The Cambourne to Cambridge Order

Transport And Works Act 1992

Transport And Works (Applications And Objections Procedure) (England And Wales) Rules 2006

Technical Report 11: Soil, Geology and Land Contamination

Document Reference	CtoC-11-TR11
Revision Number	00
Author	Greater Cambridge Partnership
Date	November 2024

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1 INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

1.1.1. This Technical Report of the Environmental Statement (ES) reports on the likely contamination effects to arise from the construction stage and the operational stage of the C2C Scheme.

1.1.2. The Scheme runs between the edge of Cambridge city centre and Cambourne, 8 miles west of Cambridge. It will serve existing and growing settlements along the route, including Cambourne and Hardwick, and future developments, including Bourn Airfield and Cambourne West.

1.1.3. The Scheme consists of the following main elements:

- a two-way guided busway 13.6 kilometres in length commencing at Sterling Way, Cambourne and terminating at Grange Road, Cambridge segregated from local highways except for stretches along St Neots Road and Charles Babbage Road;
- intermediate bus stops along the route and an emergency and maintenance access track to be dedicated as a bridleway running alongside the two-way guided busway for most of the length of the guided busway (the Service Track);
- a new travel hub building and Park and Ride site east of Scotland Farm with access for the buses over the existing A 428 bridge;
- new bridges over the M11 and at Bin Brook to provide for the two-way guided busway and adjoining emergency and maintenance track; and
- access roads, temporary compounds, stopping up, diversion and creation of public rights of way, highway crossings, drainage works and attenuation and infiltration ponds.

1.1.4. Further details about the Scheme proposal are set out in Chapter 3 of the ES[1].

The Technical Report is supported by the following technical appendices in this ES Volume:

- **Appendix TR11.1: Mott MacDonald Geotechnical and Geo-environmental Preliminary Risk Assessment**[2];
- **Appendix TR11.2: RPS Desk Study for Potential Unexploded Ordnance Contamination**; and
- WSP ES Scoping Report[3].

1.1.5. This Technical Report assesses the following potentially significant effects:

- The potential for disturbance of existing contaminated land associated with the construction and operational phases of the C2C Scheme;

[1] Environmental Statement
[2] Geotechnical and Geo-environmental Preliminary Risk Assessment (Document reference: 392438-MMD-HWA-XX-RP-GE-0001)
[3] ES Scoping Report

- The potential that construction could establish pathways between pollutants and receptors associated with the construction phase of the C2C Scheme;
- Effects on users/adjacent users associated with the construction and operational phases of the C2C Scheme;
- Effects on controlled waters (from the mobilisation of contaminants) associated with the construction and operational phases of the C2C Scheme;
- Effects on buried infrastructure (including buried services and foundations) associated with the construction and operational phases of the C2C Scheme;
- Effects on mineral resource to avoid unnecessary sterilisation of mineral resources and encourages prior extraction where practicable and viable before non-mineral development takes place to monitor loss and /or contamination; and
- Effects on the loss of agricultural land to be replaced by built development and open space.

1.2 SUMMARY

1.2.1. This assessment has considered the potential contamination impacts and likely effects associated with the construction and operational stages of the C2C Scheme. The assessment has informed by the relevant national, regional, and local planning policies which have been outlined in **Section 3** and detailed within the Planning Statement[4].

1.2.2. During construction works, construction workers, site users / adjacent site users and off-site land uses could come into contact with contaminated soils, dust, vapours, ground gas, ground water and sediment. Existing contamination could be mobilised during foundation and infrastructure formation works, adversely affecting controlled waters (groundwater and surface water).

1.2.3. There will be a loss of above 20 hectares (ha) of Best Most Versatile Land (BMVL) due to construction and development works.

1.2.4. UXO could present a risk to all construction workers, site users and adjacent site users.

1.2.5. These impacts would be managed through implementation of standard, regulated health and safety protocols, standard practice measures within the Code of Construction Practice (CoCP)[5].

1.2.6. Overall, the construction of the C2C Scheme would result in a significant effect for the loss of over 20ha of BMLV. In respect of contamination on identified human health and controlled waters receptors with the implementation of mitigation measures outlined in the CoCP[5] the effects would not be significant.

[4] Planning Statement
[5] Code of Construction Practice

2 BASELINE ENVIROMENT

2.1.1. The baseline conditions are the environmental conditions against which the potential environmental effects of the C2C Scheme are assessed. The conditions refer to the present time and with no significant change predicted during the interim period before development works are programmed to commence. The data used for the baseline assessment for the ES is dated from 2020 to 2022.

2.1.2. The baseline conditions are summarised below with further details provided in the Mott MacDonald Geotechnical and Geo-environmental Preliminary Risk Assessment (PRA), dated May 2020[2] within **Appendix TR11.1: Mott MacDonald Geotechnical and Geo-environmental Preliminary Risk Assessment**[2] and the ES Scoping Report[3], dated February 2022.

2.2 HISTORICAL LAND USE

2.2.1. Information taken from the Mott MacDonald PRA suggests the majority of the C2C Scheme has been used as agricultural land with the development of several villages (to include farms, commercial, and industrial properties); the northern boundary of the Bourn Airfield; and roadways to include major roads (A428, and M11) present adjacent or bisecting the route.

2.2.2. RAF Bourn Airfield was constructed in 1940 and operational during WWII for bombing operations from 1941. The airfield was subject to at least six air raids/strategic bombing between 1941 and 1944. The airfield was given to the RAF Maintenance Command in 1947 and the station was closed in 1948. The land was partly sold for agricultural use. The remaining areas were used for light aircraft activities (Rural Flying Corps) and small industrial developments. Residual flying activities were retained until 2010 when the licence was rescinded.

2.3 SOILS

AGRICULTURAL LAND

2.3.1. The Agricultural Land Classification (ALC) maps are available and have been viewed on the Defra MAGIC Mapping. The ALC system is graded from 1 to 5 with the Best Most Versatile Land (BMVL) graded from 1 to 3a. The mapping is available in two data sets. A national dataset that is pre-1988 and a post 1988 data set that sub-divides Grade 3a and 3b, this mapping does not however cover all areas.

2.3.2. The post 1988 ALC dataset shows land between Cambourne and the Scotland Farm Travel Hub is made up of Grade 2, 3a and 3b quality land. The Grade 2 areas are associated with slight topographic lows which align with drainage features in the area, and consequently the route only crosses short stretches of this higher quality land.

2.3.3. From Hardwick to the M11 the only available dataset on MAGIC is the pre-1988 dataset, which shows the land is all categorised as Grade 2. This could be overly conservative as all the Grade 3a and 3b land in the more accurate post 1988 dataset is categorised as Grade 2 in the earlier dataset

2.3.4. The Natural England dataset indicates the vast majority of the C2C Scheme is within ALC Grade 2 land, the exceptions being the east of the M11 and around the village of Coton and Hardwick which is situated on ALC Grade 3 land.

2.3.5. WSP have measured the approximate area of BMVL within the C2C Scheme boundary. Where available the post 1988 mapping has been used which segregates Grade 3 to 3a and 3b. Where data is not available the pre-1988 mapping has been used. WSP have also viewed recent satellite imagery and discounted areas that have been developed post mapping including the development of Camborne (~1998) and the realigning of the A428 (~2005). An approximate area of up to 45 hectares (ha) (400,000 m^2) of BMVL will be within the C2C Scheme. It is understood an area of up to 6ha (60,000m^2) will be temporary land use and restored to the original land use. A total of up to 39ha of BMVL is therefore likely to be lost as part of the development.

MADE GROUND

2.3.6. Artificial ground is not recorded on BGS mapping but may be present on or within areas surrounding the C2C Scheme associated with historic extraction/infilling, industrial infrastructure associated with road construction and within the footprint of the Bourn Airfield. Anecdotal information indicates that the field west of the crossing point of the M11 contains M11 cutting spoil.

2.4 GEOLOGY AND HYDROGEOLOGY

2.4.1. The British Geological Survey (BGS) Map Sheet 187: Huntingdon (1:50,000, 1975) has been reviewed and the underlying geology is presented in **Table TR11-2-1** together with EA aquifer designations for the relevant geological units.

Table TR11-2-1 – Summary of Geological Sequence

Strata	EA Aquifer Designation	Groundwater vulnerability	Typical Thickness*
Superficial Deposits			
Oadby Member: Located across the western and central areas of the C2C Scheme. Noted to be absent east of Cambridge Road at Coton, across the M11 and the West Cambridge site towards Grange Road.	Secondary Undifferentiated	Medium	Variable – up to 20/25m thick
Bedrock Formations			
Kimmeridge Clay: Outcropping at the very western extremity of the C2C Scheme.	Unproductive Strata	Low	Up to 27m
Woburn Sands Formation: Overlying the Kimmeridge Clay within the area of Bourn Airfield (between Camborne and Highfields Caldecote).	Principal Aquifer	Medium	Up to 12m

Strata	EA Aquifer Designation	Groundwater vulnerability	Typical Thickness*
Gault Formation: Located across the majority of the Site with exception of the far western area (underlain by Kimmeridge Clay and Woburn Sands Formation). Formation anticipated to outcrop in the far eastern extent of the C2C Scheme.	Unproductive Strata	Unproductive	Up to 40m
West Melbury Marly Chalk Formation (Grey Chalk Subgroup): Overlying the Gault Formation from Madingley Mulch to the Coton Orchard.	Principal Aquifer	Medium to High	15 to 25m

*information taken from Mott MacDonald Geotechnical and Geo-environmental Preliminary Risk Assessment (Ref: 392438-MMD-HWA-XX-RP-GE-0001, Dated May 2020)

2.4.2. The Woburn Sands Formation has been identified as being part of the Cam and Ely Ouse Woburn Sands groundwater body. The groundwater body is long and narrow from south of Cambourne, across the Bourn Airfield and then northeast to Downham Market (occupying an area of 95.3km^2).

2.4.3. The isolated outcrop of the West Melbury Marly Chalk is not included within any designated groundwater body (under the Water Framework Directive) indicating the outcrop is a small and isolated that is not likely to hold any significant quantity of groundwater. The nearest chalk groundwater body is the Cam and Ely Ouse Chalk groundwater body which commences to the east of the River Cam in Cambridge which is not connected to the chalk underlying the C2C Scheme.

2.4.4. The Site is not located within an Environment Agency Source Protection Zone (SPZ). There are three recorded groundwater abstractions within 500m of the C2C Scheme located 200m north for general farming and domestic use; and 225m north and 260m northwest for industrial processing.

2.4.5. BGS borehole logs indicate groundwater was encountered within the Oadby Member from 0.35m to 17.7m below ground level (bgl); and the Gault Formation from 1.2m to 1.7m bgl. It is anticipated that the groundwater encountered within the Gault Formation is likely to be porewater and unlikely to be a continuous unit.

2.4.6. Hydrogeological mapping (Cambridge to Maidenhead) indicates that groundwater levels within the Lower Greensand (Woburn Sands Formation) range from 30m Above ordnance datum (AOD) in the west to 10m AOD in the east near the village of Coton.

2.5 HYDROLOGY

2.5.1. Hydrology is covered in detail in **ES Technical Report TR13: Water**. Along the C2C Scheme, there are many land drains which appear to be associated with the existing road infrastructure. Several small valley streams are recorded, including Callow Brook which transects the Site north of Hardwick and appears to run under the A428 through a culvert orientated north-east to south-west. The Brook is adjacent to the proposed Scotland Travel Hub.

2.5.2. Bin Brook lies directly within the C2C Scheme in Cambridge, orientated approximately north-east to south-west. A new bridge is proposed in this location. The River Cam confluence is approximately 1.6km downstream from the works of Bin Brook.

2.5.3. In the eastern area of the site between Charles Babbage Road and Grange Road, several ponds and land drains are present. The Site also crosses over the West Cambridge Canal, a water feature (non-navigational) which is orientated east to west adjacent to the Cambridge University Sports Centre.

2.5.4. The Mott MacDonald PRA identified two surface water abstractions are located 25m south east for industrial/commercial uses and 500m east for general farming and domestic use.

2.6 GEOTECHNICAL HAZARDS

2.6.1. The Oadby Member is likely to be moisture sensitive leading to potential deterioration of ground conditions; variable conditions leading to long term consolidation settlement of embankments; potential to contain cobbles/boulders resulting in obstructions to structures; and periglacial features (shallow shear surfaces and perched water) leading to slope instability.

2.6.2. The West Melbury Marly Chalk Formation is likely to be suspectable to frost; variable weathering zones, natural dissolution, and man-made cavities (e.g. sink holes, cave systems and tapering pipes) leading to potential subsidence and potential presence of compressible material.

2.6.3. The Gault Formation may have a variable strength / weathering which may lead to differential settlement and long-term consolidation settlement of embankments. The Formation may be susceptible to shrink/swell and may contain periglacial shallow shear surfaces leading to instability. Obstructions such as limestone bands may be present.

2.6.4. Sulphate bearing minerals / nodules may be present within the above formations leading to potential risk of buried structural elements to be attacked by aggressive ground.

2.7 RECORDED MINERAL SITES AND MINERAL SAFEGUARDING

2.7.1. One BGS Recorded Mineral Site is present within 500m of the C2C Scheme. Coton Chalk Pit is situated 150m south, production within this pit is recorded as being ceased. There are three records of man-made mining cavities, situated 75m north, 360m south and 330m south the purpose of which was historical mining of coprolite.

2.7.2. The Cambridgeshire and Peterborough Minerals and Waste Local Plan indicates that there are Mineral Safeguarding Areas (MSA) located within the C2C Scheme boundary areas:

- Sand and Gravel MSA located at the eastern extremity of the C2C Scheme; and
- Chalk MSA located between Coton to the M11 and potentially within eastern extremities of the C2C Scheme.

2.7.3. As discussed within the **ES Technical Report 10: Material Assets and Waste** the Sand and Gravel MSA has already undergone development and the Chalk MSA is relatively small compared to the size of the available resource.

2.7.4. There are no allocated mineral safeguarded sites identified within the C2C Scheme and therefore does not sterilise any mineral safeguarding site.

2.7.5. Based on the information above and within **ES Technical Report 10: Materials Assets and Waste**, WSP do not consider there to be a significant mineral resource and associated impact with regard to the sterilisation of minerals, the effect on minerals will not be carried forward for further assessment.

2.8 UNEXPLODED ORDNANCE (UXO)

2.8.1. The Preliminary UXO Threat Assessment completed by 6 Alpha Associates (see Appendix E: Preliminary UXO Risk Assessment Report in **Appendix TR 11.1: Mott MacDonald Geotechnical and Geo-environmental Preliminary Risk Assessment**[2]), dated March 2020 recorded the potential for unexploded WWI and WWII ordnance to exist at the western quarter of the site, notably around Bourn Airfield, to be likely with a 'High' threat potential. It was recommended that a detailed UXO threat and risk assessment was to be completed within this area. The eastern areas were assessed as being unlikely with a 'Low' threat potential and no further action is required in accordance with CIRIA C681.

2.8.2. A desk study was completed by RPS, dated September 2017 (Ref:EES0823) provided as **Appendix TR11.2: RPS Desk Study for Potential Unexploded Ordnance Contamination**, within the vicinity of the Bourn Airfield. The assessment concluded a Moderate risk from UXO. Mitigation measures recommended to be implemented include an explosives safety and awareness briefing and an explosives safety consultancy on call in support of works taking place across the area. For all areas of intrusive works, mitigation measures include an intrusive magnetometer survey ahead of piling / boreholes (where practical), explosives site safety support for excavations, and safety awareness briefings / site safety guidance.

2.8.3. The **Technical Report 09: Major Accidents and Disasters** also includes the above mitigation measures to be completed during the construction phase.

2.9 POTENTIAL SOURCES OF CONTAMINATION

2.9.1. Based on a review of the Mott MacDonald preliminary risk assessment on-site sources of potential contamination comprise:

- Potential for impacted Made Ground from historical and current land uses from Bourn Airfield and associated ancillary buildings in the west of the C2C Scheme;
- Electricity sub-stations located in the central area of the C2C Scheme;
- Artificial ground associated with the construction and operation of the British Antarctic Survey and University of Cambridge campus buildings and associated electricity substations located in the central eastern area of the C2C Scheme. Contaminants include the storage, use and disposal of radioactive waste; and polychlorinated biphenyls (PCBs) associated with the electricity substations;
- Construction of previous and current infrastructure (roads/highways);
- Fuel / oil spillages and airborne particulates migrating into the underlying ground with the current vehicle usage of the roads/highways;
- Agricultural land including the application of pesticides and sewage sludge to the ground (agricultural land), and localised fuel / oil spillages from agricultural machinery; and

- Asbestos and other contaminants disturbed during demolition of Atlas Building on West Cambridge campus.

2.9.2. Potential off-site sources of contamination within 500m comprise:

- Impacted Made Ground from adjacent previous and current infrastructure (roads/highways); Born Airfield and related works and ancillary buildings; and construction and operation of the British Antarctic Survey and University of Cambridge campus buildings;
- Petrol filling station within 250m of the C2C Scheme to the north-east of Bourn Airfield, potential for fuel/oil spillages and airborne particulates;
- Electricity substation within 250m of the central part of the C2C Scheme;
- Mineral extraction activities and potential for subsequent infilling with unknown material;
- Fuel / oil spillages and airborne particulates migrating into the underlying ground with the current vehicle usage of the roads/highways;
- Potentially contaminative industries within 500m of the site; and
- Agricultural land including the application of pesticides and sewage sludge to the ground (agricultural land), and localised fuel / oil spillages from agricultural machinery.

2.10 CONTAMINATION PATHWAYS

2.10.1. The plausible contaminant pathways for the C2C Scheme include:

2.10.2. Human Health:

- Dermal Contact;
- Direct Ingestion;
- Direct exposure to impacted shallow groundwater and/or surface water;
- Inhalation of particulates/fibres and/or soil/water derived vapours; and
- Asphyxiation by accumulation of ground gases in internal/confined spaces.

2.10.3. Groundwater / geology:

- Leaching of contaminants through the unsaturated zone and subsequent impact on groundwater; and
- Lateral migration of impacted groundwater.

2.10.4. Surface water features:

- Surface water runoff; and
- Migration of immiscible contaminants.

2.10.5. Below Ground Services

- Direct contact with corrosive substances (e.g. sulphates and hydrocarbons) in the soils and shallow groundwater).

2.10.6. Agricultural Land

- Leaching of contaminants;
- Surface water runoff;

- Lateral migration of impacted groundwater; and
- Migration of immiscible contaminants.

2.11 SENSITIVE RECEPTORS

2.11.1. The following receptors may be impacted by potential sources of contamination within the C2C Scheme. These have been separated into four categories.

2.11.2. -Human Health:

- Construction / maintenance workers;
- Current / future users including passengers, road and pavement users; and
- Off-site non-users in the immediate vicinity including neighbouring residents.

2.11.3. -Controlled Waters:

- Groundwater – Secondary Undifferentiated Aquifer (Oadby Member); and Principal Aquifers (Woburn Sands Formation and West Melbury Marly Chalk); and
- Surface waters – On and off-site features including ponds and small streams bisecting the C2C Scheme and Bin Brook located 200m south.

2.11.4. -Below Ground Services:

- Potable water supply pipes (if present);
- Buried concrete; and
- Foundations.

2.11.5. -Agricultural Land

- Best Most Versatile Land (BMVL) – Grades 1, 2 and 3a.

3 METHODOLOGY SUMMARY

3.1.1. The assessment has been informed by the following legislation, policies, and published guidance:

International Legislation:

- Water Framework Directive (WFD) (European Council, 2000);
- Environmental Quality Standards (EQS) (European Council , 2008); and
- Priority Substances Directive (European Council, 2013).

National Legislation and Policy:

- Part 2A of the Environmental Protection Act 1990 (EPA) (Secretary of State, 1990) as inserted by S.57 of The Environment Act (Secretary of State, 1995);
- The Contaminated Land (England) Regulations (Secretary of State, 2012); and
- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021).

Local Policy relevant to South Cambridgeshire can be found in South Cambridgeshire Local Plan (South Camebridgeshire District Council, 2018)**:**

- Policy NH/3 (Protecting Agricultural Land);
- Policy CC/6 (Construction Methods; and
- Policy SC/11 (Contaminated Land).

Local policy relevant to Cambridge can be found in the Cambridge City Local Plan (Cambridge City Council, 2018)**:**

- Policy 8 (Setting of the city); and
- Policy 33 (Contaminated Land).

National Guidance and Industry Standards:

- Investigation of Potentially Contaminated Sites Code of Practice (British Standards Institute, 2011);
- Land Contamination: Risk Management (LCRM) (Environment Agency , 2020);
- Guidance on the legal definition of contaminated land (Department for Environment, Food and Rural Affairs (DEFRA), 2008);
- Guiding Principles on Land Contamination (Environment Agency, 2010);
- Human Health Toxicological Assessment of Contaminants in Soil (Environment Agency, 2008);
- Updated Technical Background to the Contaminated Land Exposure Assessment (CLEA) Model (Environment Agency , 2008);
- C665: Assessing risks posed by hazardous ground gases to buildings (Construction Industry Research and Information Association , 2007);
- Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health and Volatile Contaminates in Groundwater (The Society of Brownfield Risk Assessment (SOBRA), 2017);
- EA's approach to groundwater protection (Environment Agency, 2018);
- Anti-Pollution Works Regulations (Secretary of State, 1999);

- Water Framework Directive Directions (Secretary of State, 2017);
- The Water Supply (Water Quality) Regulations (Secretary of State, 2016);
- Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UK Water Industry Research (UKWIR), 2010);
- Special Digest 1. 3rd Edition (including February 2017 amendments), Concrete in aggressive ground (Building Research Establishment (BRE), 2005);
- Waste Classification Guidance on the calcification and assessment of waste (Environment Agency, 2015); and
- National Quality Mark Scheme for Land Contamination Management (CL:AIRE, 2020).

Methodology

3.1.2. The methodology for the assessment of potential soil contamination at the Site reflects the requirements of Part 2A of the Environmental Protection Act (Secretary of State, 1990).

3.1.3. The basis of the EIA Requirements with respect to contamination would be a qualitative assessment, using information provided within existing baseline studies and applying professional judgment to consider the significance of potential risk, the latter of which will be based on the likelihood of a complete pollutant linkage being created as a result of the C2C Scheme (the source-pathway-receptor methodology, hereafter referred to as the 'conceptual site model'; CSM).

3.1.4. For transparency, the approach adopted in applying professional judgement would be confirmed by clearly setting out the sensitivity of receptor criteria, magnitude of impact criteria and scale of effect matrix.

3.1.5. The following tiered risk-based approach will be followed, underpinned by a CSM:

- Tier 1 - Development of the specific CSM;
- Tier 2 - Assessment of site investigation results against Soil Guideline Values (SGVs) or Generic Assessment Criteria (GAC) where available; and
- Tier 3 - Assessment of site investigation results against Site Specific Assessment Criteria (SSAC) as derived by Detailed Quantitative Risk Assessment (DQRA).

3.1.6. In accordance with the LCRM (Environment Agency , 2020) document, the effects associated with contamination have been assessed by means of the source/contaminant-pathway-receptor methodology, which can be summarised as follows:

- Contaminant: contamination that has the potential to cause unacceptable adverse impacts to a receptor. This may comprise chemical, biological, or physical agents;
- Receptor: a target that may be affected by contamination; examples include human occupants or users of the site, water resources or structures; and
- Pathway: a route whereby a contaminant may come into contact with a receptor; examples include ingestion of contaminated soil and leaching of contaminants from soil into water resources.

3.1.7. The sensitivity of receptors and outline methodology for assessing significance would be based on relevant guidance including Design Manual for Road and Bridges (DMRB) LA 109 (Standards For Highways, 2019).

3.1.8. For contamination to present a potential effect, a contaminant linkage must first be established using the Conceptual Site Model approach. The likelihood must be demonstrated that there is an identifiable source of contamination (be it an on-site or off-site source), sensitive receptors and a viable pathway through which the former may affect the latter.

Demolition and Construction Stage

3.1.9. The assessment of potential impacts and likely effects has, therefore, comprised the following approach:

- Identification and establishment of the sensitivity of receptors on the basis of their use, proximity to the site, existing quality, or resource value;
- Consideration of potential source-pathway-receptor linkages;
- Evaluation of the magnitude of potential impacts from potential contamination as a result of the introduction of the C2C Scheme;
- Consideration of embedded mitigation measures integral to the proposed development proposals;
- Classification of the significance of likely effects;
- Identification of additional mitigation measures to eliminate or reduce residual effects, where considered necessary; and
- Re-assessment to conclude the significance of residual effects.

Operational Stage

3.1.10. The demolition and construction stage methodology has been applied to the identification of likely significant effects during the operational stage.

ASSESSMENT CRITERIA

3.1.11. The scale and significance level attributed to each effect has been assessed based on the sensitivity of the affected receptor(s) and the magnitude of change (or 'impact') arising from the C2C Scheme.

3.1.12. The sensitivity of receptors has been classified as low, medium, or high, in accordance with the criteria set out in **Table TR11-3-1**.

Table TR11-3-1 – Receptor Sensitivity Criteria

Sensitivity	High	Medium	Low	Negligible
Human health (construction / maintenance workers and site users and adjacent site users)	Residential properties with private gardens Schools/care homes/ hospitals /playing fields Construction/ maintenance workers	Residential properties without plant uptake retail and business parks (public and workplaces) Public open spaces	Commercial/ industrial properties, highways, and rail.	N/A

Sensitivity	High	Medium	Low	Negligible
Controlled waters (groundwater and surface water)	EA defined principal aquifers EA defined secondary A aquifers overlying principal aquifers EA groundwater SPZ 1 Surface water bodies of high quality	EA defined secondary A and B aquifers (where not overlying principal aquifers) EA groundwater SPZ 2 and 3 surface water bodies of moderate quality	EA defined unproductive strata and secondary undifferentiated aquifers Minor local drainage network	N/A
Buried structures (services and buried concrete)	Residential property, related infrastructure, and services to be utilised by people.	Potable water supply pipes and buried concrete. Commercial or industrial related infrastructure, where services are not required to be utilised by people.	Infrastructure with no requirement for service.	N/A
Agricultural land	Soils directly supporting a designated site e.g. SAC, SPA, Ramsar Soils directly supporting a designated UK site e.g. SSSI Agricultural Land Classification (ALC grade 1, 2 and Grade 3a	Soils supporting non-statutory designated sites e.g. local nature reserves ALC Grade 3b	Soils supporting non-designated notable or priority habitats ALC Grade 4 or 5	N/A

3.1.13. The magnitude of impact has been classified as low, medium, or high, in accordance with the criteria set out in **Table TR11-3-2**.

Table TR11-3-2 – Impact Magnitude Criteria

Magnitude of Impact	Definition
High	Total loss or major alteration to key elements/features of the baseline. Results in loss of attribute and/or likely to cause exceedance of statutory objectives and/or breach of legislation.
Medium	Partial loss or alteration to one or more key elements/features of the baseline. Results in effect on integrity of attribute/or loss of part of attribute, and/or possibly cause exceedance of statutory objectives and/or breach of legislation.
Low	Minor shift away from baseline. Results in minor effects on attribute.
Negligible	Very slight change from baseline Results in a very slight change or effect on attribute.

3.1.14. The impact magnitude criteria for agricultural land as a result of the C2C Scheme are detailed within **Table TR11-3-3.** This have been based on professional judgement and guidance within Roads and Bridges (DRMB) LA 109 (Standards For Highways, 2019).

Table TR11 3-3 – Impact Magnitude Criteria for Agricultural Land

Significance criteria	Definition
Major adverse	Permanent loss or degradation of over 20ha of best and most versatile land (BMVL), or entire regional resources of BMVL (ALC Grades 1, 2, 3a)
Moderate adverse	Permanent loss or degradation of 5-20ha of BMVL, or large proportion of regional resource of BMVL.
Minor adverse	Permanent loss or degradation of <5ha of BMVL, or small proportion of regional resource of BMVL.
Negligible adverse	Permanent loss or degradation of non-BMVL.
No change	No observable impact in either direction, positive or negative.

3.1.15. Unless otherwise stated in the Technical Reports of this ES, effects that are classified as minor or above are considered **significant**. Effects classified as below minor are considered **not significant**.

3.1.16. The scale of effects have been determined on the basis of the sensitivity of receptors against the magnitude of impact as presented in **Table TR11-3-4**.

Table TR11-3-4 – Scale of Effect Criteria

		Sensitivity of receptor			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change	**High**	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

3.1.17. Negligible effects can also be used in isolation when achieving a particular threshold, absolute value, or target criteria. Accordingly, negligible effects are considered to be not significant and not a matter of local concern.

DEFINING THE BASELINE

Desk Study

3.1.18. An understanding of the likely baseline conditions have been established with reference to the following:

- Natural England Multi-Agency Geographic Information for the Countryside (MAGIC);
- British Geological Survey (BGS) Map Sheet 187, Solid and Drift – Huntingdon (1:50,000, 1975);
- British Geological Survey (BGS) Map Sheet 187, Solid and Drift – Cambridge (1:50,000, 1981);
- Geology of Britain Viewer, (http://mapapps.bgs.ac.uk/geologyofbritain/), BGS, last viewed: September 2022; and
- Mott MacDonald Cambourne to Cambridge Geotechnical and Geo-environmental Preliminary Risk Assessment (PRA), dated May 2020.

3.1.19. The aim of the PRA was to highlight the key contamination constraints / ground risks associated with the Site. The PRA includes a review of previous reports and provides a Conceptual Site Model that has been used to inform the assessment.

Site Visit

3.1.20. WSP completed a site visit during May 2022 to identify access routes for a site investigation. A geotechnical site investigation was undertaken by WSP in areas of the C2C Scheme between September and November 2022. There has not been a formal site walkover conducted for the Mott MacDonald PRA due to restrictions, therefore the report has been based on desk-based information.

Extent of the Study Area

3.1.21. The extent of the study area for the assessment of ground conditions encompasses information on current and historical anthropogenic activities for all options in the following areas:

- Within the Site;
- Within 500m of the Site for human health receptors; and
- Within 500m of the Site for controlled waters receptors.

3.1.22. The extent of this zone has been developed using professional judgement on the basis that contamination migration beyond this distance is likely to be negligible.

3.1.23. Site plans are presented within **Appendix TR11.1: Mott MacDonald Geotechnical and Geo-environmental Preliminary Risk Assessment**[2]

Evolution of the Baseline

3.1.24. If the C2C Scheme is not implemented, it is anticipated (based on professional opinion) that the baseline ground conditions within the Study Area would remain the same and as defined later in this Technical Report.

ASSUMPTIONS AND LIMITATIONS

3.1.25. The assessment has relied on data provided within public domain environmental databases as well as third party, desk study data, the EA, and other third-party sources as appropriate. The assessment of ground conditions has utilised a PRA completed by Mott MacDonald in May 2020 and third-party information (presented as **Appendix TR11.1)**.

3.1.26. UXO Threat Assessment has been provided by 6 Alpha Associates, provided within Appendix E of the Mott MacDonald PRA in **Appendix TR11.1** and RPS, dated September 2017 (Ref: EES0823) provided as **Appendix TR11.2**. It has been assumed that the data sets within these reports have been reported correctly.

3.1.27. It has been assumed that areas of agricultural land marked as ‘temporary use with permanent rights’ will be returned to agricultural land.

4 EMBEDDED MITIGATION

4.1 CONSTRUCTION MITIGATION

4.1.1. **Section 8** of the CoCP[5] sets out measures to be implemented to reduce potential impacts on geology and soils. Measures implemented will include undertaking ground investigation work, risk assessments, monitoring of ground movement, groundwater, and ground gas, and undertaking structural or condition surveys of buildings or structures adjacent to the works where there may be potential risks of ground movements which may damage structures.

4.1.2. The Principal Contractor will be required to implement measures as set out in the CoCP[5] and summarised below to minimise the risk of contamination from construction activities:

- Provision of designated storage facilities with appropriate signage;
- Separate inert, non-hazardous and hazardous waste to include the completion of a waste classification;
- Skips and storage receptacles will be sheeted/lidded and remain closed when waste will not be deposited into them;
- Comply with air quality management measures;
- Provision of spill kits, bunding/drip trays and securing and restricting access to fuel storage containers;
- Correct storage of oil-based materials will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001, as amended, and GPP2: Above ground oil storage tanks. Should below ground storage tanks be required during the works GPP27: Installation, decommissioning and removal of underground storage tanks, and relevant government guidance must be complied with;
- Comply with the GPP26: safe storage – drums and intermediate bulk containers in relation to commercial storage handing and use;
- Comply with CIRIA C741. Environmental Good Practice on Site (4th Edition) (CIRIA, 2015); and
- Comply with CIRIA C532. Control of Water Pollution from Construction Sites (CIRIA, 2011).

4.1.3. A summary of additional specific mitigation measures for identified receptors has been summarised below. The measures will be secured by a planning condition, completed by a competent qualified person; and approved by the Local Authority and Environment Agency.

4.2 MITIGATION MEASURES

Human Health – Construction/maintenance workers; current users; and off-site users in the immediate vicinity of the C2C Scheme including neighbouring residents.

4.2.1. The following mitigation measures shall be implemented to address the potential effects on human health receptors:

4.2.2. Completion of a Phase 2 Contaminated Land Ground Investigation and production of a Generic Quantification Risk Assessment (GQRA) to confirm the baseline and allow characterisation and quantification of the contamination risks in the C2C Scheme and confirm the geological and hydrogeological regime as well as to inform on design.

4.2.3. If required, production of a Remediation Method Statement (RMS) which would specify the remediation measures required to reduce the risk to human health and controlled waters to an acceptable level. Measures would likely comprise, but not necessarily limited to:

- Removal / treatment of contamination hotspots, likely to be present within the area of Bourn Airfield;
- Installation of clean cover in areas of soft landscaping to include areas surrounding the Scotland Travel Hub; and
- A verification report to confirm the successes of the remediation (if required).

4.2.4. As discussed within the CoCP **Section 12.3**, the reuse of soil within the C2C Scheme shall be governed by the production of a Materials Management Plan (MMP) in which chemical criteria shall be specified for the import of soils/fill material from off-site and for the reuse of site won material. The stripping, storage and reuse of subsoil shall be carried out in accordance with BS 8061:2013 (British Standards Institution (BSI), 2013); and construction activities shall also be undertaken in accordance with appropriate CIRIA guidance as detailed above.

4.2.5. In areas where a high threat for UXO has been identified (western areas associated with and surrounding Bourn Airfield), the following UXO mitigation measures should be completed in all areas of intrusive works:

- An intrusive Magnetometer Survey ahead of piling / boreholes if/where practical;
- Explosives site safety support for excavations; and
- Safety and awareness briefings / site safety guidelines.

Controlled Waters - Groundwater – Secondary Undifferentiated Aquifer (Oadby Member); and Principal Aquifers (Woburn Sands Formation and West Melbury Marly Chalk). Surface waters – On and off-site features including ponds and small streams bisecting the C2C Scheme and Bin Brook.

4.2.6. To address the potential effects on ground and surface water receptors, the following embedded mitigation measures will be implemented, in addition to the measures identified above for human health receptors (construction/maintenance workers, site users, adjacent site users) and mitigation outlined in **Section 13** of the CoCP[5].

4.2.7. Completion of Phase 2 Contaminated Land Ground Investigation to assess ground conditions and extent of any contamination present within the C2C Scheme. To confirm contamination of underlying groundwater (if present) as well as determining groundwater levels and groundwater flow direction as part of a groundwater monitoring programme.

The Principal Contractor will undertake additional measures as detailed in the CoCP[5] including:

- The use of spill trays when refuelling;
- Treating water removed from excavations prior to discharge is considered likely to reduce identified impacts;
- Water removed from any excavations will be disposed of or discharged in accordance with EA requirements; and
- Implementation of a temporary drainage network to prevent surface runoff (silts, muds) from leaving the Site or entering surface water drains.

4.2.8. If the preferred foundation solution includes piles, a Piling Works Risk Assessment (PWRA) may be required to confirm the absence of significant risk or mitigation measures required to limit the risk of contamination to deeper water bodies further discussed in **Section 8.3.6** of the CoCP[5].

4.2.9. The measures will be secured by a planning condition, completed by a competent qualified person; and approved by the Local Authority and Environment Agency.

Below ground Services – Potable water pipes (if present), buried concrete and foundations.

4.2.10. To address the potential effects on potable water pipes (if present) and buried structures the following measures will be implemented.

4.2.11. Completion of a Phase 2 Contaminated Land Ground Investigation to assess corrosive / aggressive ground conditions present underlying the C2C Scheme.

4.2.12. The adoption of barrier type materials for potable water supply pipes in accordance with UK Water Industry Research (UKWIR) will be considered to prevent contaminant ingress (if present).

4.2.13. To prevent any adverse effects to below ground structures, appropriate techniques and design solutions will be considered during the design of the C2C Scheme, these will include Appropriate concrete in accordance with BRE Digest 1. 3rd Edition (including February 2018 amendments) (Building Research Establishment (BRE), 2005); and dedicated service corridors with clean, validated backfill.

Geology

4.2.14. There are no significant mineral resources, so no mitigation is needed.

Agricultural Land – The Loss of Best Most Versatile Land

4.2.15. Measures to reduce the potential impact on agricultural land have been outlined in **Section 4.0** of the CoCP[5]. Measures relating to the protection of soils are summarised, below:

4.2.16. The measures will be implemented in accordance with the Department for Environment, Food and Rural Affairs' (Defra) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009) in relation to working on or adjacent to agricultural land.

4.2.17. Surveys will be undertaken to inform agricultural restoration, landscape design and ecological mitigation measures. The surveys will recommend methods for handling and storing soils to protect their natural functions during the construction period.

4.2.18. Soils will be handled under suitable weather and soil conditions using appropriate machinery (typically machinery is included in Sheets 1 to 4 of the MAFF Good Practice Guide for Handling Soils, April 2000).

4.2.19. Soils will be handled when least susceptible to damage and in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.

4.2.20. The storage of soils will include segregating different soils, handling soils in a dry condition, sealing of stockpiles and prevention of soil contamination including the control of weeds either via treatment or removal.

4.2.21. Where land is to be reinstated to agricultural use, works will be in accordance with the contract specification, Defra guidance and under appropriately qualified supervision.

5 ASSESSMENT OF IMPACTS AND EVALUATION OF EFFECTS

5.1 TEMPORARY CONTRUCTION EFFECTS

Contamination – Soils

5.1.1. Risks from contamination (if any) in underlying soils will be confirmed by the results of intrusive investigations and managed as part of a Remediation Method Statement (if required) as set out in the CoCP[5]. The works required will be confirmed by a planning condition and approved by the Local Authority and Environment Agency. All construction works will be completed in accordance with best practice and guidance. Providing these mitigation measures are in place, potential impacts on contamination will be managed and no significant effects on human health receptors (demolition and construction works, site users and adjacent site users) are likely to occur. The sensitivity of human health receptors is high, and the magnitude of impact after the implementation of embedded mitigation is negligible, resulting in a direct, long term**, negligible effect (not significant)**.

Unexploded Ordnance (UXO)

5.1.2. The preliminary risk from UXO has been identified as a high threat within the area of Bourn Airfield and a low risk for the remaining areas of the scheme. A desk study within the area of Bourn Airfield identified a moderate risk with recommended mitigation measures provided for all intrusive works. The mitigation measures will be in place prior to and throughout any intrusive works being completed including an intrusive magnetometer survey, site safety support and awareness briefings. This should be arranged by the Principal Contractor and associated Contractor associated with the intrusive works. All construction works will be completed in accordance with best practice and guidance as detailed in the CoCP and should be managed by the Principal Contractor and competent/qualified persons appointed for the works. Providing these mitigation measures are in place, potential impacts on UXO will be managed and no significant effects on human health receptors (demolition and construction workers, site users and adjacent site users) are likely to occur. The sensitivity of human health receptors is high, and the magnitude of impact after the implementation of embedded mitigation is negligible, resulting in a direct, long term**, negligible effect (not significant)**

Contamination – Controlled Waters

5.1.3. The occurrence of contamination in regard to controlled waters will be confirmed by the results of an intrusive investigation and managed as part of a Remediation Method Statement (if required) as set out in the CoCP[5]. All construction works will be completed in accordance with best practice and guidance. The works required will be confirmed by a planning condition and approved by the Local Authority and Environment Agency. This will reduce and control spillages of fuels preventing migration to shallow groundwater or nearby surface water features; and the correct storage of waste materials/soils will reduce the potential for mobilisation of contaminated surface water run-off.

5.1.4. Consideration for the potential vertical mobilisation of contaminants via piling to underlying sensitive aquifers will be monitored via a piling works risk assessment. The assessment of this will be via a planning condition and approved by the Local Authority and Environment Agency. Providing these measures are in place, potential impacts on contamination will be managed and no significant effects on controlled water receptors (underlying aquifers and onsite / nearby surface water

features) are likely to occur. The sensitivity of controlled water receptors is high, and the magnitude of impact after the implementation of embedded mitigation is negligible, resulting in a direct, long term**, negligible effect (not significant)**.

Corrosive Ground Conditions

5.1.5. There may be the potential for there to be aggressive/ corrosive ground conditions (high pH or resistivity within soils and rocks) and the potential for elevated sulphate concentrations to be present in the ground which could detrimentally affect buried concrete and below ground services. This would include bridge foundations for the proposed M11 Overbridge and the Bin Brook Bridge; and below ground services including any water supply pipes that may be required for the Scotland Travel Hub.

5.1.6. The occurrence of aggressive ground conditions will be confirmed by the results of an intrusive investigation and mitigated as part of concrete design / protection barriers to be installed in accordance with guidance and best practice during the construction phase. The works will be approved by a competent person and relevant regulatory body Providing these mitigation measures are in place, potential impacts on contamination will be managed and no effects on buried concrete and supply pipes are likely to occur. The sensitivity of below ground services / foundations is medium, and the magnitude of impact after the implementation of embedded mitigation is negligible, resulting in a direct, long term**, negligible effect (not significant)**.

Agricultural Land

5.1.7. There will be the potential sterilisation of up to 45 ha (450,000m^2) of BMVL as a result of the construction of the C2C scheme. The impact will be managed by the completion of surveys, the correct handling and storage of the soils and consideration for temporary land use to be restore as much as possible. The works will be approved by a competent person and relevant regulatory body. It is understood approximately up to 6 ha (60,000m^2) will be restored to agricultural land from the temporary works areas, therefore a total of up to 39ha of BMVL is likely to be lost as part of the scheme.

5.1.8. The sensitivity of agricultural land is high and the magnitude of impact after the implementation of embedded mitigations will be major adverse due to a loss of over 20 ha of BMVL, resulting in a direct, **permanent, long-term major effect (Significant)**.

5.2 PERMANENT AND OPERATIONAL EFFECTS

5.2.1. Design measures and embedded mitigation would be in place specifically relating to potential contamination impacts following the completion of the construction phase. Specific measures would include:

- Remediation works where required to include removal of impacted soils;
- Concrete design and barrier pipes to withstand any aggressive ground conditions (if identified) during the ground investigation. This would include foundations for bridges and supply pipes to the Scotland Travel Hub;
- Re-use of chemically suitable site-won and imported soils;
- Implementation of surface water drainage systems to include interceptors for any future fuel / chemical spills;

- Provision of cover systems over any contamination that will remain in the ground including proposed hardstanding and a clean cover of topsoil within designated open / landscaping areas;
- Installation of ground gas protection measures (if required) within new buildings including the Scotland Travel Hub; and
- Suitable chemical, fuel and waste storage for permanent use (where required).

5.2.2. The measures will be secured by a planning condition, completed by a competent qualified person; and approved by the Local Authority and Environment Agency.

Contamination – Soils

5.2.3. The occurrence of contamination will be addressed during the construction phase, this will include remediation works (where required) and mitigation measures as outlined above. Providing these are in place the potential for exposure of any residual contamination to maintenance workers and future site users will be limited.

5.2.4. The sensitivity of maintenance workers and future site users would be high, and the magnitude of impact after the implementation of mitigation measures would be negligible resulting in a permanent, long-term, **negligible effect (not significant**).

Contamination – Controlled Waters

5.2.5. The occurrence of contamination will be managed during the construction phase, this will include remediation works (where required) and mitigation measures as outlined above including the installation of hardstanding to limit vertical migration and installation of drainage and interceptors for any future fuel spillages from future site users. Providing these are in place the potential for exposure of any residual contamination to controlled waters will be limited.

5.2.6. The sensitivity of controlled waters (groundwater and surface water) would be high, and the magnitude of impact after the implementation of mitigation measures would be negligible, this would result in a permanent, long-term, **negligible effect (not significant**).

6 SUMMARY OF LIKELY SIGNIFICANT EFFECTS

6.1.1. This assessment has considered the potential contamination impacts and likely direct and indirect significant effects associated with the construction and operational stages of the C2C Scheme. The assessment has informed by the relevant national, regional, and local policy framework and published guidance outlined in the ES Scoping Report[3] (dated February 2022).

Table TR11-6-1 – Summary of Residual Effects

Receptor	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Direct (D) /Indirect (I)	Permanent (P) / Temporary (T)	Short Term (ST) / Medium Term (MT) / Long Term (LT)
Human Health –Demolition and Construction workers	Impact on the health of construction/demolition workers and Contractors from contaminated soils, groundwater, particulate matter, asbestos, dust vapours, UXO and ground gases.	Negligible	Not Significant	D	P	Lt
Human Health – Site users and adjacent site users including neighbouring residents	Impact on the health of current site users and adjacent site users from contaminated soils, groundwater, particulate matter, asbestos, dust vapours and ground gases.	Negligible	Not Significant	D	P	Lt
Controlled Waters - Secondary Undifferentiated Aquifer (Oadby Member); and Principal Aquifers (Woburn Sands Formation and West Melbury Marly Chalk). On and off-site features, small streams bisecting the C2C Scheme and Bin Brook.	Impact of the disturbance / mobilisation of contaminated materials on controlled water receptors. Impact of spills on controlled waters.	Negligible	Not Significant	I	T	Lt

Receptor	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Direct (D) /Indirect (I)	Permanent (P) / Temporary (T)	Short Term (ST) / Medium Term (MT) / Long Term (LT)
Below Ground Services – Potable water supply pipes (if present), buried concrete and foundations	Impact on below ground services due to exposure to contaminated soil and / or groundwater and deterioration of concrete due to aggressive ground.	Negligible	Not Significant	D	P	Lt
Agricultural Land	Impact on agricultural land quality and loss of BMVL.	Major Adverse	Significant	D	P	Lt
Human Health – Maintenance workers and future site users	Impact on the health of maintenance workers, future site users and adjacent site uses from contaminated soils, groundwater, particulate matter, asbestos, dust vapours, and ground gases. Impact on the health of future users from contaminated water supply.	Negligible	Not Significant	D	P	Lt
Secondary Undifferentiated Aquifer (Oadby Member); and Principal Aquifers (Woburn Sands Formation and West Melbury Marly Chalk). On and off-site features, small streams bisecting the C2C Scheme and Bin Brook.	Impact of the disturbance / mobilisation of contaminated materials on controlled water receptors. Impact of spills on controlled waters.	Negligible	Not Significant	I	T	Lt

7 CUMULATIVE EFFECTS

7.1.1. As explained in ES Chapter 2: The EIA Process, cumulative effects are discussed in ES Chapter 11: Cumulative Effects.

7.1.2. **Table TR11-7-1** presents a screening of the complete list of cumulative schemes to identify the potential for in-combination cumulative effects.

Table TR11-7-1 – Summary of Cumulative Effects

Cumulative Scheme	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
Cambourne West	No	Considered to be too far away from the Site (>500 m). Airborne contaminants and lateral migration of surface / groundwater deemed unlikely	No	Considered to be too far away from Site (>500 m)
Bourn Airfield New Village	No	Should contaminative sources be present on-site then appropriate mitigation measures, such as ground investigation and remediation method statements, would likely be conditioned through the planning consent and works would be undertaken in accordance with a CEMP. Accordingly, the risk is negligible	No	Completed development would have been signed off as fit for purpose.
Land at Highfields	No	Considered to be too far away from Site (>500 m). Airborne contaminants and lateral migration of surface / groundwater deemed unlikely.	No	Considered to be too far away from Site (>500 m)
Inspired Villages at Combeton	No	Considered to be too far away from Site (>500 m). Airborne contaminants and lateral migration of surface / groundwater deemed unlikely.	No	Considered to be too far away from Site (>500 m)

Cumulative Scheme	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
West Cambridge Development Site	No	Should contaminative sources be present on-site then appropriate mitigation measures, such as ground investigation and remediation method statements, would likely be conditioned through the planning consent and works would be undertaken in accordance with a CEMP. Accordingly, the risk is negligible.	No	Completed development would have been signed off as fit for purpose.
Clerk Maxwell	No	Should contaminative sources be present on-site then appropriate mitigation measures, such as ground investigation and remediation method statements, would likely be conditioned through the planning consent and works would be undertaken in accordance with a CEMP. Accordingly, the risk is negligible	No	Completed development would have been signed off as fit for purpose.
Northwest Cambridge Development	No	Considered to be too far away from Site (>500 m). Airborne contaminants and lateral migration of surface / groundwater deemed unlikely.	No	Considered to be too far away from Site (>500 m)
Land between 21 and 29 Barton Road	No	Considered to be too far away from Site (>500 m). Airborne contaminants and lateral migration of surface / groundwater deemed unlikely.	No	Considered to be too far away from Site (>500 m)
Darwin Green	No	Considered to be too far away from Site (>500 m). Airborne contaminants and lateral migration of surface / groundwater deemed unlikely.	No	Considered to be too far away from Site (>500 m)

Cumulative Scheme	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
New Development @ St Chads	No	Should contaminative sources be present on-site then appropriate mitigation measures, such as ground investigation and remediation method statements, would likely be conditioned through the planning consent and works would be undertaken in accordance with a CEMP. Accordingly, the risk is negligible.	No	Completed development would have been signed off as fit for purpose.
Grange Lane College	No	Should contaminative sources be present on-site then appropriate mitigation measures, such as ground investigation and remediation method statements, would likely be conditioned through the planning consent and works would be undertaken in accordance with a CEMP. Accordingly, the risk is negligible.	No	Completed development would have been signed off as fit for purpose.

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Appendix TR11.1

GEOTECHNICAL AND GEO-ENVIRONMENTAL PRELIMINARY

Public

Appendix TR11.2

DESK STUDY FOR POTENTIAL UNEXPLODED ORDNANCE CONTAMINATION

Public

62-64 Hills Road
Cambridge
CB2 1LA

wsp.com

PUBLIC