0.20	22/04/2021
24157789	CPT-PTR-06		0.50	22/04/2021
24157790	CPT-PTR-06		1.00	22/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33 Client Reference: B025563 Report Number: 596585
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24157789	
	Customer Sample Reference		CPT-PTR-06	
	AGS Reference			
	Depth (m)		0.50	
	Container		250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 1	X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X	
Boron Water Soluble	All	NDPs: 0 Tests: 1	X	
CEN Readings	All	NDPs: 0 Tests: 1	X	
Chromium III	All	NDPs: 0 Tests: 1	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X	
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1	X	
Fluoride	All	NDPs: 0 Tests: 1	X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X	

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24157789	
	Customer Sample Reference		CPT-PTR-06	
	AGS Reference			
	Depth (m)		0.50	
	Container		250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S
<div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X
	Mercury Dissolved	All	NDPs: 0 Tests: 1	X
	Metals in solid samples by OES	All	NDPs: 0 Tests: 1	X
	PAH by GCMS	All	NDPs: 0 Tests: 1	X
	pH	All	NDPs: 0 Tests: 1	X
	pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X
	Phenols by HPLC (S)	All	NDPs: 0 Tests: 1	X
	Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X
	Sample description	All	NDPs: 0 Tests: 1	X
	Total Organic Carbon	All	NDPs: 0 Tests: 1	X
	Total Sulphur	All	NDPs: 0 Tests: 1	X
	TPH CWG GC (S)	All	NDPs: 0 Tests: 1	X
	VOC MS (S)	All	NDPs: 0 Tests: 1	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
Lab Sample No(s)		Customer Sample Ref.		Depth (m)	Colour	Description	Inclusions	Inclusions 2	
24157789		CPT-PTR-06		0.50	Black	Loamy Sand	Stones	None	

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unflit + "" (F) 1-4+5/6</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>CPT-PTR-06</div> <div>0.50 Soil/Solid (S) 22/04/2021 . 26/04/2021 210427-33 24157789</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	6.9						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Sulphur, Total	<0.02 %	TM132	<0.02						
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00851	#					
pH	1 pH Units	TM133	8.67	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
Chromium, Trivalent	<0.9 mg/kg	TM181	10.1						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	10.7	M					
Barium	<0.6 mg/kg	TM181	32.2	#					
Beryllium	<0.01 mg/kg	TM181	0.234	M					
Cadmium	<0.02 mg/kg	TM181	0.16	M					
Chromium	<0.9 mg/kg	TM181	10.1	M					
Copper	<1.4 mg/kg	TM181	10	M					
Iron	<1000 mg/kg	TM181	13000	#					
Lead	<0.7 mg/kg	TM181	4.07	M					
Manganese	<0.13 mg/kg	TM181	73.4	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	0.39	#					
Nickel	<0.2 mg/kg	TM181	9.35	M					
Selenium	<1 mg/kg	TM181	<1	#					
Vanadium	<0.2 mg/kg	TM181	18.2	#					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

		CERTIFICATE OF ANALYSIS				Validated	
SDG: 210427-33		Client Reference: B025563		Report Number: 596585			
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:			
VOC MS (S)							
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		CPT-PTR-06 0.50 Soil/Solid (S) 22/04/2021 26/04/2021 210427-33 24157789			
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	107				
Toluene-d8**	%	TM116	96				
4-Bromofluorobenzene**	%	TM116	79.1				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				

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		CERTIFICATE OF ANALYSIS				Validated	
SDG: 210427-33		Client Reference: B025563		Report Number: 596585			
Location: Cambridge South East Tra		Order Number: 7000964		Superseded Report:			
VOC MS (S)							
<div>Results Legend</div> <div># ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44@ Sample deviation (see appendix)</div>		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		CPT-PTR-06 0.50 Soil/Solid (S) 22/04/2021 26/04/2021 210427-33 24157789			
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20				
Naphthalene	<13 µg/kg	TM116	<13 M				

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33
Location: Cambridge South East Tra

Client Reference: B025563
Order Number: 7000964

Report Number: 596585
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	CPT-PTR-06				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		22/04/2021				
diss.filt	Dissolved / filtered sample.		26/04/2021				
tot.unfilt	Total / unfiltered sample.		210427-33				
*	Subcontracted - refer to subcontractor report for accreditation status.		24157789				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-44@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20				
Naphthalene	<13 µg/kg	TM116	<13 M				

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Validated

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - I
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)	13.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.4
Particle Size <4mm	>95%		

Case

SDG	210427-33			
Lab Sample Number(s)	24157789			
Sampled Date	22-Apr-2021			
Customer Sample Ref.	CPT-PTR-06			
Depth (m)	0.50			

Eluate Analysis	C2 Conc^n in 10:1 eluate (mg/l)		A2 10:1 conc^n leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.018	<0.01	0.18	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	4.06	<3	40.6	<30	-	-	-
Fluoride	0.782	<0.5	7.82	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00103	<0.0005	0.0103	<0.005	-	-	-
Barium	0.00356	<0.0002	0.0356	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0278	<0.01	0.278	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	16.9	<0.2	169	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00112	<0.0003	0.0112	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.227	<0.036	2.27	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000822	<0.0004	0.00822	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	29-Apr-2021
pH (pH Units)	8.79
Conductivity (µS/cm)	85.80
Temperature (°C)	19.00
Volume Leachant (Litres)	0.888

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - 1
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)		13.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		88.4
Particle Size <4mm	>95%			

Case

SDG	210427-33			
Lab Sample Number(s)	24157789			
Sampled Date	22-Apr-2021			
Customer Sample Ref.	CPT-PTR-06			
Depth (m)	0.50			

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Leach Test Information

Date Prepared	29-Apr-2021
pH (pH Units)	8.79
Conductivity (µS/cm)	85.80
Temperature (°C)	19.00
Volume Leachant (Litres)	0.888

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24157789
Customer Sample Ref.	CPT-PTR-06
AGS Ref.	
Depth	0.50
Type	Soil/Solid (S)
Ammonium Low	05-May-2021
Anions by Kone (soil)	05-May-2021
Anions by Kone (w)	05-May-2021
Asbestos ID in Solid Samples	04-May-2021
Boron Water Soluble	04-May-2021
CEN 10:1 Leachate (1 Stage)	30-Apr-2021
CEN Readings	01-May-2021
Chromium III	05-May-2021
Cyanide Comp/Free/Total/Thiocyanate	04-May-2021
Dissolved Metals by ICP-MS	05-May-2021
Dissolved Organic/Inorganic Carbon	05-May-2021
EPH CWG GC (S)	30-Apr-2021
Fluoride	05-May-2021
GRO by GC-FID (S)	05-May-2021
Hexavalent Chromium (s)	05-May-2021
Low Level Cyanide (W)	05-May-2021
Low Level Hexavalent Chromium (w)	04-May-2021
Mercury Dissolved	05-May-2021
Metals in solid samples by OES	05-May-2021
Moisture at 105C	29-Apr-2021
PAH by GCMS	04-May-2021
pH	05-May-2021
pH Value of Filtered Water	05-May-2021
Phenols by HPLC (S)	30-Apr-2021
Phenols by HPLC (W)	05-May-2021
Sample description	28-Apr-2021
Total Organic Carbon	05-May-2021
Total Sulphur	04-May-2021
TPH CWG GC (S)	05-May-2021
VOC MS (S)	04-May-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2454
Ammoniacal Nitrogen as N	TM099	98.6 96.04 : 106.80

Anions by Kone (w)

Component	Method Code	QC 2489
Chloride	TM184	94.9 91.40 : 109.10
Sulphate (soluble)	TM184	95.2 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2415
Water Soluble Boron	TM222	102.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2475
Free Cyanide	TM153	102.97 86.90 : 108.50
Thiocyanate	TM153	103.85 94.53 : 113.33
Total Cyanide	TM153	102.1 86.13 : 102.13

Dissolved Metals by ICP-MS

Component	Method Code	QC 2492	QC 2450
Aluminium	TM152	102.67 94.21 : 111.52	100.33 90.98 : 111.82
Antimony	TM152	100.83 88.37 : 130.57	100.33 90.44 : 113.04
Arsenic	TM152	99.0 92.62 : 113.52	98.67 88.00 : 112.00
Barium	TM152	99.33 88.62 : 113.14	99.0 90.20 : 111.19
Beryllium	TM152	103.67 87.08 : 111.38	100.5 87.77 : 113.97
Bismuth	TM152	101.83 92.62 : 115.02	100.0 91.90 : 112.20
Borate	TM152		103.09 88.00 : 112.00

Dissolved Metals by ICP-MS

		QC 2492	QC 2450
Boron	TM152	105.67 86.31 : 120.88	103.0 96.48 : 114.93
Cadmium	TM152	92.17 93.85 : 111.65	101.0 96.43 : 110.53
Calcium	TM152	97.33 89.20 : 126.91	100.0 81.38 : 119.09
Chromium	TM152	99.33 92.50 : 113.03	97.17 91.84 : 108.67
Cobalt	TM152	98.67 85.01 : 114.87	97.67 88.00 : 112.00
Copper	TM152	98.83 89.87 : 119.73	98.83 92.47 : 118.11
Iron	TM152	100.0 93.02 : 113.86	98.0 92.00 : 113.00
Lead	TM152	100.0 91.11 : 116.98	98.83 88.00 : 112.00
Lithium	TM152	104.33 87.70 : 115.90	101.17 91.62 : 113.12
Magnesium	TM152	95.33 89.60 : 116.61	98.67 93.14 : 107.91
Manganese	TM152	100.33 93.97 : 112.46	98.0 95.03 : 110.58
Molybdenum	TM152	98.67 89.07 : 110.96	97.0 88.00 : 112.00
Nickel	TM152	99.67 93.70 : 112.15	98.5 88.00 : 112.00
Phosphorus	TM152	100.17 89.24 : 114.18	100.0 88.00 : 112.00
Potassium	TM152	96.67 93.20 : 115.55	100.67 93.90 : 112.36
Selenium	TM152	102.17 91.69 : 117.12	101.33 91.58 : 115.98
Silver	TM152	98.83 90.93 : 121.73	95.83 88.80 : 122.30
Sodium	TM152	96.0 92.42 : 113.24	98.0 91.50 : 108.35
Strontium	TM152	100.67 92.14 : 116.24	99.33 88.00 : 112.00
Tellurium	TM152	101.17 89.88 : 111.78	98.0 93.32 : 114.66
Thallium	TM152	89.5 82.43 : 113.83	78.83 88.00 : 112.00
Tin	TM152	100.5 94.62 : 107.79	100.83 92.63 : 109.70
Titanium	TM152	103.17 90.29 : 115.23	103.83 95.58 : 111.68
Tungsten	TM152	102.17 77.61 : 132.31	100.67 81.32 : 124.72
Uranium	TM152	99.83 86.97 : 115.76	96.0 88.00 : 112.00
Vanadium	TM152	100.83 89.61 : 115.48	100.17 88.00 : 112.00
Zinc	TM152	100.0 87.51 : 116.26	98.33 92.98 : 118.95

Dissolved Organic/Inorganic Carbon		
Component	Method Code	QC 2454
Dissolved Inorganic Carbon	TM090	118.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.17 96.13 : 109.53

EPH CWG GC (S)		
Component	Method Code	QC 2439
EPH >C8-C40 Raw	TM414	90.45 67.87 : 120.05
Total Aliphatics Raw	TM414	98.63 66.68 : 120.89
Total Aromatics Raw	TM414	82.17 61.16 : 129.42

Fluoride		
Component	Method Code	QC 2416
Fluoride	TM104	103.33 96.67 : 108.67

GRO by GC-FID (S)		
Component	Method Code	QC 2404
QC	TM089	87.19 72.28 : 114.54

Hexavalent Chromium (s)		
Component	Method Code	QC 2406
Hexavalent Chromium	TM151	108.0 91.40 : 115.40

Low Level Cyanide (W)		
Component	Method Code	QC 2436
Free Cyanide - Low Level	TM279	77.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	94.75 81.83 : 110.45

Mercury Dissolved		
-------------------	--	--

Mercury Dissolved		
Component	Method Code	QC 2401
Mercury Dissolved (CVAf)	TM183	104.0 69.30 : 128.70

Metals in solid samples by OES		
Component	Method Code	QC 2441
Aluminium	TM181	99.12 77.46 : 123.98
Antimony	TM181	95.53 87.04 : 111.16
Arsenic	TM181	103.2 87.34 : 110.87
Barium	TM181	93.58 80.73 : 115.16
Beryllium	TM181	93.66 89.47 : 112.97
Boron	TM181	90.83 76.57 : 104.15
Cadmium	TM181	91.36 78.94 : 102.43
Chromium	TM181	82.96 77.55 : 104.47
Cobalt	TM181	86.79 82.95 : 107.41
Copper	TM181	90.14 84.36 : 106.14
Iron	TM181	94.44 81.43 : 115.79
Lead	TM181	89.41 81.95 : 107.63
Manganese	TM181	117.78 94.29 : 119.51
Mercury	TM181	96.86 82.73 : 106.36
Molybdenum	TM181	97.12 86.61 : 111.07
Nickel	TM181	85.82 79.72 : 103.80
Phosphorus	TM181	130.91 92.65 : 125.47
Selenium	TM181	100.78 88.36 : 111.25
Strontium	TM181	83.74 77.99 : 108.06
Thallium	TM181	99.12 88.60 : 116.73
Tin	TM181	92.02 89.77 : 112.62
Titanium	TM181	84.73 66.29 : 105.96

Metals in solid samples by OES

		QC 2441
Vanadium	TM181	87.18 75.51 : 108.87
Zinc	TM181	97.33 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2454
Acenaphthene	TM218	98.0 78.59 : 112.16
Acenaphthylene	TM218	98.0 75.11 : 109.01
Anthracene	TM218	97.5 73.99 : 113.85
Benz(a)anthracene	TM218	99.0 69.31 : 119.18
Benzo(a)pyrene	TM218	94.0 66.97 : 114.92
Benzo(b)fluoranthene	TM218	97.0 67.41 : 114.46
Benzo(ghi)perylene	TM218	89.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	93.5 69.98 : 116.49
Chrysene	TM218	95.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	89.5 64.54 : 115.22
Fluoranthene	TM218	101.0 72.56 : 111.70
Fluorene	TM218	98.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	96.0 61.22 : 113.25
Naphthalene	TM218	91.0 77.96 : 110.91
Phenanthrene	TM218	100.5 76.83 : 113.25
Pyrene	TM218	100.0 72.45 : 110.77

pH

Component	Method Code	QC 2498
pH	TM133	100.29 97.51 : 101.32

pH Value of Filtered Water

pH Value of Filtered Water

Component	Method Code	QC 2453
pH	TM256	100.4 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2449
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	46.75 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	40.94 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	44.68 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	45.03 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	45.21 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2438
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	99.61 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	100.66 76.60 : 126.28
Napthol by HPLC (W)	TM259	93.75 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	98.42 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2401
Total Organic Carbon	TM132	96.88 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2405
Total Sulphur %	TM132	73.58 61.64 : 114.47



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33 Client Reference: B025563 Report Number: 596585
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

VOC MS (S)

Component	Method Code	QC 2464
1,1,1,2-tetrachloroethane	TM116	107.8 79.10 : 119.66
1,1,1-Trichloroethane	TM116	108.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	102.0 81.29 : 113.79
1,1-Dichloroethane	TM116	115.0 86.77 : 122.11
1,2-Dichloroethane	TM116	117.2 90.04 : 132.28
1,4-Dichlorobenzene	TM116	101.6 80.81 : 125.07
2-Chlorotoluene	TM116	91.4 73.13 : 114.13
4-Chlorotoluene	TM116	87.8 68.66 : 109.13
Benzene	TM116	106.4 84.29 : 112.22
Carbon Disulphide	TM116	108.6 75.11 : 124.81
Carbontetrachloride	TM116	105.6 82.35 : 126.46
Chlorobenzene	TM116	107.4 82.88 : 122.42
Chloroform	TM116	113.0 90.35 : 120.38
Chloromethane	TM116	116.6 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	109.0 78.27 : 128.90
Dibromomethane	TM116	97.2 76.00 : 120.73
Dichloromethane	TM116	119.2 92.27 : 134.36
Ethylbenzene	TM116	99.6 70.95 : 113.07
Hexachlorobutadiene	TM116	102.4 14.55 : 147.92
Isopropylbenzene	TM116	95.0 52.00 : 108.19
Naphthalene	TM116	108.0 80.29 : 135.77
o-Xylene	TM116	91.8 68.34 : 101.99
p/m-Xylene	TM116	91.1 69.47 : 97.31
Sec-Butylbenzene	TM116	85.6 27.03 : 135.73
Tetrachloroethene	TM116	113.0 81.43 : 126.65
Toluene	TM116	98.6 82.44 : 103.50
Trichloroethene	TM116	103.2 79.80 : 112.33



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33 Client Reference: B025563 Report Number: 596585
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

VOC MS (S)

		QC 2464
Trichlorofluoromethane	TM116	110.8 89.67 : 132.09
Vinyl Chloride	TM116	119.0 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33 Client Reference: B025563 Report Number: 596585
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24168833 Depth : 0.50
Sample ID : CPT-PTR-06



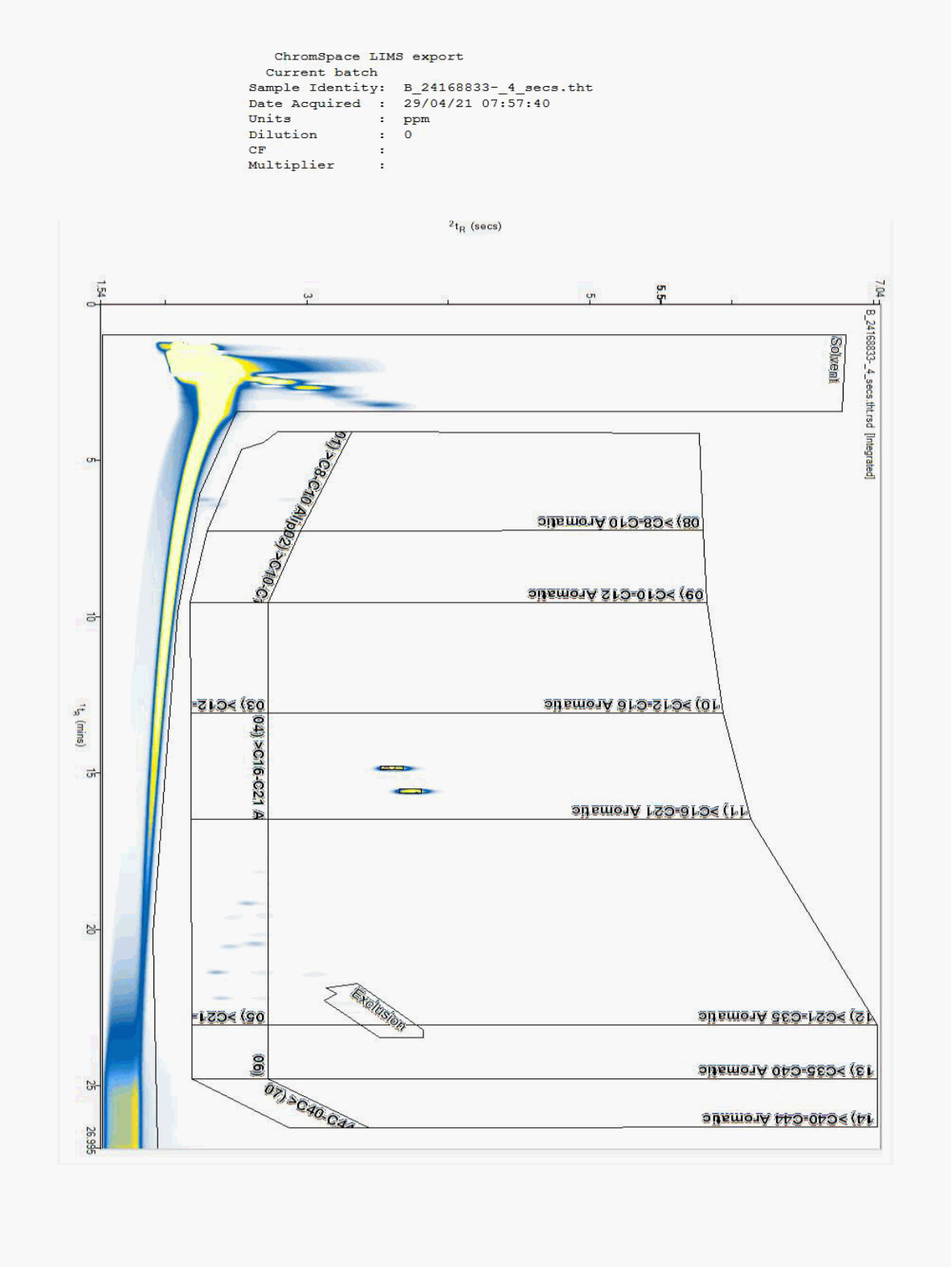
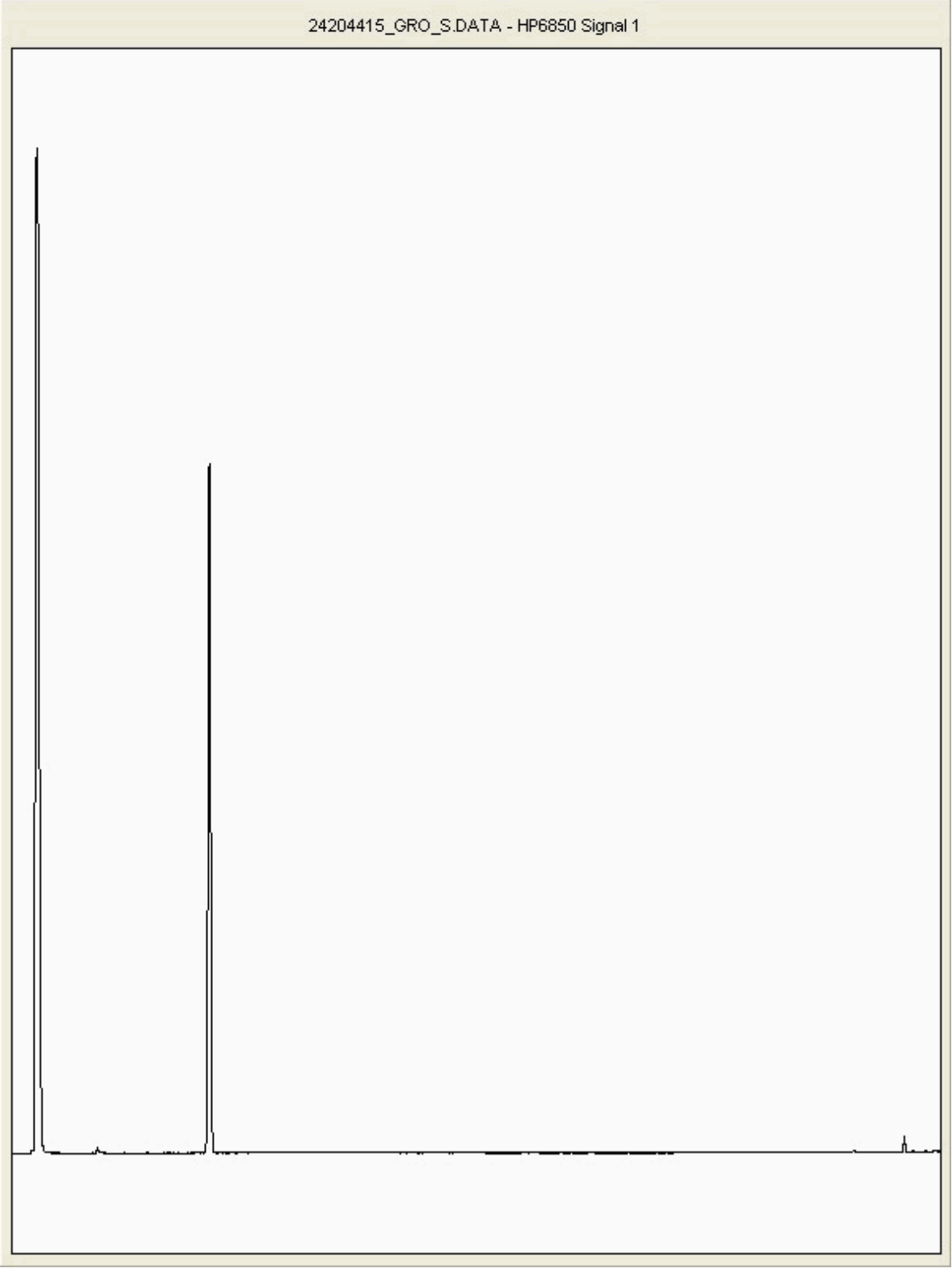
CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-33 Client Reference: B025563 Report Number: 596585
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24204415 Depth : 0.50
Sample ID : CPT-PTR-06





CERTIFICATE OF ANALYSIS

SDG:	210427-33	Client Reference:	B025563	Report Number:	596585
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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CERTIFICATE OF ANALYSIS

Date of report Generation:

05 May 2021

Customer:

Tetra Tech Europe

Sample Delivery Group (SDG):

210427-36

Your Reference:

B025563

Location:

Cambridge South East Transport - Phase 2

Report No:

596586

We received 13 samples on Monday April 26, 2021 and 1 of these samples were scheduled for analysis which was completed on Wednesday May 05, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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Version: 2.7

Version Issued: 05/05/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-36 Client Reference: B025563 Report Number: 596586
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24157993	TP-PTR-02		0.10	22/04/2021
24157994	TP-PTR-02		0.20	22/04/2021
24157995	TP-PTR-02		0.50	22/04/2021
24157996	TP-PTR-02		1.00	22/04/2021
24157989	TP-PTR-05		0.10	22/04/2021
24157990	TP-PTR-05		0.20	22/04/2021
24157991	TP-PTR-05		0.50	22/04/2021
24157992	TP-PTR-05		1.00	22/04/2021
24157984	TP-PTR-05		2.90	22/04/2021
24157985	TP-PTR-06		0.10	22/04/2021
24157986	TP-PTR-06		0.20	22/04/2021
24157987	TP-PTR-06		0.50	22/04/2021
24157988	TP-PTR-06		1.00	22/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-36 Client Reference: B025563 Report Number: 596586
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24157995		
	Customer Sample Reference		TP-PTR-02		
	AGS Reference				
	Depth (m)		0.50		
	Container		250g Amber Jar (ALE210) Handle (ALE260)	60g VOC (ALE215)	
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

<div>Results Legend</div> <div># M aq diss.flit tot.unflit + " (F) 1-456</div> <div>ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div>		<div>Customer Sample Ref.</div> <div>Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference</div>		<div>TP-PTR-02</div> <div>0.50 Soil/Solid (S) 22/04/2021 04:00:00 26/04/2021 210427-36 24157995</div>					
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	15						
Catechol	<0.01 mg/kg	TM062 (S)	<0.01						
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M					
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05						
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M					
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01						
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M					
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13						
Sulphur, Total	<0.02 %	TM132	<0.02						
Fraction Organic Carbon (FOC)	<0.002	TM132	<0.002	#					
pH	1 pH Units	TM133	8.81	M					
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#					
Cyanide, Free	<1 mg/kg	TM153	<1	M					
Chromium, Trivalent	<0.9 mg/kg	TM181	3.17						
Antimony	<0.6 mg/kg	TM181	<0.6	#					
Arsenic	<0.6 mg/kg	TM181	1.2	M					
Barium	<0.6 mg/kg	TM181	17.8	#					
Beryllium	<0.01 mg/kg	TM181	0.115	M					
Cadmium	<0.02 mg/kg	TM181	0.0807	M					
Chromium	<0.9 mg/kg	TM181	3.17	M					
Copper	<1.4 mg/kg	TM181	2.82	M					
Iron	<1000 mg/kg	TM181	3370	#					
Lead	<0.7 mg/kg	TM181	<0.7	M					
Manganese	<0.13 mg/kg	TM181	497	M					
Mercury	<0.1 mg/kg	TM181	<0.1	M					
Molybdenum	<0.1 mg/kg	TM181	<0.1	#					
Nickel	<0.2 mg/kg	TM181	6.11	M					
Selenium	<1 mg/kg	TM181	<1	#					
Vanadium	<0.2 mg/kg	TM181	3.55	#					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-02				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*5/6 Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 Soil/Solid (S) 22/04/2021 04:00:00 26/04/2021 210427-36 24157995				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	106				
Toluene-d8**	%	TM116	100				
4-Bromofluorobenzene**	%	TM116	99.7				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-02					
# M aq diss.filt tot.unfilt * ** (F) 1-4*5@	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M					
Tetrachloroethene	<5 µg/kg	TM116	<5 M					
Dibromochloromethane	<10 µg/kg	TM116	<10 M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M					
Chlorobenzene	<5 µg/kg	TM116	<5 M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M					
Ethylbenzene	<4 µg/kg	TM116	<4 M					
p/m-Xylene	<10 µg/kg	TM116	<10 #					
o-Xylene	<10 µg/kg	TM116	<10 M					
Styrene	<10 µg/kg	TM116	<10 @ #					
Bromoform	<10 µg/kg	TM116	<10 M					
Isopropylbenzene	<5 µg/kg	TM116	<5 #					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M					
Bromobenzene	<10 µg/kg	TM116	<10 M					
Propylbenzene	<10 µg/kg	TM116	<10 M					
2-Chlorotoluene	<9 µg/kg	TM116	<9 M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M					
4-Chlorotoluene	<10 µg/kg	TM116	<10 M					
tert-Butylbenzene	<14 µg/kg	TM116	<14 M					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #					
sec-Butylbenzene	<10 µg/kg	TM116	<10					
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M					
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M					
n-Butylbenzene	<11 µg/kg	TM116	<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20					
Naphthalene	<13 µg/kg	TM116	<13 M					

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
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VOC MS (S)

[illegible]

SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-PTR-02	04/05/2021	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	SOLID										
Date Sampled	22/04/2021 00:00:00										
Date Received	26/04/2021 13:00:00										
SDG	210427-36										
Original Sample Method Number	24157995 TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24157995
Customer Sample Ref.	TP-PTR-02
AGS Ref.	
Depth	0.50
Type	Soil/Solid (S)
Anions by Kone (soil)	05-May-2021
Asbestos ID in Solid Samples	04-May-2021
Boron Water Soluble	05-May-2021
Chromium III	05-May-2021
Cyanide Comp/Free/Total/Thiocyanate	04-May-2021
EPH CWG GC (S)	04-May-2021
GRO by GC-FID (S)	04-May-2021
Hexavalent Chromium (s)	05-May-2021
Metals in solid samples by OES	05-May-2021
PAH by GCMS	04-May-2021
pH	30-Apr-2021
Phenols by HPLC (S)	04-May-2021
Sample description	29-Apr-2021
Total Organic Carbon	05-May-2021
Total Sulphur	04-May-2021
TPH CWG GC (S)	04-May-2021
VOC MS (S)	04-May-2021

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2468
Water Soluble Boron	TM222	97.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2431
Free Cyanide	TM153	95.64 86.90 : 108.50
Thiocyanate	TM153	101.92 94.53 : 113.33
Total Cyanide	TM153	98.6 86.13 : 102.13

GRO by GC-FID (S)

Component	Method Code	QC 2410
QC	TM089	89.23 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2489
Hexavalent Chromium	TM151	110.0 91.40 : 115.40

Metals in solid samples by OES

Component	Method Code	QC 2412
Aluminium	TM181	104.42 77.46 : 123.98
Antimony	TM181	95.12 87.04 : 111.16
Arsenic	TM181	103.49 87.34 : 110.87
Barium	TM181	93.58 80.73 : 115.16
Beryllium	TM181	91.42 89.47 : 112.97
Boron	TM181	93.41 76.57 : 104.15
Cadmium	TM181	93.42 78.94 : 102.43

Metals in solid samples by OES

		QC 2412
Chromium	TM181	82.35 77.55 : 104.47
Cobalt	TM181	86.79 82.95 : 107.41
Copper	TM181	89.79 84.36 : 106.14
Iron	TM181	95.24 81.43 : 115.79
Lead	TM181	90.77 81.95 : 107.63
Manganese	TM181	113.61 94.29 : 119.51
Mercury	TM181	95.89 82.73 : 106.36
Molybdenum	TM181	95.88 86.61 : 111.07
Nickel	TM181	86.06 79.72 : 103.80
Phosphorus	TM181	129.49 92.65 : 125.47
Selenium	TM181	100.0 88.36 : 111.25
Strontium	TM181	83.52 77.99 : 108.06
Thallium	TM181	100.44 88.60 : 116.73
Tin	TM181	92.4 89.77 : 112.62
Titanium	TM181	84.73 66.29 : 105.96
Vanadium	TM181	83.88 75.51 : 108.87
Zinc	TM181	98.56 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2496
Acenaphthene	TM218	97.5 78.59 : 112.16
Acenaphthylene	TM218	97.0 75.11 : 109.01
Anthracene	TM218	95.0 73.99 : 113.85
Benz(a)anthracene	TM218	99.0 69.31 : 119.18
Benzo(a)pyrene	TM218	94.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	100.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	90.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	102.5 69.98 : 116.49

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	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
PAH by GCMS						

		QC 2496
Chrysene	TM218	97.0 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	92.0 64.54 : 115.22
Fluoranthene	TM218	98.0 72.56 : 111.70
Fluorene	TM218	97.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	84.0 61.22 : 113.25
Naphthalene	TM218	93.0 77.96 : 110.91
Phenanthrene	TM218	95.5 76.83 : 113.25
Pyrene	TM218	98.5 72.45 : 110.77

pH		
Component	Method Code	QC 2447
pH	TM133	98.24 97.51 : 101.32

Phenols by HPLC (S)		
Component	Method Code	QC 2465
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	48.7 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.11 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	45.72 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	46.35 76.56 : 106.38

Total Organic Carbon		
Component	Method Code	QC 2456
Total Organic Carbon	TM132	102.34 87.02 : 113.45

Total Sulphur

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210427-36	Client Reference:	B025563	Report Number:	596586
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Total Sulphur						

Component	Method Code	QC 2405
Total Sulphur %	TM132	73.58 61.64 : 114.47

VOC MS (S)		
Component	Method Code	QC 2413
1,1,1,2-tetrachloroethane	TM116	98.6 79.10 : 119.66
1,1,1-Trichloroethane	TM116	98.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	93.4 81.29 : 113.79
1,1-Dichloroethane	TM116	104.2 86.77 : 122.11
1,2-Dichloroethane	TM116	104.8 90.04 : 132.28
1,4-Dichlorobenzene	TM116	100.0 80.81 : 125.07
2-Chlorotoluene	TM116	93.8 73.13 : 114.13
4-Chlorotoluene	TM116	91.4 68.66 : 109.13
Benzene	TM116	98.2 84.29 : 112.22
Carbon Disulphide	TM116	100.6 75.11 : 124.81
Carbontetrachloride	TM116	101.8 82.35 : 126.46
Chlorobenzene	TM116	99.0 82.88 : 122.42
Chloroform	TM116	101.8 90.35 : 120.38
Chloromethane	TM116	105.4 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	98.0 78.27 : 128.90
Dibromomethane	TM116	93.8 76.00 : 120.73
Dichloromethane	TM116	106.0 92.27 : 134.36
Ethylbenzene	TM116	89.2 70.95 : 113.07
Hexachlorobutadiene	TM116	60.0 14.55 : 147.92
Isopropylbenzene	TM116	83.8 52.00 : 108.19
Naphthalene	TM116	93.2 80.29 : 135.77
o-Xylene	TM116	87.4 68.34 : 101.99



CERTIFICATE OF ANALYSIS

Validated

SDG:210427-36Client Reference: B025563Report Number: 596586

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

VOC MS (S)

		QC 2413
p/m-Xylene	TM116	84.1 69.47 : 97.31
Sec-Butylbenzene	TM116	78.6 27.03 : 135.73
Tetrachloroethene	TM116	97.4 81.43 : 126.65
Toluene	TM116	91.2 82.44 : 103.50
Trichloroethene	TM116	95.0 79.80 : 112.33
Trichlorofluoromethane	TM116	95.4 89.67 : 132.09
Vinyl Chloride	TM116	106.4 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

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SDG:210427-36Client Reference: B025563Report Number: 596586

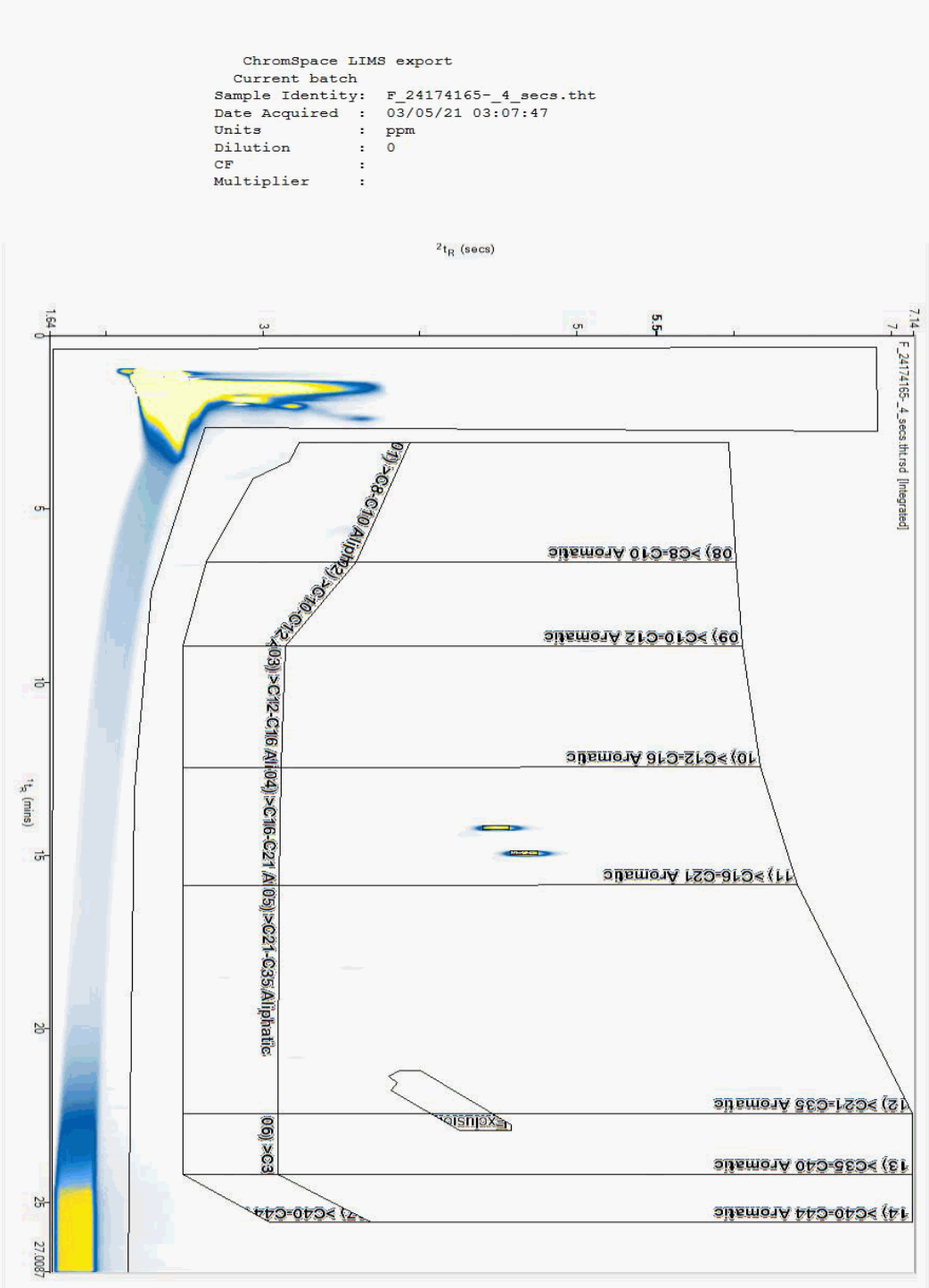
Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24174165Sample ID : TP-PTR-02

Depth : 0.50





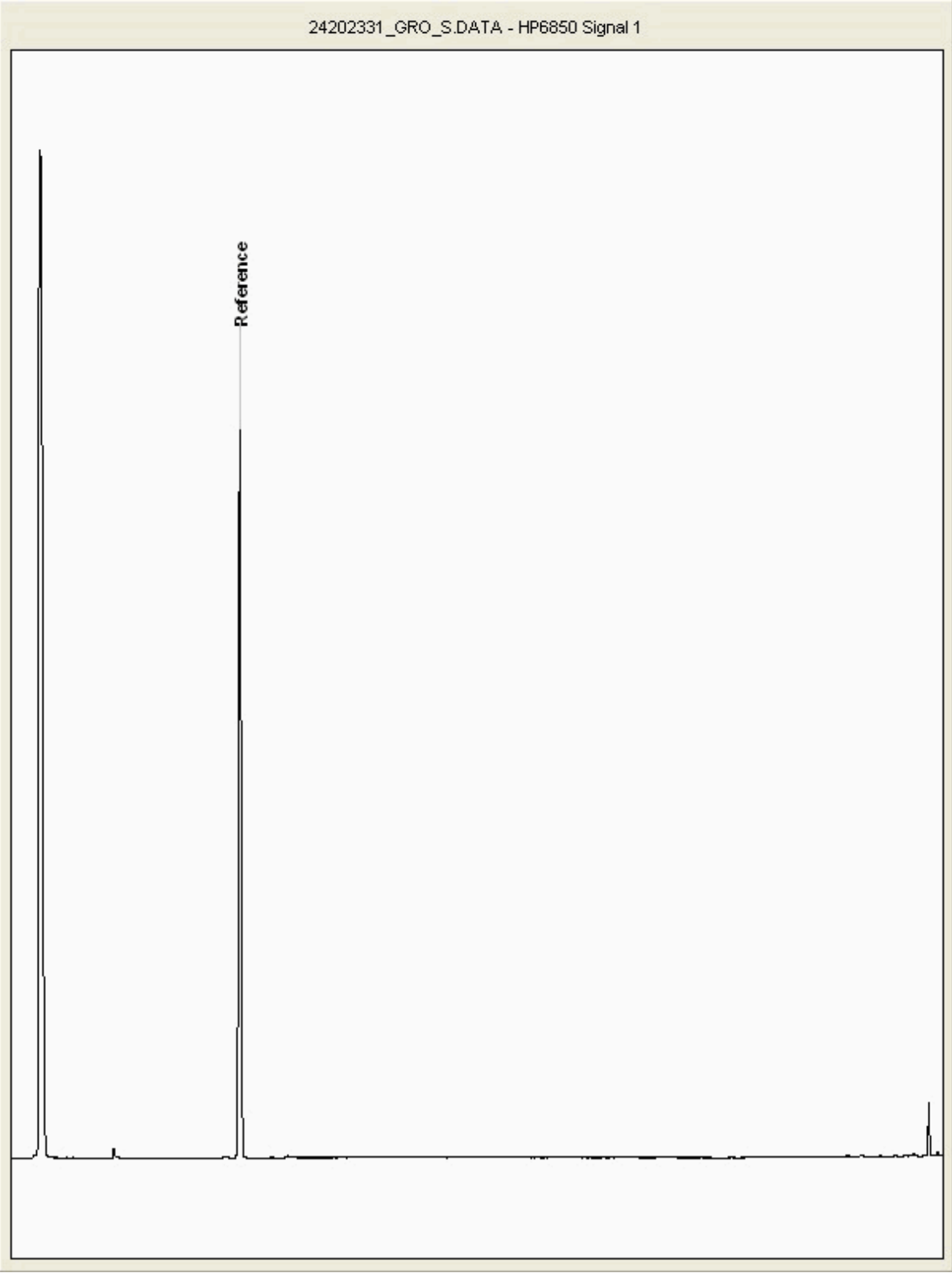
CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-36 Client Reference: B025563 Report Number: 596586
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24202331 Depth : 0.50
Sample ID : TP-PTR-02



CERTIFICATE OF ANALYSIS

SDG: 210427-36 Client Reference: B025563 Report Number: 596586
Location: Cambridge South East Transport - PhOrder Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, The Quantification of Asbestos in Soil (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 06 May 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210427-40
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 596598

We received 4 samples on Monday April 26, 2021 and 1 of these samples were scheduled for analysis which was completed on Thursday May 06, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-40 Client Reference: B025563 Report Number: 596598
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24158165	TP-HRS-04		0.10	24/04/2021
24158167	TP-HRS-04		0.20	24/04/2021
24158168	TP-HRS-04		0.50	24/04/2021
24158170	TP-HRS-04		1.00	24/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

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SDG: 210427-40 Client Reference: B025563 Report Number: 596598
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Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24158165		
	Customer Sample Reference		TP-HRS-04		
	AGS Reference				
	Depth (m)		0.10		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	



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Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24158165		
	Customer Sample Reference		TP-HRS-04		
	AGS Reference				
	Depth (m)		0.10		
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24158165	TP-HRS-04	0.10	Light Brown	Sandy Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-HRS-04					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10					
M	mCERTS accredited.		Soil/Solid (S)					
aq	Aqueous / settled sample.		24/04/2021					
dis.filt	Dissolved / filtered sample.		05:00:00					
tot.unfilt	Total / unfiltered sample.		26/04/2021					
*	Subcontracted - refer to subcontractor report for accreditation status.		210427-40					
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24158165					
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	14					
Catechol	<0.01 mg/kg	TM062 (S)	<0.01					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M				
Cresols	<0.01 mg/kg	TM062 (S)	0.0116	M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05					
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13					
Sulphur, Total	<0.02 %	TM132	<0.02					
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0147	#				
pH	1 pH Units	TM133	8.19	M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#				
Cyanide, Free	<1 mg/kg	TM153	<1	M				
Chromium, Trivalent	<0.9 mg/kg	TM181	10.2					
Antimony	<0.6 mg/kg	TM181	0.739	#				
Arsenic	<0.6 mg/kg	TM181	10.4	M				
Barium	<0.6 mg/kg	TM181	58.3	#				
Beryllium	<0.01 mg/kg	TM181	0.27	M				
Cadmium	<0.02 mg/kg	TM181	0.295	M				
Chromium	<0.9 mg/kg	TM181	10.2	M				
Copper	<1.4 mg/kg	TM181	12.8	M				
Iron	<1000 mg/kg	TM181	15400	#				
Lead	<0.7 mg/kg	TM181	24.4	M				
Manganese	<0.13 mg/kg	TM181	607	M				
Mercury	<0.1 mg/kg	TM181	<0.1	M				
Molybdenum	<0.1 mg/kg	TM181	0.382	#				
Nickel	<0.2 mg/kg	TM181	12.3	M				
Selenium	<1 mg/kg	TM181	<1	#				
Vanadium	<0.2 mg/kg	TM181	20	#				

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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

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PAH by GCMS

[illegible]

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TPH CWG (S)

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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		TP-HRS-04				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-44\$@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 24/04/2021 05:00:00 26/04/2021 210427-40 24158165					
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	103					
Toluene-d8**	%	TM116	95.2					
4-Bromofluorobenzene**	%	TM116	76					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M					
Bromomethane	<10 µg/kg	TM116	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M					
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M					
Benzene	<9 µg/kg	TM116	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M					
Toluene	<7 µg/kg	TM116	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M					

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SDG:	210427-40	Client Reference:	B025563	Report Number:	596598
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.		TP-HRS-04					
# M aq diss.filt tot.unfilt + "	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid (S) 24/04/2021 05:00:00 26/04/2021 210427-40 24158165						
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M						
Tetrachloroethene	<5 µg/kg	TM116	<5 M						
Dibromochloromethane	<10 µg/kg	TM116	<10 M						
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M						
Chlorobenzene	<5 µg/kg	TM116	<5 M						
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M						
Ethylbenzene	<4 µg/kg	TM116	<4 M						
p/m-Xylene	<10 µg/kg	TM116	<10 #						
o-Xylene	<10 µg/kg	TM116	<10 M						
Styrene	<10 µg/kg	TM116	<10 @ #						
Bromoform	<10 µg/kg	TM116	<10 M						
Isopropylbenzene	<5 µg/kg	TM116	<5 #						
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #						
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M						
Bromobenzene	<10 µg/kg	TM116	<10 M						
Propylbenzene	<10 µg/kg	TM116	<10 M						
2-Chlorotoluene	<9 µg/kg	TM116	<9 M						
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M						
4-Chlorotoluene	<10 µg/kg	TM116	<10 M						
tert-Butylbenzene	<14 µg/kg	TM116	<14 M						
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #						
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M						
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M						
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M						
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M						
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #						
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13 M						



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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-HRS-04	04.05.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.10										
Sample Type	SOLID										
Date Sampled	24/04/2021 00:00:00										
Date Received	26/04/2021 13:00:00										
SDG	210427-40										
Original Sample	24158165										
Method Number	TM048										

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24158165
Customer Sample Ref.	TP-HRS-04
AGS Ref.	
Depth	0.10
Type	Soil/Solid (S)
Anions by Kone (soil)	05-May-2021
Asbestos ID in Solid Samples	04-May-2021
Boron Water Soluble	05-May-2021
Chromium III	05-May-2021
Cyanide Comp/Free/Total/Thiocyanate	04-May-2021
EPH CWG GC (S)	04-May-2021
GRO by GC-FID (S)	05-May-2021
Hexavalent Chromium (s)	05-May-2021
Metals in solid samples by OES	06-May-2021
PAH by GCMS	05-May-2021
pH	30-Apr-2021
Phenols by HPLC (S)	04-May-2021
Sample description	29-Apr-2021
Total Organic Carbon	05-May-2021
Total Sulphur	04-May-2021
TPH CWG GC (S)	05-May-2021
VOC MS (S)	04-May-2021

ASSOCIATED AQC DATA

Boron Water Soluble		
Component	Method Code	QC 2461
Water Soluble Boron	TM222	95.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate		
Component	Method Code	QC 2469
Free Cyanide	TM153	94.95 86.90 : 108.50
Thiocyanate	TM153	100.64 94.53 : 113.33
Total Cyanide	TM153	95.8 86.13 : 102.13

GRO by GC-FID (S)		
Component	Method Code	QC 2444
QC	TM089	83.15 72.28 : 114.54

Hexavalent Chromium (s)		
Component	Method Code	QC 2489
Hexavalent Chromium	TM151	110.0 91.40 : 115.40

Metals in solid samples by OES		
Component	Method Code	QC 2400
Aluminium	TM181	102.65 77.46 : 123.98
Antimony	TM181	97.15 87.04 : 111.16
Arsenic	TM181	104.07 87.34 : 110.87
Barium	TM181	101.83 80.73 : 115.16
Beryllium	TM181	93.66 89.47 : 112.97
Boron	TM181	93.41 76.57 : 104.15
Cadmium	TM181	93.42 78.94 : 102.43

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Metals in solid samples by OES						

		QC 2400
Chromium	TM181	85.4 77.55 : 104.47
Cobalt	TM181	88.36 82.95 : 107.41
Copper	TM181	91.73 84.36 : 106.14
Iron	TM181	100.79 81.43 : 115.79
Lead	TM181	93.47 81.95 : 107.63
Manganese	TM181	114.72 94.29 : 119.51
Mercury	TM181	96.62 82.73 : 106.36
Molybdenum	TM181	97.94 86.61 : 111.07
Nickel	TM181	88.75 79.72 : 103.80
Phosphorus	TM181	130.3 92.65 : 125.47
Selenium	TM181	102.35 88.36 : 111.25
Strontium	TM181	85.97 77.99 : 108.06
Thallium	TM181	101.33 88.60 : 116.73
Tin	TM181	94.68 89.77 : 112.62
Titanium	TM181	89.31 66.29 : 105.96
Vanadium	TM181	85.71 75.51 : 108.87
Zinc	TM181	101.23 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2466
Acenaphthene	TM218	92.5 78.59 : 112.16
Acenaphthylene	TM218	91.5 75.11 : 109.01
Anthracene	TM218	88.0 73.99 : 113.85
Benz(a)anthracene	TM218	87.5 69.31 : 119.18
Benzo(a)pyrene	TM218	85.5 66.97 : 114.92
Benzo(b)fluoranthene	TM218	84.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	86.5 62.92 : 114.36
Benzo(k)fluoranthene	TM218	94.5 69.98 : 116.49

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PAH by GCMS						

		QC 2466
Chrysene	TM218	84.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	88.0 64.54 : 115.22
Fluoranthene	TM218	75.5 72.56 : 111.70
Fluorene	TM218	90.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	93.0 61.22 : 113.25
Naphthalene	TM218	90.0 77.96 : 110.91
Phenanthrene	TM218	85.0 76.83 : 113.25
Pyrene	TM218	78.5 72.45 : 110.77

pH

Component	Method Code	QC 2416
pH	TM133	100.15 97.51 : 101.32

Phenols by HPLC (S)

Component	Method Code	QC 2465
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	48.7 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	42.11 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	45.72 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	46.35 76.56 : 106.38

Total Organic Carbon

Component	Method Code	QC 2401
Total Organic Carbon	TM132	96.88 87.02 : 113.45

Total Sulphur

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Total Sulphur						
Component	Method Code	QC 2405				
Total Sulphur %	TM132	73.58 61.64 : 114.47				

VOC MS (S)		
Component	Method Code	QC 2413
1,1,1,2-tetrachloroethane	TM116	98.6 79.10 : 119.66
1,1,1-Trichloroethane	TM116	98.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	93.4 81.29 : 113.79
1,1-Dichloroethane	TM116	104.2 86.77 : 122.11
1,2-Dichloroethane	TM116	104.8 90.04 : 132.28
1,4-Dichlorobenzene	TM116	100.0 80.81 : 125.07
2-Chlorotoluene	TM116	93.8 73.13 : 114.13
4-Chlorotoluene	TM116	91.4 68.66 : 109.13
Benzene	TM116	98.2 84.29 : 112.22
Carbon Disulphide	TM116	100.6 75.11 : 124.81
Carbontetrachloride	TM116	101.8 82.35 : 126.46
Chlorobenzene	TM116	99.0 82.88 : 122.42
Chloroform	TM116	101.8 90.35 : 120.38
Chloromethane	TM116	105.4 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	98.0 78.27 : 128.90
Dibromomethane	TM116	93.8 76.00 : 120.73
Dichloromethane	TM116	106.0 92.27 : 134.36
Ethylbenzene	TM116	89.2 70.95 : 113.07
Hexachlorobutadiene	TM116	60.0 14.55 : 147.92
Isopropylbenzene	TM116	83.8 52.00 : 108.19
Naphthalene	TM116	93.2 80.29 : 135.77
o-Xylene	TM116	87.4 68.34 : 101.99

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210427-40	Client Reference:	B025563	Report Number:	596598	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
VOC MS (S)						
		QC 2413				
p/m-Xylene	TM116	84.1 69.47 : 97.31				
Sec-Butylbenzene	TM116	78.6 27.03 : 135.73				
Tetrachloroethene	TM116	97.4 81.43 : 126.65				
Toluene	TM116	91.2 82.44 : 103.50				
Trichloroethene	TM116	95.0 79.80 : 112.33				
Trichlorofluoromethane	TM116	95.4 89.67 : 132.09				
Vinyl Chloride	TM116	106.4 69.66 : 136.55				

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-40 Client Reference: B025563 Report Number: 596598
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24174113 Depth : 0.10
Sample ID : TP-HRS-04



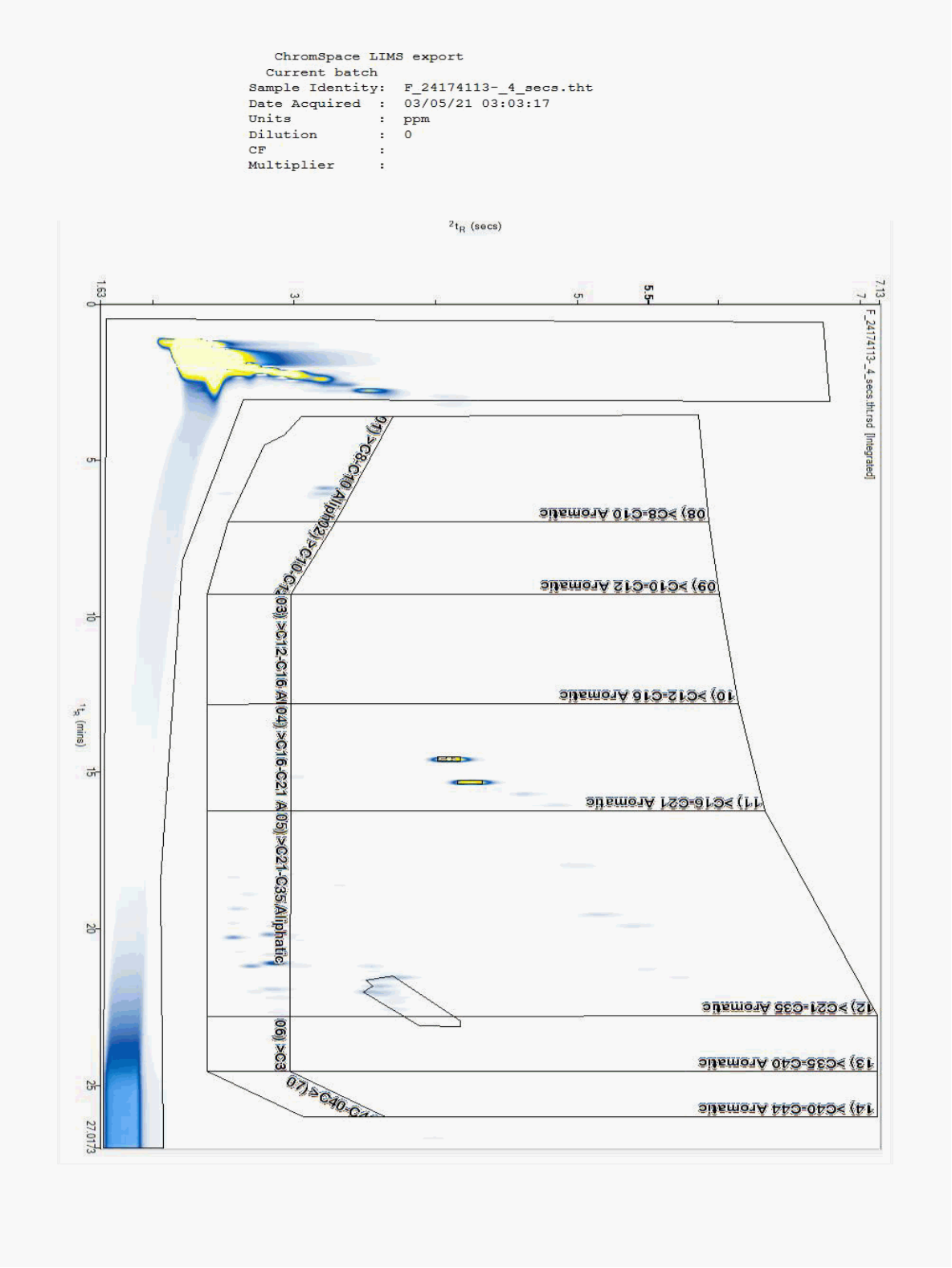
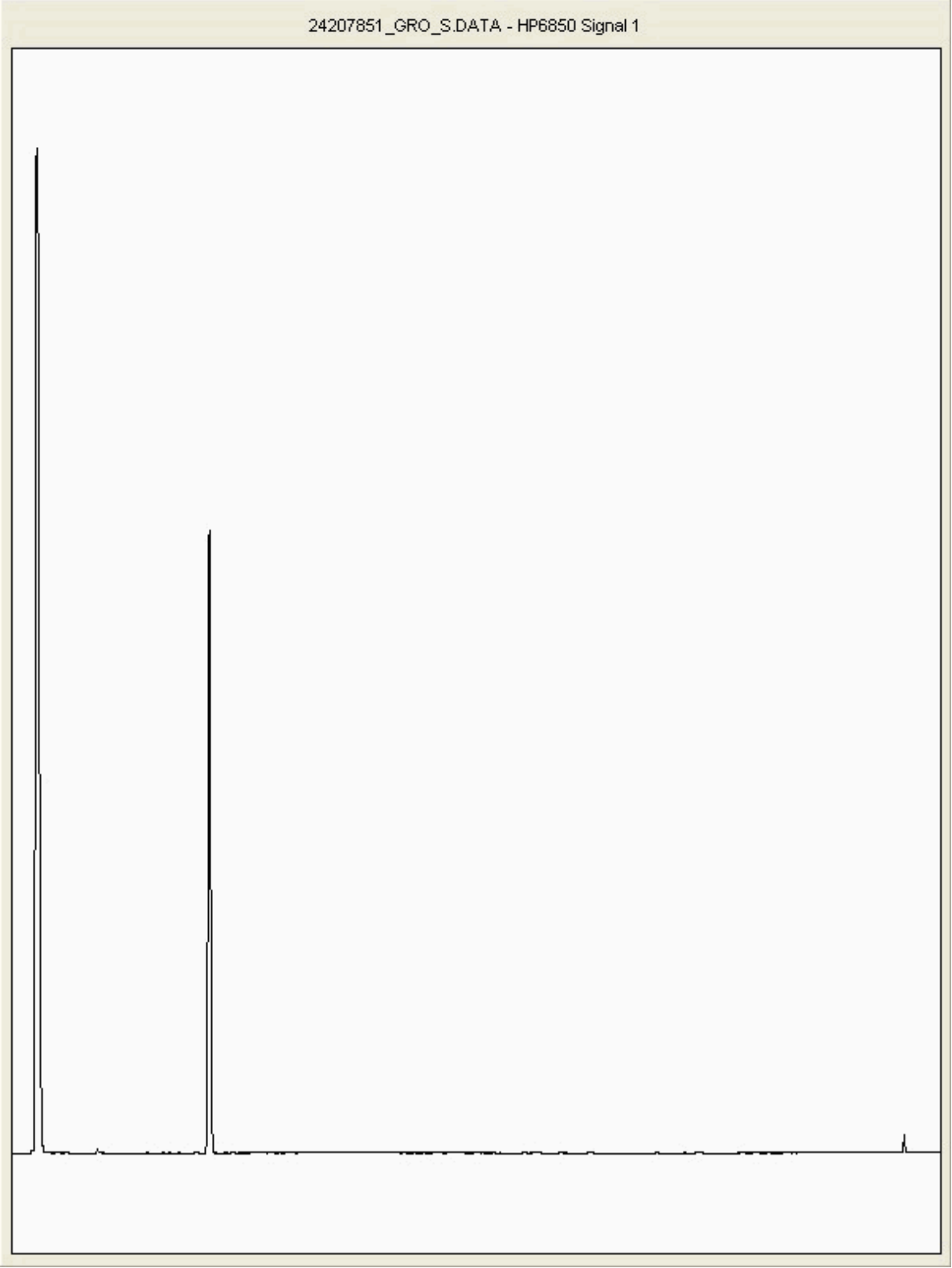
CERTIFICATE OF ANALYSIS

Validated

SDG: 210427-40 Client Reference: B025563 Report Number: 596598
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24207851 Depth : 0.10
Sample ID : TP-HRS-04





CERTIFICATE OF ANALYSIS

SDG:	210427-40	Client Reference:	B025563	Report Number:	596598
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
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CERTIFICATE OF ANALYSIS

Date of report Generation:	08 March 2022
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210429-144
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	636545
Order Number:	7000964

This report has been revised and directly supersedes 597667 in its entirety.

We received 8 samples on Thursday April 29, 2021 and 1 of these samples were scheduled for analysis which was completed on Wednesday May 12, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results. The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



ALS Life Sciences Limited. ALS Life Sciences Limited registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

Version: 3.1 Version Issued: 08/03/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144
Client Ref.: B025563

Report Number: 636545
Location: Cambridge South East Transport - Phase 2

Superseded Report: 597667

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24182792	DCP-HRS-01	ES1	0.10	27/04/2021
24182793	DCP-HRS-01	ES2	0.20	27/04/2021
24182794	DCP-HRS-01	ES3	0.50	27/04/2021
24182795	DCP-HRS-01	ES4	1.00	27/04/2021
24182796	TP-PTR-56	ES1	0.10	27/04/2021
24182797	TP-PTR-56	ES2	0.20	27/04/2021
24182798	TP-PTR-56	ES3	0.50	27/04/2021
24182799	TP-PTR-56	ES4	1.00	27/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144
Client Ref.: B025563

Report Number: 636545
Location: Cambridge South East Transport - Phase 2

Superseded Report: 597667

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24182797		
	Customer Sample Reference		TP-PTR-56		
	AGS Reference		ES2		
	Depth (m)		0.20		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X		
Boron Water Soluble	All	NDPs: 0 Tests: 1		X	
Chromium III	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144 Report Number: 636545 Superseded Report: 597667
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24182797		
	Customer Sample Reference		TP-PTR-56		
	AGS Reference		ES2		
	Depth (m)		0.20		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X



CERTIFICATE OF ANALYSIS

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SDG: 210429-144 Report Number: 636545 Superseded Report: 597667
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24182797	TP-PTR-56	0.20	Dark Brown	Sandy Loam	Vegetation	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 210429-144
Client Ref.: B025563

Report Number: 636545

Superseded Report: 597667

Location: Cambridge South East Transport - Phase 2

Results Legend		Customer Sample Ref.	TP-PTR-56				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*\$@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 27/04/2021 . 29/04/2021 210429-144 24182797 ES2				
Component		LOD/Units	Method				
Moisture Content Ratio (% of as received sample)		%	PM024	7.9			
Catechol		<0.01 mg/kg	TM062 (S)	<0.01			
Phenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
Cresols		<0.01 mg/kg	TM062 (S)	<0.01 M			
Resorcinol		<0.05 mg/kg	TM062 (S)	<0.05			
Xylenols		<0.015 mg/kg	TM062 (S)	<0.015 M			
1-Naphthol		<0.01 mg/kg	TM062 (S)	<0.01			
2,3,5-Trimethylphenol		<0.01 mg/kg	TM062 (S)	<0.01 M			
2-Isopropylphenol		<0.015 mg/kg	TM062 (S)	<0.015 M			
Phenols, Total Detected 5 speciated		<0.06 mg/kg	TM062 (S)	<0.06 M			
Phenols, Total Detected 8 Speciated		<0.13 mg/kg	TM062 (S)	<0.13			
Sulphur, Total		<0.02 %	TM132	0.0226			
Fraction Organic Carbon (FOC)		<0.002	TM132	0.00973 #			
pH		1 pH Units	TM133	8.29 M			
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6 #			
Cyanide, Free		<1 mg/kg	TM153	<1 M			
Chromium, Trivalent		<0.9 mg/kg	TM181	15.9			
Antimony		<0.6 mg/kg	TM181	<0.6 #			
Arsenic		<0.6 mg/kg	TM181	15.7 M			
Barium		<0.6 mg/kg	TM181	50.5 #			
Beryllium		<0.01 mg/kg	TM181	0.324 M			
Cadmium		<0.02 mg/kg	TM181	0.406 M			
Chromium		<0.9 mg/kg	TM181	15.9 M			
Copper		<1.4 mg/kg	TM181	11.5 M			
Iron		<1000 mg/kg	TM181	19800 #			
Lead		<0.7 mg/kg	TM181	15.6 M			
Manganese		<0.13 mg/kg	TM181	440 M			
Mercury		<0.1 mg/kg	TM181	<0.1 M			
Molybdenum		<0.1 mg/kg	TM181	1.06 #			
Nickel		<0.2 mg/kg	TM181	15.3 M			
Selenium		<1 mg/kg	TM181	<1 #			
Vanadium		<0.2 mg/kg	TM181	35.4 #			



SDG: 210429-144
Client Ref.: B025563

Report Number: 636545

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Location: Cambridge South East Transport - Phase 2

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144
Client Ref.: B025563

Report Number: 636545

Superseded Report: 597667

Location: Cambridge South East Transport - Phase 2

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG: 210429-144
Client Ref.: B025563

Report Number: 636545

Superseded Report: 597667

Location: Cambridge South East Transport - Phase 2

TPH CWG (S)

[illegible]

ALS

CERTIFICATE OF ANALYSIS

SDG: 210429-144

Client Ref.: B025563

Report Number: 636545

Location: Cambridge South East Transport - Phase 2

Superseded Report: 597667

Validated

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-56				
#	ISO17025 accredited. mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4\$@ Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	101				
Toluene-d8**	%	TM116	95.8				
4-Bromofluorobenzene**	%	TM116	83.1				
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M				
Chloromethane	<7 µg/kg	TM116	<7 #				
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M				
Bromomethane	<10 µg/kg	TM116	<10 M				
Chloroethane	<10 µg/kg	TM116	<10 M				
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M				
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #				
Carbon Disulphide	<7 µg/kg	TM116	<7 M				
Dichloromethane	<10 µg/kg	TM116	<10 #				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M				
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M				
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M				
2,2-Dichloropropane	<10 µg/kg	TM116	<10				
Bromochloromethane	<10 µg/kg	TM116	<10 M				
Chloroform	<8 µg/kg	TM116	<8 M				
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M				
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M				
Carbontetrachloride	<10 µg/kg	TM116	<10 M				
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M				
Benzene	<9 µg/kg	TM116	<9 M				
Trichloroethene	<9 µg/kg	TM116	<9 #				
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M				
Dibromomethane	<9 µg/kg	TM116	<9 M				
Bromodichloromethane	<7 µg/kg	TM116	<7 M				
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M				
Toluene	<7 µg/kg	TM116	<7 M				
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M				

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144
Client Ref.: B025563

Report Number: 636545
Location: Cambridge South East Transport - Phase 2

Superseded Report: 597667

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-56				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 27/04/2021 . 29/04/2021 210429-144 24182797 ES2				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20				
Naphthalene	<13 µg/kg	TM116	<13 M				

12:12:52 08/03/2022

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CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144 Report Number: 636545 Superseded Report: 597667
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144 Report Number: 636545 Superseded Report: 597667
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Test Completion Dates

Lab Sample No(s)	24182797
Customer Sample Ref.	TP-PTR-56
AGS Ref.	ES2
Depth	0.20
Type	Soil/Solid (S)
Anions by Kone (soil)	11-May-2021
Asbestos ID in Solid Samples	07-May-2021
Boron Water Soluble	10-May-2021
Chromium III	11-May-2021
Cyanide Comp/Free/Total/Thiocyanate	11-May-2021
EPH CWG GC (S)	10-May-2021
GRO by GC-FID (S)	10-May-2021
Hexavalent Chromium (s)	11-May-2021
Metals in solid samples by OES	12-May-2021
PAH by GCMS	07-May-2021
pH	07-May-2021
Phenols by HPLC (S)	10-May-2021
Sample description	05-May-2021
Total Organic Carbon	10-May-2021
Total Sulphur	07-May-2021
TPH CWG GC (S)	10-May-2021
VOC MS (S)	07-May-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144 Report Number: 636545 Superseded Report: 597667
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2463
Water Soluble Boron	TM222	98.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2402
Free Cyanide	TM153	95.54 86.90 : 108.50
Thiocyanate	TM153	97.44 94.53 : 113.33
Total Cyanide	TM153	97.2 86.13 : 102.13

GRO by GC-FID (S)

Component	Method Code	QC 2464
QC	TM089	83.19 70.34 : 111.95

Hexavalent Chromium (s)

Component	Method Code	QC 2484
Hexavalent Chromium	TM151	106.0 91.40 : 115.40

Metals in solid samples by OES

Component	Method Code	QC 2402	QC 2440
Aluminium	TM181	101.77 77.46 : 123.98	100.88 73.56 : 108.85
Antimony	TM181	82.93 87.04 : 111.16	103.66 76.89 : 111.24
Arsenic	TM181	98.26 87.34 : 110.87	103.78 88.53 : 111.01
Barium	TM181	95.41 80.73 : 115.16	99.08 77.67 : 105.35
Beryllium	TM181	95.15 89.47 : 112.97	99.63 85.44 : 109.61
Boron	TM181	95.7 76.57 : 104.15	95.7 73.51 : 104.66
Cadmium	TM181	90.53 81.71 : 107.91	96.3 77.67 : 104.12



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SDG: 210429-144 Report Number: 636545 Superseded Report: 597667
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Metals in solid samples by OES

		QC 2402	QC 2440
Chromium	TM181	86.82 77.55 : 104.47	90.06 79.64 : 105.83
Cobalt	TM181	86.16 82.95 : 107.41	92.14 84.60 : 104.13
Copper	TM181	93.13 84.36 : 106.14	97.18 82.40 : 105.45
Iron	TM181	98.41 81.43 : 115.79	95.24 82.95 : 110.58
Lead	TM181	90.09 81.95 : 107.63	99.32 78.24 : 104.05
Manganese	TM181	107.22 94.29 : 119.51	105.56 94.29 : 119.51
Mercury	TM181	91.06 82.73 : 106.36	97.83 83.16 : 107.81
Molybdenum	TM181	94.24 86.61 : 111.07	102.06 87.11 : 106.87
Nickel	TM181	85.57 79.72 : 103.80	91.69 80.26 : 102.28
Phosphorus	TM181	105.25 92.65 : 125.47	108.69 94.56 : 124.28
Selenium	TM181	97.25 88.36 : 111.25	102.75 82.28 : 110.48
Strontium	TM181	92.2 77.99 : 108.06	96.88 79.13 : 102.79
Thallium	TM181	98.23 88.60 : 116.73	104.42 82.94 : 111.86
Tin	TM181	94.68 89.77 : 112.62	100.76 86.72 : 110.03
Titanium	TM181	92.37 66.29 : 105.96	89.31 66.23 : 102.06
Vanadium	TM181	96.34 75.51 : 108.87	103.3 86.19 : 109.45
Zinc	TM181	97.13 84.02 : 111.24	98.36 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2443
Acenaphthene	TM218	93.5 76.79 : 103.90
Acenaphthylene	TM218	92.0 74.19 : 106.17
Anthracene	TM218	87.0 70.90 : 109.22
Benz(a)anthracene	TM218	101.5 73.77 : 119.26
Benzo(a)pyrene	TM218	100.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	100.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	97.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	99.0 75.98 : 116.59



CERTIFICATE OF ANALYSIS

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SDG: 210429-144
Client Ref.: B025563

Report Number: 636545
Location: Cambridge South East Transport - Phase 2

Superseded Report: 597667

VOC MS (S)

		QC 2497
p/m-Xylene	TM116	89.2 69.47 : 97.31
Sec-Butylbenzene	TM116	93.8 27.03 : 135.73
Tetrachloroethene	TM116	102.0 81.43 : 126.65
Toluene	TM116	92.4 82.44 : 103.50
Trichloroethene	TM116	96.6 79.80 : 112.33
Trichlorofluoromethane	TM116	99.4 83.13 : 123.97
Vinyl Chloride	TM116	105.8 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210429-144
Client Ref.: B025563

Report Number: 636545
Location: Cambridge South East Transport - Phase 2

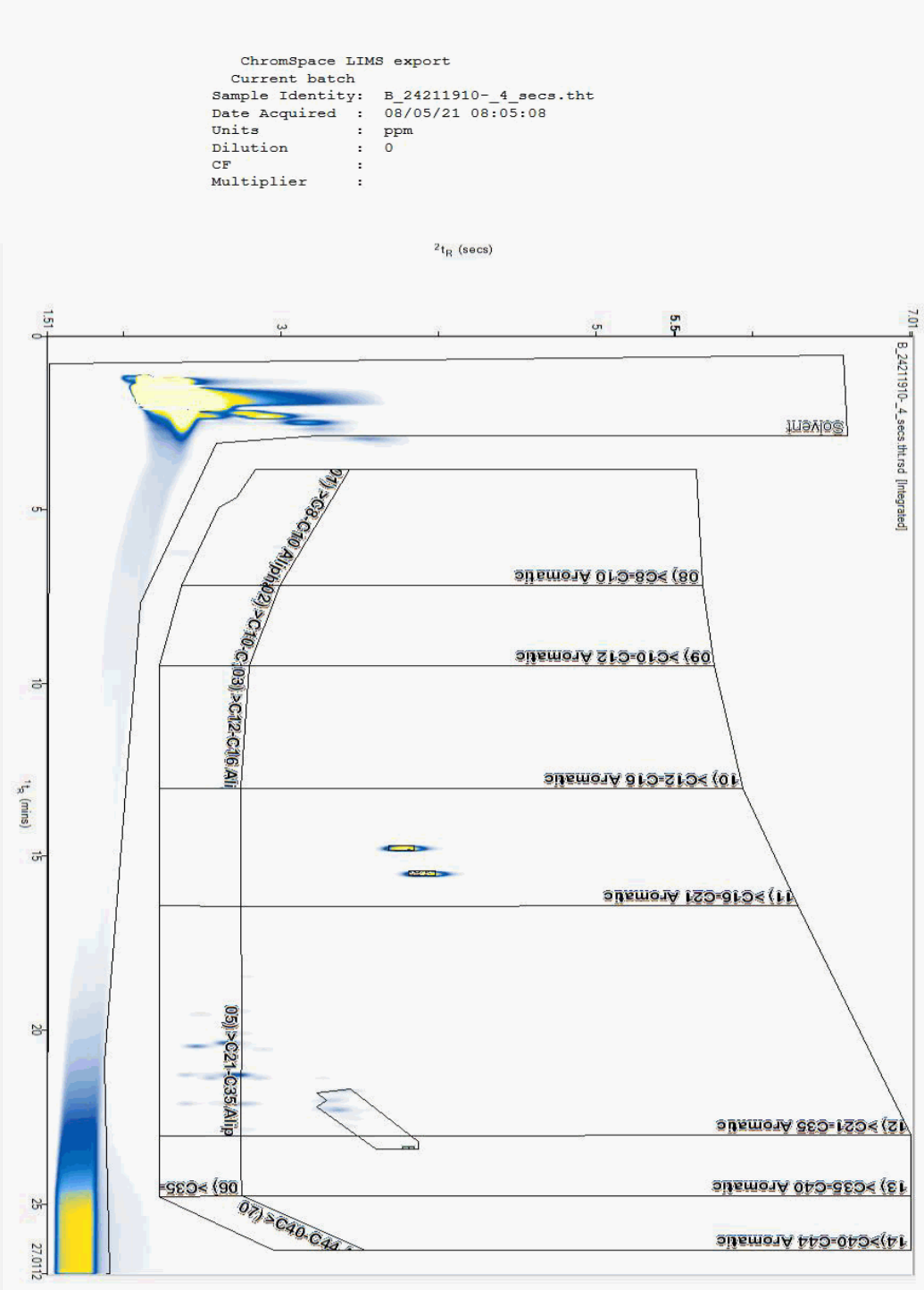
Superseded Report: 597667

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24211910
Sample ID : TP-PTR-56

Depth : 0.20





CERTIFICATE OF ANALYSIS

SDG:	210429-144	Client Reference:	8025563	Report Number:	636545
Location:	idge South East Transport -	Order Number:	7000964	Superseded Report:	597667

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subject to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 12 April 2022
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210505-10
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 641959
Order Number: 7000964

This report has been revised and directly supersedes 597748 in its entirety.

We received 4 samples on Tuesday May 04, 2021 and 1 of these samples were scheduled for analysis which was completed on Thursday May 13, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



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Version: 3.2 Version Issued: 12/04/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10

Report Number: 641959

Superseded Report: 597748

Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24205681	TP-PTR-43	ES1	0.10	30/04/2021
24205682	TP-PTR-43	ES2	0.20	30/04/2021
24205683	TP-PTR-43	ES3	0.50	30/04/2021
24205684	TP-PTR-43	ES4	1.00	30/04/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10

Report Number: 641959

Superseded Report: 597748

Client Ref.: B025563

Location: Cambridge South East Transport - Phase 2

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water</div> <div>Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Lab Sample No(s)		24205683			
	Customer Sample Reference		TP-PTR-43			
	AGS Reference		ES3			
	Depth (m)		0.50			
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)		
	Sample Type		1kg TUB with Handle (ALE200)	S		
			S	S		
Ammonium Low	All	NDPs: 0 Tests: 1	X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 1		X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X			
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1	X			
Boron Water Soluble	All	NDPs: 0 Tests: 1		X		
CEN Readings	All	NDPs: 0 Tests: 1	X			
Chromium III	All	NDPs: 0 Tests: 2	X	X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X			
EPH CWG GC (S)	All	NDPs: 0 Tests: 1		X		
Fluoride	All	NDPs: 0 Tests: 1	X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1				X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1		X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X			

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div>	Lab Sample No(s)		24205683		
	Customer Sample Reference		TP-PTR-43		
	AGS Reference		ES3		
	Depth (m)		0.50		
	Container		1kg TUB with Handle	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Sample Type		S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1		X	
PAH by GCMS	All	NDPs: 0 Tests: 1		X	
pH	All	NDPs: 0 Tests: 1		X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1		X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X		
Sample description	All	NDPs: 0 Tests: 1		X	
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
Total Sulphur	All	NDPs: 0 Tests: 1		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24205683	TP-PTR-43	0.50	Dark Brown	Loamy Sand	Vegetation	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 210505-10
Client Ref.: B025563

Report Number: 641959

Superseded Report: 597748

Location: Cambridge South East Transport - Phase 2

<div><div>Results Legend</div><div><div># M aq diss.filt tot.unfilt + ** (F) 1-4</div><div>ISU17/020 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)</div></div></div>	Customer Sample Ref.		TP-PTR-43				
	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.50 Soil/Solid (S) 30/04/2021 . 04/05/2021 210505-10 24205683 ES3				
	Component	LOD/Units	Method				
	Moisture Content Ratio (% of as received sample)	%	PM024	9.8			
	Catechol	<0.01 mg/kg	TM062 (S)	<0.01			
	Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M		
	Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M		
	Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05			
	Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M		
	1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00479	#			
pH	1 pH Units	TM133	8.8	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Free	<1 mg/kg	TM153	<1	M			
Chromium, Trivalent	<0.9 mg/kg	TM181	9.53				
Antimony	<0.6 mg/kg	TM181	0.634	#			
Arsenic	<0.6 mg/kg	TM181	6.9	M			
Barium	<0.6 mg/kg	TM181	43	#			
Beryllium	<0.01 mg/kg	TM181	0.187	M			
Cadmium	<0.02 mg/kg	TM181	0.204	M			
Chromium	<0.9 mg/kg	TM181	9.53	M			
Copper	<1.4 mg/kg	TM181	4.8	M			
Iron	<1000 mg/kg	TM181	12900	#			
Lead	<0.7 mg/kg	TM181	4.22	M			
Manganese	<0.13 mg/kg	TM181	332	M			
Mercury	<0.1 mg/kg	TM181	<0.1	M			
Molybdenum	<0.1 mg/kg	TM181	0.249	#			
Nickel	<0.2 mg/kg	TM181	9.21	M			
Selenium	<1 mg/kg	TM181	<1	#			
Vanadium	<0.2 mg/kg	TM181	22.3	#			



SDG: 210505-10
Client Ref.: B025563

Report Number: 641959

Superseded Report: 597748

Location: Cambridge South East Transport - Phase 2

[illegible]

CERTIFICATE OF ANALYSIS

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SDG: 210505-10
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Location: Cambridge South East Transport - Phase 2

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10
Client Ref.: B025563

Report Number: 641959

Superseded Report: 597748

Location: Cambridge South East Transport - Phase 2

TPH CWG (S)

[illegible]

<div><div><div><div><div></div><div>ALS</div></div><div></div></div><div></div></div><div>CERTIFICATE OF ANALYSIS</div><div>Validated</div></div>				<div><div><div><div><div></div><div>ALS</div></div><div></div></div><div></div></div><div>CERTIFICATE OF ANALYSIS</div><div>Validated</div></div>			
SDG: 210505-10 Client Ref.: B025563		Report Number: 641959 Location: Cambridge South East Transport - Phase 2		SDG: 210505-10 Client Ref.: B025563		Report Number: 641959 Location: Cambridge South East Transport - Phase 2	
Superseded Report: 597748				Superseded Report: 597748			
VOC MS (S)				VOC MS (S)			
<div><div><div><div><div></div><div>ISO17025 accredited.</div></div><div><div>mCERTS accredited.</div><div>Aqueous / settled sample.</div><div>Dissolved / filtered sample.</div><div>Total / unfiltered sample.</div><div>Subcontracted - refer to subcontractor report for accreditation status.</div><div>% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery</div><div>Trigger breach confirmed</div><div>Sample deviation (see appendix)</div></div></div><div><div>Customer Sample Ref.</div><div>TP-PTR-43</div><div>0.50</div><div>Soil/Solid (S)</div><div>30/04/2021</div><div>04/05/2021</div><div>210505-10</div><div>24205683</div><div>ES3</div></div></div></div>		<div><div><div><div><div></div><div>Depth (m)</div></div><div><div>Sample Type</div><div>Date Sampled</div><div>Sampled Time</div><div>Date Received</div><div>SDG Ref</div><div>Lab Sample No.(s)</div><div>AGS Reference</div></div></div></div></div>		<div><div><div><div><div></div><div>ISO17025 accredited.</div></div><div><div>mCERTS accredited.</div><div>Aqueous / settled sample.</div><div>Dissolved / filtered sample.</div><div>Total / unfiltered sample.</div><div>Subcontracted - refer to subcontractor report for accreditation status.</div><div>% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery</div><div>Trigger breach confirmed</div><div>Sample deviation (see appendix)</div></div></div><div><div>Customer Sample Ref.</div><div>TP-PTR-43</div><div>0.50</div><div>Soil/Solid (S)</div><div>30/04/2021</div><div>04/05/2021</div><div>210505-10</div><div>24205683</div><div>ES3</div></div></div></div>		<div><div><div><div><div></div><div>Depth (m)</div></div><div><div>Sample Type</div><div>Date Sampled</div><div>Sampled Time</div><div>Date Received</div><div>SDG Ref</div><div>Lab Sample No.(s)</div><div>AGS Reference</div></div></div></div></div>	
Component		LOD/Units	Method	Component		LOD/Units	Method
Dibromofluoromethane**		%	TM116	1,3-Dichloropropane		<7	TM116
Toluene-d8**		%	TM116			M	
4-Bromofluorobenzene**		%	TM116	Tetrachloroethene		<5	TM116
Dichlorodifluoromethane		<6	TM116			M	
Chloromethane		<7	TM116	Dibromochloromethane		<10	TM116
Vinyl Chloride		<6	TM116			M	
Bromomethane		<10	TM116	1,2-Dibromoethane		<10	TM116
Chloroethane		<10	TM116			M	
Trichlorofluoromethane		<6	TM116	Chlorobenzene		<5	TM116
1,1-Dichloroethene		<10	TM116			M	
Carbon Disulphide		<7	TM116	1,1,1,2-Tetrachloroethane		<10	TM116
Dichloromethane		<10	TM116			M	
Methyl Tertiary Butyl Ether		<10	TM116	Ethylbenzene		<4	TM116
trans-1,2-Dichloroethene		<10	TM116			M	
1,1-Dichloroethane		<8	TM116	p/m-Xylene		<10	TM116
cis-1,2-Dichloroethene		<6	TM116			#	
2,2-Dichloropropane		<10	TM116	o-Xylene		<10	TM116
Bromochloromethane		<10	TM116			M	
Chloroform		<8	TM116	Styrene		<10	TM116
1,1,1-Trichloroethane		<7	TM116			@ #	
1,1-Dichloropropene		<10	TM116	Bromoform		<10	TM116
Carbontetrachloride		<10	TM116			M	
1,2-Dichloroethane		<5	TM116	Isopropylbenzene		<5	TM116
Benzene		<9	TM116			#	
Trichloroethene		<9	TM116	1,1,2,2-Tetrachloroethane		<10	TM116
1,2-Dichloropropane		<10	TM116			#	
Dibromomethane		<9	TM116	1,2,3-Trichloropropane		<16	TM116
Bromodichloromethane		<7	TM116			M	
cis-1,3-Dichloropropene		<10	TM116	Bromobenzene		<10	TM116
Toluene		<7	TM116			M	
trans-1,3-Dichloropropene		<10	TM116	Propylbenzene		<10	TM116
1,1,2-Trichloroethane		<10	TM116			M	
				2-Chlorotoluene		<9	TM116
						M	
				1,3,5-Trimethylbenzene		<8	TM116
						M	
				4-Chlorotoluene		<10	TM116
						M	
				tert-Butylbenzene		<14	TM116
						M	
				1,2,4-Trimethylbenzene		<9	TM116
						#	
				sec-Butylbenzene		<10	TM116
				4-Isopropyltoluene		<10	TM116
						M	
				1,3-Dichlorobenzene		<8	TM116
						M	
				1,4-Dichlorobenzene		<5	TM116
						M	
				n-Butylbenzene		<11	TM116
				1,2-Dichlorobenzene		<10	TM116
						M	
				1,2-Dibromo-3-chloropropane		<14	TM116
						M	
				Tert-amyl methyl ether		<10	TM116
						#	
				1,2,4-Trichlorobenzene		<20	TM116
				Hexachlorobutadiene		<20	TM116
				Naphthalene		<13	TM116
						M	

09:12:18 12/04/2022

Page 10 of 29

09:12:18 12/04/2022

Page 11 of 29

SDG: 210505-10
Client Ref.: B025563

Report Number: 641959

Superseded Report: 597748

Location: Cambridge South East Transport - Phase 2

VOC MS (S)

[illegible]

SDG: 210505-10
Client Ref.: B025563

Report Number: 641959

Superseded Report: 597748

Location: Cambridge South East Transport - Phase 2

Asbestos Identification - Solid Samples

Results Legend											
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
1-5&\$@	Sample deviation (see appendix)										
Cust. Sample Ref.	TP-PTR-43ES3	07/05/2021	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50										
Sample Type	SOLID										
Date Sampled	30/04/2021 00:00:00										
Date Received	04/05/2021 08:20:00										
SDG	210505-10										
Original Sample	24205683										
Method Number	TM048										



CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10

Client Ref.: B025563

Report Number: 641959

Location: Cambridge South East Transport - Phase 2

Superseded Report: 597748

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.100

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport

11

90.1

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210505-10

24205683

30-Apr-2021

TP-PTR-43 ES3

0.50

Eluate Analysis

C2 Concⁿ in 10:1 eluate (mg/l)

A2 10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Ammoniacal Nitrogen as N

0.019

<0.01

0.19

<0.1

-

-

-

Low Level Hexavalent Chromium

<0.003

<0.003

<0.03

<0.03

-

-

-

Chromium III (Low)

<0.003

<0.003

<0.03

<0.03

-

-

-

Complex Cyanide - Low Level

<0.005

<0.005

<0.05

<0.05

-

-

-

Free Cyanide - Low Level

<0.0025

<0.0025

<0.025

<0.025

-

-

-

Dissolved Organic Carbon

5.18

<3

51.8

<30

-

-

-

Fluoride

<0.5

<0.5

<5

<5

-

-

-

Mercury Dissolved (CVAF)

0.0000111

<0.00001

0.000111

<0.0001

-

-

-

Arsenic

<0.0005

<0.0005

<0.005

<0.005

-

-

-

Barium

0.00371

<0.0002

0.0371

<0.002

-

-

-

Beryllium

<0.0001

<0.0001

<0.001

<0.001

-

-

-

Boron

0.0282

<0.01

0.282

<0.1

-

-

-

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

-

-

-

Chromium

<0.001

<0.001

<0.01

<0.01

-

-

-

Copper

0.00195

<0.0003

0.0195

<0.003

-

-

-

Lead

<0.0002

<0.0002

<0.002

<0.002

-

-

-

Magnesium (Dis.Filt) mg/l

0.777

<0.036

7.77

<0.36

-

-

-

Manganese

<0.003

<0.003

<0.03

<0.03

-

-

-

Molybdenum

<0.003

<0.003

<0.03

<0.03

-

-

-

Nickel

0.000525

<0.0004

0.00525

<0.004

-

-

-

Selenium

<0.001

<0.001

<0.01

<0.01

-

-

-

Vanadium

<0.001

<0.001

<0.01

<0.01

-

-

-

Zinc

0.00308

<0.001

0.0308

<0.01

-

-

-

Chloride

<2

<2

<20

<20

-

-

-

Sulphate (soluble)

<2

<2

<20

<20

-

-

-

pH Value of Filtered Water

8.3

<0.001

83

<0.01

-

-

-

2,3,5 Trimethyl-Phenol by HPLC (W)

<0.003

<0.003

<0.03

<0.03

-

-

-

2-Isopropyl Phenol by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Catechol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Cresols by HPLC (W)

<0.006

<0.006

<0.06

<0.06

-

-

-

Napthol by HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

NG Total Speciated Phenols by HPLC (W)

<0.045

<0.045

<0.45

<0.45

-

-

-

Phenol by HPLC (W)

<0.002

<0.002

<0.02

<0.02

-

-

-

Resorcinol HPLC (W)

<0.01

<0.01

<0.1

<0.1

-

-

-

Xylenols by HPLC (W)

<0.008

<0.008

<0.08

<0.08

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

05-May-2021

8.24

96.40

21.70

0.890

ALS

CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10

Client Ref.: B025563

Report Number: 641959

Location: Cambridge South East Transport - Phase 2

Superseded Report: 597748

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)

Mass of dry sample (kg)

Particle Size <4mm

0.100

0.090

>95%

Site Location

Natural Moisture Content (%)

Dry Matter Content (%)

Cambridge South East Transport

11

90.1

Case

SDG

Lab Sample Number(s)

Sampled Date

Customer Sample Ref.

Depth (m)

210505-10

24205683

30-Apr-2021

TP-PTR-43 ES3

0.50

Eluate Analysis

C2 Concⁿ in 10:1 eluate (mg/l)

A2 10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Calcium (Dis.Filt) mg/l

18.8

<0.2

188

<2

-

-

-

Hardness dissolved

50.2

<0.65

502

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.739

<0.019

7.39

<0.19

-

-

-

Leach Test Information

Date Prepared

pH (pH Units)

Conductivity (µS/cm)

Temperature (°C)

Volume Leachant (Litres)

05-May-2021

8.24

96.40

21.70

0.890

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24205683
Customer Sample Ref.	TP-PTR-43
AGS Ref.	ES3
Depth	0.50
Type	Soil/Solid (S)
Ammonium Low	11-May-2021
Anions by Kone (soil)	11-May-2021
Anions by Kone (w)	11-May-2021
Asbestos ID in Solid Samples	07-May-2021
Boron Water Soluble	10-May-2021
CEN 10:1 Leachate (1 Stage)	06-May-2021
CEN Readings	10-May-2021
Chromium III	12-May-2021
Cyanide Comp/Free/Total/Thiocyanate	11-May-2021
Dissolved Metals by ICP-MS	10-May-2021
Dissolved Organic/Inorganic Carbon	13-May-2021
EPH CWG GC (S)	10-May-2021
Fluoride	11-May-2021
GRO by GC-FID (S)	10-May-2021
Hexavalent Chromium (s)	11-May-2021
Low Level Cyanide (W)	10-May-2021
Low Level Hexavalent Chromium (w)	12-May-2021
Mercury Dissolved	10-May-2021
Metals in solid samples by OES	12-May-2021
Moisture at 105C	05-May-2021
PAH by GCMS	07-May-2021
pH	07-May-2021
pH Value of Filtered Water	09-May-2021
Phenols by HPLC (S)	10-May-2021
Phenols by HPLC (W)	11-May-2021
Sample description	05-May-2021
Total Organic Carbon	11-May-2021
Total Sulphur	07-May-2021
TPH CWG GC (S)	10-May-2021
VOC MS (S)	10-May-2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10 Report Number: 641959 Superseded Report: 597748
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2485
Ammoniacal Nitrogen as N	TM099	100.0 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2484
Chloride (soluble)	TM243	147.67 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	166.82 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2431
Chloride	TM184	95.8 91.40 : 109.10
Sulphate (soluble)	TM184	98.8 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2443
Water Soluble Boron	TM222	97.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2402
Free Cyanide	TM153	95.54 86.90 : 108.50
Thiocyanate	TM153	97.44 94.53 : 113.33
Total Cyanide	TM153	97.2 86.13 : 102.13

Dissolved Metals by ICP-MS

Component	Method Code	QC 2402
Aluminium	TM152	103.33 94.21 : 111.52
Antimony	TM152	102.67 88.37 : 130.57
Arsenic	TM152	102.33 92.62 : 113.52



CERTIFICATE OF ANALYSIS

Validated

SDG: 210505-10 Report Number: 641959 Superseded Report: 597748
Client Ref.: B025563 Location: Cambridge South East Transport - Phase 2

Dissolved Metals by ICP-MS

		QC 2402
Barium	TM152	100.33 88.62 : 113.14
Beryllium	TM152	100.83 87.08 : 111.38
Bismuth	TM152	101.33 92.62 : 115.02
Boron	TM152	104.67 86.31 : 120.88
Cadmium	TM152	101.17 93.85 : 111.65
Calcium	TM152	104.67 89.20 : 126.91
Chromium	TM152	101.83 92.50 : 113.03
Cobalt	TM152	103.33 85.01 : 114.87
Copper	TM152	103.0 89.87 : 119.73
Iron	TM152	103.33 93.02 : 113.86
Lead	TM152	100.33 91.11 : 116.98
Lithium	TM152	101.0 87.70 : 115.90
Magnesium	TM152	102.0 89.60 : 116.61
Manganese	TM152	102.83 93.97 : 112.46
Molybdenum	TM152	100.0 89.07 : 110.96
Nickel	TM152	104.17 93.70 : 112.15
Phosphorus	TM152	102.67 89.24 : 114.18
Potassium	TM152	103.33 93.20 : 115.55
Selenium	TM152	103.67 91.69 : 117.12
Silver	TM152	101.17 90.93 : 121.73
Sodium	TM152	104.0 92.42 : 113.24
Strontium	TM152	103.0 92.14 : 116.24
Tellurium	TM152	100.67 89.88 : 111.78
Thallium	TM152	96.33 82.43 : 113.83
Tin	TM152	103.33 94.62 : 107.79
Titanium	TM152	101.5 90.29 : 115.23
Tungsten	TM152	104.67 77.61 : 132.31

Dissolved Metals by ICP-MS

		QC 2402
Uranium	TM152	97.5 86.97 : 115.76
Vanadium	TM152	103.33 89.61 : 115.48
Zinc	TM152	102.67 87.51 : 116.26

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2411
Dissolved Inorganic Carbon	TM090	117.83 93.58 : 112.28
Dissolved Organic Carbon	TM090	102.5 96.13 : 109.53

EPH CWG GC (S)

Component	Method Code	QC 2467
EPH >C8-C40 Raw	TM414	91.19 73.48 : 116.68
Total Aliphatics Raw	TM414	97.62 72.61 : 118.71
Total Aromatics Raw	TM414	96.33 63.37 : 122.69

Fluoride

Component	Method Code	QC 2421
Fluoride	TM104	101.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2444
QC	TM089	87.91 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2453
Hexavalent Chromium	TM151	108.0 91.40 : 115.40

Low Level Cyanide (W)

Component	Method Code	QC 2444
Free Cyanide - Low Level	TM279	80.75 88.26 : 122.21
Total Cyanide - Low Level	TM279	102.5 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2468
Mercury Dissolved (CVAf)	TM183	114.0 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2445	QC 2440
Aluminium	TM181	107.96 77.46 : 123.98	100.88 73.56 : 108.85
Antimony	TM181	91.46 87.04 : 111.16	103.66 76.89 : 111.24
Arsenic	TM181	104.07 87.34 : 110.87	103.78 88.53 : 111.01
Barium	TM181	102.75 80.73 : 115.16	99.08 77.67 : 105.35
Beryllium	TM181	101.12 89.47 : 112.97	99.63 85.44 : 109.61
Boron	TM181	92.55 76.57 : 104.15	95.7 73.51 : 104.66
Cadmium	TM181	92.59 81.71 : 107.91	96.3 77.67 : 104.12
Chromium	TM181	92.9 77.55 : 104.47	90.06 79.64 : 105.83
Cobalt	TM181	90.57 82.95 : 107.41	92.14 84.60 : 104.13
Copper	TM181	96.83 84.36 : 106.14	97.18 82.40 : 105.45
Iron	TM181	104.76 81.43 : 115.79	95.24 82.95 : 110.58
Lead	TM181	93.02 81.95 : 107.63	99.32 78.24 : 104.05
Manganese	TM181	115.28 94.29 : 119.51	105.56 94.29 : 119.51
Mercury	TM181	96.62 82.73 : 106.36	97.83 83.16 : 107.81
Molybdenum	TM181	98.77 86.61 : 111.07	102.06 87.11 : 106.87
Nickel	TM181	90.22 79.72 : 103.80	91.69 80.26 : 102.28
Phosphorus	TM181	111.31 92.65 : 125.47	108.69 94.56 : 124.28



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Metals in solid samples by OES

		QC 2445	QC 2440
Selenium	TM181	103.92 88.36 : 111.25	102.75 82.28 : 110.48
Strontium	TM181	97.1 77.99 : 108.06	96.88 79.13 : 102.79
Thallium	TM181	104.42 88.60 : 116.73	104.42 82.94 : 111.86
Tin	TM181	98.86 89.77 : 112.62	100.76 86.72 : 110.03
Titanium	TM181	96.95 66.29 : 105.96	89.31 66.23 : 102.06
Vanadium	TM181	104.4 75.51 : 108.87	103.3 86.19 : 109.45
Zinc	TM181	103.49 84.02 : 111.24	98.36 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2443
Acenaphthene	TM218	93.5 76.79 : 103.90
Acenaphthylene	TM218	92.0 74.19 : 106.17
Anthracene	TM218	87.0 70.90 : 109.22
Benz(a)anthracene	TM218	101.5 73.77 : 119.26
Benzo(a)pyrene	TM218	100.5 73.20 : 114.18
Benzo(b)fluoranthene	TM218	100.5 75.36 : 117.58
Benzo(ghi)perylene	TM218	97.5 70.73 : 116.12
Benzo(k)fluoranthene	TM218	99.0 75.98 : 116.59
Chrysene	TM218	99.5 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	99.0 69.17 : 115.30
Fluoranthene	TM218	95.0 66.06 : 114.63
Fluorene	TM218	86.5 76.66 : 107.56
Indeno(123cd)pyrene	TM218	93.0 70.26 : 117.95
Naphthalene	TM218	91.5 74.70 : 101.83
Phenanthrene	TM218	87.5 73.62 : 109.34
Pyrene	TM218	95.5 71.46 : 117.00

pH



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pH

Component	Method Code	QC 2411
pH	TM133	100.15 98.41 : 102.48

pH Value of Filtered Water

Component	Method Code	QC 2401
pH	TM256	100.94 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2452
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.03 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	49.06 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	50.99 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	49.69 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2458
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	99.61 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	99.34 76.60 : 126.28
Napthol by HPLC (W)	TM259	95.7 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	97.15 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2450
Total Organic Carbon	TM132	105.86 87.02 : 113.45



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Total Sulphur

Component	Method Code	QC 2465
Total Sulphur %	TM132	<div>93.78</div> <div>61.64 : 114.47</div>

VOC MS (S)		
Component	Method Code	QC 2401
1,1,1,2-tetrachloroethane	TM116	99.6 79.10 : 119.66
1,1,1-Trichloroethane	TM116	99.8 88.34 : 114.50
1,1,2-Trichloroethane	TM116	98.8 81.29 : 113.79
1,1-Dichloroethane	TM116	103.4 86.77 : 122.11
1,2-Dichloroethane	TM116	110.2 90.04 : 132.28
1,4-Dichlorobenzene	TM116	102.4 80.81 : 125.07
2-Chlorotoluene	TM116	93.8 73.13 : 114.13
4-Chlorotoluene	TM116	89.2 68.66 : 109.13
Benzene	TM116	99.0 84.29 : 112.22
Carbon Disulphide	TM116	99.4 75.11 : 124.81
Carbontetrachloride	TM116	107.8 82.35 : 126.46
Chlorobenzene	TM116	98.8 82.88 : 122.42
Chloroform	TM116	106.4 90.35 : 120.38
Chloromethane	TM116	103.2 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	101.8 78.27 : 128.90
Dibromomethane	TM116	100.4 76.00 : 120.73
Dichloromethane	TM116	111.2 92.27 : 134.36
Ethylbenzene	TM116	92.8 70.95 : 113.07
Hexachlorobutadiene	TM116	55.4 14.55 : 147.92
Isopropylbenzene	TM116	83.8 52.00 : 108.19
Naphthalene	TM116	96.8 80.29 : 135.77
o-Xylene	TM116	88.8 68.34 : 101.99



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VOC MS (S)

		QC 2401
p/m-Xylene	TM116	<div>86.0</div> <div>69.47 : 97.31</div>
Sec-Butylbenzene	TM116	<div>79.2</div> <div>27.03 : 135.73</div>
Tetrachloroethene	TM116	<div>101.2</div> <div>81.43 : 126.65</div>
Toluene	TM116	<div>91.2</div> <div>82.44 : 103.50</div>
Trichloroethene	TM116	<div>96.0</div> <div>79.80 : 112.33</div>
Trichlorofluoromethane	TM116	<div>99.8</div> <div>83.13 : 123.97</div>
Vinyl Chloride	TM116	<div>107.0</div> <div>69.66 : 136.55</div>

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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Report Number: 641959
Superseded Report: 597748
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24211232 Depth : 0.50
Sample ID : TP-PTR-43



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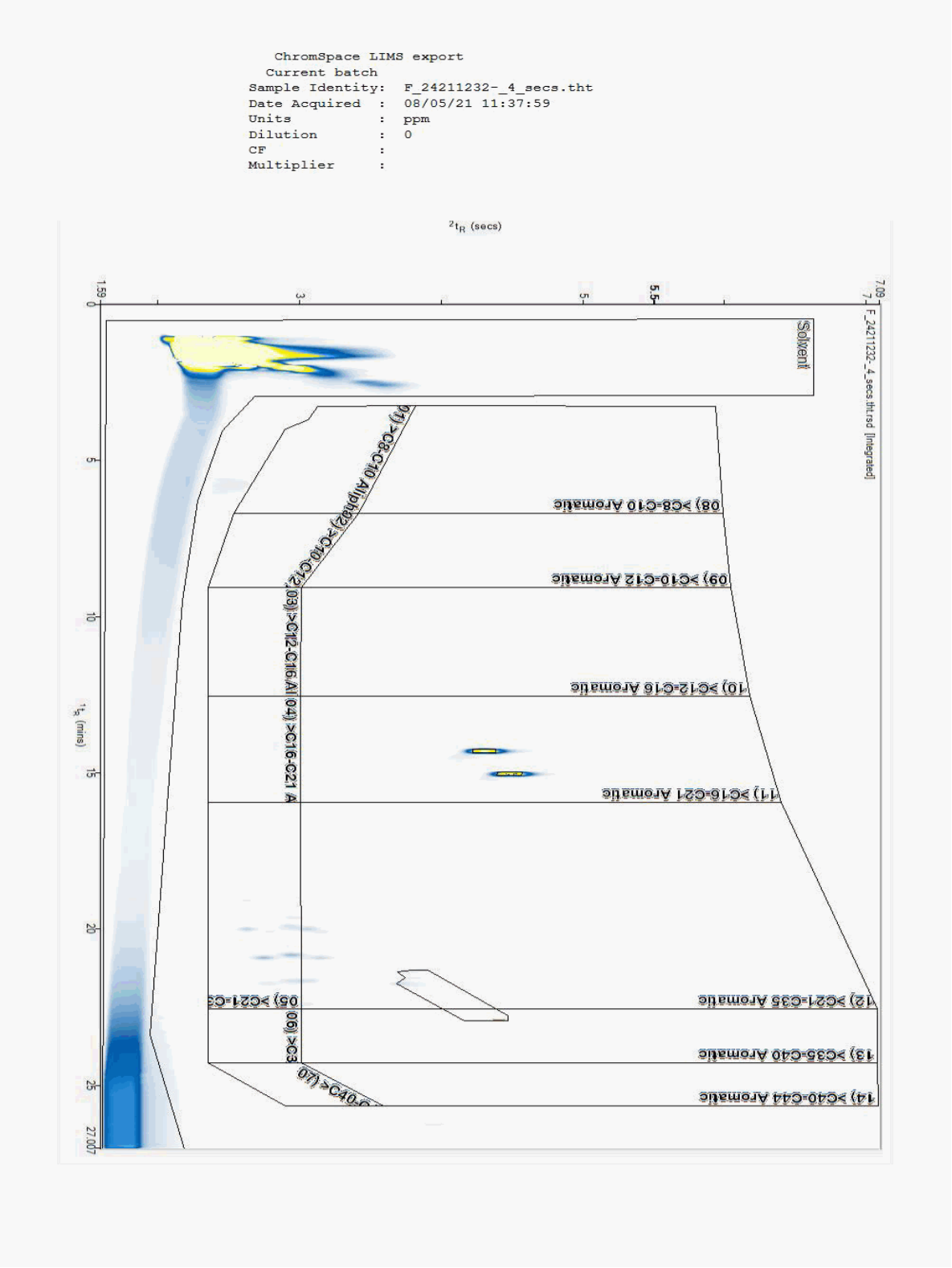
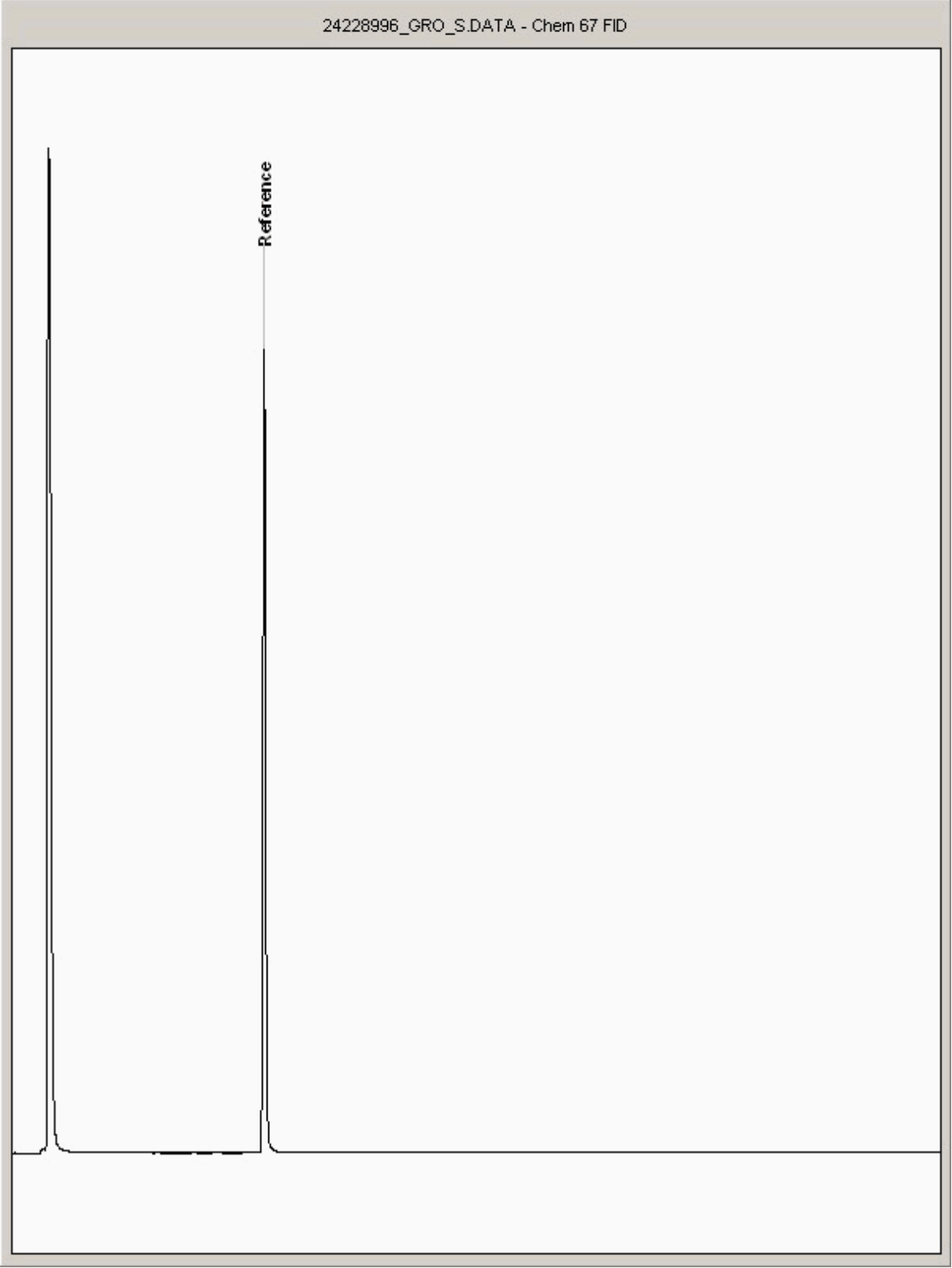
Validated

SDG: 210505-10
Client Ref.: B025563

Report Number: 641959
Superseded Report: 597748
Location: Cambridge South East Transport - Phase 2

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24228996 Depth : 0.50
Sample ID : TP-PTR-43



SDG	Sample Event	Sample ID	Date Amended	Amendment Reason	Analysis/Component	Authorised (Lab Manager)	Previous Value	New Value	Units	Supersedes Report
210505-10	N/A	N/A	12/04/2022	IT Issue	Report Formatting	Sarah Middleton	Formatting incorrect, additional blank pages	Fixed Formatting	N/A	597748



Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
Leeds
West Yorkshire
LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
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CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 21 May 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210511-32
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 598862

We received 4 samples on Monday May 10, 2021 and 2 of these samples were scheduled for analysis which was completed on Friday May 21, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210511-32 Client Reference: B025563 Report Number: 598862
Location: Cambridge South East Transport Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24242340	TP-PTR-31		0.10	07/05/2021
24242341	TP-PTR-31		0.20	07/05/2021
24242342	TP-PTR-31		0.50	07/05/2021
24242343	TP-PTR-31		1.00	07/05/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



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Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		24242343		24242343	
	Customer Sample Reference		TP-PTR-31		TP-PTR-31	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 1	X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 2		X		X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X			
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X		X	
Boron Water Soluble	All	NDPs: 0 Tests: 2		X		X
CEN Readings	All	NDPs: 0 Tests: 1	X			
Chromium III	All	NDPs: 0 Tests: 3	X	X		X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2		X		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X			
EPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
Fluoride	All	NDPs: 0 Tests: 1	X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2			X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2		X		X
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X			



CERTIFICATE OF ANALYSIS

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SDG: 210511-32 Client Reference: B025563 Report Number: 598862
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		24242343		24242343	
	Customer Sample Reference		TP-PTR-31		TP-PTR-31	
	AGS Reference					
	Depth (m)		0.20		1.00	
	Container		Handle (ALE260)	1kg TUB with (ALE210)	250g Amber Jar (ALE215)	60g VOC (ALE215)
	Sample Type		S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Sample description	All	NDPs: 0 Tests: 2		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24242341	TP-PTR-31	0.20	Dark Brown	Sandy Loam	Vegetation	Stones
24242343	TP-PTR-31	1.00	Dark Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP-PTR-31	TP-PTR-31				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP-PTR-31	TP-PTR-31				
M	mCERTS accredited.		0.20	1.00				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		07/05/2021	07/05/2021				
tot.unfilt	Total / unfiltered sample.		10/05/2021	10/05/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.		210511-32	210511-32				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24242341	24242343				
(F)	Trigger breach confirmed							
1-445@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	12	15				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	<0.02	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00674	0.00428				
pH	1 pH Units	TM133	8.58	8.5				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	11.7	19.1				
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6				
Arsenic	<0.6 mg/kg	TM181	11.8	6.85				
Barium	<0.6 mg/kg	TM181	62.1	101				
Beryllium	<0.01 mg/kg	TM181	0.454	0.86				
Cadmium	<0.02 mg/kg	TM181	0.131	0.158				
Chromium	<0.9 mg/kg	TM181	11.7	19.1				
Copper	<1.4 mg/kg	TM181	6.78	49.2				
Iron	<1000 mg/kg	TM181	21400	24100				
Lead	<0.7 mg/kg	TM181	9.17	10.5				
Manganese	<0.13 mg/kg	TM181	290	150				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.56	0.112				
Nickel	<0.2 mg/kg	TM181	21.1	21.5				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	31.5	49.6				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

CERTIFICATE OF ANALYSIS

SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	TP-PTR-31	TP-PTR-31				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.20 Soil/Solid (S) 07/05/2021 . 10/05/2021 210511-32 24242341	1.00 Soil/Solid (S) 07/05/2021 . 10/05/2021 210511-32 24242343				
1-4+5+6 (F)	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Trigger breach confirmed Sample deviation (see appendix)								
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	117	118					
Toluene-d8**	%	TM116	96.2	96.8					
4-Bromofluorobenzene**	%	TM116	90.8	94.3					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M					
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #					
Vinyl Chloride	<6 µg/kg	TM116	<6 M	<6 M					
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M					
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M					
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M					
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #					
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M					
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M					
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M					
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M					
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10					
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M					
Chloroform	<8 µg/kg	TM116	<8 M	<8 M					
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M					
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M					
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M					
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M					
Benzene	<9 µg/kg	TM116	<9 M	<9 M					
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #					
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M					
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M					
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M					
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M					
Toluene	<7 µg/kg	TM116	<7 M	<7 M					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M					

ALS

CERTIFICATE OF ANALYSIS

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SDG:210511-32

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CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)0.101

Mass of dry sample (kg)0.090

Particle Size <4mm>95%

Site Location

Natural Moisture Content (%)12.2

Dry Matter Content (%)89.1

Cambridge South East Transport - f

Case

SDG210511-32

Lab Sample Number(s)24242341

Sampled Date07-May-2021

Customer Sample Ref.TP-PTR-31

Depth (m)0.20

Eluate Analysis

C2Concⁿ in 10:1 eluate (mg/l)

A210:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Hardness dissolved

44.1

<0.65

441

<6.5

-

-

-

Iron (Dis.Filt) mg/l

0.15

<0.019

1.5

<0.19

-

-

-

Leach Test Information

Date Prepared14-May-2021

pH (pH Units)8.71

Conductivity (µS/cm)101.00

Temperature (°C)17.60

Volume Leachant (Litres)0.889



CERTIFICATE OF ANALYSIS

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Order Number:7000964

Report Number:598862

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24242341	24242343
Customer Sample Ref.	TP-PTR-31	TP-PTR-31
AGS Ref.		
Depth	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	19-May-2021	
Anions by Kone (soil)	19-May-2021	19-May-2021
Anions by Kone (w)	18-May-2021	
Asbestos ID in Solid Samples	14-May-2021	17-May-2021
Boron Water Soluble	17-May-2021	17-May-2021
CEN 10:1 Leachate (1 Stage)	14-May-2021	
CEN Readings	15-May-2021	
Chromium III	18-May-2021	18-May-2021
Cyanide Comp/Free/Total/Thiocyanate	17-May-2021	17-May-2021
Dissolved Metals by ICP-MS	17-May-2021	
Dissolved Organic/Inorganic Carbon	21-May-2021	
EPH CWG GC (S)	14-May-2021	14-May-2021
Fluoride	17-May-2021	
GRO by GC-FID (S)	14-May-2021	14-May-2021
Hexavalent Chromium (s)	17-May-2021	17-May-2021
Low Level Cyanide (W)	18-May-2021	
Low Level Hexavalent Chromium (w)	17-May-2021	
Mercury Dissolved	19-May-2021	
Metals in solid samples by OES	18-May-2021	18-May-2021
Moisture at 105C	14-May-2021	
PAH by GCMS	17-May-2021	17-May-2021
pH	13-May-2021	13-May-2021
pH Value of Filtered Water	17-May-2021	
Phenols by HPLC (S)	17-May-2021	17-May-2021
Phenols by HPLC (W)	19-May-2021	
Sample description	13-May-2021	13-May-2021
Total Organic Carbon	17-May-2021	17-May-2021
Total Sulphur	17-May-2021	17-May-2021
TPH CWG GC (S)	14-May-2021	14-May-2021
VOC MS (S)	14-May-2021	14-May-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2401
Chloride (soluble)	TM243	147.67 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	158.88 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2401
Chloride	TM184	106.0 91.40 : 109.10
Sulphate (soluble)	TM184	104.8 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2493	QC 2498
Water Soluble Boron	TM222	98.5 84.00 : 111.00	99.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2475
Free Cyanide	TM153	100.0 78.00 : 114.00
Thiocyanate	TM153	103.21 94.53 : 113.33
Total Cyanide	TM153	100.0 77.13 : 111.53

Dissolved Metals by ICP-MS

Component	Method Code	QC 2461
Aluminium	TM152	103.33 94.21 : 111.52
Antimony	TM152	108.5 88.37 : 130.57
Arsenic	TM152	104.83 92.62 : 113.52
Barium	TM152	104.0 88.62 : 113.14
Beryllium	TM152	108.83 87.08 : 111.38
Bismuth	TM152	109.67 92.62 : 115.02
Boron	TM152	108.33 86.31 : 120.88

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	SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Dissolved Metals by ICP-MS						

		QC 2461
Cadmium	TM152	104.83 93.85 : 111.65
Calcium	TM152	102.0 89.20 : 126.91
Chromium	TM152	99.83 92.50 : 113.03
Cobalt	TM152	103.0 85.01 : 114.87
Copper	TM152	101.83 89.87 : 119.73
Iron	TM152	102.0 93.02 : 113.86
Lead	TM152	103.0 91.11 : 116.98
Lithium	TM152	104.83 87.70 : 115.90
Magnesium	TM152	100.0 89.60 : 116.61
Manganese	TM152	105.67 93.97 : 112.46
Molybdenum	TM152	99.17 89.07 : 110.96
Nickel	TM152	101.67 93.70 : 112.15
Phosphorus	TM152	102.67 89.24 : 114.18
Potassium	TM152	102.0 93.20 : 115.55
Selenium	TM152	102.67 91.69 : 117.12
Silver	TM152	104.67 90.93 : 121.73
Sodium	TM152	100.67 92.42 : 113.24
Strontium	TM152	106.67 92.14 : 116.24
Tellurium	TM152	105.67 89.88 : 111.78
Thallium	TM152	97.17 82.43 : 113.83
Tin	TM152	106.0 94.62 : 107.79
Titanium	TM152	106.33 90.29 : 115.23
Tungsten	TM152	102.83 77.61 : 132.31
Uranium	TM152	103.0 86.97 : 115.76
Vanadium	TM152	95.0 89.61 : 115.48
Zinc	TM152	102.0 87.51 : 116.26

EPH CWG GC (S)

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
EPH CWG GC (S)						

Component	Method Code	QC 2457
EPH >C8-C40 Raw	TM414	90.16 70.16 : 114.99
Total Aliphatics Raw	TM414	95.25 68.59 : 115.04
Total Aromatics Raw	TM414	104.59 69.80 : 126.50

GRO by GC-FID (S)

Component	Method Code	QC 2481
QC	TM089	83.9 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2486
Hexavalent Chromium	TM151	104.0 91.40 : 115.40

Low Level Cyanide (W)

Component	Method Code	QC 2416
Free Cyanide - Low Level	TM279	84.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.0 81.83 : 110.45

Mercury Dissolved

Component	Method Code	QC 2463
Mercury Dissolved (CVAf)	TM183	94.7 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2448	QC 2407
Aluminium	TM181	98.23 73.56 : 108.85	103.54 77.46 : 123.98
Antimony	TM181	100.41 76.89 : 111.24	105.69 87.04 : 111.16
Arsenic	TM181	102.91 88.53 : 111.01	106.69 87.34 : 110.87
Barium	TM181	86.97 77.67 : 105.35	100.0 80.73 : 115.16

		CERTIFICATE OF ANALYSIS				Validated
SDG:	210511-32	Client Reference:	B025563	Report Number:	598862	
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:		
Metals in solid samples by OES						

		QC 2448	QC 2407
Beryllium	TM181	103.73 85.44 : 109.61	106.72 89.47 : 112.97
Boron	TM181	95.99 73.51 : 104.66	102.87 76.57 : 104.15
Cadmium	TM181	96.3 77.67 : 104.12	99.18 81.71 : 107.91
Chromium	TM181	88.44 79.64 : 105.83	91.89 77.55 : 104.47
Cobalt	TM181	94.97 84.60 : 104.13	97.8 82.95 : 107.41
Copper	TM181	100.35 82.40 : 105.45	96.65 84.36 : 106.14
Iron	TM181	99.21 82.95 : 110.58	100.79 81.43 : 115.79
Lead	TM181	92.57 78.24 : 104.05	90.54 81.95 : 107.63
Manganese	TM181	106.11 94.29 : 119.51	110.83 94.29 : 119.51
Mercury	TM181	97.83 83.16 : 107.81	101.21 82.73 : 106.36
Molybdenum	TM181	97.12 87.11 : 106.87	105.76 86.61 : 111.07
Nickel	TM181	92.67 80.26 : 102.28	95.84 79.72 : 103.80
Phosphorus	TM181	111.31 94.56 : 124.28	117.37 92.65 : 125.47
Selenium	TM181	104.31 82.28 : 110.48	110.2 88.36 : 111.25
Strontium	TM181	94.21 79.13 : 102.79	99.11 77.99 : 108.06
Thallium	TM181	107.08 82.94 : 111.86	108.85 88.60 : 116.73
Tin	TM181	104.18 86.72 : 110.03	98.48 89.77 : 112.62
Titanium	TM181	87.02 66.23 : 102.06	89.31 66.29 : 105.96
Vanadium	TM181	100.73 86.19 : 109.45	104.4 75.51 : 108.87
Zinc	TM181	101.03 84.68 : 113.99	105.54 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2424
Acenaphthene	TM218	91.0 78.59 : 112.16
Acenaphthylene	TM218	90.0 75.11 : 109.01
Anthracene	TM218	87.5 73.99 : 113.85
Benz(a)anthracene	TM218	94.0 69.31 : 119.18
Benzo(a)pyrene	TM218	93.5 66.97 : 114.92

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PAH by GCMS						

		QC 2424
Benzo(b)fluoranthene	TM218	91.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	89.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	97.5 69.98 : 116.49
Chrysene	TM218	95.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	89.0 64.54 : 115.22
Fluoranthene	TM218	86.0 72.56 : 111.70
Fluorene	TM218	91.0 79.13 : 111.49
Indeno(123cd)pyrene	TM218	87.5 61.22 : 113.25
Naphthalene	TM218	91.5 77.96 : 110.91
Phenanthrene	TM218	88.0 76.83 : 113.25
Pyrene	TM218	87.0 72.45 : 110.77

pH

Component	Method Code	QC 2443
pH	TM133	99.71 98.41 : 102.48

pH Value of Filtered Water

Component	Method Code	QC 2463
pH	TM256	100.53 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2439	QC 2413
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	49.35 70.71 : 116.42	53.25 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	43.27 64.54 : 117.79	44.44 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	45.93 74.40 : 108.98	50.1 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	49.01 69.44 : 122.18	51.66 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	46.87 76.56 : 106.38	50.42 88.23 : 104.42



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Phenols by HPLC (W)

Component	Method Code	QC 2466
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	97.66 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	91.78 82.77 : 126.51
Cresols by HPLC (W)	TM259	97.37 76.60 : 126.28
Napthol by HPLC (W)	TM259	99.61 75.40 : 129.40
Phenol by HPLC (W)	TM259	92.63 85.77 : 125.91
Xylenols by HPLC (W)	TM259	95.89 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2497	QC 2418
Total Organic Carbon	TM132	110.55 87.02 : 113.45	108.59 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2485
Total Sulphur %	TM132	89.64 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2483
1,1,1,2-tetrachloroethane	TM116	103.0 79.10 : 119.66
1,1,1-Trichloroethane	TM116	99.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	98.4 81.29 : 113.79
1,1-Dichloroethane	TM116	104.4 86.77 : 122.11
1,2-Dichloroethane	TM116	114.4 90.04 : 132.28
1,4-Dichlorobenzene	TM116	107.0 80.81 : 125.07
2-Chlorotoluene	TM116	93.8 73.13 : 114.13
4-Chlorotoluene	TM116	94.6 68.66 : 109.13
Benzene	TM116	100.8 84.29 : 112.22
Carbon Disulphide	TM116	93.8 75.11 : 124.81



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VOC MS (S)

		QC 2483
Carbontetrachloride	TM116	109.0 82.35 : 126.46
Chlorobenzene	TM116	102.6 82.88 : 122.42
Chloroform	TM116	105.0 90.35 : 120.38
Chloromethane	TM116	93.2 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	102.2 78.27 : 128.90
Dibromomethane	TM116	104.0 76.00 : 120.73
Dichloromethane	TM116	110.4 92.27 : 134.36
Ethylbenzene	TM116	94.4 70.95 : 113.07
Hexachlorobutadiene	TM116	80.6 14.55 : 147.92
Isopropylbenzene	TM116	88.6 52.00 : 108.19
Naphthalene	TM116	106.4 80.29 : 135.77
o-Xylene	TM116	89.2 68.34 : 101.99
p/m-Xylene	TM116	89.6 69.47 : 97.31
Sec-Butylbenzene	TM116	87.6 27.03 : 135.73
Tetrachloroethene	TM116	105.6 81.43 : 126.65
Toluene	TM116	93.2 82.44 : 103.50
Trichloroethene	TM116	96.6 79.80 : 112.33
Trichlorofluoromethane	TM116	96.0 83.13 : 123.97
Vinyl Chloride	TM116	93.4 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

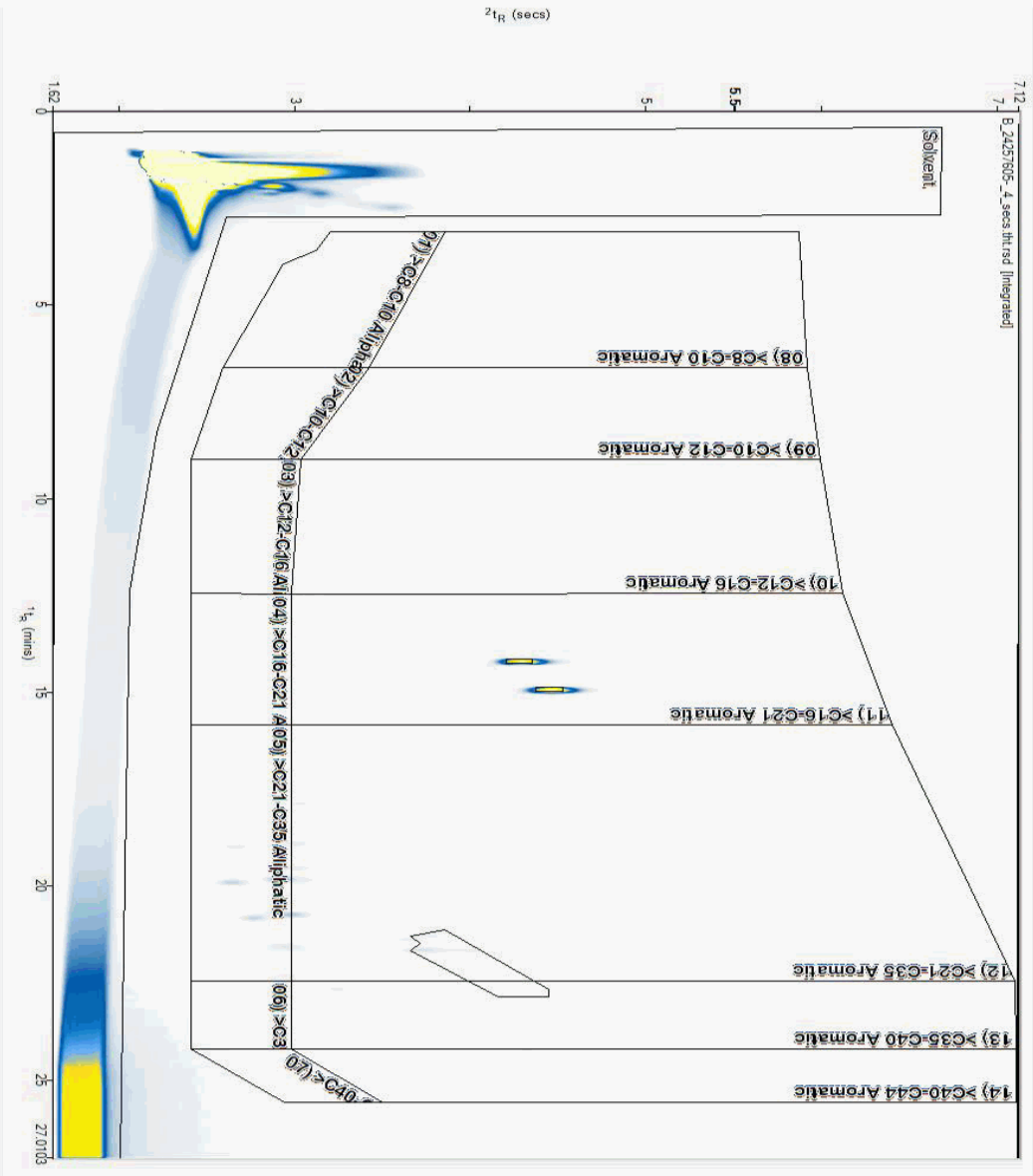
Validated

SDG: 210511-32 Client Reference: B025563 Report Number: 598862
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24257605 Depth : 0.20
Sample ID : TP-PTR-31

ChromSpace LIMS export
Current batch
Sample Identity: B_24257605-4_secs.tht
Date Acquired : 13/05/21 06:29:52
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

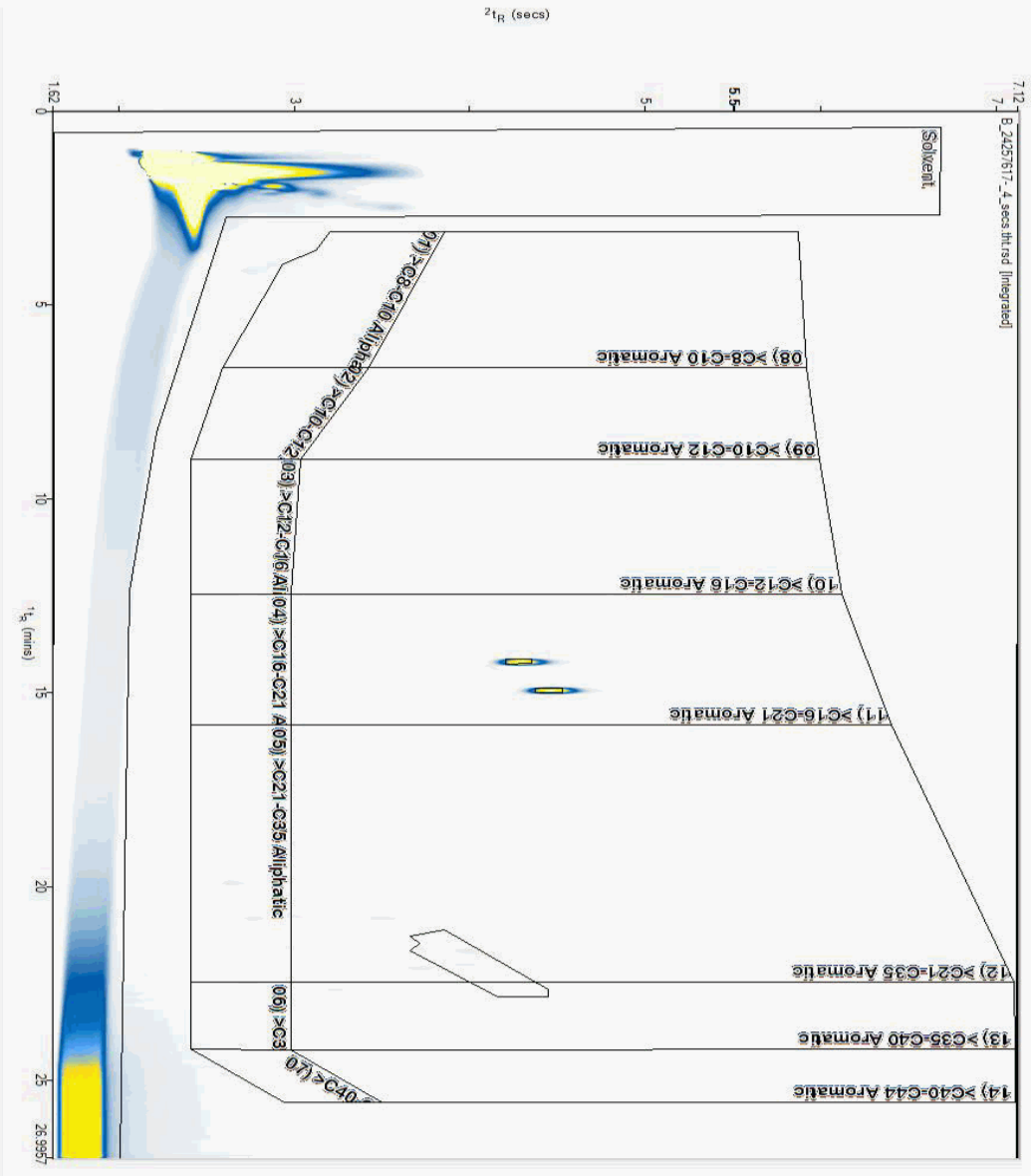
Validated

SDG: 210511-32 Client Reference: B025563 Report Number: 598862
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24257617 Depth : 1.00
Sample ID : TP-PTR-31

ChromSpace LIMS export
Current batch
Sample Identity: B_24257617-4_secs.tht
Date Acquired : 13/05/21 07:00:26
Units : ppm
Dilution : 0
CF :
Multiplier :





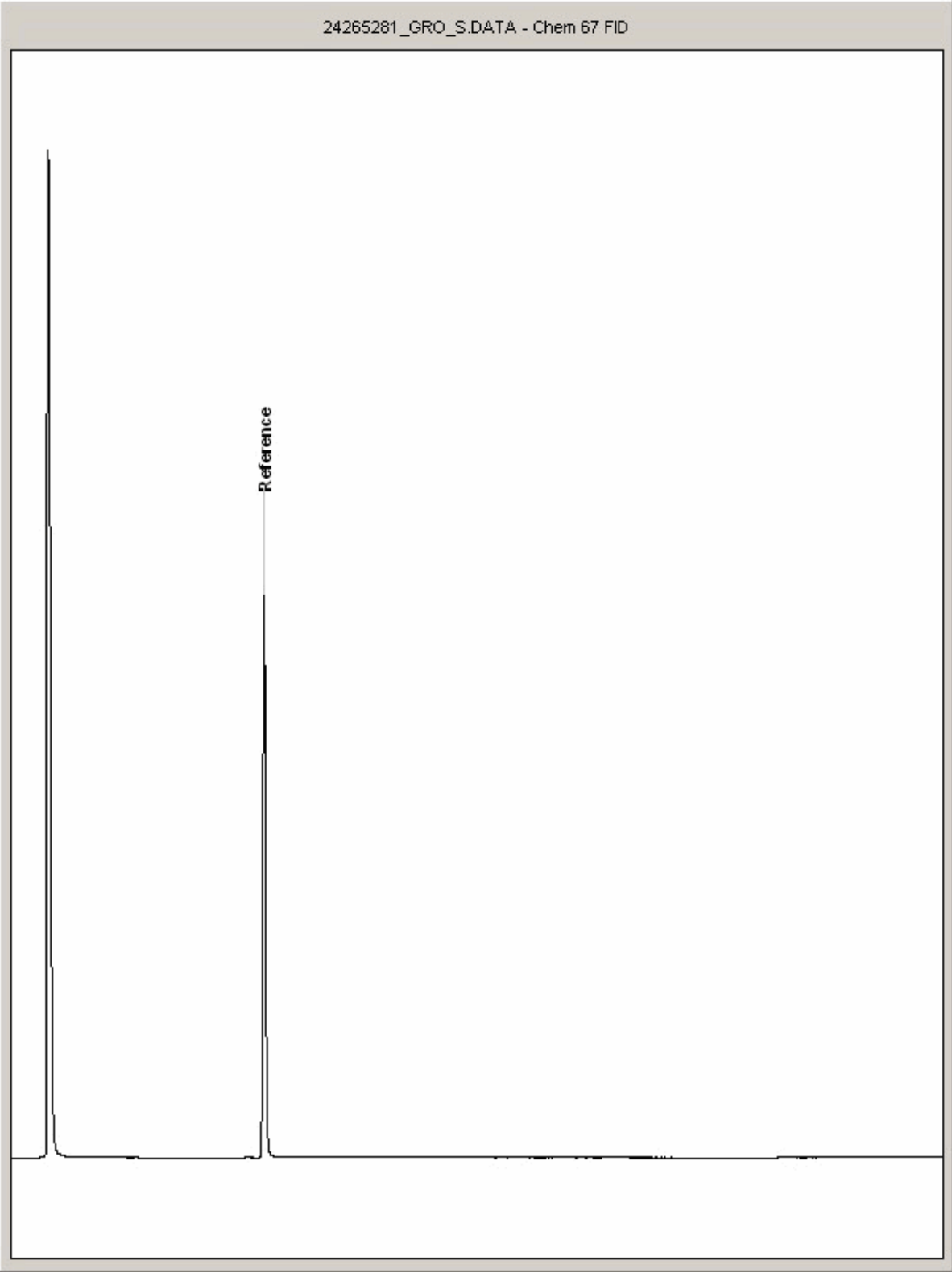
CERTIFICATE OF ANALYSIS

Validated

SDG: 210511-32 Client Reference: B025563 Report Number: 598862
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24265281 Depth : 1.00
Sample ID : TP-PTR-31



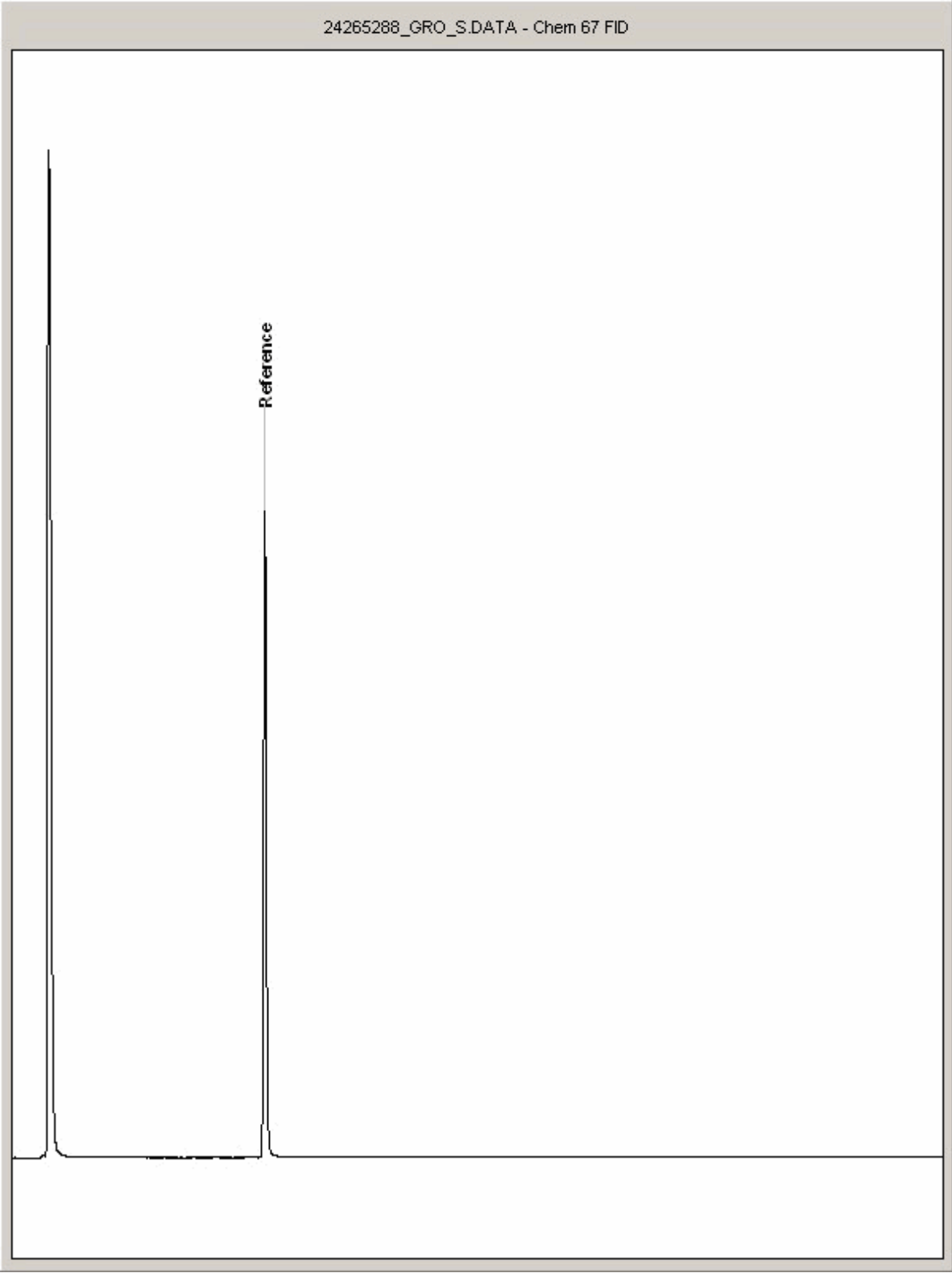
CERTIFICATE OF ANALYSIS

Validated

SDG: 210511-32 Client Reference: B025563 Report Number: 598862
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24265288 Depth : 0.20
Sample ID : TP-PTR-31





CERTIFICATE OF ANALYSIS

SDG:	210511-32	Client Reference:	B025563	Report Number:	598862
Location:	bridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
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Attention: Richard Tonge

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Hawarden

Deeside

CH5 3US

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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	21 May 2021
Customer:	Tetra Tech Europe
Sample Delivery Group (SDG):	210511-35
Your Reference:	B025563
Location:	Cambridge South East Transport - Phase 2
Report No:	598872

We received 4 samples on Monday May 10, 2021 and 2 of these samples were scheduled for analysis which was completed on Friday May 21, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210511-35 Client Reference: B025563 Report Number: 598872
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24242516	TP-PTR-42		0.10	06/05/2021
24242517	TP-PTR-42		0.20	06/05/2021
24242519	TP-PTR-42		0.50	06/05/2021
24242520	TP-PTR-42		1.00	06/05/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210511-35 Client Reference: B025563 Report Number: 598872
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	24242517						24242519					
						24242517	TP-PTR-42	TP-PTR-42	TP-PTR-42	TP-PTR-42	TP-PTR-42	24242519	TP-PTR-42	TP-PTR-42	TP-PTR-42	TP-PTR-42	TP-PTR-42
Ammonium Low	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S	X											
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
Anions by Kone (w)	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S												
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
Boron Water Soluble	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
CEN Readings	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S												
Chromium III	All	NDPs: 0 Tests: 3	0.20	60g VOC (ALE215)	S												
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S												
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S												
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
Fluoride	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S												
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	0.20	60g VOC (ALE215)	S												
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	0.20	60g VOC (ALE215)	S												

<div>Results Legend</div> <div><div>X</div>Test</div> <div><div>N</div>No Determination Possible</div>	Lab Sample No(s)		24242517		24242519	
	Customer Sample Reference		TP-PTR-42		TP-PTR-42	
	AGS Reference					
	Depth (m)		0.20		0.50	
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X			
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		X		X
PAH by GCMS	All	NDPs: 0 Tests: 2		X		X
pH	All	NDPs: 0 Tests: 2		X		X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2		X		X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			
Sample description	All	NDPs: 0 Tests: 2		X		X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X		X
Total Sulphur	All	NDPs: 0 Tests: 2		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		X		X
VOC MS (S)	All	NDPs: 0 Tests: 2			X	X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24242517	TP-PTR-42	0.20	Dark Brown	Sandy Loam	Stones	Vegetation
24242519	TP-PTR-42	0.50	Dark Brown	Sandy Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Results Legend		Customer Sample Ref.	TP-PTR-42	TP-PTR-42				
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4*\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	11	9.6				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06 M	<0.06 M				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.0232	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0101 #	0.00563 #				
pH	1 pH Units	TM133	8.39 M	8.69 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #				
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M				
Chromium, Trivalent	<0.9 mg/kg	TM181	8.83	8.86				
Antimony	<0.6 mg/kg	TM181	<0.6 #	<0.6 #				
Arsenic	<0.6 mg/kg	TM181	8.27 M	8.18 M				
Barium	<0.6 mg/kg	TM181	46.2 #	51.7 #				
Beryllium	<0.01 mg/kg	TM181	0.261 M	0.256 M				
Cadmium	<0.02 mg/kg	TM181	0.298 M	0.185 M				
Chromium	<0.9 mg/kg	TM181	8.83 M	8.86 M				
Copper	<1.4 mg/kg	TM181	18.7 M	9.17 M				
Iron	<1000 mg/kg	TM181	13800 #	14700 #				
Lead	<0.7 mg/kg	TM181	26.5 M	16.6 M				
Manganese	<0.13 mg/kg	TM181	411 M	451 M				
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M				
Molybdenum	<0.1 mg/kg	TM181	0.392 #	0.348 #				
Nickel	<0.2 mg/kg	TM181	11 M	11.5 M				
Selenium	<1 mg/kg	TM181	<1 #	<1 #				
Vanadium	<0.2 mg/kg	TM181	24.5 #	24.9 #				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
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PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

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SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

[illegible]

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP-PTR-42	TP-PTR-42			
#	ISO17025 accredited.		0.20	0.50			
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.		06/05/2021	06/05/2021			
diss.filt	Dissolved / filtered sample.		.	.			
tot.unfilt	Total / unfiltered sample.		10/05/2021	10/05/2021			
+	Subcontracted - refer to subcontractor report for accreditation status.		210511-35	210511-35			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24242517	24242519			
(F)	Trigger breach confirmed						
1-4+5/6	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	106	109			
Toluene-d8**	%	TM116	93	96			
4-Bromofluorobenzene**	%	TM116	79.2	93.2			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M			
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #			
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M			
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M			
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M			
Trichlorofluoromethane	<6 µg/kg	TM116	<6 M	<6 M			
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #			
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M			
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M			
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M			
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M			
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10			
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M			
Chloroform	<8 µg/kg	TM116	<8 M	<8 M			
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M			
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M			
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M			
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M			
Benzene	<9 µg/kg	TM116	<9 M	<9 M			
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #			
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M			
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M			
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M			
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M			
Toluene	<7 µg/kg	TM116	<7 M	<7 M			
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10			
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M			



CERTIFICATE OF ANALYSIS

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP-PTR-42	TP-PTR-42				
# M aq diss.filt tot.unfilt *	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-456 Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20				
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M				



CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location		Cambridge South East Transport - P
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)		14.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)		87.5
Particle Size <4mm	>95%			

Case

SDG	210511-35			
Lab Sample Number(s)	24242517			
Sampled Date	06-May-2021			
Customer Sample Ref.	TP-PTR-42			
Depth (m)	0.20			

Eluate Analysis	C2		A2				
	Conc ⁿ in 10:1 eluate (mg/l)		10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.033	<0.01	0.33	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	5.27	<3	52.7	<30	-	-	-
Fluoride	0.747	<0.5	7.47	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00284	<0.0005	0.0284	<0.005	-	-	-
Barium	0.176	<0.0002	1.76	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0881	<0.01	0.881	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	19.1	<0.2	191	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00497	<0.0003	0.0497	<0.003	-	-	-
Lead	0.000585	<0.0002	0.00585	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.681	<0.036	6.81	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000922	<0.0004	0.00922	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00114	<0.001	0.0114	<0.01	-	-	-
Zinc	0.00908	<0.001	0.0908	<0.01	-	-	-
Chloride	3.3	<2	33	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	13-May-2021
pH (pH Units)	8.55
Conductivity (µS/cm)	131.00
Temperature (°C)	14.30
Volume Leachant (Litres)	0.887

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09:02:36 21/05/2021

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)	14.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87.5
Particle Size <4mm	>95%		

Case

SDG	210511-35			
Lab Sample Number(s)	24242517			
Sampled Date	06-May-2021			
Customer Sample Ref.	TP-PTR-42			
Depth (m)	0.20			

[illegible]

Leach Test Information

Date Prepared	13-May-2021
pH (pH Units)	8.55
Conductivity (µS/cm)	131.00
Temperature (°C)	14.30
Volume Leachant (Litres)	0.887

21/05/2021 09:02:55

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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Test Completion Dates

Lab Sample No(s)	24242517	24242519
Customer Sample Ref.	TP-PTR-42	TP-PTR-42
AGS Ref.		
Depth	0.20	0.50
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	19-May-2021	
Anions by Kone (soil)	18-May-2021	18-May-2021
Anions by Kone (w)	18-May-2021	
Asbestos ID in Solid Samples	17-May-2021	17-May-2021
Boron Water Soluble	17-May-2021	17-May-2021
CEN 10:1 Leachate (1 Stage)	13-May-2021	
CEN Readings	14-May-2021	
Chromium III	17-May-2021	17-May-2021
Cyanide Comp/Free/Total/Thiocyanate	14-May-2021	14-May-2021
Dissolved Metals by ICP-MS	17-May-2021	
Dissolved Organic/Inorganic Carbon	21-May-2021	
EPH CWG GC (S)	14-May-2021	14-May-2021
Fluoride	17-May-2021	
GRO by GC-FID (S)	14-May-2021	14-May-2021
Hexavalent Chromium (s)	14-May-2021	14-May-2021
Low Level Cyanide (W)	18-May-2021	
Low Level Hexavalent Chromium (w)	17-May-2021	
Mercury Dissolved	17-May-2021	
Metals in solid samples by OES	17-May-2021	17-May-2021
Moisture at 105C	13-May-2021	
PAH by GCMS	13-May-2021	13-May-2021
pH	13-May-2021	13-May-2021
pH Value of Filtered Water	17-May-2021	
Phenols by HPLC (S)	14-May-2021	14-May-2021
Phenols by HPLC (W)	18-May-2021	
Sample description	12-May-2021	12-May-2021
Total Organic Carbon	17-May-2021	17-May-2021
Total Sulphur	17-May-2021	17-May-2021
TPH CWG GC (S)	14-May-2021	14-May-2021
VOC MS (S)	14-May-2021	14-May-2021

ASSOCIATED AQC DATA

Anions by Kone (soil)

Component	Method Code	QC 2499
Water Soluble Sulphate as SO4 2:1 Extract	TM243	163.08 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2401
Chloride	TM184	106.0 91.40 : 109.10
Sulphate (soluble)	TM184	104.8 91.99 : 109.30

Boron Water Soluble

Component	Method Code	QC 2493
Water Soluble Boron	TM222	98.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2436
Free Cyanide	TM153	98.32 78.00 : 114.00
Thiocyanate	TM153	103.85 94.53 : 113.33
Total Cyanide	TM153	101.4 77.13 : 111.53

Dissolved Metals by ICP-MS

Component	Method Code	QC 2461
Aluminium	TM152	103.33 94.21 : 111.52
Antimony	TM152	108.5 88.37 : 130.57
Arsenic	TM152	104.83 92.62 : 113.52
Barium	TM152	104.0 88.62 : 113.14
Beryllium	TM152	108.83 87.08 : 111.38
Bismuth	TM152	109.67 92.62 : 115.02
Boron	TM152	108.33 86.31 : 120.88

Dissolved Metals by ICP-MS

		QC 2461
Cadmium	TM152	104.83 93.85 : 111.65
Calcium	TM152	102.0 89.20 : 126.91
Chromium	TM152	99.83 92.50 : 113.03
Cobalt	TM152	103.0 85.01 : 114.87
Copper	TM152	101.83 89.87 : 119.73
Iron	TM152	102.0 93.02 : 113.86
Lead	TM152	103.0 91.11 : 116.98
Lithium	TM152	104.83 87.70 : 115.90
Magnesium	TM152	100.0 89.60 : 116.61
Manganese	TM152	105.67 93.97 : 112.46
Molybdenum	TM152	99.17 89.07 : 110.96
Nickel	TM152	101.67 93.70 : 112.15
Phosphorus	TM152	102.67 89.24 : 114.18
Potassium	TM152	102.0 93.20 : 115.55
Selenium	TM152	102.67 91.69 : 117.12
Silver	TM152	104.67 90.93 : 121.73
Sodium	TM152	100.67 92.42 : 113.24
Strontium	TM152	106.67 92.14 : 116.24
Tellurium	TM152	105.67 89.88 : 111.78
Thallium	TM152	97.17 82.43 : 113.83
Tin	TM152	106.0 94.62 : 107.79
Titanium	TM152	106.33 90.29 : 115.23
Tungsten	TM152	102.83 77.61 : 132.31
Uranium	TM152	103.0 86.97 : 115.76
Vanadium	TM152	95.0 89.61 : 115.48
Zinc	TM152	102.0 87.51 : 116.26

EPH CWG GC (S)

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
EPH CWG GC (S)						

Component	Method Code	QC 2445	QC 2483
EPH >C8-C40 Raw	TM414	86.91 73.48 : 116.68	86.92 67.87 : 120.05
Total Aliphatics Raw	TM414	93.2 72.61 : 118.71	93.66 66.68 : 120.89
Total Aromatics Raw	TM414	90.57 63.37 : 122.69	87.26 61.16 : 129.42

Component	Method Code	QC 2466
Fluoride	TM104	103.33 96.67 : 108.67

Component	Method Code	QC 2481
QC	TM089	83.9 70.75 : 114.19

Component	Method Code	QC 2416
Free Cyanide - Low Level	TM279	84.5 88.26 : 122.21
Total Cyanide - Low Level	TM279	100.0 81.83 : 110.45

Component	Method Code	QC 2450
Mercury Dissolved (CVAf)	TM183	94.1 69.30 : 128.70

Component	Method Code	QC 2459
Aluminium	TM181	103.54 73.56 : 108.85
Antimony	TM181	100.0 76.89 : 111.24
Arsenic	TM181	100.29 88.53 : 111.01
Barium	TM181	98.17 77.67 : 105.35

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES						

		QC 2459
Beryllium	TM181	103.73 85.44 : 109.61
Boron	TM181	95.42 73.51 : 104.66
Cadmium	TM181	93.0 77.67 : 104.12
Chromium	TM181	89.66 79.64 : 105.83
Cobalt	TM181	92.14 84.60 : 104.13
Copper	TM181	98.94 82.40 : 105.45
Iron	TM181	100.79 82.95 : 110.58
Lead	TM181	97.52 78.24 : 104.05
Manganese	TM181	111.67 94.29 : 119.51
Mercury	TM181	95.65 83.16 : 107.81
Molybdenum	TM181	103.29 87.11 : 106.87
Nickel	TM181	89.73 80.26 : 102.28
Phosphorus	TM181	107.88 94.56 : 124.28
Selenium	TM181	100.78 82.28 : 110.48
Strontium	TM181	100.0 79.13 : 102.79
Thallium	TM181	104.42 82.94 : 111.86
Tin	TM181	103.42 86.72 : 110.03
Titanium	TM181	90.84 66.23 : 102.06
Vanadium	TM181	105.13 86.19 : 109.45
Zinc	TM181	98.97 84.68 : 113.99

Component	Method Code	QC 2470
Acenaphthene	TM218	96.5 78.59 : 112.16
Acenaphthylene	TM218	95.0 75.11 : 109.01
Anthracene	TM218	91.5 73.99 : 113.85
Benz(a)anthracene	TM218	102.0 69.31 : 119.18
Benzo(a)pyrene	TM218	99.0 66.97 : 114.92



CERTIFICATE OF ANALYSIS

Validated

SDG:210511-35

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

598872

PAH by GCMS

		QC 2470
Benzo(b)fluoranthene	TM218	94.5 67.41 : 114.46
Benzo(ghi)perylene	TM218	96.0 62.92 : 114.36
Benzo(k)fluoranthene	TM218	102.0 69.98 : 116.49
Chrysene	TM218	103.5 69.86 : 114.50
Dibenzo(ah)anthracene	TM218	95.5 64.54 : 115.22
Fluoranthene	TM218	92.0 72.56 : 111.70
Fluorene	TM218	95.5 79.13 : 111.49
Indeno(123cd)pyrene	TM218	92.5 61.22 : 113.25
Naphthalene	TM218	95.5 77.96 : 110.91
Phenanthrene	TM218	92.5 76.83 : 113.25
Pyrene	TM218	92.5 72.45 : 110.77

Component	Method Code	QC 2432
pH	TM133	100.29 98.41 : 102.48

Component	Method Code	QC 2407
pH	TM256	100.4 99.33 : 102.54

Component	Method Code	QC 2411	QC 2414
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 70.71 : 116.42	51.3 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.61 64.54 : 117.79	42.69 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	50.52 74.40 : 108.98	48.02 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	52.32 69.44 : 122.18	49.67 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	50.94 76.56 : 106.38	48.65 76.56 : 106.38



CERTIFICATE OF ANALYSIS

Validated

SDG:210511-35

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

598872

Phenols by HPLC (W)

Component	Method Code	QC 2468
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	99.61 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	93.69 82.77 : 126.51
Cresols by HPLC (W)	TM259	98.68 76.60 : 126.28
Napthol by HPLC (W)	TM259	103.52 75.40 : 129.40
Phenol by HPLC (W)	TM259	94.52 85.77 : 125.91
Xylenols by HPLC (W)	TM259	97.78 79.09 : 131.82

Component	Method Code	QC 2400
Total Organic Carbon	TM132	102.73 87.02 : 113.45

Component	Method Code	QC 2485
Total Sulphur %	TM132	89.64 61.64 : 114.47

Component	Method Code	QC 2483
1,1,1,2-tetrachloroethane	TM116	103.0 79.10 : 119.66
1,1,1-Trichloroethane	TM116	99.4 88.34 : 114.50
1,1,2-Trichloroethane	TM116	98.4 81.29 : 113.79
1,1-Dichloroethane	TM116	104.4 86.77 : 122.11
1,2-Dichloroethane	TM116	114.4 90.04 : 132.28
1,4-Dichlorobenzene	TM116	107.0 80.81 : 125.07
2-Chlorotoluene	TM116	93.8 73.13 : 114.13
4-Chlorotoluene	TM116	94.6 68.66 : 109.13
Benzene	TM116	100.8 84.29 : 112.22
Carbon Disulphide	TM116	93.8 75.11 : 124.81



CERTIFICATE OF ANALYSIS

Validated

SDG:210511-35Client Reference: B025563Report Number: 598872

Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

VOC MS (S)

		QC 2483
Carbontetrachloride	TM116	109.0 82.35 : 126.46
Chlorobenzene	TM116	102.6 82.88 : 122.42
Chloroform	TM116	105.0 90.35 : 120.38
Chloromethane	TM116	93.2 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	102.2 78.27 : 128.90
Dibromomethane	TM116	104.0 76.00 : 120.73
Dichloromethane	TM116	110.4 92.27 : 134.36
Ethylbenzene	TM116	94.4 70.95 : 113.07
Hexachlorobutadiene	TM116	80.6 14.55 : 147.92
Isopropylbenzene	TM116	88.6 52.00 : 108.19
Naphthalene	TM116	106.4 80.29 : 135.77
o-Xylene	TM116	89.2 68.34 : 101.99
p/m-Xylene	TM116	89.6 69.47 : 97.31
Sec-Butylbenzene	TM116	87.6 27.03 : 135.73
Tetrachloroethene	TM116	105.6 81.43 : 126.65
Toluene	TM116	93.2 82.44 : 103.50
Trichloroethene	TM116	96.6 79.80 : 112.33
Trichlorofluoromethane	TM116	96.0 83.13 : 123.97
Vinyl Chloride	TM116	93.4 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG:210511-35Client Reference: B025563Report Number: 598872

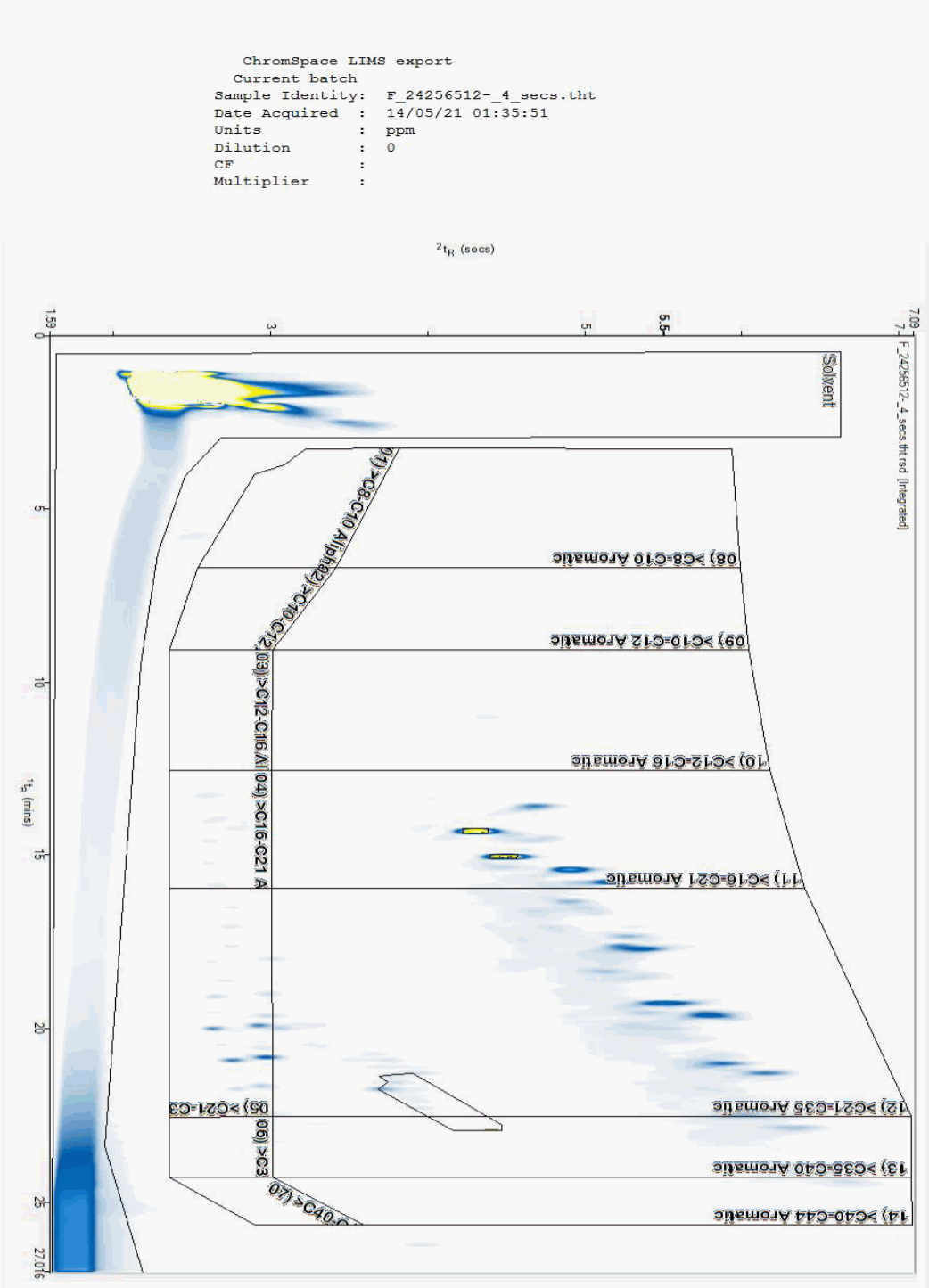
Location:Cambridge South East TraOrder Number: 7000964Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24256512Sample ID : TP-PTR-42

Depth : 0.20





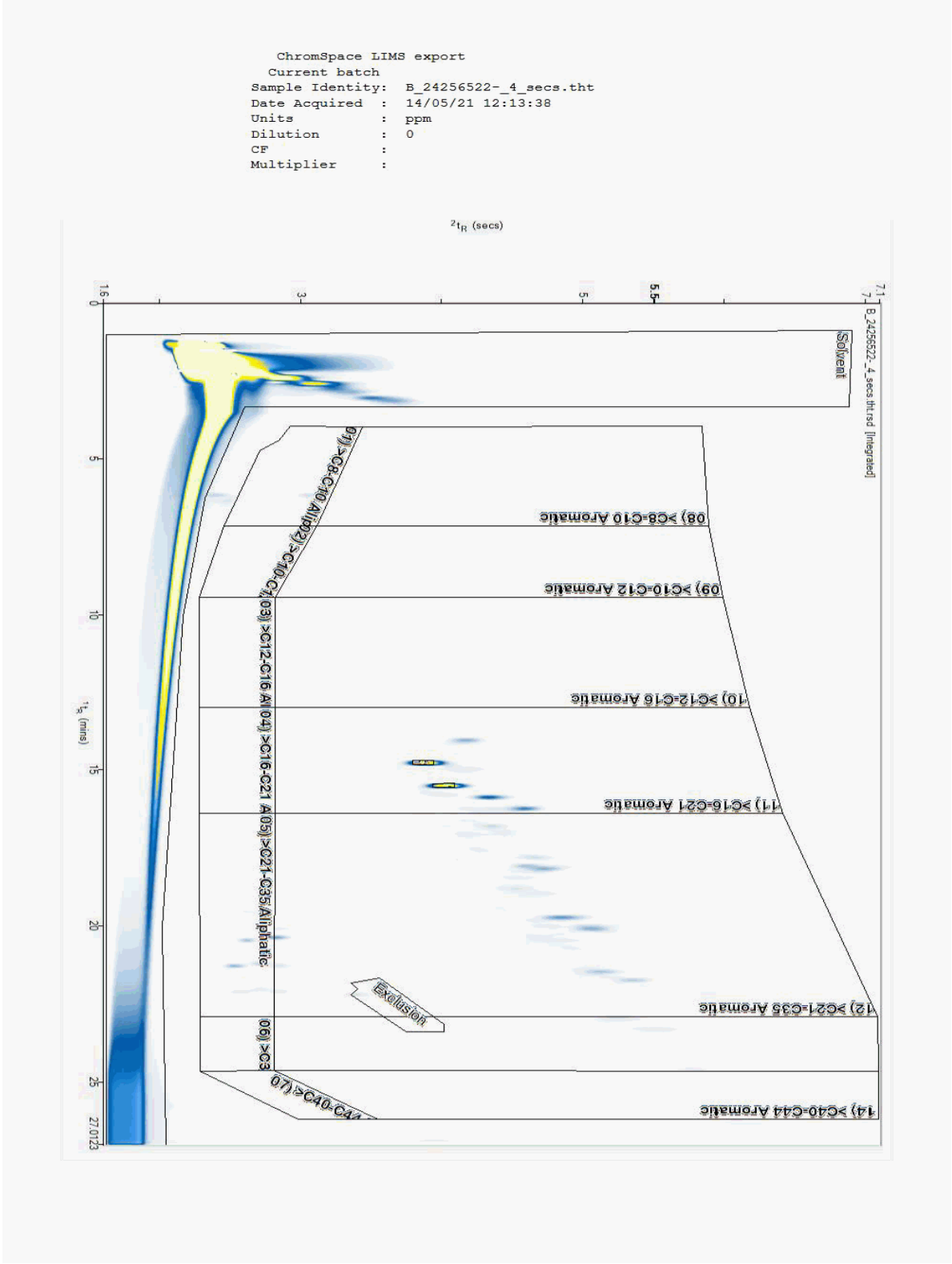
CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24256522 Depth : 0.50
Sample ID : TP-PTR-42



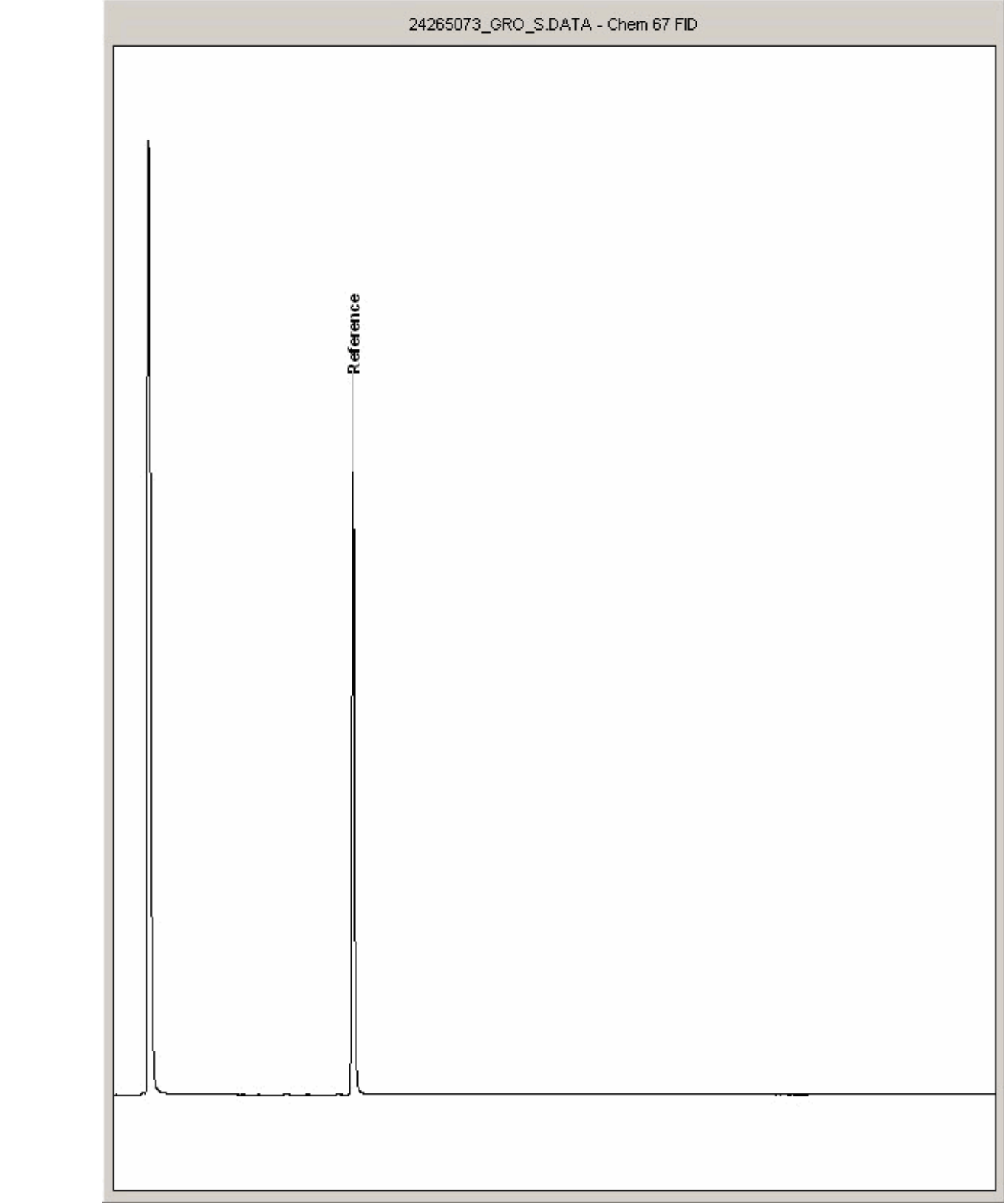
CERTIFICATE OF ANALYSIS

Validated

SDG:	210511-35	Client Reference:	B025563	Report Number:	598872
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24265073 Depth : 0.20
Sample ID : TP-PTR-42



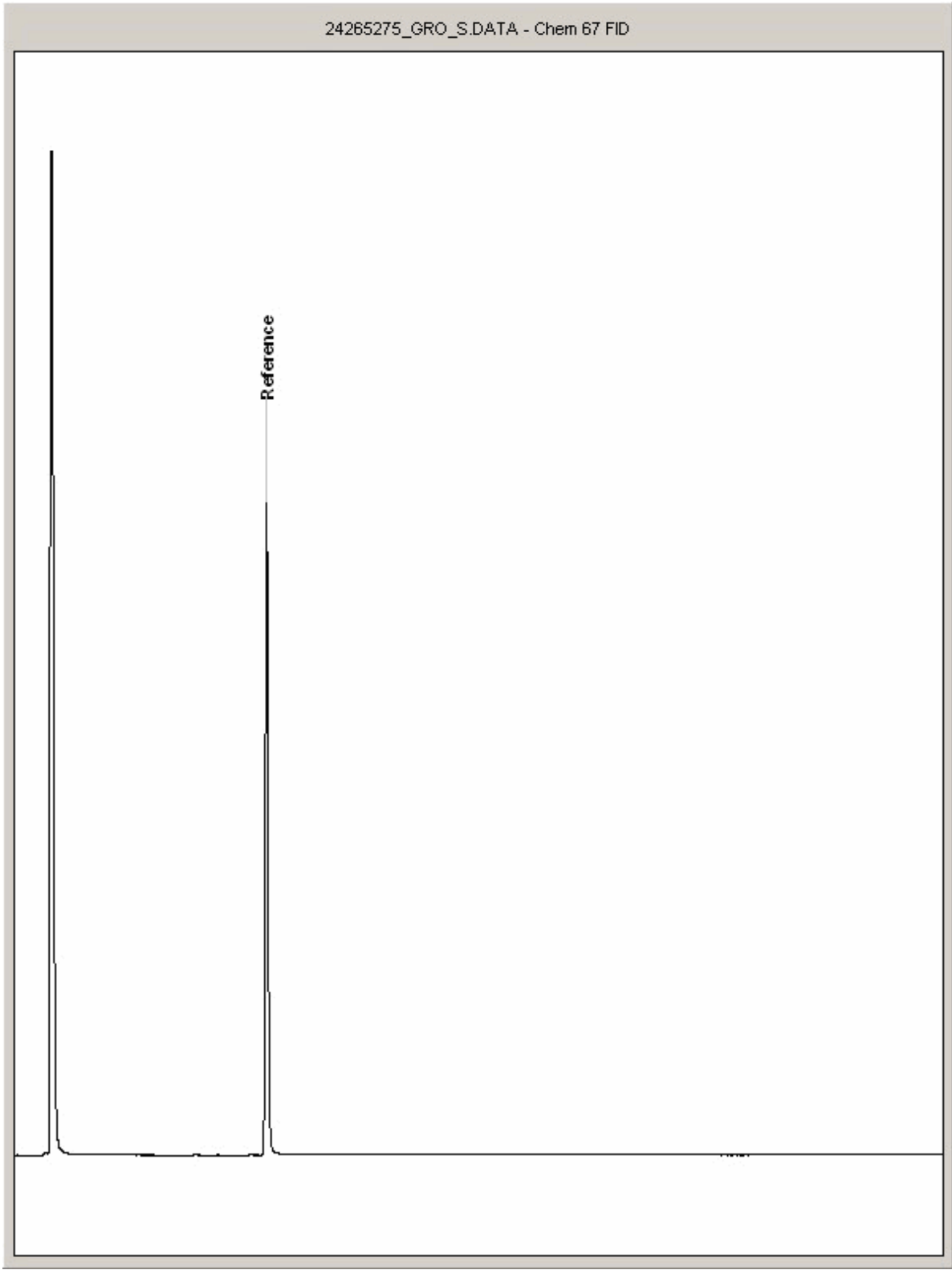
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 24265275

Sample ID : TP-PTR-42

Depth : 0.50



Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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LS1 4ER

Attention: Richard Tonge

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Hawarden
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Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 May 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210514-160
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 599497

We received 8 samples on Friday May 14, 2021 and 3 of these samples were scheduled for analysis which was completed on Wednesday May 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210514-160 Client Reference: B025563 Report Number: 599497
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24272960	TP - OBC - 02	ES1	0.10	10/05/2021
24272961	TP - OBC - 02	ES2	0.20	10/05/2021
24272962	TP - OBC - 02	ES3	0.50	10/05/2021
24272963	TP - OBC - 02	ES4	1.00	10/05/2021
24272956	TP - PTR - 44	ES1	0.10	10/05/2021
24272957	TP - PTR - 44	ES2	0.20	10/05/2021
24272958	TP - PTR - 44	ES3	0.50	10/05/2021
24272959	TP - PTR - 44	ES4	1.00	10/05/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210514-160 Client Reference: B025563 Report Number: 599497
Location: Cambridge South East TraOrder Number: 7000964

Results Legend	Lab Sample No(s)		24272961	24272957	24272959								
	Customer Sample Reference		TP - OBC - 02	TP - PTR - 44	TP - PTR - 44								
	AGS Reference		ES2	ES2	ES4								
	Depth (m)		0.20	0.20	1.00								
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S	S	S	S	S	S	S
Ammonium Low	All	NDPs: 0 Tests: 2	X		X								
Anions by Kone (soil)	All	NDPs: 0 Tests: 3		X		X				X			
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X		X								
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X		X			X					
Boron Water Soluble	All	NDPs: 0 Tests: 3		X		X				X			
CEN Readings	All	NDPs: 0 Tests: 2	X		X								
Chromium III	All	NDPs: 0 Tests: 5	X	X		X	X				X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3		X		X				X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X		X								
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X		X								
EPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X				X			
Fluoride	All	NDPs: 0 Tests: 2	X		X								
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3			X		X					X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3		X		X				X			
Low Level Cyanide (W)	All	NDPs: 0 Tests: 2	X		X								



CERTIFICATE OF ANALYSIS

Validated

SDG: 210514-160 Client Reference: B025563 Report Number: 599497
Location: Cambridge South East TraOrder Number: 7000964

Results Legend	Lab Sample No(s)		24272961	24272957	24272959								
	Customer Sample Reference		TP - OBC - 02	TP - PTR - 44	TP - PTR - 44								
	AGS Reference		ES2	ES2	ES4								
	Depth (m)		0.20	0.20	1.00								
	Container		60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S	S	S	S	S	S	S
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2	X		X								
Mercury Dissolved	All	NDPs: 0 Tests: 2	X		X								
Metals in solid samples by OES	All	NDPs: 0 Tests: 3		X		X				X			
PAH by GCMS	All	NDPs: 0 Tests: 3		X		X				X			
pH	All	NDPs: 0 Tests: 3		X		X				X			
pH Value of Filtered Water	All	NDPs: 0 Tests: 2	X		X								
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3		X		X				X			
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2	X		X								
Sample description	All	NDPs: 0 Tests: 3		X		X				X			
Total Organic Carbon	All	NDPs: 0 Tests: 3		X		X				X			
Total Sulphur	All	NDPs: 0 Tests: 3		X		X				X			
TPH CWG GC (S)	All	NDPs: 0 Tests: 3		X		X				X			
VOC MS (S)	All	NDPs: 0 Tests: 3			X		X					X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24272961	TP - OBC - 02	0.20	Light Brown	Sandy Loam	Stones	Vegetation
24272957	TP - PTR - 44	0.20	Light Brown	Sandy Loam	Stones	Vegetation
24272959	TP - PTR - 44	1.00	White	Chalk	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	TP - OBC - 02	TP - PTR - 44	TP - PTR - 44			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.20	0.20	1.00			
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
dis.filt	Dissolved / filtered sample.		10/05/2021	10/05/2021	10/05/2021			
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.		14/05/2021	14/05/2021	14/05/2021			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210514-160	210514-160	210514-160			
(F)	Trigger breach confirmed		24272961	24272957	24272959			
1-445@	Sample deviation (see appendix)		ES2	ES2	ES4			
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	9.4	9.6	9.8			
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05	<0.05			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06	<0.06			
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13	<0.13			
Sulphur, Total	<0.02 %	TM132	<0.02	<0.02	<0.02			
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0148	0.00967	0.00266			
pH	1 pH Units	TM133	8.41	8.25	8.84			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6			
Cyanide, Free	<1 mg/kg	TM153	<1	<1	<1			
Chromium, Trivalent	<0.9 mg/kg	TM181	10.8	13.2	5.51			
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6	<0.6			
Arsenic	<0.6 mg/kg	TM181	10.7	11	4.62			
Barium	<0.6 mg/kg	TM181	64.9	61.8	26.4			
Beryllium	<0.01 mg/kg	TM181	0.575	0.422	0.172			
Cadmium	<0.02 mg/kg	TM181	0.313	0.345	0.159			
Chromium	<0.9 mg/kg	TM181	10.8	13.2	5.51			
Copper	<1.4 mg/kg	TM181	18.8	10.5	3			
Iron	<1000 mg/kg	TM181	15400	17700	7780			
Lead	<0.7 mg/kg	TM181	18.8	14.7	1.2			
Manganese	<0.13 mg/kg	TM181	425	457	243			
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1	<0.1			
Molybdenum	<0.1 mg/kg	TM181	0.494	0.407	0.23			
Nickel	<0.2 mg/kg	TM181	11.9	13.1	6.4			
Selenium	<1 mg/kg	TM181	<1	<1	<1			
Vanadium	<0.2 mg/kg	TM181	23.8	26	11.3			

CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP - OBC - 02 0.20 Soil/Solid (S) 10/05/2021 14/05/2021 210514-160 24272961 ES2	TP - PTR - 44 0.20 Soil/Solid (S) 10/05/2021 14/05/2021 210514-160 24272957 ES2	TP - PTR - 44 1.00 Soil/Solid (S) 10/05/2021 14/05/2021 210514-160 24272959 ES4			
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
totUnfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-44\$@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	113	113	112			
Toluene-d8**	%	TM116	93.5	96.9	99.7			
4-Bromofluorobenzene**	%	TM116	74.5	84.4	95.2			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6 M	<6 M	<6 #			
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #	<7 #			
Vinyl Chloride	<6 µg/kg	TM116	<6 @ M	<6 @ M	<6 @ #			
Bromomethane	<10 µg/kg	TM116	<10 M	<10 M	<10 #			
Chloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 #			
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M	<6 #			
1,1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #	<10 #			
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M	<7 #			
Dichloromethane	<10 µg/kg	TM116	12.4 #	<10 #	<10 #			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M	<10 #			
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10 M	<10 M	<10 #			
1,1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M	<8 M			
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6 M	<6 M	<6 M			
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10	<10			
Bromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Chloroform	<8 µg/kg	TM116	<8 M	<8 M	<8 M			
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
1,1-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Carbontetrachloride	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
1,2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M	<5 M			
Benzene	<9 µg/kg	TM116	<9 M	<9 M	<9 M			
Trichloroethene	<9 µg/kg	TM116	<9 #	<9 #	<9 #			
1,2-Dichloropropane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M	<9 M			
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10 M	<10 M	<10 M			
Toluene	<7 µg/kg	TM116	<7 M	<7 M	<7 M			
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10	<10			
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M			

VOC MS (S)

Results Legend			Customer Sample Ref.	TP - OBC - 02	TP - PTR - 44	TP - PTR - 44			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No(s) AGS Reference							
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
-	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4+5@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
1,3-Dichloropropane	<7 µg/kg	TM116	<7 M	<7 M	<7 M				
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M	<5 M				
Dibromochloromethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #	<10 #				
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Styrene	<10 µg/kg	TM116	<10 @ #	<10 @ #	<10 @ #				
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Isopropylbenzene	<5 µg/kg	TM116	<5 #	<5 #	<5 #				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16 M	<16 M	<16 M				
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
Propylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M				
4-Chlorotoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
tert-Butylbenzene	<14 µg/kg	TM116	<14 M	<14 M	<14 M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #				
sec-Butylbenzene	<10 µg/kg	TM116	<10	<10	<10				
4-Isopropyltoluene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8 M	<8 M	<8 M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M				
n-Butylbenzene	<11 µg/kg	TM116	<11	<11	<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10 #	<10 #	<10 #				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	<20	<20				
Hexachlorobutadiene	<20 µg/kg	TM116	<20	<20	<20				
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M	<13 M				

VOC MS (S)

[illegible]

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - OBC - 02ES2 0.20 SOLID 10/05/2021 00:00:00 14/05/2021 11:30:00 210514-160 24272961 TM048	21/05/2021	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - PTR - 44ES2 0.20 SOLID 10/05/2021 00:00:00 14/05/2021 11:30:00 210514-160 24272957 TM048	21.05.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - PTR - 44ES4 1.00 SOLID 10/05/2021 00:00:00 14/05/2021 11:30:00 210514-160 24272959 TM048	21/05/2021	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F		
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.1		
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.4		
Particle Size <4mm	>95%				
Case					
SDG	210514-160				
Lab Sample Number(s)	24272957				
Sampled Date	10-May-2021				
Customer Sample Ref.	TP - PTR - 44 ES2				
Depth (m)	0.20				

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.017	<0.01	0.17	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	5.21	<3	52.1	<30	-	-	-
Fluoride	0.72	<0.5	7.2	<5	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00099	<0.0005	0.0099	<0.005	-	-	-
Barium	0.0714	<0.0002	0.714	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.103	<0.01	1.03	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.3	<0.2	233	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00268	<0.0003	0.0268	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.577	<0.036	5.77	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000848	<0.0004	0.00848	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00116	<0.001	0.0116	<0.01	-	-	-
Zinc	0.00875	<0.001	0.0875	<0.01	-	-	-
Chloride	2	<2	20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-May-2021
pH (pH Units)	8.00
Conductivity (µS/cm)	116.00
Temperature (°C)	22.40
Volume Leachant (Litres)	0.888



CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.1
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.4
Particle Size <4mm	>95%		

Case

SDG	210514-160			
Lab Sample Number(s)	24272957			
Sampled Date	10-May-2021			
Customer Sample Ref.	TP - PTR - 44 ES2			
Depth (m)	0.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Hardness dissolved	60.6	<0.65	606	<6.5	-	-	-
Iron (Dis.Filt) mg/l	0.103	<0.019	1.03	<0.19	-	-	-

Leach Test Information

Date Prepared	19-May-2021
pH (pH Units)	8.00
Conductivity (µS/cm)	116.00
Temperature (°C)	22.40
Volume Leachant (Litres)	0.888

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	14
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87.7
Particle Size <4mm	>95%		

Case

SDG	210514-160			
Lab Sample Number(s)	24272961			
Sampled Date	10-May-2021			
Customer Sample Ref.	TP - OBC - 02 ES2			
Depth (m)	0.20			

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.016	<0.01	0.16	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.33	<3	63.3	<30	-	-	-
Fluoride	0.745	<0.5	7.45	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.00246	<0.0005	0.0246	<0.005	-	-	-
Barium	0.00677	<0.0002	0.0677	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0492	<0.01	0.492	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	23.6	<0.2	236	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00537	<0.0003	0.0537	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.636	<0.036	6.36	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00104	<0.0004	0.0104	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00253	<0.001	0.0253	<0.01	-	-	-
Zinc	0.00145	<0.001	0.0145	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-May-2021
pH (pH Units)	7.98
Conductivity (µS/cm)	121.00
Temperature (°C)	22.60
Volume Leachant (Litres)	0.888

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Test Completion Dates

Lab Sample No(s)	24272961	24272957	24272959
Customer Sample Ref.	TP - OBC - 02	TP - PTR - 44	TP - PTR - 44
AGS Ref.	ES2	ES2	ES4
Depth	0.20	0.20	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	25-May-2021	25-May-2021	
Anions by Kone (soil)	24-May-2021	21-May-2021	24-May-2021
Anions by Kone (w)	21-May-2021	21-May-2021	
Asbestos ID in Solid Samples	21-May-2021	21-May-2021	21-May-2021
Boron Water Soluble	25-May-2021	25-May-2021	25-May-2021
CEN 10:1 Leachate (1 Stage)	20-May-2021	20-May-2021	
CEN Readings	24-May-2021	24-May-2021	
Chromium III	25-May-2021	25-May-2021	24-May-2021
Cyanide Comp/Free/Total/Thiocyanate	21-May-2021	21-May-2021	21-May-2021
Dissolved Metals by ICP-MS	24-May-2021	24-May-2021	
Dissolved Organic/Inorganic Carbon	26-May-2021	26-May-2021	
EPH CWG GC (S)	20-May-2021	20-May-2021	20-May-2021
Fluoride	24-May-2021	24-May-2021	
GRO by GC-FID (S)	21-May-2021	21-May-2021	21-May-2021
Hexavalent Chromium (s)	24-May-2021	20-May-2021	20-May-2021
Low Level Cyanide (W)	26-May-2021	26-May-2021	
Low Level Hexavalent Chromium (w)	25-May-2021	25-May-2021	
Mercury Dissolved	24-May-2021	24-May-2021	
Metals in solid samples by OES	24-May-2021	24-May-2021	24-May-2021
Moisture at 105C	19-May-2021	19-May-2021	
PAH by GCMS	20-May-2021	20-May-2021	20-May-2021
pH	20-May-2021	20-May-2021	20-May-2021
pH Value of Filtered Water	25-May-2021	25-May-2021	
Phenols by HPLC (S)	20-May-2021	20-May-2021	20-May-2021
Phenols by HPLC (W)	25-May-2021	25-May-2021	
Sample description	18-May-2021	18-May-2021	18-May-2021
Total Organic Carbon	25-May-2021	24-May-2021	25-May-2021
Total Sulphur	24-May-2021	21-May-2021	24-May-2021
TPH CWG GC (S)	21-May-2021	21-May-2021	21-May-2021
VOC MS (S)	21-May-2021	21-May-2021	21-May-2021

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2481	QC 2494
Ammoniacal Nitrogen as N	TM099	102.4 96.04 : 106.80	102.6 96.04 : 106.80

Anions by Kone (soil)

Component	Method Code	QC 2412
Chloride (soluble)	TM243	145.08 80.93 : 111.66
Water Soluble Sulphate as SO4 2:1 Extract	TM243	164.49 70.00 : 130.00

Anions by Kone (w)

Component	Method Code	QC 2400
Chloride	TM184	107.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2461	QC 2457
Water Soluble Boron	TM222	98.5 84.00 : 111.00	99.0 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2440
Free Cyanide	TM153	98.61 78.00 : 114.00
Thiocyanate	TM153	96.79 94.53 : 113.33
Total Cyanide	TM153	97.2 77.13 : 111.53

Dissolved Metals by ICP-MS

Component	Method Code	QC 2489	QC 2420
Aluminium	TM152	100.0 90.98 : 111.82	102.0 90.98 : 111.82
Antimony	TM152	105.17 90.44 : 113.04	106.5 90.44 : 113.04
Arsenic	TM152	100.67 88.00 : 112.00	104.83 88.00 : 112.00



CERTIFICATE OF ANALYSIS

Validated

SDG:210514-160

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

599497

Dissolved Metals by ICP-MS

		QC 2489	QC 2420
Barium	TM152	100.17 90.20 : 111.19	100.5 90.20 : 111.19
Beryllium	TM152	105.67 87.77 : 113.97	106.33 87.77 : 113.97
Bismuth	TM152	108.17 91.90 : 112.20	107.83 91.90 : 112.20
Borate	TM152	106.79 88.00 : 112.00	106.79 88.00 : 112.00
Boron	TM152	107.0 96.48 : 114.93	107.0 96.48 : 114.93
Cadmium	TM152	101.5 96.43 : 110.53	104.5 96.43 : 110.53
Calcium	TM152	100.67 81.38 : 119.09	104.0 81.38 : 119.09
Chromium	TM152	99.33 91.84 : 108.67	101.5 91.84 : 108.67
Cobalt	TM152	100.5 88.00 : 112.00	105.33 88.00 : 112.00
Copper	TM152	101.5 92.47 : 118.11	105.17 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00	104.0 92.00 : 113.00
Lead	TM152	99.83 88.00 : 112.00	100.5 88.00 : 112.00
Lithium	TM152	101.0 91.62 : 113.12	103.5 91.62 : 113.12
Magnesium	TM152	97.33 93.14 : 107.91	101.33 93.14 : 107.91
Manganese	TM152	102.67 95.03 : 110.58	106.5 95.03 : 110.58
Molybdenum	TM152	97.0 88.00 : 112.00	98.0 88.00 : 112.00
Nickel	TM152	102.33 88.00 : 112.00	104.33 88.00 : 112.00
Phosphorus	TM152	98.5 88.00 : 112.00	101.83 88.00 : 112.00
Potassium	TM152	98.67 93.90 : 112.36	102.67 93.90 : 112.36
Selenium	TM152	100.17 91.58 : 115.98	101.0 91.58 : 115.98
Silver	TM152	105.67 88.80 : 122.30	106.83 88.80 : 122.30
Sodium	TM152	97.33 91.50 : 108.35	102.67 91.50 : 108.35
Strontium	TM152	100.33 88.00 : 112.00	103.67 88.00 : 112.00
Tellurium	TM152	102.83 93.32 : 114.66	105.5 93.32 : 114.66
Thallium	TM152	101.67 88.00 : 112.00	103.5 88.00 : 112.00
Tin	TM152	104.83 92.63 : 109.70	106.17 92.63 : 109.70
Titanium	TM152	104.83 95.58 : 111.68	107.17 95.58 : 111.68



CERTIFICATE OF ANALYSIS

Validated

SDG:210514-160

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

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Dissolved Metals by ICP-MS

		QC 2489	QC 2420
Tungsten	TM152	98.67 81.32 : 124.72	101.17 81.32 : 124.72
Uranium	TM152	101.17 88.00 : 112.00	99.33 88.00 : 112.00
Vanadium	TM152	99.5 88.00 : 112.00	104.17 88.00 : 112.00
Zinc	TM152	100.0 92.98 : 118.95	103.0 92.98 : 118.95

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2497
Dissolved Inorganic Carbon	TM090	102.33 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2489
Fluoride	TM104	103.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2448
QC	TM089	91.85 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2420	QC 2415
Hexavalent Chromium	TM151	100.0 91.40 : 115.40	96.0 91.40 : 115.40

Low Level Cyanide (W)

Component	Method Code	QC 2485
Free Cyanide - Low Level	TM279	80.5 88.27 : 122.21
Total Cyanide - Low Level	TM279	98.25 76.58 : 119.24

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Mercury Dissolved						

Component	Method Code	QC 2438
Mercury Dissolved (CVAF)	TM183	98.5 69.30 : 128.70

Metals in solid samples by OES

Component	Method Code	QC 2421	QC 2454	QC 2464
Aluminium	TM181	102.65 77.46 : 123.98	102.65 77.46 : 123.98	92.92 77.46 : 123.98
Antimony	TM181	101.63 87.04 : 111.16	101.63 87.04 : 111.16	98.37 87.04 : 111.16
Arsenic	TM181	102.91 87.34 : 110.87	102.33 87.34 : 110.87	100.29 87.34 : 110.87
Barium	TM181	104.59 80.73 : 115.16	100.0 80.73 : 115.16	92.66 80.73 : 115.16
Beryllium	TM181	104.1 89.47 : 112.97	102.24 89.47 : 112.97	97.76 89.47 : 112.97
Boron	TM181	93.12 76.57 : 104.15	93.41 76.57 : 104.15	90.83 76.57 : 104.15
Cadmium	TM181	99.18 81.71 : 107.91	94.24 81.71 : 107.91	89.71 81.71 : 107.91
Chromium	TM181	87.63 77.55 : 104.47	89.05 77.55 : 104.47	84.38 77.55 : 104.47
Cobalt	TM181	91.19 82.95 : 107.41	90.57 82.95 : 107.41	88.05 82.95 : 107.41
Copper	TM181	97.36 84.36 : 106.14	97.36 84.36 : 106.14	91.02 84.36 : 106.14
Iron	TM181	100.79 81.43 : 115.79	101.59 81.43 : 115.79	93.65 81.43 : 115.79
Lead	TM181	94.14 81.95 : 107.63	92.12 81.95 : 107.63	91.89 81.95 : 107.63
Manganese	TM181	110.56 94.29 : 119.51	112.5 94.29 : 119.51	103.33 94.29 : 119.51
Mercury	TM181	97.83 82.73 : 106.36	97.34 82.73 : 106.36	95.89 82.73 : 106.36
Molybdenum	TM181	102.47 86.61 : 111.07	100.0 86.61 : 111.07	97.94 86.61 : 111.07
Nickel	TM181	89.73 79.72 : 103.80	90.22 79.72 : 103.80	86.31 79.72 : 103.80
Phosphorus	TM181	114.55 92.65 : 125.47	114.14 92.65 : 125.47	112.12 92.65 : 125.47
Selenium	TM181	103.53 88.36 : 111.25	101.96 88.36 : 111.25	100.0 88.36 : 111.25
Strontium	TM181	94.65 77.99 : 108.06	94.21 77.99 : 108.06	89.09 77.99 : 108.06
Thallium	TM181	105.31 88.60 : 116.73	105.75 88.60 : 116.73	104.42 88.60 : 116.73
Tin	TM181	103.42 89.77 : 112.62	102.28 89.77 : 112.62	98.48 89.77 : 112.62
Titanium	TM181	89.31 66.29 : 105.96	88.55 66.29 : 105.96	84.73 66.29 : 105.96

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
Metals in solid samples by OES						

		QC 2421	QC 2454	QC 2464
Vanadium	TM181	96.7 75.51 : 108.87	95.97 75.51 : 108.87	88.64 75.51 : 108.87
Zinc	TM181	101.03 84.02 : 111.24	101.64 84.02 : 111.24	98.77 84.02 : 111.24

PAH by GCMS

Component	Method Code	QC 2407	QC 2428
Acenaphthene	TM218	94.5 76.79 : 103.90	96.5 73.47 : 109.80
Acenaphthylene	TM218	93.0 74.19 : 106.17	95.0 70.00 : 130.00
Anthracene	TM218	89.5 70.90 : 109.22	91.5 68.68 : 111.89
Benz(a)anthracene	TM218	91.0 73.77 : 119.26	98.5 68.12 : 118.39
Benzo(a)pyrene	TM218	86.0 73.20 : 114.18	98.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	86.0 75.36 : 117.58	97.5 66.89 : 120.40
Benzo(ghi)perylene	TM218	90.0 70.73 : 116.12	102.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	87.0 75.98 : 116.59	100.0 73.10 : 117.03
Chrysene	TM218	86.0 74.82 : 114.18	95.0 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	90.0 69.17 : 115.30	93.0 67.32 : 121.35
Fluoranthene	TM218	85.5 66.06 : 114.63	93.5 75.16 : 117.28
Fluorene	TM218	93.0 76.66 : 107.56	93.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	83.5 70.26 : 117.95	102.5 68.91 : 117.62
Naphthalene	TM218	92.5 74.70 : 101.83	95.0 72.12 : 106.18
Phenanthrene	TM218	89.5 73.62 : 109.34	92.5 69.01 : 113.72
Pyrene	TM218	85.0 71.46 : 117.00	94.0 64.28 : 115.75

pH

Component	Method Code	QC 2435
pH	TM133	99.56 98.41 : 102.48

pH Value of Filtered Water

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
pH Value of Filtered Water						

Component	Method Code	QC 2479	QC 2481
pH	TM256	100.4 99.33 : 102.54	100.67 99.33 : 102.54

Phenols by HPLC (S)

Component	Method Code	QC 2487
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	45.03 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	48.64 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	51.66 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	50.0 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2443
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	103.52 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	97.51 82.77 : 126.51
Cresols by HPLC (W)	TM259	101.97 76.60 : 126.28
Napthol by HPLC (W)	TM259	103.52 75.40 : 129.40
Phenol by HPLC (W)	TM259	98.3 85.77 : 125.91
Xylenols by HPLC (W)	TM259	100.63 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2458	QC 2439
Total Organic Carbon	TM132	102.34 87.02 : 113.45	94.14 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2456	QC 2456
Total Sulphur %	TM132	95.34 61.64 : 114.47	96.37 61.64 : 114.47

	CERTIFICATE OF ANALYSIS				Validated	
	SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
	Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	
VOC MS (S)						

Component	Method Code	QC 2480
1,1,1,2-tetrachloroethane	TM116	97.8 84.84 : 116.25
1,1,1-Trichloroethane	TM116	94.2 73.73 : 118.05
1,1,2-Trichloroethane	TM116	95.2 77.12 : 116.04
1,1-Dichloroethane	TM116	102.2 74.46 : 129.15
1,2-Dichloroethane	TM116	103.6 92.38 : 131.65
1,4-Dichlorobenzene	TM116	94.6 83.64 : 126.18
2-Chlorotoluene	TM116	88.0 76.03 : 113.25
4-Chlorotoluene	TM116	85.0 66.90 : 112.46
Benzene	TM116	94.8 88.60 : 113.80
Carbon Disulphide	TM116	96.4 74.91 : 122.14
Carbontetrachloride	TM116	100.2 80.31 : 124.50
Chlorobenzene	TM116	96.4 83.81 : 114.18
Chloroform	TM116	101.2 87.40 : 122.49
Chloromethane	TM116	99.8 65.89 : 136.93
Cis-1,2-Dichloroethene	TM116	98.4 80.67 : 126.72
Dibromomethane	TM116	94.8 73.23 : 118.35
Dichloromethane	TM116	109.8 81.11 : 133.25
Ethylbenzene	TM116	88.2 75.92 : 110.41
Hexachlorobutadiene	TM116	58.2 12.82 : 152.73
Isopropylbenzene	TM116	75.2 55.79 : 97.59
Naphthalene	TM116	101.8 80.86 : 128.81
o-Xylene	TM116	84.6 69.99 : 108.74
p/m-Xylene	TM116	82.9 68.32 : 108.91
Sec-Butylbenzene	TM116	65.0 38.50 : 101.50
Tetrachloroethene	TM116	97.6 76.95 : 121.02
Toluene	TM116	88.4 74.24 : 107.42
Trichloroethene	TM116	95.0 85.28 : 109.36



CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

		QC 2480
Trichlorofluoromethane	TM116	100.2 81.46 : 120.52
Vinyl Chloride	TM116	101.0 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



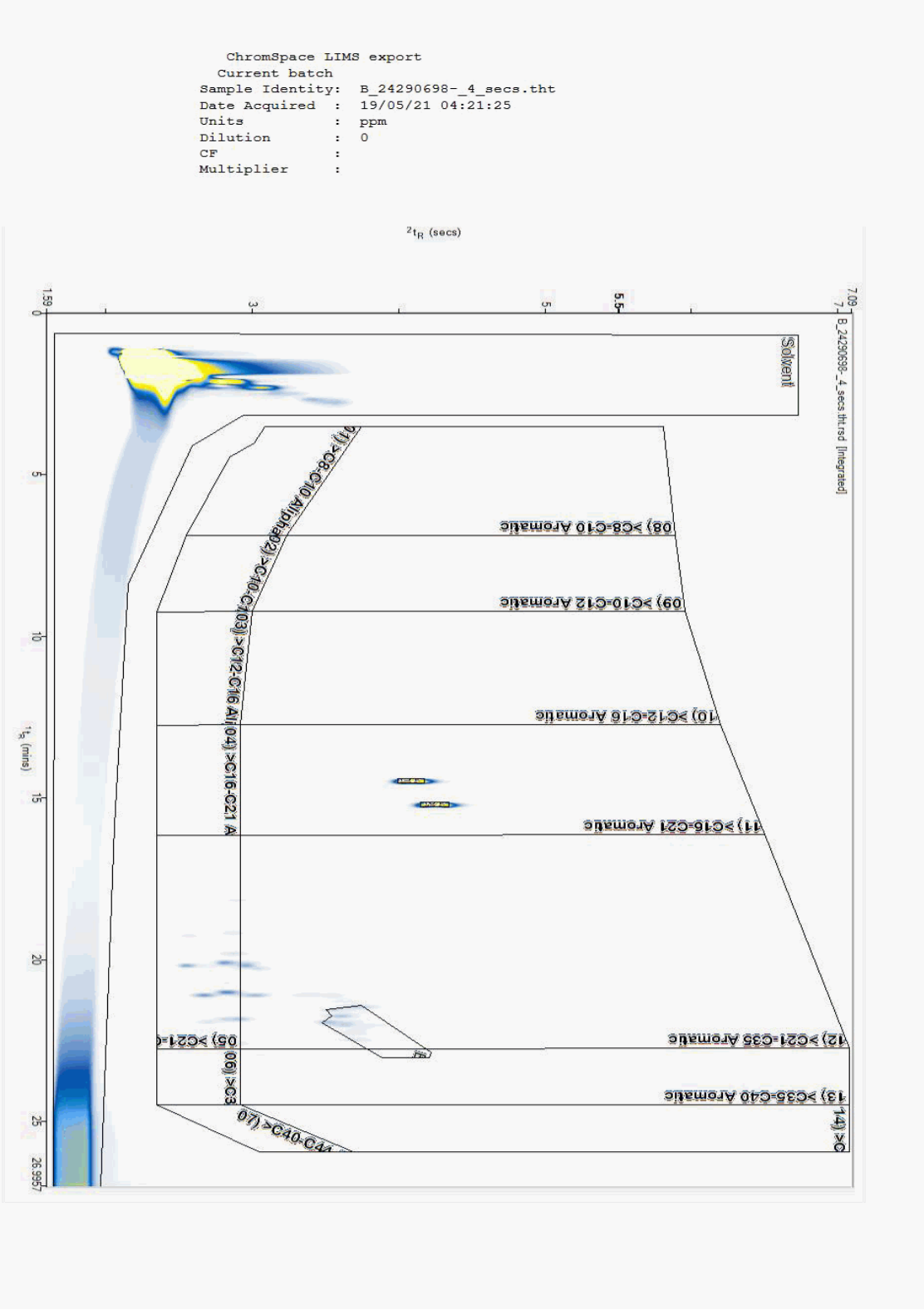
CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis:	EPH CWG GC (S)	Sample No :	24290698	Depth :	0.20
		Sample ID :	TP - PTR - 44		





CERTIFICATE OF ANALYSIS

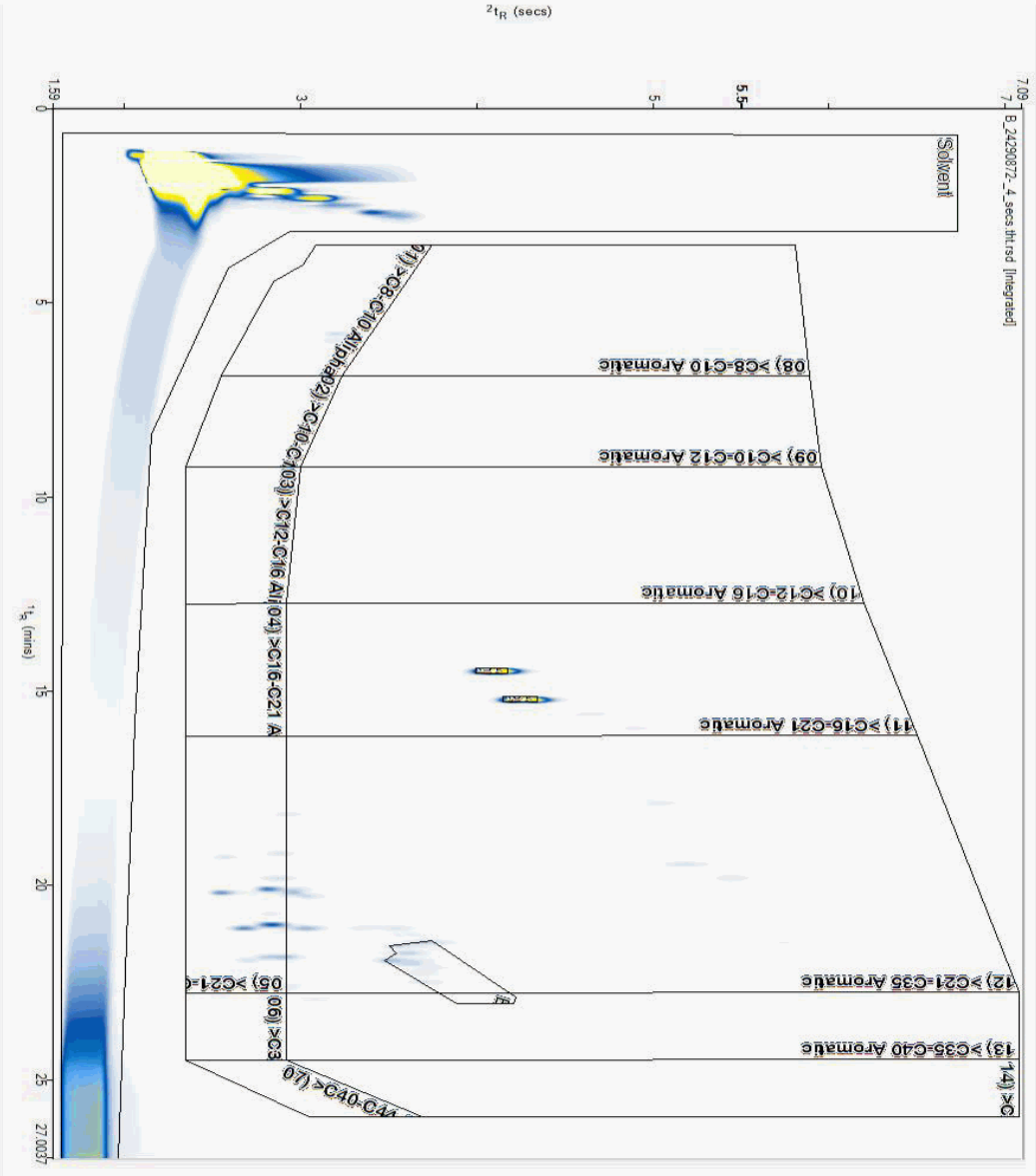
Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24290872 Depth : 0.20
Sample ID : TP - OBC - 02

ChromSpace LIMS export
Current batch
Sample Identity: B_24290872-4_secs.tht
Date Acquired : 19/05/21 08:31:27
Units : ppm
Dilution : 0
CF :
Multiplier :



CERTIFICATE OF ANALYSIS

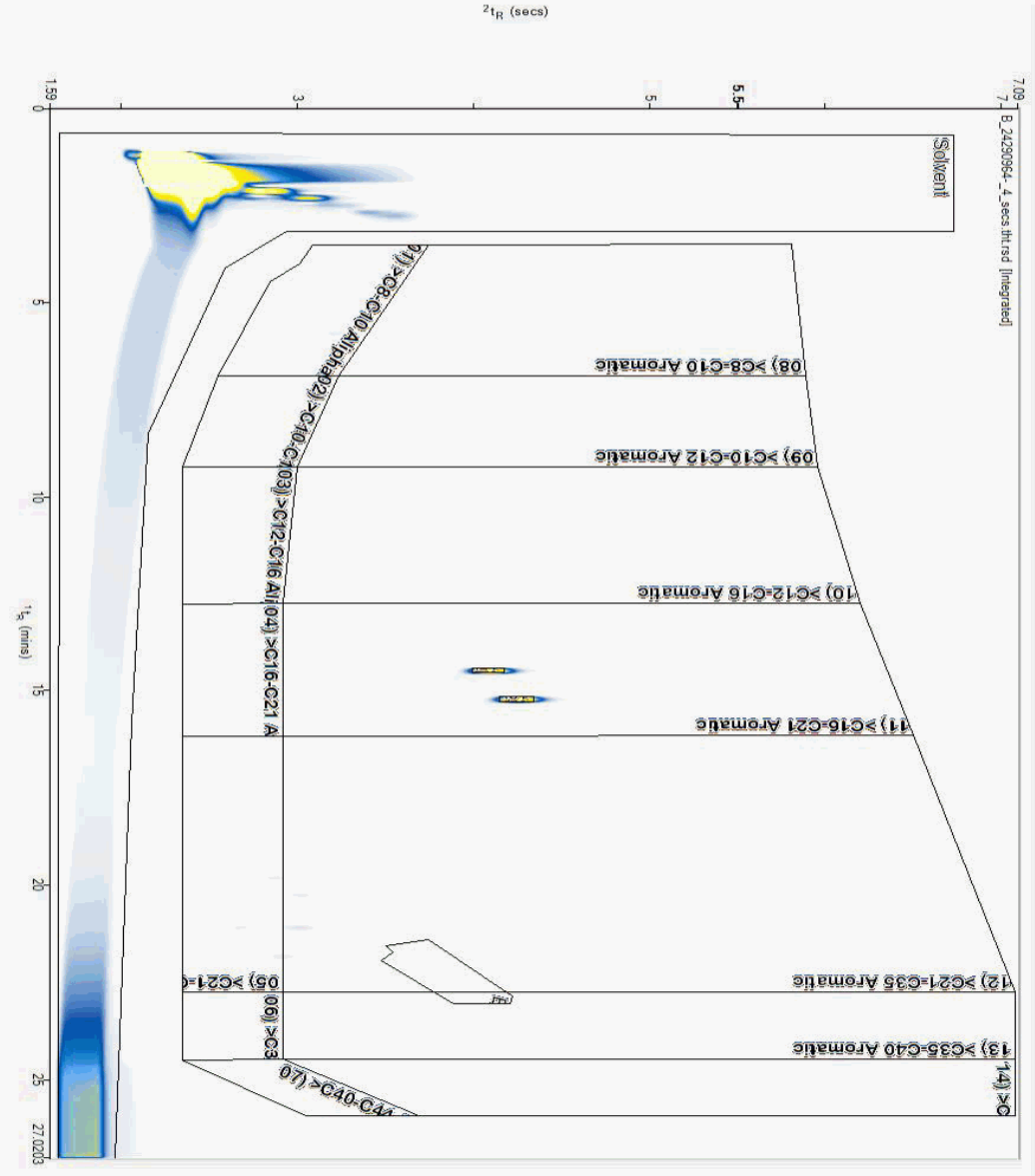
Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24290964 Depth : 1.00
Sample ID : TP - PTR - 44

ChromSpace LIMS export
Current batch
Sample Identity: B_24290964-4_secs.tht
Date Acquired : 19/05/21 04:52:43
Units : ppm
Dilution : 0
CF :
Multiplier :





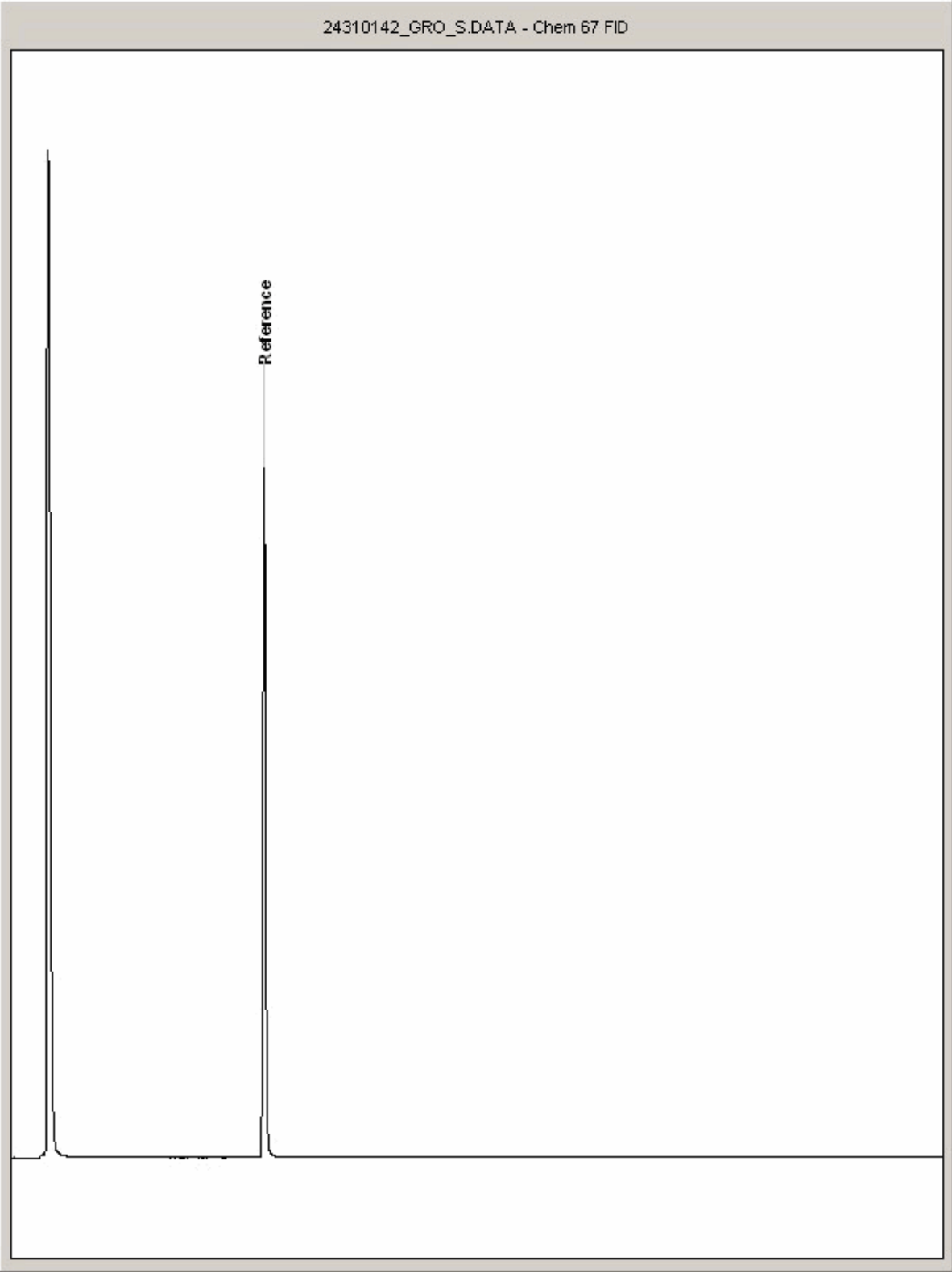
CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24310142 Depth : 0.20
Sample ID : TP - OBC - 02



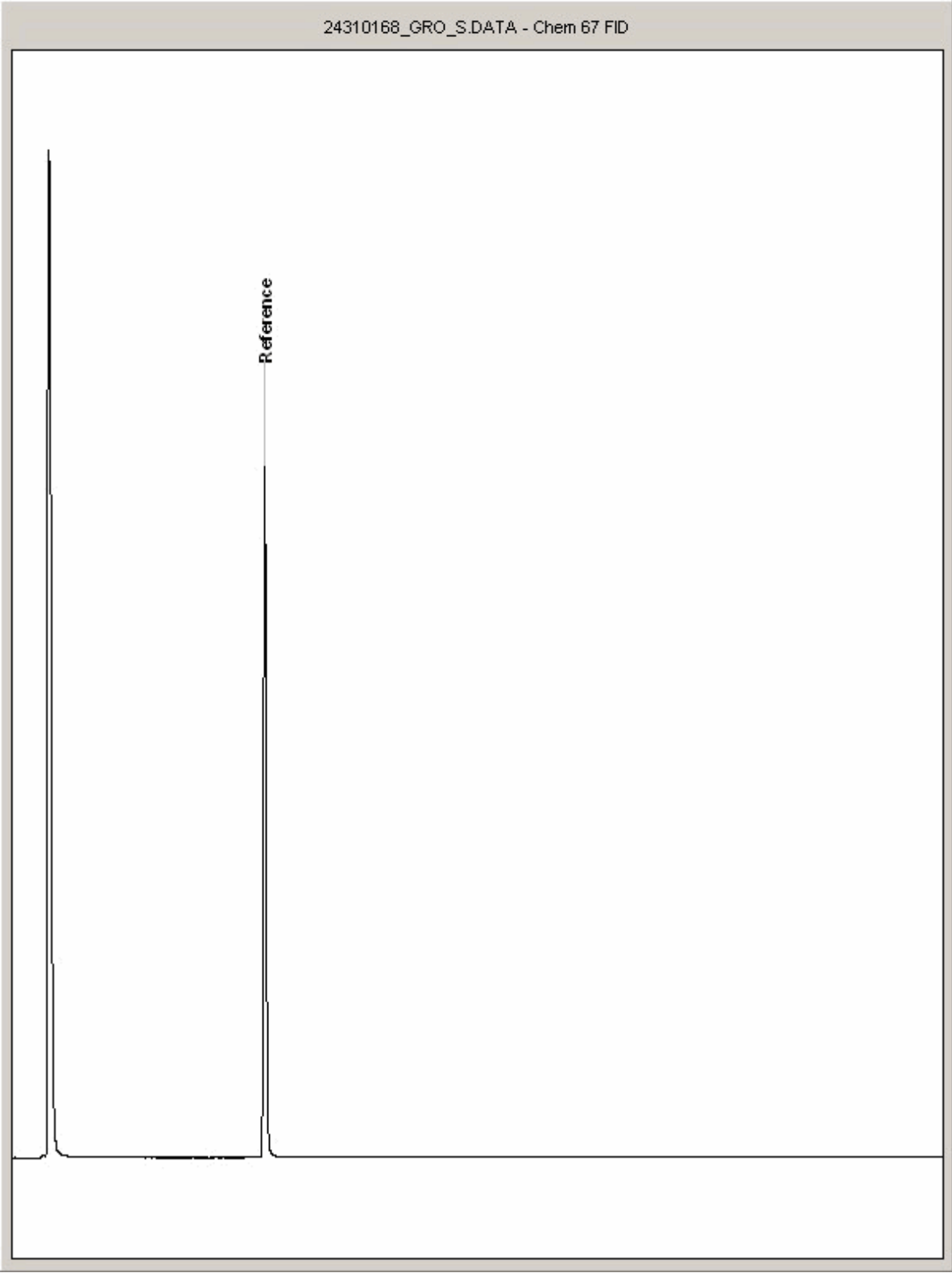
CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-160	Client Reference:	B025563	Report Number:	599497
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24310168 Depth : 1.00
Sample ID : TP - PTR - 44





CERTIFICATE OF ANALYSIS

Validated

SDG: 210514-160 Client Reference: B025563 Report Number: 599497
Location: Cambridge South East TraOrder Number: 7000964 Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24310200 Depth : 0.20
Sample ID : TP - PTR - 44

24310200_GRO_S.DATA - Chem 67 FID



CERTIFICATE OF ANALYSIS

SDG: 210514-160 Client Reference: B025563 Report Number: 599497
Location: Cambridge South East Transport - Ph: Order Number: 7000964 Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. Surrogate recoveries - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Tetra Tech Europe
3 Sovereign Square
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LS1 4ER

Attention: Richard Tonge

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Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 May 2021
Customer: Tetra Tech Europe
Sample Delivery Group (SDG): 210514-163
Your Reference: B025563
Location: Cambridge South East Transport - Phase 2
Report No: 599499

We received 9 samples on Friday May 14, 2021 and 2 of these samples were scheduled for analysis which was completed on Wednesday May 26, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 210514-163 Client Reference: B025563 Report Number: 599499
Location: Cambridge South East Transport - Phase 2 Order Number: 7000964 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24273128	BH - PTR - 40	ES1	0.10	10/05/2021
24273129	BH - PTR - 40	ES2	0.20	10/05/2021
24273130	BH - PTR - 40	ES3	0.50	10/05/2021
24273131	BH - PTR - 40	ES4	1.00	10/05/2021
24273132	BLANK			
24273123	TP - OBC - 04	ES1	0.10	10/05/2021
24273125	TP - OBC - 04	ES2	0.20	10/05/2021
24273126	TP - OBC - 04	ES3	0.50	10/05/2021
24273127	TP - OBC - 04	ES4	1.00	10/05/2021

Only received samples which have had analysis scheduled will be shown on the following pages.

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24273123	24273123			
	Customer Sample Reference		BH - PTR - 40	TP - OBC - 04			
	AGS Reference		ES2	ES1			
	Depth (m)		0.20	0.10			
	Container		Handle (ALE260)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	
	Sample Type		S	S	S	S	
Ammonium Low	All	NDPs: 0 Tests: 1	X				
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X		X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X				
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X	X			
Boron Water Soluble	All	NDPs: 0 Tests: 2	X		X		
CEN Readings	All	NDPs: 0 Tests: 1	X				
Chromium III	All	NDPs: 0 Tests: 2	X		X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X				
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X				
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X		
Fluoride	All	NDPs: 0 Tests: 1	X				
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X			X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X		X		
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1	X				

<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</div>	Lab Sample No(s)		24273123	24273123			
	Customer Sample Reference		BH - PTR - 40	TP - OBC - 04			
	AGS Reference		ES2	ES1			
	Depth (m)		0.20	0.10			
	Container		Handle (ALE260)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	
	Sample Type		S	S	S	S	
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1	X				
Mercury Dissolved	All	NDPs: 0 Tests: 1	X				
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X		X		
PAH by GCMS	All	NDPs: 0 Tests: 2	X		X		
pH	All	NDPs: 0 Tests: 2	X		X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 1	X				
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X				
Sample description	All	NDPs: 0 Tests: 2	X		X		
Total Organic Carbon	All	NDPs: 0 Tests: 2	X		X		
Total Sulphur	All	NDPs: 0 Tests: 2	X		X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X		
VOC MS (S)	All	NDPs: 0 Tests: 2	X			X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24273129	BH - PTR - 40	0.20	Dark Brown	Sandy Loam	Stones	Vegetation
24273123	TP - OBC - 04	0.10	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Results Legend		Customer Sample Ref.	BH - PTR - 40	TP - OBC - 04				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.20	0.10				
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)				
dis.filt	Dissolved / filtered sample.		10/05/2021	10/05/2021				
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.		14/05/2021	14/05/2021				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		210514-163	210514-163				
(F)	Trigger breach confirmed		24273129	24273123				
1-445@	Sample deviation (see appendix)		ES2	ES1				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	21	12				
Catechol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)	0.0254	<0.01				
Resorcinol	<0.05 mg/kg	TM062 (S)	<0.05	<0.05				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
1-Naphthol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	<0.015				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	<0.06				
Phenols, Total Detected 8 Speciated	<0.13 mg/kg	TM062 (S)	<0.13	<0.13				
Sulphur, Total	<0.02 %	TM132	0.022	<0.02				
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0124	0.00745				
pH	1 pH Units	TM133	8.18	8.26				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181	10.9	8.46				
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6				
Arsenic	<0.6 mg/kg	TM181	14.3	8.29				
Barium	<0.6 mg/kg	TM181	49.2	50.8				
Beryllium	<0.01 mg/kg	TM181	0.309	0.382				
Cadmium	<0.02 mg/kg	TM181	0.301	0.229				
Chromium	<0.9 mg/kg	TM181	10.9	8.46				
Copper	<1.4 mg/kg	TM181	7.09	11				
Iron	<1000 mg/kg	TM181	27200	12200				
Lead	<0.7 mg/kg	TM181	10.5	17.3				
Manganese	<0.13 mg/kg	TM181	362	388				
Mercury	<0.1 mg/kg	TM181	<0.1	<0.1				
Molybdenum	<0.1 mg/kg	TM181	0.728	0.339				
Nickel	<0.2 mg/kg	TM181	11.9	11.4				
Selenium	<1 mg/kg	TM181	<1	<1				
Vanadium	<0.2 mg/kg	TM181	24.2	21.3				

CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

PAH by GCMS

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

TPH CWG (S)

Results Legend			Customer Sample Ref. Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH - PTR - 40	TP - OBC - 04			
#	ISO17025 accredited.			0.20	0.10			
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.			10/05/2021	10/05/2021			
diss.filt	Dissolved / filtered sample.			.	.			
tot.unfilt	Total / unfiltered sample.			14/05/2021	14/05/2021			
*	Subcontracted - refer to subcontractor report for accreditation status.			210514-163	210514-163			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			24273129	24273123			
(F)	Trigger breach confirmed			ES2	ES1			
1-456	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**		TM089	106	98.8				
	%		2					
Aliphatics >C5-C6	<10	TM089	<10	<10				
	µg/kg		2					
Aliphatics >C6-C8	<10	TM089	<10	<10				
	µg/kg		2					
Aliphatics >C8-C10	<10	TM089	<10	<10				
	µg/kg		2					
Aliphatics >C10-C12	<1000	TM414	<1000	<1000				
	µg/kg							
Aliphatics >C12-C16	<1000	TM414	<1000	<1000				
	µg/kg							
Aliphatics >C16-C21	<1000	TM414	<1000	<1000				
	µg/kg							
Aliphatics >C21-C35	<1000	TM414	9300	2950				
	µg/kg							
Aliphatics >C35-C44	<1000	TM414	<1000	<1000				
	µg/kg							
Total Aliphatics >C10-C44	<5000	TM414	9900	<5000				
	µg/kg							
Total Aliphatics & Aromatics >C10-C44	<10000	TM414	17300	<10000				
	µg/kg							
Aromatics >EC5-EC7	<10	TM089	<10	<10				
	µg/kg		2					
Aromatics >EC7-EC8	<10	TM089	<10	<10				
	µg/kg		2					
Aromatics >EC8-EC10	<10	TM089	<10	<10				
	µg/kg		2					
Aromatics > EC10-EC12	<1000	TM414	<1000	<1000				
	µg/kg							
Aromatics > EC12-EC16	<1000	TM414	<1000	<1000				
	µg/kg							
Aromatics > EC16-EC21	<1000	TM414	<1000	<1000				
	µg/kg							
Aromatics > EC21-EC35	<1000	TM414	6310	1130				
	µg/kg							
Aromatics >EC35-EC44	<1000	TM414	<1000	<1000				
	µg/kg							
Aromatics > EC40-EC44	<1000	TM414	<1000	<1000				
	µg/kg							
Total Aromatics > EC10-EC44	<5000	TM414	7450	<5000				
	µg/kg							
Total Aliphatics & Aromatics >C5-C44	<10000	TM414	17300	<10000				
	µg/kg							
Total Aliphatics >C5-C10	<50	TM089	<50	<50				
	µg/kg		2					
Total Aromatics >EC5-EC10	<50	TM089	<50	<50				
	µg/kg		2					
GRO >C5-C10	<20	TM089	<20	<20				
	µg/kg		2					



CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

VOC MS (S)

Results Legend			Customer Sample Ref.	BH - PTR - 40	TP - OBC - 04				
#	ISO17025 accredited.			0.20	0.10				
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.			10/05/2021	10/05/2021				
dis.filt	Dissolved / filtered sample.			.	.				
tot.unfilt	Total / unfiltered sample.			14/05/2021	14/05/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.			210514-163	210514-163				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		24273129	24273123					
(F)	Trigger breach confirmed		ES2	ES1					
1-4+5@	Sample deviation (see appendix)								
Component		LOD/Units	Method						
Dibromofluoromethane**		%	TM116	121	123				
				2					
Toluene-d8**		%	TM116	99	98.2				
				2					
4-Bromofluorobenzene**		%	TM116	90.6	87.4				
				2					
Dichlorodifluoromethane		<6	TM116	<60	<6				
		µg/kg		2 M	M				
Chloromethane		<7	TM116	<70	<7				
		µg/kg		2 #	#				
Vinyl Chloride		<6	TM116	<60	<6				
		µg/kg		2 M	@ M				
Bromomethane		<10	TM116	<100	<10				
		µg/kg		2 M	M				
Chloroethane		<10	TM116	<100	<10				
		µg/kg		2 M	M				
Trichlorofluoromethane		<6	TM116	<60	<6				
		µg/kg		2 M	M				
1,1-Dichloroethene		<10	TM116	<100	<10				
		µg/kg		2 #	#				
Carbon Disulphide		<7	TM116	<70	<7				
		µg/kg		2 M	M				
Dichloromethane		<10	TM116	<100	<10				
		µg/kg		2 #	#				
Methyl Tertiary Butyl Ether		<10	TM116	<100	<10				
		µg/kg		2 M	M				
trans-1,2-Dichloroethene		<10	TM116	<100	<10				
		µg/kg		2 M	M				
1,1-Dichloroethane		<8	TM116	<80	<8				
		µg/kg		2 M	M				
cis-1,2-Dichloroethene		<6	TM116	<60	<6				
		µg/kg		2 M	M				
2,2-Dichloropropane		<10	TM116	<100	<10				
		µg/kg		2					
Bromochloromethane		<10	TM116	<100	<10				
		µg/kg		2 M	M				
Chloroform		<8	TM116	<80	<8				
		µg/kg		2 M	M				
1,1,1-Trichloroethane		<7	TM116	<70	<7				
		µg/kg		2 M	M				
1,1-Dichloropropene		<10	TM116	<100	<10				
		µg/kg		2 M	M				
Carbontetrachloride		<10	TM116	<100	<10				
		µg/kg		2 M	M				
1,2-Dichloroethane		<5	TM116	<50	<5				
		µg/kg		2 M	M				
Benzene		<9	TM116	<90	<9				
		µg/kg		2 M	M				
Trichloroethene		<9	TM116	<90	<9				
		µg/kg		2 #	#				
1,2-Dichloropropane		<10	TM116	<100	<10				
		µg/kg		2 M	M				
Dibromomethane		<9	TM116	<90	<9				
		µg/kg		2 M	M				
Bromodichloromethane		<7	TM116	<70	<7				
		µg/kg		2 M	M				
cis-1,3-Dichloropropene		<10	TM116	<100	<10				
		µg/kg		2 M	M				
Toluene		<7	TM116	<70	<7				
		µg/kg		2 M	M				
trans-1,3-Dichloropropene		<10	TM116	<100	<10				
		µg/kg		2					
1,1,2-Trichloroethane		<10	TM116	<100	<10				
		µg/kg		2 M	M				

Asbestos Identification - Solid Samples

Results Legend		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
#	ISO17025 accredited.										
M	mCERTS accredited.										
*	Subcontracted test.										
(F)	Trigger breach confirmed										
1-5&*\$@	Sample deviation (see appendix)										
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH - PTR - 40ES2 0.20 SOLID 10/05/2021 00:00:00 14/05/2021 11:30:00 210514-163 24273129 TM048	21.05.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP - OBC - 04ES1 0.10 SOLID 10/05/2021 00:00:00 14/05/2021 11:30:00 210514-163 24273123 TM048	21.05.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - F
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17.2
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.3
Particle Size <4mm	>95%		
Case			
SDG	210514-163		
Lab Sample Number(s)	24273129		
Sampled Date	10-May-2021		
Customer Sample Ref.	BH - PTR - 40 ES2		
Depth (m)	0.20		

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Ammoniacal Nitrogen as N	0.025	<0.01	0.25	<0.1	-	-	-
Low Level Hexavalent Chromium	<0.003	<0.003	<0.03	<0.03	-	-	-
Chromium III (Low)	<0.003	<0.003	<0.03	<0.03	-	-	-
Complex Cyanide - Low Level	<0.005	<0.005	<0.05	<0.05	-	-	-
Free Cyanide - Low Level	<0.0025	<0.0025	<0.025	<0.025	-	-	-
Dissolved Organic Carbon	6.75	<3	67.5	<30	-	-	-
Fluoride	0.684	<0.5	6.84	<5	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Arsenic	0.000976	<0.0005	0.00976	<0.005	-	-	-
Barium	0.0116	<0.0002	0.116	<0.002	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Boron	0.0262	<0.01	0.262	<0.1	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Calcium (Dis.Filt) mg/l	28.5	<0.2	285	<2	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00206	<0.0003	0.0206	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Magnesium (Dis.Filt) mg/l	0.725	<0.036	7.25	<0.36	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00169	<0.0004	0.0169	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00193	<0.001	0.0193	<0.01	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
2,3,5 Trimethyl-Phenol by HPLC (W)	<0.003	<0.003	<0.03	<0.03	-	-	-
2-Isopropyl Phenol by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Catechol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Cresols by HPLC (W)	<0.006	<0.006	<0.06	<0.06	-	-	-
Napthol by HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
NG Total Speciated Phenols by HPLC (W)	<0.045	<0.045	<0.45	<0.45	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Resorcinol HPLC (W)	<0.01	<0.01	<0.1	<0.1	-	-	-
Xylenols by HPLC (W)	<0.008	<0.008	<0.08	<0.08	-	-	-

Leach Test Information

Date Prepared	19-May-2021
pH (pH Units)	7.94
Conductivity (µS/cm)	145.00
Temperature (°C)	22.40
Volume Leachant (Litres)	0.884



CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Cambridge South East Transport - 1
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17.2
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85.3
Particle Size <4mm	>95%		

Case

SDG 210514-163

Lab Sample Number(s) 24273129

Sampled Date 10-May-2021

Customer Sample Ref. BH - PTR - 40 ES2

Depth (m) 0.20

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Leach Test Information

Date Prepared	19-May-2021
pH (pH Units)	7.94
Conductivity (µS/cm)	145.00
Temperature (°C)	22.40
Volume Leachant (Litres)	0.884

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CERTIFICATE OF ANALYSIS

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SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM331		Low Level Hexavalent Chromium
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

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CERTIFICATE OF ANALYSIS

Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	24273129	24273123
Customer Sample Ref.	BH - PTR - 40	TP - OBC - 04
AGS Ref.	ES2	ES1
Depth	0.20	0.10
Type	Soil/Solid (S)	Soil/Solid (S)
Ammonium Low	25-May-2021	
Anions by Kone (soil)	21-May-2021	21-May-2021
Anions by Kone (w)	21-May-2021	
Asbestos ID in Solid Samples	21-May-2021	21-May-2021
Boron Water Soluble	25-May-2021	25-May-2021
CEN 10:1 Leachate (1 Stage)	20-May-2021	
CEN Readings	24-May-2021	
Chromium III	25-May-2021	24-May-2021
Cyanide Comp/Free/Total/Thiocyanate	21-May-2021	21-May-2021
Dissolved Metals by ICP-MS	24-May-2021	
Dissolved Organic/Inorganic Carbon	26-May-2021	
EPH CWG GC (S)	20-May-2021	20-May-2021
Fluoride	24-May-2021	
GRO by GC-FID (S)	21-May-2021	21-May-2021
Hexavalent Chromium (s)	20-May-2021	20-May-2021
Low Level Cyanide (W)	26-May-2021	
Low Level Hexavalent Chromium (w)	25-May-2021	
Mercury Dissolved	24-May-2021	
Metals in solid samples by OES	25-May-2021	24-May-2021
Moisture at 105C	19-May-2021	
PAH by GCMS	21-May-2021	20-May-2021
pH	20-May-2021	20-May-2021
pH Value of Filtered Water	25-May-2021	
Phenols by HPLC (S)	20-May-2021	20-May-2021
Phenols by HPLC (W)	25-May-2021	
Sample description	18-May-2021	18-May-2021
Total Organic Carbon	25-May-2021	25-May-2021
Total Sulphur	21-May-2021	21-May-2021
TPH CWG GC (S)	21-May-2021	21-May-2021
VOC MS (S)	24-May-2021	21-May-2021



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SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

ASSOCIATED AQC DATA

Ammonium Low

Component	Method Code	QC 2494
Ammoniacal Nitrogen as N	TM099	102.6 96.04 : 106.80

Anions by Kone (w)

Component	Method Code	QC 2400
Chloride	TM184	107.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03

Boron Water Soluble

Component	Method Code	QC 2461
Water Soluble Boron	TM222	98.5 84.00 : 111.00

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2466
Free Cyanide	TM153	97.33 78.00 : 114.00
Thiocyanate	TM153	94.87 94.53 : 113.33
Total Cyanide	TM153	98.6 77.13 : 111.53

Dissolved Metals by ICP-MS

Component	Method Code	QC 2489	QC 2420
Aluminium	TM152	100.0 90.98 : 111.82	102.0 90.98 : 111.82
Antimony	TM152	105.17 90.44 : 113.04	106.5 90.44 : 113.04
Arsenic	TM152	100.67 88.00 : 112.00	104.83 88.00 : 112.00
Barium	TM152	100.17 90.20 : 111.19	100.5 90.20 : 111.19
Beryllium	TM152	105.67 87.77 : 113.97	106.33 87.77 : 113.97
Bismuth	TM152	108.17 91.90 : 112.20	107.83 91.90 : 112.20
Borate	TM152	106.79 88.00 : 112.00	106.79 88.00 : 112.00



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SDG:210514-163

Location:Cambridge South East Tra

Client Reference:

Order Number:

B025563

7000964

Report Number:

Superseded Report:

599499

Dissolved Metals by ICP-MS

		QC 2489	QC 2420
Boron	TM152	107.0 96.48 : 114.93	107.0 96.48 : 114.93
Cadmium	TM152	101.5 96.43 : 110.53	104.5 96.43 : 110.53
Calcium	TM152	100.67 81.38 : 119.09	104.0 81.38 : 119.09
Chromium	TM152	99.33 91.84 : 108.67	101.5 91.84 : 108.67
Cobalt	TM152	100.5 88.00 : 112.00	105.33 88.00 : 112.00
Copper	TM152	101.5 92.47 : 118.11	105.17 92.47 : 118.11
Iron	TM152	101.33 92.00 : 113.00	104.0 92.00 : 113.00
Lead	TM152	99.83 88.00 : 112.00	100.5 88.00 : 112.00
Lithium	TM152	101.0 91.62 : 113.12	103.5 91.62 : 113.12
Magnesium	TM152	97.33 93.14 : 107.91	101.33 93.14 : 107.91
Manganese	TM152	102.67 95.03 : 110.58	106.5 95.03 : 110.58
Molybdenum	TM152	97.0 88.00 : 112.00	98.0 88.00 : 112.00
Nickel	TM152	102.33 88.00 : 112.00	104.33 88.00 : 112.00
Phosphorus	TM152	98.5 88.00 : 112.00	101.83 88.00 : 112.00
Potassium	TM152	98.67 93.90 : 112.36	102.67 93.90 : 112.36
Selenium	TM152	100.17 91.58 : 115.98	101.0 91.58 : 115.98
Silver	TM152	105.67 88.80 : 122.30	106.83 88.80 : 122.30
Sodium	TM152	97.33 91.50 : 108.35	102.67 91.50 : 108.35
Strontium	TM152	100.33 88.00 : 112.00	103.67 88.00 : 112.00
Tellurium	TM152	102.83 93.32 : 114.66	105.5 93.32 : 114.66
Thallium	TM152	101.67 88.00 : 112.00	103.5 88.00 : 112.00
Tin	TM152	104.83 92.63 : 109.70	106.17 92.63 : 109.70
Titanium	TM152	104.83 95.58 : 111.68	107.17 95.58 : 111.68
Tungsten	TM152	98.67 81.32 : 124.72	101.17 81.32 : 124.72
Uranium	TM152	101.17 88.00 : 112.00	99.33 88.00 : 112.00
Vanadium	TM152	99.5 88.00 : 112.00	104.17 88.00 : 112.00
Zinc	TM152	100.0 92.98 : 118.95	103.0 92.98 : 118.95



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Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2497
Dissolved Inorganic Carbon	TM090	102.33 93.58 : 112.28
Dissolved Organic Carbon	TM090	103.5 96.13 : 109.53

Fluoride

Component	Method Code	QC 2489
Fluoride	TM104	103.33 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2448	QC 2410
QC	TM089	91.85 70.75 : 114.19	85.63 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2415
Hexavalent Chromium	TM151	96.0 91.40 : 115.40

Low Level Cyanide (W)

Component	Method Code	QC 2485
Free Cyanide - Low Level	TM279	80.5 88.27 : 122.21
Total Cyanide - Low Level	TM279	98.25 76.58 : 119.24

Mercury Dissolved

Component	Method Code	QC 2438
Mercury Dissolved (CVAf)	TM183	98.5 69.30 : 128.70

Metals in solid samples by OES



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Metals in solid samples by OES

Component	Method Code	QC 2471	QC 2421
Aluminium	TM181	107.08 73.56 : 108.85	102.65 77.46 : 123.98
Antimony	TM181	98.37 76.89 : 111.24	101.63 87.04 : 111.16
Arsenic	TM181	100.29 88.53 : 111.01	102.91 87.34 : 110.87
Barium	TM181	98.17 77.67 : 105.35	104.59 80.73 : 115.16
Beryllium	TM181	102.24 85.44 : 109.61	104.1 89.47 : 112.97
Boron	TM181	100.57 73.51 : 104.66	93.12 76.57 : 104.15
Cadmium	TM181	90.53 77.67 : 104.12	99.18 81.71 : 107.91
Chromium	TM181	89.86 79.64 : 105.83	87.63 77.55 : 104.47
Cobalt	TM181	90.57 84.60 : 104.13	91.19 82.95 : 107.41
Copper	TM181	99.12 82.40 : 105.45	97.36 84.36 : 106.14
Iron	TM181	100.0 82.95 : 110.58	100.79 81.43 : 115.79
Lead	TM181	95.5 78.24 : 104.05	94.14 81.95 : 107.63
Manganese	TM181	106.39 94.29 : 119.51	110.56 94.29 : 119.51
Mercury	TM181	95.89 83.16 : 107.81	97.83 82.73 : 106.36
Molybdenum	TM181	101.23 87.11 : 106.87	102.47 86.61 : 111.07
Nickel	TM181	89.98 80.26 : 102.28	89.73 79.72 : 103.80
Phosphorus	TM181	108.08 94.56 : 124.28	114.55 92.65 : 125.47
Selenium	TM181	100.39 82.28 : 110.48	103.53 88.36 : 111.25
Strontium	TM181	101.11 79.13 : 102.79	94.65 77.99 : 108.06
Thallium	TM181	102.21 82.94 : 111.86	105.31 88.60 : 116.73
Tin	TM181	102.66 86.72 : 110.03	103.42 89.77 : 112.62
Titanium	TM181	95.42 66.23 : 102.06	89.31 66.29 : 105.96
Vanadium	TM181	106.59 86.19 : 109.45	96.7 75.51 : 108.87
Zinc	TM181	100.41 84.68 : 113.99	101.03 84.02 : 111.24

PAH by GCMS



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PAH by GCMS

Component	Method Code	QC 2401
Acenaphthene	TM218	94.5 73.47 : 109.80
Acenaphthylene	TM218	93.0 70.00 : 130.00
Anthracene	TM218	94.0 68.68 : 111.89
Benz(a)anthracene	TM218	107.0 68.12 : 118.39
Benzo(a)pyrene	TM218	105.5 71.72 : 115.31
Benzo(b)fluoranthene	TM218	106.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	101.0 67.82 : 118.49
Benzo(k)fluoranthene	TM218	104.0 73.10 : 117.03
Chrysene	TM218	102.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	97.0 67.32 : 121.35
Fluoranthene	TM218	101.0 75.16 : 117.28
Fluorene	TM218	92.5 73.81 : 108.66
Indeno(123cd)pyrene	TM218	97.0 68.91 : 117.62
Naphthalene	TM218	90.5 72.12 : 106.18
Phenanthrene	TM218	97.5 69.01 : 113.72
Pyrene	TM218	99.5 64.28 : 115.75

pH

Component	Method Code	QC 2416	QC 2457
pH	TM133	99.71 98.41 : 102.48	99.85 98.41 : 102.48

pH Value of Filtered Water

Component	Method Code	QC 2481
pH	TM256	100.67 99.33 : 102.54

Phenols by HPLC (S)

Phenols by HPLC (S)

Component	Method Code	QC 2458	QC 2487
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	46.1 70.71 : 116.42	52.6 70.71 : 116.42
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	40.94 64.54 : 117.79	45.03 64.54 : 117.79
Cresols by HPLC (S)	TM062 (S)	43.63 74.40 : 108.98	48.64 74.40 : 108.98
Phenol by HPLC (S)	TM062 (S)	45.03 69.44 : 122.18	51.66 69.44 : 122.18
Xylenols by HPLC (S)	TM062 (S)	44.69 76.56 : 106.38	50.0 76.56 : 106.38

Phenols by HPLC (W)

Component	Method Code	QC 2443
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	103.52 77.41 : 127.55
2-Isopropyl Phenol by HPLC (W)	TM259	97.51 82.77 : 126.51
Cresols by HPLC (W)	TM259	101.97 76.60 : 126.28
Napthol by HPLC (W)	TM259	103.52 75.40 : 129.40
Phenol by HPLC (W)	TM259	98.3 85.77 : 125.91
Xylenols by HPLC (W)	TM259	100.63 79.09 : 131.82

Total Organic Carbon

Component	Method Code	QC 2439
Total Organic Carbon	TM132	94.14 87.02 : 113.45

Total Sulphur

Component	Method Code	QC 2456
Total Sulphur %	TM132	95.34 61.64 : 114.47

VOC MS (S)

Component	Method Code	QC 2480	QC 2427
1,1,1,2-tetrachloroethane	TM116	97.8 84.84 : 116.25	98.2 79.10 : 119.66
1,1,1-Trichloroethane	TM116	94.2 73.73 : 118.05	103.6 88.34 : 114.50
1,1,2-Trichloroethane	TM116	95.2 77.12 : 116.04	92.4 81.29 : 113.79

VOC MS (S)

		QC 2480	QC 2427
1,1-Dichloroethane	TM116	102.2 74.46 : 129.15	112.2 86.77 : 122.11
1,2-Dichloroethane	TM116	103.6 92.38 : 131.65	112.2 90.04 : 132.28
1,4-Dichlorobenzene	TM116	94.6 83.64 : 126.18	99.6 80.81 : 125.07
2-Chlorotoluene	TM116	88.0 76.03 : 113.25	95.2 73.13 : 114.13
4-Chlorotoluene	TM116	85.0 66.90 : 112.46	89.0 68.66 : 109.13
Benzene	TM116	94.8 88.60 : 113.80	101.2 84.29 : 112.22
Carbon Disulphide	TM116	96.4 74.91 : 122.14	102.6 75.11 : 124.81
Carbontetrachloride	TM116	100.2 80.31 : 124.50	101.6 82.35 : 126.46
Chlorobenzene	TM116	96.4 83.81 : 114.18	98.2 82.88 : 122.42
Chloroform	TM116	101.2 87.40 : 122.49	107.0 90.35 : 120.38
Chloromethane	TM116	99.8 65.89 : 136.93	98.8 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	98.4 80.67 : 126.72	102.2 78.27 : 128.90
Dibromomethane	TM116	94.8 73.23 : 118.35	94.4 76.00 : 120.73
Dichloromethane	TM116	109.8 81.11 : 133.25	112.6 92.27 : 134.36
Ethylbenzene	TM116	88.2 75.92 : 110.41	89.6 70.95 : 113.07
Hexachlorobutadiene	TM116	58.2 12.82 : 152.73	69.6 14.55 : 147.92
Isopropylbenzene	TM116	75.2 55.79 : 97.59	88.0 52.00 : 108.19
Naphthalene	TM116	101.8 80.86 : 128.81	97.2 80.29 : 135.77
o-Xylene	TM116	84.6 69.99 : 108.74	85.2 68.34 : 101.99
p/m-Xylene	TM116	82.9 68.32 : 108.91	85.2 69.47 : 97.31
Sec-Butylbenzene	TM116	65.0 38.50 : 101.50	79.2 27.03 : 135.73
Tetrachloroethene	TM116	97.6 76.95 : 121.02	104.2 81.43 : 126.65
Toluene	TM116	88.4 74.24 : 107.42	92.0 82.44 : 103.50
Trichloroethene	TM116	95.0 85.28 : 109.36	99.0 79.80 : 112.33
Trichlorofluoromethane	TM116	100.2 81.46 : 120.52	108.0 83.13 : 123.97
Vinyl Chloride	TM116	101.0 68.02 : 143.37	107.4 69.66 : 136.55



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Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .
The figure detailed is the percentage recovery result for the AQC .
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

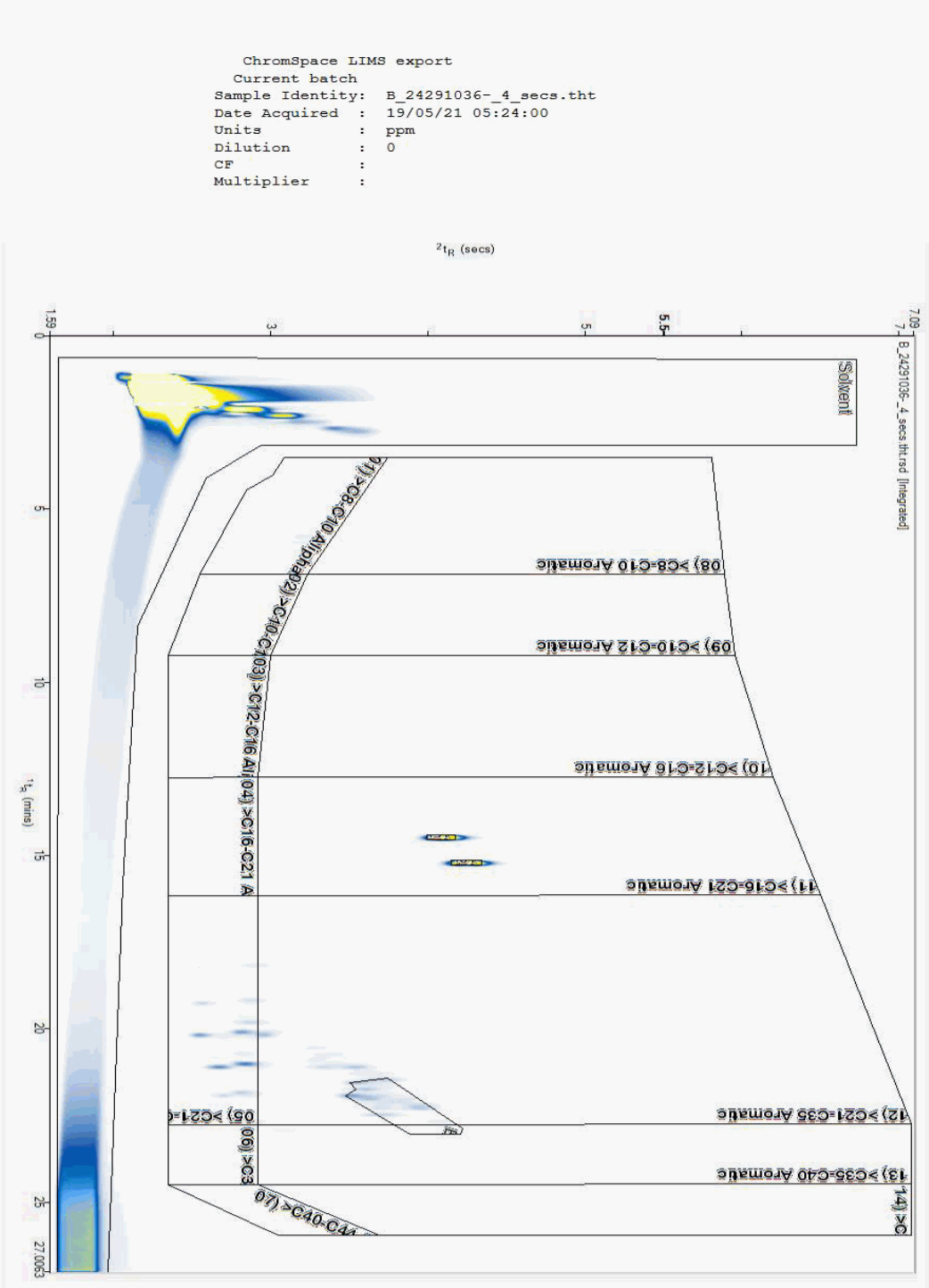
SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
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Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 24291036
Sample ID : BH - PTR - 40

Depth : 0.20





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Chromatogram

Analysis: EPH CWG GC (S) Sample No : 24291108 Depth : 0.10
Sample ID : TP - OBC - 04



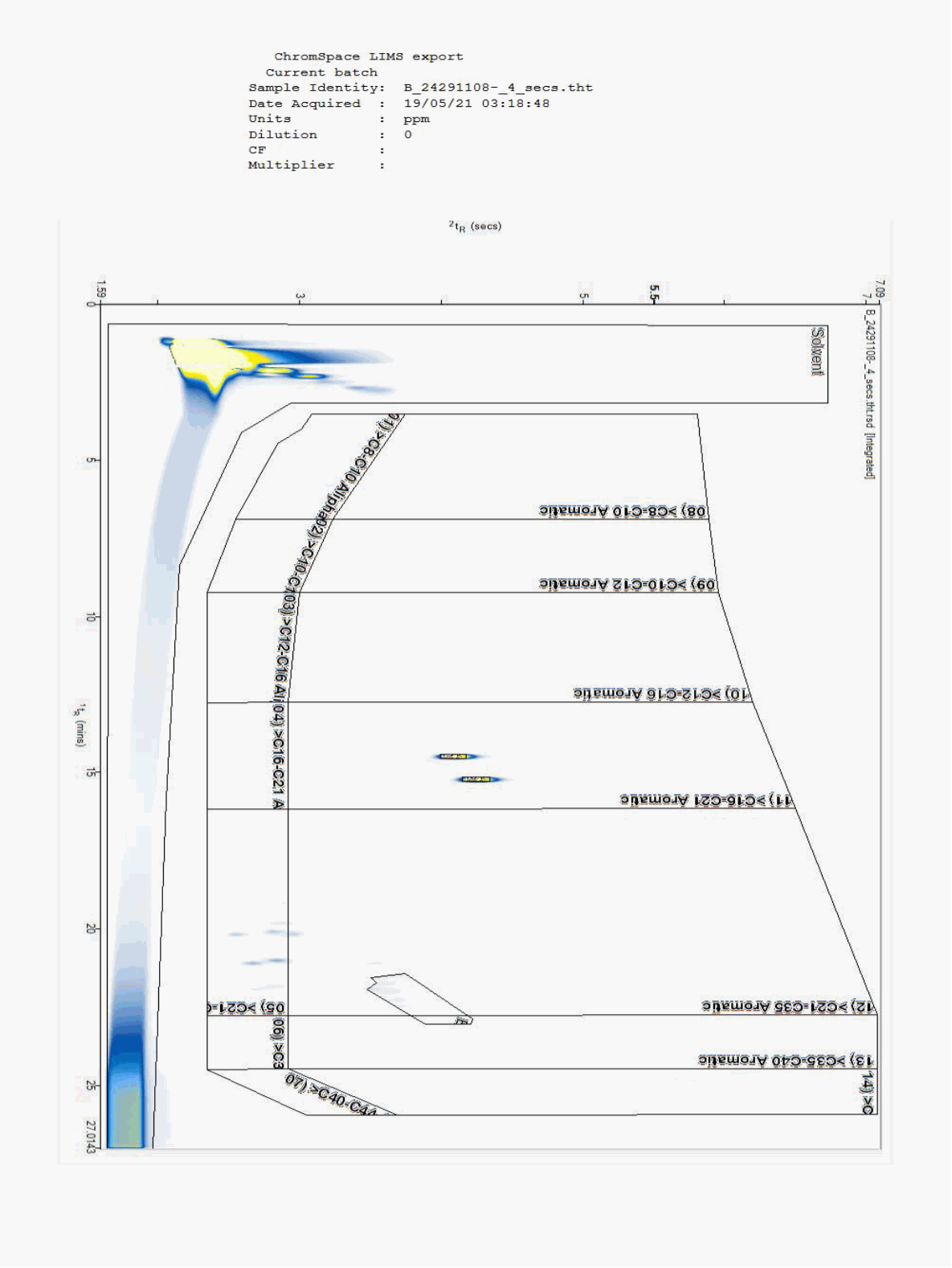
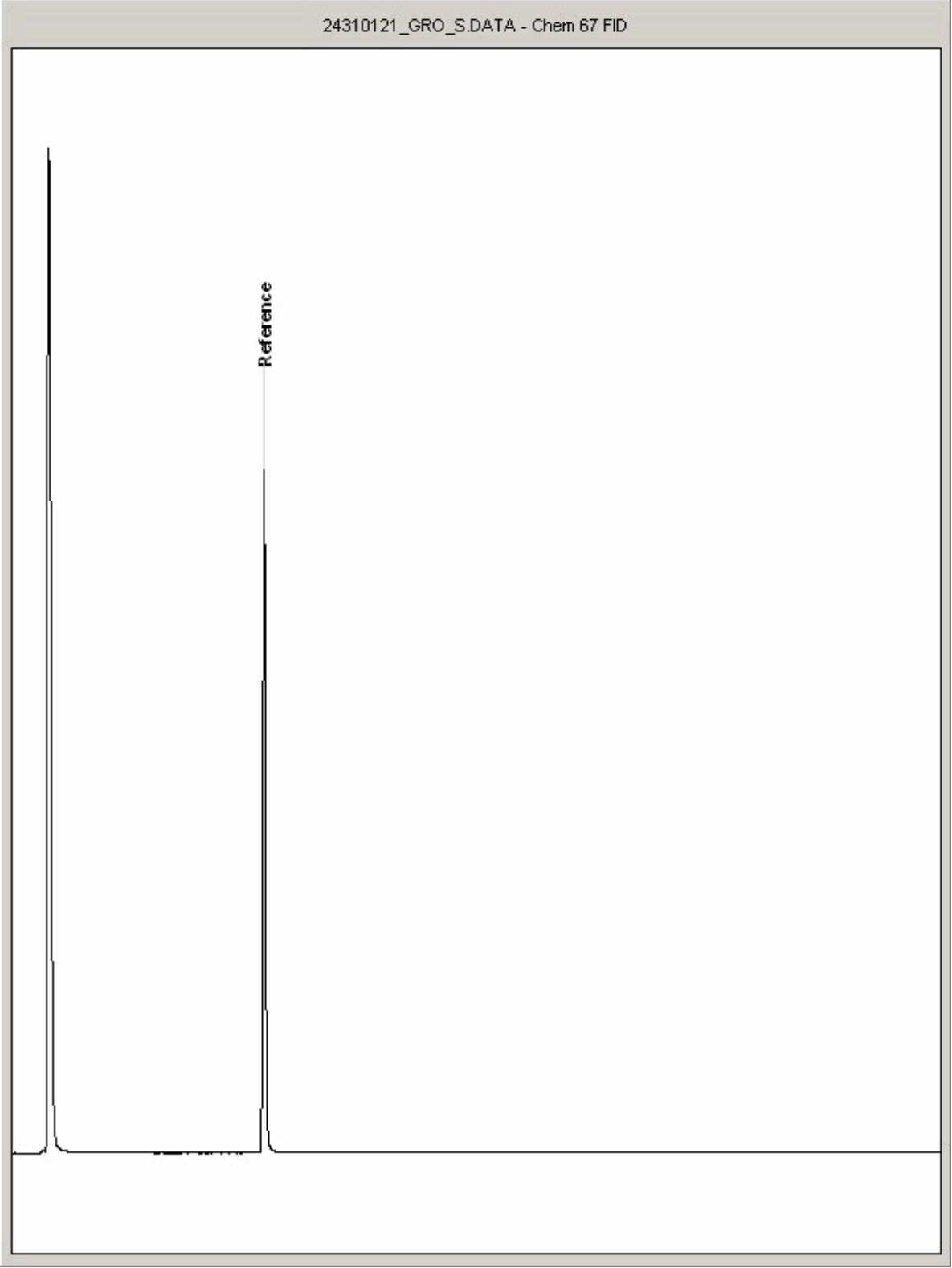
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SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
Location:	Cambridge South East Tra	Order Number:	7000964	Superseded Report:	

Chromatogram

Analysis: GRO by GC-FID (S) Sample No : 24310121 Depth : 0.10
Sample ID : TP - OBC - 04





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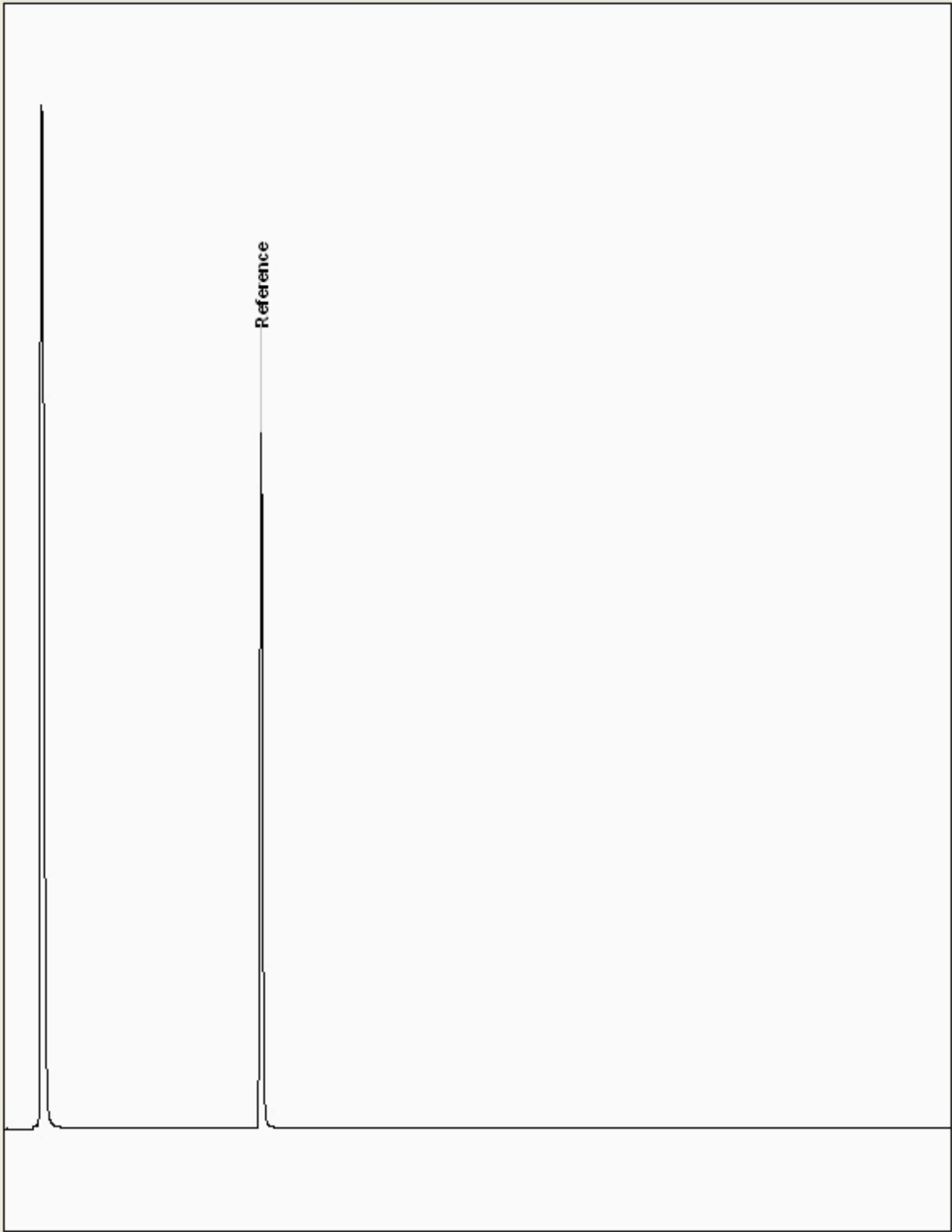
Validated

SDG:	210514-163	Client Reference:	B025563	Report Number:	599499
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Chromatogram

Analysis:	GRO by GC-FID (S)	Sample No :	24314527	Depth :	0.20
		Sample ID :	BH - PTR - 40		

24314527_GRO_S.DATA - Chem 67 FID



CERTIFICATE OF ANALYSIS

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Location:	Cambridge South East Transport - Ph	Order Number:	7000964	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.