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THE NETWORK RAIL (STALYBRIDGE TO DIGGLE (SADDLEWORTH) ENHANCEMENTS) ORDER

DOCUMENT : NR14 VOLUME 3 ENVIRONMENTAL REPORT VOLUME 3 APPENDIX 12C – SURFACE WATER ASSESSMENT

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EXCUTIVE SUMMARY

This Technical Note presents the surface water assessment for the proposed Network Rail (Stalybridge to Diggle Enhancements Order) Transport and Works Act Order (TWAO) (hereafter referred to as "the Order Scheme"). The assessment has considered impacts to surface water quality and hydromorphology only. Impacts to groundwater quantity/flow and flood risk can be found in Volume 3, Appendix 12A (Water Framework Directive Assessment) and 12B (Flood Risk Assessment) of this document [**NR14**].

Impacts to the following surface water receptors within the Order Scheme have been assessed:

- Diggle Brook
- River Tame
- Huddersfield Narrow Canal
- Unnamed watercourse near Standedge Tunnel
- Ordinary Watercourse (OW) 7, as defined in Section 3.
- OW 13
- OW 14

With the implementation of the proposed Code of Construction Practice (CoCP) which will be secured through the implementation of planning conditions as included in the Order application document 'Request for deemed planning permission and statement of proposed conditions' [**NR11**], surface water management measures outlined in the Pollution Prevention and Incident Control Plan (PPICP), and additional specific mitigation measures, no significant adverse (or beneficial) effects on any identified surface water receptor within the water environment are predicted during either construction or operation of the Order Scheme.

1. INTRODUCTION

1.1 Purpose

1.1.1 This report presents the surface water assessment for the proposed Network Rail (Stalybridge to Diggle Enhancements) Order (hereafter referred to as "the Order Scheme").

1.1.2 A detailed description of the Order Scheme is provided in Volume 1 of the Environment Report [**NR14**]. All Appendices and Figures referred to in this chapter are provided in Volumes 2 and 3 of the Environment Report [**NR14**], respectively.

1.1.3 The consultation responses relevant to the water environment are provided in the Consultation Report [**NR07**] of the Order Scheme.

1.1.4 The scope of the report will comprise impacts to surface water receptors. The impact assessment will consider surface water quality and hydromorphology separately.

1.1.5 A Water Framework Directive (WFD) assessment has been undertaken and is presented in Volume 3, Appendix 12A of this Report [**NR14**]. The WFD assessment provides an assessment of likely significant effects of the Order Scheme in accordance with the WFD and considers opportunities for betterment to help meet the objectives of the WFD (to protect the water environment) where appropriate.

1.2 Figures

1.2.1 In Volume 2 of the Environmental Report [**NR14**], the following figures provide relevant background information and can be referred to in the context of this document:

- Figure 12C.3.1 WFD surface waterbodies within a 1 km buffer of the Order Scheme boundary.
- Figure 12C.4.1 Surface water receptors scoped in for further assessment

2. METHODOLOGY

2.1 Overview

2.1.1 The surface water assessment has been undertaken utilising the following key steps:

- Baseline – the water environment baseline within the Order Scheme is summarised.
- Potential effects – the potential impacts and effects (both beneficial and adverse) on receptors in the Order Scheme during construction and operation are characterised.
- Mitigation measures – avoidance, mitigation, compensation and enhancement measures are described.
- Residual effects – the significance of residual effects (both beneficial and adverse) on receptors following the implementation of mitigation measures is assessed.

2.2 Desk Study

2.2.1 A desk study was undertaken to identify surface water receptors which could potentially be impacted by the Order Scheme and to establish the water baseline environment.

2.2.2 The following sources of information were used to undertake the desk-based study:

- Ordnance Survey (OS) Open Data[1];
- The Environment Agency (EA) website[2];
- The EA Catchment Data Explorer website[3];
- Multi-Agency Geographic Information for the Countryside (MAGIC) Map[4];
- The EA Water Quality Data archive website[5];
- High-resolution aerial photography, e.g. Google Earth.

[1] Free OS OpenData Map Downloads | Free Vector & Raster Map Data | OS Data Hub

[2] Environment Agency - GOV.UK

[3] England | Catchment Data Explorer

[4] MAGIC - Map Page new URL

[5] Open WIMS data

2.2.3 Reportable WFD watercourses are assessed under the WFD and assigned a WFD status. Non-reportable watercourses drain into reportable WFD watercourses and although not assessed and assigned a WFD status are part of the WFD water body catchment. It is therefore necessary that consideration should be given to their impact upon the status of the wider WFD water body.

2.2.4 Watercourses are classified as either Main River or Ordinary Watercourses. Ordinary Watercourses are all other watercourses which are not classified as Main River. Main Rivers fall under the legal powers and responsibility of the EA, whereas Ordinary Watercourses are the responsibility of Internal Drainage Boards (IDBs) and the Local Lead Flood Authority (LLFA).

2.3 Determining Sensitivity

2.3.1 The methodology presented in DMRB LA 113[6] has been applied to assign the sensitivity of the surface water receptors (See Table 2-1).

2.3.2 Where the information provided in Table 2-1 is unknown; professional judgement was used to determine importance.

Table 2-1 Criteria for determining the sensitivity for water environment receptors.

Receptor importance	Receptor	Typical examples
Very High	Surface water	• Nationally significant attribute of high importance. • Watercourse having a WFD classification shown in a RBMP and a Q95 ≥ 1.0 m^3/s. • Site protected / designated under European Commission (EC) or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water) / Species protected by EC legislation LA 108.
High	Surface water	• Locally significant attribute of high importance. • Watercourse having a WFD classification shown in a RBMP and a Q95 < 1.0 m^3/s.

[6] Highways England LA 113 Road Drainage and the water environment Revision 1

Receptor importance	Receptor	Typical examples
		• Species protected under EC or UK legislation LA 108.
Medium	Surface water	• Watercourse/ attribute of moderate quality or rarity • Watercourse not having a WFD classification shown in a RBMP and a Q95 > 0.001 m^3/s
Low	Surface water	• Watercourse with a lower quality. • Watercourse not having a WFD classification shown in a RBMP and a Q95 ≤ 0.001 m^3/s.

2.4 Impact Assessment

2.4.1 Potential impacts to surface water receptors are identified by considering activities during the construction and operation of the Order Scheme.

2.4.2 If an impact is identified, the feasibility of mitigating it is evaluated, and the corresponding mitigation measures are outlined. The mitigated impact is then assigned a magnitude according to the established criteria in Table 2-2.

Table 2-2 Magnitude of Impact

Magnitude of impact	Criteria	Typical example	
Major adverse	Results in loss of attribute and/or quality and integrity of the attribute.	Surface water:	• Loss or extensive change to a fishery. • Loss of regionally important public water supply. • Loss or extensive change to a designated nature conservation site. • Reduction in water body WFD classification.

Magnitude of impact	Criteria	Typical example	
Moderate adverse	Results in effect on integrity of attribute, or loss of part of attribute.	Surface water:	• Partial loss in productivity of a fishery. • Degradation of regionally important public water supply or loss of major commercial/ industrial/ agricultural supplies. • Contribution to reduction in water body WFD classification. • The required pollution hazard indices in the CIRIA simple index approach are not met for two of TSS, metals or hydrocarbons.
Minor adverse	Results in some measurable change in attributes, quality or vulnerability.	Surface water:	• Minor effects on water supplies. • The required pollution hazard indices in the CIRIA simple index approach are not met for one of TSS, metals or hydrocarbons.
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity.	Surface water:	• The required pollution hazard indices in the CIRIA simple index approach for TSS, metals and hydrocarbons are met.
Minor beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring.	Surface water:	• Improvement from a baseline where one of TSS, metals or hydrocarbons were not meeting the required pollution hazard index in the CIRIA simple index approach.
Moderate beneficial	Results in moderate	Surface water:	• Contribution to improvement in water

Magnitude of impact	Criteria	Typical example	
	improvement of attribute quality.		body WFD classification. • Improvement from a baseline where two of TSS, metals or hydrocarbons were not meeting the required pollution hazard indices in the CIRIA simple index approach.
Major beneficial	Results in major improvement of attribute quality.	Surface water:	• Improvement in water body WFD classification. • Improvement from a baseline where all three of TSS, metals or hydrocarbons were not meeting the required pollution hazard indices in the CIRIA simple index approach.
No change			• No loss or alteration of characteristics, features or elements; no observable impact in either direction.

2.5 Significance of Effect

2.5.1 The significance of effect is determined by considering the relationship between sensitivity of the receptor and the impact magnitude, as shown in Table 2-3. Very large, large or moderate effects are deemed to be significant. minor and negligible effects are deemed to be not significant. This has been determined based on the methodology set out in DMRB LA 104[7].

2.5.2 It is important to note that this approach acts as a guide to demonstrate a clear thought process in determining whether an effect will be significant or not. It is not intended to replace the professional judgement exercised by the assessor which will be the main determining factor for attributing effect significance.

[7] Highways England LA 113 Road Drainage and the water environment Revision 1

Table 2-3 Significance of Effect

		Impact Magnitude				
		Major	**Moderate**	**Minor**	**Negligible**	**No Change**
Receptor Sensitivity	**Very High**	Very large	Very large or Large	Large or Moderate	Slight	Neutral
	High	Very large or Large	Large or Moderate	Moderate or Slight	Slight	Neutral
	Medium	Large or Moderate	Moderate	Slight	Slight/ Neutral	Neutral
	Low	Slight or Moderate	Slight	Slight of Neutral	Slight/ Neutral	Neutral
	Negligible	Slight	Neutral or Slight	Neutral or Slight	Neutral/ Slight	Neutral

2.6 Assumptions

2.6.1 The following assumptions have been used when undertaking the surface water assessment:

- During construction best practice environmental management measures will be implemented on site.
- It is assumed that all earthworks have been designed and will be undertaken in accordance with relevant guidance and industry best practice to ensure protection of the environment.
- There will be like for like replacement or improvements to drainage design.
- Outfalls and culverts: Works will be undertaken using best practice and appropriate mitigation measures. Changes to culvert designs will either be like for like or improved (taking into account any downstream flood risk receptors).
- Discharges and abstractions: All discharges and abstractions will be undertaken in accordance with regulatory requirements and as such will not cause deterioration to the impacted receptors. Appropriate protective provisions will be acquired for any additional drainage works not included in the Order.

3. BASELINE

3.1 Study Area

3.1.1 Surface water receptors have been identified within a 1 km buffer of the Order Scheme boundary, which runs approximately from Diggle to Stalybridge, as shown in Figure 12C.3.1 in Volume 2 of the Environmental Report [**NR14**].

3.1.2 Six WFD water bodies are located within the Order Scheme, four rivers and two canals. Four WFD river catchments cover 32 watercourses and two canals, as shown in Table 3-1.

Table 3-1 Surface watercourses within 1 km buffer of the Order Scheme boundary

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
Tame (Source to Chew Brook) GB112069064741			
Diggle Brook	No	Main River	Diggle Brook is a designated Main River located in the north of the study area. It flows in a south westerly direction from Diggle Reservoir before crossing the Huddersfield trainline and Huddersfield Narrow Canal in Diggle Village centre. At this point, the watercourse flows southerly direction, through the centre of the study area to join the River Tame at Brownhill Nature Garden.
River Tame	Yes	Main River	The Rive Tame flows in a generally southerly direction. The River Tame originates on Denshaw Moor in Greater Manchester (outside of the Order Scheme boundary), close to the border with West Yorkshire. The river flows through towns such as Uppermill, Mossley and Stalybridge, before joining the River Goyt in Stockport to form the River Mersey, approximately 9.2 km southwest of the study area.

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
Will Clough	No	Ordinary Watercourse	Will Clough is a short tributary of the unnamed watercourse near Standedge Tunnel. It flows in a westerly direction and is situated due south of Brunclough reservoir.
Unnamed watercourse - Uppermill Village	No	Main River	There is an unnamed designated Main River located in Uppermill Village towards the north of the study area. The watercourse is culverted throughout the study area and flows in a south-westerly direction from Church Road before discharging to the River Tame near the A670.
Unnamed watercourse near Standedge Tunnel	No	Ordinary Watercourse	The unnamed watercourse near Standedge Tunnel is an Ordinary Watercourse which flows in a southerly direction joining Diggle Brook upstream of Diggle Village.
Wall Hill Brook	No	Ordinary Watercourse	Wall Hill Brook is an Ordinary Watercourse located in the northwest of the study area. Wall Hill Brook flows is a tributary of the River Tame, it flows in a north-easterly direction from near Husteads Lane to join the Tame, south of Holy Trinity Church of England Primary School.
White Brook	No	Ordinary Watercourse	White Brook is an Ordinary Watercourse located to the east of the study area. It generally flows in a westerly direction from Knowl Top Lane before being culverted beneath Uppermill Village and out falling to the River Tame.
Pickhill Brook	No	Ordinary Watercourse	Pickhill Brook is an Ordinary Watercourse located to the north-east of the study area. The watercourse generally flows in a south-westerly direction from

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
			Broadstone outside of the study area to its discharge to the River Tame south of A670 – High Street.
OW 1	No	Ordinary Watercourse	OW 1 is located in the northern section of the study area, it slows in a southerly direction from south of Huddersfield Road to join Diggle Brook in Diggle Village.
OW 2	No	Ordinary Watercourse	OW 2 is a small watercourse located in the northern section of the study area. It generally flows in a southerly direction to join the Unnamed watercourse near Standedge Tunnel.
OW 3	No	Ordinary Watercourse	OW 3 and OW 4 are small tributaries of the Unnamed watercourse near Standedge Tunnel. They both flow in a north- westerly direction and cross Standedge Tunnel and Huddersfield Narrow Canal to join the watercourse.
OW 4	No	Ordinary Watercourse	
OW 5	No	Ordinary Watercourse	OW 5 and OW 6 are small tributaries of the Unnamed watercourse - Uppermill Village. OW 5 flows in a southerly direction and OW 6 flows in a westerly direction to join the watercourse south of Church Lane.
OW 6	No	Ordinary Watercourse	
OW 7	No	Ordinary Watercourse	OW 7 flows in a westerly direction draining an area of grazed pasture to the east of the Order Scheme boundary. The watercourse is culverted beneath the existing rail line and then passes above the Huddersfield Narrow canal, in an open piped structure, before entering a pond adjacent to Diggle Brook.
Tame (Chew Brook to Swineshaw Brook) GB112069061111			

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
Staly Brook	No	Main River	Staly Brook is a Main River located near Moorgate in Greater Manchester. It flows in a north- westerly direction to join Micklehurst Brook in Mossley, south-east of the study area.
Unnamed river - Grasscroft Village	No	Main River	There is an unnamed designated Main River located in Grasscroft Village towards the centre of the study area. The watercourse is culverted throughout the study area and flows in a southerly direction from Oldham Road before discharging to the River Tame near Saddleworth Cricket and Tennis Club.
Unnamed river - Stalybridge	No	Main River	There is an unnamed designated Main River located in Stalybridge in the south of the study area. The watercourse is culverted throughout the study area; it flows in a north-westerly direction from Fern Bank Recreation Ground to outfall at the River Tame near Higher Tame Street.
Swineshaw Brook	No	Ordinary Watercourse	Swineshaw Brook is an Ordinary Watercourse located to the south- east of the study area. The watercourse flows in a north- westerly direction through Millbrook Village to join Huddersfield Narrow Canal near Grove Road.
Micklehurst Brook	No	Ordinary Watercourse	Micklehurst Brook an Ordinary Watercourse located to the east of the study area. Micklehurst Brook generally flows in a westerly direction, parallel to Micklehurst Road before flowing into the River Tame.
Acres Brook	No	Ordinary Watercourse	Acres Brook is an Ordinary Watercourse which flows in a north westerly direction form near Cheetham Park to discharge to the River Tame near Higher Tame Street.

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
Stocks Brook	No	Ordinary Watercourse	Stocks Brook flows in a north- westerly direction from the Stocks area to join Acres Brook north of Mottram Road and Huddersfield Road junction.
OW 9	No	Ordinary Watercourse	OW 9 is located south-west of Greenfield Village, in the centre of the study area. The watercourse is mainly culverted as it flows in a northerly direction through a residential area and under Manchester Road. The watercourse then flows through fields to join the River Tame.
OW 11	No	Ordinary Watercourse	OW 11 is located in Heyrod in the southern section of the study area. It appears to flow in a southerly direction and then is hydrologically connected to a pond. It is unclear from the background mapping if there are any further connections to other watercourses.
OW 12	No	Ordinary Watercourse	OW 12 is located in Buckton Value in the southern section of the study area. It appears to flow in a south- westerly direction and then is hydrologically connected to a pond. It is unclear from the background mapping if there are any further connections to other watercourses.
River Tame	Yes	Main River	See text above
OW 13	No	Ordinary Watercourse	The watercourse flows in a south- easterly direction draining an area of pasture/scrub. The watercourse crosses a rail line presumably via a culvert. The hydrology downstream of this point is uncertain however it is likely that some of the flow feeds the pond adjacent to Low Grove Lane.
OW 14	No	Ordinary Watercourse	OW 14 is not currently marked on Ordnance survey mapping. It is our understanding that the watercourse is culverted beneath ground through a 1500

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
			mm diameter culvert beneath the proposed location for Mossley Station before out falling to the River Tame.
Chew Brook GB112069061300			
Chew Brook	Yes	Main River	Chew Brook is a designated Main River located to the east of the study area. Chew Brook flows in a north-easterly direction through Greenfield Village before joining the River Tame north of Friezland Bowling Club
Warlow Brook	No	Ordinary Watercourse	Warlow Brook is an Ordinary Watercourse located east of the study area. Warlow Brook flows north from the residential area south the A635 – Manchester Road, to join Chew Brook near Croft Edge.
OW 8	No	Ordinary Watercourse	OW 8 is a small tributary of the River Tame which flows in a northerly direction bisecting Manchester Road near the village of Greenfield.
OW 10	No	Ordinary Watercourse	OW 9 is located towards the centre of the study area. The watercourse flows in a north-westerly direction, before being culverted beneath Friezland Lane and joining Warlow Brook.
Tame (Swineshaw Brook to Mersey) GB112069061112			
River Tame	Yes	Main River	See text above

Surface watercourses	WFD reportable watercourse	Main River/ Ordinary Watercourse	Summary
Huddersfield Narrow Canal west section GB71210268			Huddersfield Narrow Canal is an Ordinary Watercourse that stretches across the entire length of the study area. The northern section of the canal is tunnelled, this tunnel is identified as Standedge Tunnels and it stretches from Marsden, located approximately 3.5 km north-east of the study area to Diggle Village in the north of the study area. From this point, Huddersfield Narrow Canal spans south through the centre of the study area before exiting the study area at Stalybridge.
Huddersfield Narrow Canal summit section GB70410520			

3.2 Surface Waters and WFD Status

3.2.1 The WFD is implemented through River Basin Management Plans (RBMPs) which set out statutory objectives for river, canal, lake, groundwater, estuarine and coastal water bodies and summarise the measures needed to achieve them. The Order Scheme is covered by the north-west RBMP (EA, 2022[8]) and includes WFD surface water bodies and one groundwater WFD water body; these are discussed further as follows.

3.2.2 As described previously, there are four river and two canal water bodies within the Order Scheme boundary. Details of the current status for the WFD for each river and canal waterbody is provided in Table 3-2 and Table 3-3 respectively.

3.2.3 All the river water bodies are designated as Heavily Modified Water Bodies (HMWBs), which means that they are substantially altered. Consequently, rather than achieving Good 'status' they aspire to achieving Good 'potential'.

3.2.4 Currently all river water bodies have an overall status/potential of Moderate and Moderate ecological status/potential Table 3-2.

3.2.5 The canal water bodies are Artificial Water Bodies (AWB), which means that they have been created where no natural water body existed previously. The Huddersfield Narrow Canal west section water body has overall Moderate potential, whereas the Huddersfield Narrow Canal summit section water body has overall Good potential *Currently reported but noting timeframe has now passed.

3.2.6 Table 3-3 below shows the river WFD water bodies within the study area (2022 status).

Table 3-2 River WFD water bodies within the study area (2022 status)

Water Body Name	Tame (Source to Chew Brook)	Chew Brook	Tame (Chew Brook to Swineshaw Brook)	Tame (Swineshaw Brook to Mersey)
Water Body ID	GB112069064741	GB112069061300	GB112069061111	GB112069061112
Hydromorphological Designation	Heavily modified	Heavily modified	Heavily modified	Heavily modified
Cycle 3 2019 or 2022	2019	2022	2019	2022
Classification	Moderate	Moderate	Moderate	Moderate

[8] River basin management plans, updated 2022: introduction - GOV.UK

Water Body Name	Tame (Source to Chew Brook)	Chew Brook	Tame (Chew Brook to Swineshaw Brook)	Tame (Swineshaw Brook to Mersey)
Objectives	Good by 2027	Good by 2027	Moderate by 2015*	Moderate by 2015*
Ecological	Moderate	Moderate	Moderate	Moderate
Supporting elements (surface water)	Moderate	Moderate	Moderate	Moderate
Mitigation Measures Assessment	Moderate or less	Moderate or less	Moderate or less	Moderate or less
Biological quality elements	Moderate	Poor	Moderate	Poor
Macrophytes and Phytobenthos	Good	Not assessed	Not assessed	Moderate
Fish	Moderate	Poor	Not assessed	Poor
Invertebrates	Good	Poor	Moderate	Poor
Hydromorphological supporting elements	Not assessed	Not assessed	Not assessed	Not assessed
Specific pollutants	Not assessed	Not assessed	High	High
Chemical	Fail	Does not require assessment	Fail	Does not require assessment
Priority substances	Fail	Does not require assessment	Fail	Does not require assessment
Other pollutants	Does not require assessment	Does not require assessment	Does not require assessment	Does not require assessment
Priority hazardous substances	Fail	Does not require assessment	Fail	Does not require assessment
RNAG (2019)	Phosphate Water industry Urban & transport	PBDE Fish Urban and transport	Perfluorooctane sulphonate (PFOS) PBDE Phosphate	Invertebrates PBDE Urban and transport

Water Body Name	Tame (Source to Chew Brook)	Chew Brook	Tame (Chew Brook to Swineshaw Brook)	Tame (Swineshaw Brook to Mersey)
	Mercury and Its Compounds Polybrominated diphenyl ethers (PBDE)	Water industry	Mercury and Its Compounds Water industry Ammonia (Phys-Chem)	PFOS Phosphate Fish Ammonia (Phys-Chem) Macrophytes and Phytobenthos Combined Mercury and Its Compounds
Linked Protected Areas	South Pennine Moors (UK0030280) South Pennine Moors Phase 2 (UK9007022) Peak District Moors (South Pennine Moors Phase 1) (UK9007021)	South Pennine Moors (UK0030280) Peak District Moors (South Pennine Moors Phase 1) (UK9007021)	South Pennine Moors (UK0030280) Peak District Moors (South Pennine Moors Phase 1) (UK9007021) River Tame (UKENRI144)	River Tame (UKENRI144)

*Currently reported but noting timeframe has now passed.

Table 3-3 Canal WFD water bodies within the study area (2019 status)

Water Body Name	Huddersfield Narrow Canal west section	Huddersfield Narrow Canal summit section
Water Body ID	GB71210268	GB70410520
Hydromorphological Designation	Artificial	Artificial
Cycle 3	2019	2019
Classification	Moderate	Good
Objectives	Good by 2027	Good by 2015*

Water Body Name	Huddersfield Narrow Canal west section	Huddersfield Narrow Canal summit section
Ecological	Moderate	Good
Supporting elements (surface water)	Moderate	Good
Mitigation Measures Assessment	Moderate or less	Good
Chemical	Fail	Fail
Other Pollutants	Does not require assessment	Does not require assessment
RNAG (2019)	Mercury and Its Compounds Polybrominated diphenyl ethers (PBDE)	Mercury and Its Compounds Polybrominated diphenyl ethers (PBDE)
Linked Protected Areas	N/A	N/A

*Currently reported but noting timeframe has now passed.

3.2.7 Baseline water quality for each waterbody has been assessed using the water quality parameters considered as part of the WFD classification for each respective waterbody and any relevant EA water quality monitoring data.

3.2.8 Table 3-4 shows a breakdown of the physico-chemical quality elements for the four river water bodies within the Order Scheme boundary. Two of the water bodies (Tame (Source to Chew Brook) and Tame (Chew Brook to Swineshaw Brook)) have Moderate physico-chemical status, with the less than good status being driven by phosphate in both water bodies. Chew Brook and Tame (Swineshaw Brook to Mersey) water bodies have High physico-chemical status, being driven by ammonia, biological oxygen demand (BOD) and phosphate.

3.2.9 Physico-chemical quality elements were not assessed for canal waterbodies during the latest cycle of WFD classifications.

3.2.10 Table 3-4 Water quality under the WFD for river water bodies within the Order Scheme boundary (2022 status) shows a breakdown of the priority hazardous and priority substances assessed during the most recent WFD cycle (2019) for the relevant canal waterbodies.

Table 3-4 Water quality under the WFD for river water bodies within the Order Scheme boundary (2022 status)

River Waterbody	Tame (Source to Chew Brook)	Chew Brook	Tame (Chew Brook to Swineshaw Brook)	Tame (Swineshaw Brook to Mersey)
Waterbody ID	**GB11206906474 1**	**GB11206906130 0**	**GB11206906111 1**	**GB11206906111 2**
Physico-chemical quality elements	Moderate	High	Moderate	High
Ammonia (phys-chem)	High	High	Moderate	Good
Biochemical Oxygen Demand (BOD)	Not assessed	Not assessed	High	High
Dissolved oxygen	High	High	High	High
pH	High	High	High	High
Phosphate	Moderate	High	Poor	Poor
Temperature	High	High	High	High
Acid neutralising capacity	Not assessed	Not assessed	High	High

Table 3-5 Water quality under the WFD for canal water body within study area (2019 status)

Canal Waterbody	Huddersfield Narrow Canal west section	Huddersfield Narrow Canal summit section
Waterbody ID	GB71210268	GB70410520
Priority hazardous substances	Fail	Fail
Benzo(a)pyrene	Good	Good
Dioxins and dioxin-like compounds	Good	Good
Heptachlor and cis-Heptachlor epoxide	Good	Good
Hexabromocyclododecane (HBCDD)	Good	Good

Canal Waterbody	Huddersfield Narrow Canal west section	Huddersfield Narrow Canal summit section
Hexachlorobenzene	Good	Good
Hexachlorobutadiene	Good	Good
Mercury and Its Compounds	Fail	Fail
Perfluorooctane sulphonate (PFOS)	Good	Good
Polybrominated diphenyl ethers (PBDE)	Good	Fail
Priority substances	Good	Good
Fluoranthene	Good	Good

3.3 EA Surface Water Quality Monitoring

3.3.1 Surface water quality is routinely monitored by the EA at several locations on the River Tame (see Table 3-6).

3.3.2 Routine wastewater monitoring locations are also presented in Table 3-6 which monitor discharge from wastewater treatment works (WwTW). This includes Ashton Under Lyne WwTW, Dunkinfield WwTW, Mossley WwTW and Saddleworth WwTW.

Table 3-6 EA water quality monitoring locations.

Sampling location	Sampling type
River Tame at broomstairs Bridge Hyde	Freshwater – Rivers
Ashton-under-Lyne WwTW final effluent	Sewage Discharges – Final/Treated Effluent – Water Company
Dukinfield stw final effluent sampled from open channel to river after humus tanks	Sewage Discharges – Final/Treated Effluent – Water Company
River tame below Dukinfield bridge at Whitelands	Freshwater – Rivers
Swineshaw brook u/s of the river tame	Freshwater – Rivers
Mossley stw final effluent sampled from open channel to river	Sewage Discharges – Final/Treated Effluent – Water Company
River tame at Egmont Street Bridge	Freshwater – Rivers

Sampling location	Sampling type
Saddleworth wwtw final effluent	Sewage Discharges – Final/Treated Effluent – Water Company
Chew Brook above confluence with River Tame	Freshwater – Rivers
Chew Brook at Stable Bridge	Freshwater – Rivers
River Tame above confluence with Chew Brook	Freshwater – Rivers

4. POTENTIAL EFFECTS

4.1 Overview

4.1.1 Potential effects are split into two categories: construction and operation. For the purpose of this assessment construction impacts are mainly reported to be short-term which occur during the construction phase only. Operational impacts are long-term or permanent impacts affecting surface water receptors after the construction phase is complete.

4.2 Construction Impacts

4.2.1 The potential impacts during construction to water quality are summarised in Table 4-1 and are discussed in further detail below.

Table 4-1 Potential water quality impacts during construction

Activity	Potential impact to water quality
Direct works to/within watercourses and indirect/associated works such as earthworks, bridge structures and temporary works.	Increased risk of pollution to watercourses due to runoff containing elevated levels of suspended solids and resuspension of potentially contaminated sediments. Runoff with high sediment load can have direct adverse effects on adjacent watercourses through increasing turbidity and sedimentation.
Vehicles/ plant movement and operation.	Risk of release of hydrocarbons and oils, leading to polluted runoff migrating to surface water and groundwater. Hydrocarbons within surface water can chemically impair biological functions of freshwater organisms such as fish and invertebrates.
Storage and use of construction materials/ chemicals (e.g. solvents, degreasers) on site	Risk of accidental releases of contaminants to surface water and infiltration to groundwaters where materials and chemicals are not stored/ used correctly.
Changes to existing drainage network	Where drainage is not sufficiently attenuated changes to physio-chemical water quality parameters e.g. dissolved oxygen may occur in receptor watercourse.
Runoff from construction compounds – stockpiles, drainage, wheel washings and material movements	Construction compound runoff typically contains elevated suspended solids levels. Runoff with high sediment load can have direct adverse effects on adjacent watercourses through increased turbidity and sedimentation.

1.1.1 The potential impacts during construction to hydromorphology are summarised in Table 4-2.

Table 4-2 Potential impacts to hydromorphology during construction

Activity	Potential impact
Works to watercourses, including temporary structures in-channel to facilitate structural works and works in the floodplain	In-channel structures can act as a barrier to flow which may cause local changes in velocities and cause increased erosional and depositional processes. This can limit available habitat for aquatic flora and fauna and may also impede the movement of any fish present within the watercourse. Construction activities in the floodplain may alter natural functioning (floodplain connectivity and storage), runoff rates and velocities which contribute to the adjacent watercourse and may also contain elevated levels of suspended solids which can cause increased turbidity and may smother vegetation and bed substrates.
Runoff from construction compounds – stockpiles, drainage, wheel washings and material movements	Construction compound runoff typically contains elevated suspended solids levels. Runoff with high sediment load can have direct adverse effects on watercourse hydromorphology as a result of sedimentation.
Installation of culverts	Dewatering and over pumping activities, in relation to the installation of culverts, to allow for a dry and stable environment. The removal of water can increase the velocity of remaining flows, leading to erosion of riverbanks and beds. Dewatering can also mobilise contaminants in the soil, which can then enter the watercourse. Changes in water levels and flow patterns can disrupt habitats for fish and other aquatic organisms.

4.2.2 Construction works associated with the Order Scheme which are considered to have a potential impact on the water quality/hydromorphology (and therefore require assessment) are provided below. A detailed description of the works is provided in Volume 1 of the Environment Report [**NR14**].

Culverts

4.2.3 One new culvert is proposed for the Order Scheme: MVL3/39B – Bywash (Ordnance Survey Nation Grid Reference (OS NGR): SE 00759 08132).

4.2.4 The existing rivetted plate steel underbridge over the Huddersfield Narrow Canal, supporting longitudinal timber sleeper track, is to be reconstructed with a precast reinforced concrete culvert to accommodate the new track alignment. The culvert will comprise four precast segments which shall be tied together transversely by eight stainless steel post-tensioned bars. Installation of the culvert sections will also require local demolition of the abutment walls supporting the existing structure. The adjacent walls on the approach to the structure are to be retained as much as possible, with the section of walls immediately adjacent to the existing deck being taken down and rebuilt to tie into the new culvert. Precast robust kerb L-units with edge protection will be installed onto the top of the culvert structure and bolted to the culvert via resin anchors. Over-pumping and dewatering of the unnamed watercourse near Standedge Tunnel will be required to facilitate the works.

4.2.5 The proposed works are likely to result in the mobilisation of sediments both within the Huddersfield Narrow Canal and the unnamed watercourse near Standedge Tunnel which could results in the deterioration of water quality parameters such as reduced concentrations of dissolved oxygen and increased turbidity.

4.2.6 During the works there will be an increased risk of pollution to the Huddersfield Narrow Canal as a result of surface water runoff from works areas adjacent to the watercourse.

Drainage/Outfalls

4.2.7 There is one new drainage outfall associated with the works:

- Firstly, at Mossley Station a positive drainage system shall be installed for the station access loop and accessible parking, link road, station building and platforms. This system requires attenuation and therefore an additional excavation of approximately 1.5 m in depth is required below the access loop and accessible car park for the proposed attenuation tank. In addition to the collector pipes, gullies and channel drains, the system requires to outfall into the wider water network. The outfall location will be a 1500 diameter culverted watercourse (OW 14) that outfalls to the River Tame approximate OS NGR: SD 97530 02537) roughly 50 m downstream of the proposed tie in location.

Structures

4.2.8 There are works at five structures that could pose an impact at the construction stage due to their proximity to surface watercourses and potential for surface water run off to watercourses:

- Reconstruction of the existing Wrights overbridge superstructure MVL3/23: The existing stone arch overbridge superstructure is to be removed as it does not have sufficient headroom to accommodate installation of OLE (OS NGR: SD 98109 04139). The public right of way (PRoW) over the structure is to be diverted via the adjacent MVL3/22 Hobble Hole underbridge.
- Reconstruction of existing overbridge superstructure on Ward Lane (MVL3/36): The existing overbridge superstructure is to be reconstructed as it does not have sufficient headroom to accommodate installation of OLE and is in poor condition (OS NGR: SE 00280 07551). The footbridge is not over the canal; however, the works are adjacent, and the Order Scheme boundary contains a small section of the Huddersfield Barrow Canal West Section. The construction methodology is yet to be finalised.
- Reconstruction of Diggle Road overbridge (MVL3/39): Reconstruction of span 1 on the Diggle Road overbridge on Station Road in Diggle, approximately 90 metres south of Standedge Tunnel (OS NGR: SE 00711 08065).
- Extension of canal bridge (MVL3/39A): The key issue relating to construction of MVL3/36 is access to site for large capacity cranes and heavy bridge components, as there is limited space at track level to site a large crane and access to site would require traversing over the portion of MVL3/39A Standedge canal tunnel (OS NGR: SE 00680 08021). The design for strengthening of the canal structure is unknown at this stage. The construction methodology is yet to be finalised.
- Reconstruction of existing rivetted plate steel underbridge (MVL3/39b): The existing rivetted plate steel underbridge over the Huddersfield Narrow Canal, supporting longitudinal timber sleeper track, is to be reconstructed with a precast reinforced concrete culvert to accommodate the new track alignment (OS NGR: SD 98109 04139). Works will require temporary damming and over-pumping of the unnamed watercourse near Standedge Tunnel (with water pumped partially into canal tunnel inlet and partially downstream towards Diggle ponds).

Temporary Compounds

4.2.9 The following temporary compounds could pose an impact to surface water due to their proximity to surface watercourses and potential for surface water run off to watercourses:

- Diggle Compound works.
  - Diggle Welfare rail hub and office compound (OS NGR: SE 00598 07868).
  - Sam Road Car Park Compound (OS NGR: SE 00621 07970).
- Plevins Compound (OS NGR: SD 97757 01536).
- Scout Spoil Point compound (OS NGR : SD 97331 01196).
- Manchester Road Scout West Compound (OS NGR: SD 97448 01241).
- Ward Lane Site compound works.
  - Ward Lane Satellite Compound (OS NGR: SE 00300 07517).
  - Grandpa Greens Site 2 Compound (OS NGR: SE 00370 07697).

4.3 Operational Impacts

4.3.1 The potential impacts to water quality during operation of the Order Scheme are detailed in Table 4-3.

Table 4-3 Potential water quality impacts during operation

Activity	Potential impact
Changes to drainage	Various drainage works are required as part of the Order Scheme which could result in changes to water quality in surface water receptors.

4.3.2 The potential impacts to hydromorphology during operation are summarised in Table 4-4.

Table 4-4 Potential hydromorphological impacts during operation.

Activity	Potential impact
Changes to drainage	Changes to surface water discharge, resulting from changes to the drainage network, has the potential to cause localised changes in flow and sediment dynamics in receptor watercourses.

4.3.3 Operational aspects of the Order Scheme which are considered to have a potential impact on the water environment (and therefore require assessment) are detailed below. A detailed description of the works is provided Volume 1 of the Environment Report [**NR14**].

Culverts

4.3.4 Installation of the culvert on the Huddersfield Narrow Canal is likely to result in localised permanent changes to the physical characteristic of the canal namely wetted width and water depth.

4.3.5 Furthermore, over-pumping and dewatering of the unnamed watercourse near Standedge Tunnel will be required to facilitate the works at MVL3/39B – Bywash. The works are likely to result in changes to the physical characteristic of the channel (width, water depth substrate composition etc.) when compared to baseline conditions.

Drainage/Outfalls

4.3.6 As previously mentioned, there is one new drainage outfall associated with the works at Mossley Station. Various other drainage works/upgrades will be required as part of the Order Scheme which do not outfall directly to watercourses.

4.3.7 It is assumed as part of this assessment that any new drainage measures will provide, as a minimum, equivalent levels of water attenuation. Using this assumption potential impacts to surface water quality/hydromorphology arising from surface water drainage changes/upgrades are considered negligible.

4.4 Scoping

4.4.1 Taking into consideration the potential effects to surface water quality and watercourse hydromorphology presented in section 4 the following surface water receptors, detailed in Table 4-5, have been scoped out of further assessment. Watercourses scoped in for further assessment are detailed in Table 4-6 below and Figure 12C.4.1 in Volume 2 of the Environmental Report [**NR14**].

Table 4-5 Surface water receptors not included as part of assessment.

Watercourse name	Reason for exclusion in assessment
Unnamed watercourse - Uppermill Village	No hydraulic connectivity
Wall Hill Brook	No hydraulic connectivity
White Brook	No hydraulic connectivity
Pickhill Brook	No hydraulic connectivity
Capper Clough	No hydraulic connectivity
Golburn Clough	No hydraulic connectivity
OW 1	No hydraulic connectivity
OW 2	No hydraulic connectivity
OW 3	No hydraulic connectivity
OW 4	No hydraulic connectivity
OW 5	No hydraulic connectivity
OW 6	No hydraulic connectivity
OW 8	No hydraulic connectivity
OW 9	No hydraulic connectivity
OW 10	No hydraulic connectivity
OW 11	No hydraulic connectivity
OW 12	No hydraulic connectivity
Staly Brook	No hydraulic connectivity

Watercourse name	Reason for exclusion in assessment
Unnamed watercourse - Grasscroft Village	No hydraulic connectivity
Unnamed river - Stalybridge	No hydraulic connectivity
Swineshaw Brook	No hydraulic connectivity
Micklehurst Brook	No hydraulic connectivity
Acres Brook	No hydraulic connectivity
Chew Brook	No hydraulic connectivity
Warlow Brook	No hydraulic connectivity

Table 4-6 Surface water receptors included as part of assessment.

Receptor	Descriptor		Importance		Overall	Reason for inclusion in assessment
	Water quality	Hydromorphology	Water quality	Hydromorphology		
Diggle Brook	Main Watercourse. Not assigned a WFD classification.	Main Watercourse. Not assigned a WFD classification.	Medium	Medium	Medium	Immediately downstream of works on the unnamed watercourse near Standedge Tunnel and immediately adjacent to Diggle Welfare Compound.
River Tame	Reportable WFD watercourse. Classified under the WFD as having Moderate Ecological Potential and Moderate/ High Physico-Chemical Quality Elements but	Reportable WFD watercourse. Designated “heavily modified”. Classified under the WFD as having Moderate Overall Status, Good/Moderate Ecological Potential. Hydromorphological Supporting	High	Medium	High	Flows immediately adjacent to the Order Scheme. A new outfall will be installed to OW 14 as part of the Mossley Station works which ultimately discharge to the River Tame. Several compounds lie in close proximity to River Tame.

Receptor	Descriptor		Importance		Overall	Reason for inclusion in assessment
	Water quality	Hydromorphology	Water quality	Hydromorphology		
	Fail Chemical status due to Priority Hazardous Substances.	Elements are not assessed.				
Huddersfield Narrow Canal	Classified under the WFD as having Moderate Overall Status and Good/Moderate Ecological Potential but Fail Chemical Status due to Priority Substances and Priority Hazardous Substances.	Reportable WFD watercourse. Designated “artificial”. Classified under the WFD as having Good/Moderate Overall Status and Good/Moderate Ecological Potential. Hydromorphological Supporting Elements of canal water body not assessed.	High	Low	High	Flows immediately adjacent to the Order Scheme. In-channel works required at Standedge Tunnel. Several compound locations lie immediately adjacent to the Huddersfield Narrow Canal.

Receptor	Descriptor		Importance		Overall	Reason for inclusion in assessment
	Water quality	Hydromorphology	Water quality	Hydromorphology		
Unnamed watercourse near Standedge Tunnel	Not assigned a WFD classification	Ordinary Watercourse. Not assigned a WFD classification.	Low	Low	Low	Temporary damming and over pumping of the watercourse will be required during the works.
OW 7	Not assigned a WFD classification	Ordinary Watercourse. Not assigned a WFD classification.	Low	Low	Low	Bridge reconstruction works will be undertaken immediately adjacent to watercourse.
OW 13	Not assigned a WFD classification	Ordinary Watercourse. Not assigned a WFD classification.	Low	Low	Low	Works to railway embankment will be undertaken immediately adjacent to the watercourse.
OW 14	Not assigned a WFD classification	Ordinary Watercourse. Not assigned a WFD classification.	Low	Low	Low	A new outfall will be installed to OW 14 as part of the Mossley Station works.

5. SIGNIFICANCE OF EFFECTS

5.1 Construction – Water Quality

5.1.1 Potential effects on surface water receptors (as a result of changes in water quality during construction) within the Order Scheme boundary are summarised in Table 5-1.

Table 5-1 Potential significance of effects during construction – water quality

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
Diggle Brook	Medium	Minor adverse	Slight	Diggle Brook lies immediately downstream of the proposed in-channel works on the unnamed watercourse near Standedge Tunnel and immediately adjacent to Diggle Welfare Compound. Mobilisation of fine sediments are likely to occur during the works leading to potential changes in water quality in Diggle Brook. Impacts will be restricted to the construction phase of the works and will therefore be temporary in nature. Furthermore, there is an increased risk of pollution to Diggle brook due to the watercourse's proximity to the proposed works/compound locations and potential for surface water runoff.
River Tame	High	Minor adverse	Slight	No direct in-channel works' will be required on the River Tame. Several compound locations immediately border the watercourse therefore there is potential for construction derived pollution to enter the

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
				Tame via surface water run-off. Additionally, there is a risk that construction derived pollutants may enter the watercourse during the outfall construction at OW 14, which has hydrological connectivity to the River Tame. Mobilisation of sediments within the culverted watercourse may also occur during the outfall construction resulting in increased turbidity and sedimentation within the River Tame.
Huddersfield Narrow Canal	High	Minor adverse	Slight	Sediment mobilisation from within the Huddersfield Narrow Canal is likely to occur during the culvert installation. There is also an increased risk of pollution to the Huddersfield Canal from runoff as the watercourse borders several compound locations.
Unnamed watercourse near Standedge Tunnel	Low	Minor adverse	Slight	Mobilisation of in-channel fine sediments are likely to occur during the in-channel works on the unnamed watercourse leading to potential changes in water quality. Impacts will be restricted to the construction phase of the works and will therefore be temporary in nature.

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
				Furthermore, there is an increased risk of pollution to unnamed watercourse from construction derived pollutants due to the watercourses proximity to the proposed works locations and potential for surface water runoff.
OW 7	Low	Minor adverse	Slight	Due to the proximity of the works to the watercourse there is an increased risk of construction derived pollution entering the watercourse via surface water runoff.
OW 13	Low	Minor adverse	Slight	Due to the proximity of the works to the watercourse there is an increased risk of construction derived pollution entering the watercourse via surface water runoff.
OW 14	Low	Minor adverse	Slight	During construction of the outfall at OW14 there is a risk that construction derived pollutants may enter the watercourse, via surface water runoff. Mobilisation of sediments within the culverted watercourse may also occur during the outfall construction resulting in increased turbidity and sedimentation within the River Tame.

5.2 Construction – Hydromorphology

5.2.1 The anticipated impact of the construction works upon the hydromorphology of the identified surface water receptors are summarised in Table 5-2.

Table 5-2 Potential significance of effects during construction – hydromorphology

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
Diggle Brook	Medium	Minor adverse	Slight	Diggle Brook lies immediately downstream of the proposed in-channel works on the unnamed watercourse near Standedge Tunnel and immediately adjacent to Diggle Welfare Compound. It is anticipated that mobilisation of in-channel fine sediments is likely to occur during the in-channel works on the unnamed watercourse leading to potential changes in sedimentation in Diggle Brook. Further sedimentation may occur as a result of runoff from temporary compound areas.
River Tame	High	Minor adverse	Slight	The new outfall construction to OW 14 may result in the mobilisation of fine sediment which may propagate to the River Tame due to hydrological connectivity.

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
				Further sedimentation may occur as a result of runoff from compound areas.
Huddersfield Narrow Canal	High	Minor adverse	Slight	Sediment mobilisation from within the Huddersfield Narrow Canal is likely to occur during the culvert installation and outfall construction resulting in localised changes in sedimentation. Further sedimentation may occur as a result of runoff from compound areas.
Unnamed watercourse near Standedge Tunnel	Low	Minor adverse	Slight	Mobilisation of in-channel fine sediments are likely to occur during the in-channel works on the unnamed watercourse leading to potential changes in sedimentation downstream. Further sedimentation may also occur as a result of runoff from

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
				construction/ compound areas.
OW 7	Low	Minor adverse	Slight	Sedimentation of the watercourse may occur as a result of runoff from construction areas.
OW 13	Low	Minor adverse	Slight	Sedimentation of the watercourse may also occur as a result of runoff from construction areas.
OW 14	Low	Minor adverse	Slight	The new outfall construction to OW 14 may result in the mobilisation of fine sediment which may propagate to the River Tame due to hydrological connectivity.

5.3 Operation – Water Quality

5.3.1 Potential effects on surface water receptors (as a result of changes in water quality during operation) within the Order Scheme boundary are summarised in Table 5-3.

Table 5-3 Potential significance of effects during operation – water quality

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
Diggle Brook	Medium	No change	Neutral	Once the works are complete there are no anticipated impacts to water quality during operation.
River Tame	High	No change	Neutral	Assuming drainage to the new outfall on OW 14 is sufficiently attenuated impacts to water quality associated with its operation are considered negligible.
Huddersfield Narrow Canal	High	No change	Neutral	Once the works are completed there are no impact pathways associated with the culverts works.
Unnamed watercourse near Standedge Tunnel	Low	No change	Neutral	Once the works are complete there are no anticipated impacts to water quality during operation.
OW 7	Low	No change	Neutral	Once the works are complete there are no anticipated impacts to water quality during operation.
Ow 13	Low	No change	Neutral	Once the works are complete there are no anticipated impacts to water quality during operation.
OW 14	Low	No change	Neutral	Assuming drainage to the new outfall at OW 14 is sufficiently attenuated impacts to water quality associated with operation are considered negligible.

5.4 Operation – Hydromorphology

5.4.1 The anticipated impacts upon the hydromorphology of the identified surface water receptors during operation of the Order Scheme are summarised in Table 5-4.

Table 5-4 Potential significance of effects during operation – hydromorphology

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
Diggle Brook	Medium	No change	Neutral	No impacts to the hydromorphology of Diggle Brook are anticipated following completion of the works.
River Tame	High	No change	Neutral	Assuming surface water drainage to the new outfall on OW 14 is sufficiently attenuated impacts to hydromorphology during operation are considered negligible.
Huddersfield Narrow Canal	High	No change	Neutral	Assuming the new surface water drainage to the Huddersfield Narrow Canal is sufficiently attenuated impacts to hydromorphology during operation are considered negligible.
Unnamed watercourse near Standedge Tunnel	Low	Minor adverse	Slight	The watercourse will be restored following completion of the works however some minor localised change to hydromorphology is expected to occur.

Water receptor	Receptor importance	Magnitude of impact	Significance of effect	Comments
OW 7	Low	No change	Neutral	No impacts to the hydromorphology of OW 7 are anticipated following completion of the works.
OW 13	Low	No change	Neutral	No impacts to the hydromorphology of OW 13 are anticipated following completion of the works.
OW 14	Low	No change	Neutral	Assuming surface water drainage to the new outfall is sufficiently attenuated impacts to hydromorphology during operation are considered negligible.

5.5 Mitigation Measures

5.5.1 The following mitigation measures are recommended to reduce potential impacts of the Order Scheme on surface water quality and hydromorphology.

5.5.2 During construction best practice environmental management measures should be implemented on site through application of a Code of Construction Practice (CoCP). These measures will be detailed in a Pollution Prevention and Incident Control Plan (PPICP) which will be secured via the Code of Construction Practice Part B and submitted for approval to the relevant local authority.

5.5.3 The changes to surface water drainage associated with the new outfall to OW 14 may contribute to a decline in water quality in the receptor and also the wider catchment if the surface water drainage is not attenuated prior to discharge. Following the surface water management measures set in the PPICP, which outlines key design principles for the foul and surface water drainage works, will mitigate potential risk to water quality.

5.5.4 The design process should seek to minimise in-channel works where practicable. Any in-channel works which cannot be eliminated will require the following mitigation measures:

- Use appropriate isolation techniques such as dams/over-pumping to create dry working areas e.g. during works on the unnamed watercourse near Standedge Tunnel.
- Installation of silt curtains to minimize the propagation of fine sediment pollution in watercourses e.g. during works on the Huddersfield Narrow Canal at Standedge Tunnel.
- Continuous water quality monitoring should be undertaken prior to, during and following in-channel works to identify and assess magnitude of potential pollution events downstream of works and whether additional mitigation is required.
- Use of appropriate pollution control measures to ensure contaminants from construction activities do not enter the watercourse e.g. silt fences.
- Prepare site-specific responses for potential pollution incidents (e.g. spillages) or extreme weather events (e.g. storms) which may cause an increase in sediment runoff.

5.5.5 No specific mitigation measures are required during operation in terms of water quality for surface water receptors, but following the surface water management measures set in the PPICP, which outlines key design principles for the foul and surface water drainage works, will mitigate potential risk to water quality.

5.6 Residual Effects (Overall)

Construction

5.6.1 Taking into consideration the potential impacts to water quality/hydromorphology resulting from construction identified in sections 5 and the proposed mitigation detailed in section 5.5 an assessment for residual effects resulting from the construction phase of the Order Scheme is presented in Table 5-5.

Table 5-5 Potential significance of effects during construction – overall

Water receptor	Significance of effect	Significance of effect driven by
Diggle Brook	Slight	Water quality and hydromorphology
River Tame	Slight	
Huddersfield Narrow Canal	Slight	
Unnamed watercourse near Standedge Tunnel	Slight	
OW 7	Slight	

Water receptor	Significance of effect	Significance of effect driven by
OW 13	Slight	
OW 14	Slight	

Operation

5.6.2 Taking into consideration the potential impacts to water quality/hydromorphology during operation identified in sections 5 and the proposed mitigation detailed in section 5.5 an assessment for residual impacts resulting from the operation of the Order Scheme are presented in Table 5-6.

Table 5-6 Potential significance of effects during operation – overall

Water receptor	Significance of effect	Significance of effect driven by
Diggle Brook	Neutral	N/A – effects associated with operation are considered to be neutral for all surface water receptors.
River Tame	Neutral	
Huddersfield Narrow Canal	Neutral	
Unnamed watercourse near Standedge Tunnel	Neutral	
OW 7	Neutral	
OW 13	Neutral	
OW 14	Neutral	

6. CONCLUSIONS

6.1 Summary

6.1.1 Assuming the mitigation measures detailed in section 5.5 are implemented during the design and construction of the Order Scheme this assessment has concluded that the Order Scheme will result in slight adverse impacts to the River Tame and Huddersfield Narrow Canal and slight/neutral impacts to the unnamed watercourse near Standedge Tunnel and OW 14 and neutral impacts to OW 7 and OW 13. These impacts are associated with the construction phase only and are not deemed to be significant.

6.2 Limitations

6.2.1 At this stage of the assessment the Order Scheme is in the outline design phase. For this reason, this assessment should be revisited once the design freeze has come into effect. Further details required include:

6.2.2 At the time of undertaking this assessment finalised drainage information was not available for all working areas and temporary compounds. This assessment has therefore been undertaken under the assumption that drainage measures will provide, as a minimum, equivalent levels of water attenuation and treatment.