

Network Rail

**170248 Headbolt Lane New
Station GRIP 4**

WFD Assessment

170248-ARU-REP-EEN-000022

Final | Aug 2021

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Executive Summary

Ove Arup and Partners (Arup) has been commissioned by Buckingham Group Contracting Limited (BGCL), on behalf of Network Rail, to undertake a Water Framework Directive (WFD) Compliance Assessment for a proposed station and car park at Headbolt Lane and associated rail upgrades. The assessment has identified the potential for the proposed scheme to affect the current status and/or status objectives of relevant WFD water bodies at the site, without the implementation of additional mitigation measures.

Headbolt Lane is located in Kirkby, Merseyside, 11 km north east of the centre of Liverpool. The site extends from the location of the existing Kirkby Station to the location of the new Headbolt Lane station along a 1.25 km single track rail line.

The site falls within the ‘Simonswood Brook’ (GB112069060630) and ‘Alt US Bull Bridge’ (read: Alt upstream of Bull Bridge) (GB112069061441) WFD river water bodies. Proposed scheme elements which cross WFD waterbodies are the following:

- the rail line connecting the two stations crosses Simonswood Brook in the Simonswood Brook WFD water body catchment via a pre-existing rail bridge; and
- At the site of the proposed Headbolt Lane station and car park, one road bridge, one new footbridge and one existing footbridge will cross Kirkby Brook, which is a tributary within the Simonswood Brook WFD water body catchment, at Headbolt Lane Station. The watercourse at the site is heavily modified with low morphological diversity.

The site is near the WFD artificial water body ‘Leeds and Liverpool Canal, Wigan to Liverpool (GB71210083); however, this artificial water body has been screened out of the assessment as there are no pathways from the site identified which would cause a WFD impact. The site is underlain by the groundwater body ‘Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers’ (GB41201G101700); however, this groundwater body has been screened out of the assessment as there are no significant workings proposed below groundwater level at the site.

The assessment has found that proposed works are not currently anticipated to cause any adverse effects that might lead to a deterioration in the status of any of the quality elements of the Simonswood Brook water body catchment, or the Alt US Bull Bridge water body catchment. This is provided that appropriate construction mitigation measures, as stated in this report, are developed in consultation with the Environment Agency (EA) and implemented during construction via a Construction Environmental Management Plan (CEMP) and appropriate construction environmental method statements.

The proposals are also not expected to prevent the future attainment of the status objectives of the Simonswood Brook water body and the Alt US Bull Bridge water body, with regard to the implementation of measures and actions identified

by the EA to address existing pressures on quality elements status. General mitigation measures for the affected water bodies as set out by the EA include: maintenance measures to manage woody debris, measures to maintain channel bed/margins, measures to retain habitats, vegetation control measures, selective vegetation control measures, and vegetation control measures which are timing dependent. Actions include plans to reduce concentrations of nutrients from sewage works, correct plumbing and drainage modifications, reduce agricultural pollution, remediate contaminated land, restrict the disposal of chemicals, mitigate erosion issues, de-culvert and culvert sections, create a wetlands, improve hydromorphological regime, and limit nutrient spreading and run-off.

The proposed scheme is therefore considered to be compliant with the objectives of the WFD based on the scheme description provided in Appendix B and with the following overarching assessment objectives identified by the EA:

- The proposed scheme does not cause deterioration in the Status of the relevant water bodies;
- The proposed scheme does not compromise the ability of the relevant water bodies to achieve their WFD status objectives;
- The proposed scheme does not cause a permanent exclusion or compromised achievement of the WFD objectives in other water bodies within the same RBD.

However, it is recommended that this preliminary assessment is reviewed and updated where necessary as a 'living document' to account for:

- any material detailed design changes;
- acquisition of any further, relevant site information, including those gathered during any preliminary works (such as additional ground investigation data); and/or
- the provision of any further EA WFD datasets/information for the relevant water bodies present at the site.

This assessment, including any subsequent updates, should be used to inform any subsequent design works and the development of construction phase mitigation requirements, in consultation with the local EA area team staff.

Morphological and marginal habitat diversity along the Simonswood Brook water body and the Alt US Bull Bridge water body within the vicinity of the site is current limited. It is recommended that opportunities for any in-channel enhancement works to help contribute towards WFD and Biodiversity objectives in this area are considered in consultation with the EA and Network Rail at this stage.

2 Introduction

2.1 Project Background

This report has been prepared by Ove Arup and Partners (Arup) on behalf of Buckingham Group Contracting Limited (BGCL) to support a Network Rail planning application and corresponding Environmental Impact Assessment (EIA) for a new station and car park at Headbolt Lane. The project is at Outline Design stage (RIBA stage 3).

Merseytravel is looking to extend the current Merseyrail network east of Kirkby Station (Kirkby, Merseyside, England) to a new station at Headbolt Lane. It is proposed that Headbolt Lane will become the new interchange between Merseyrail services for Liverpool Central and Northern services from Manchester Victoria, where Kirkby Station was the old interchange. Headbolt Lane will be a new three platform station with adjacent car park. It is located approximately 900 m north-east of Kirkby Station and will be connected to Kirkby Station using the existing railway alignment. This alignment will be upgraded from a single track to a twin track.

2.2 Purpose of this Report

Arup has been commissioned to undertake a Water Framework Directive (WFD) Compliance Assessment to support the EIA assessment for a planning application for works on Kirkby Station and Headbolt Lane Station.

The key objectives of the assessment are to:

- identify the relevant WFD water bodies that may be affected by the proposed scheme and collate the available WFD baseline information;
- identify relevant scheme components with the potential to affect the WFD water bodies at the site, together with any embedded mitigation measures integrated into the current design;
- undertake a scoping assessment to identify the likely impacts of the proposed scheme on the current status and status objectives of the relevant waterbodies (including identification of any additional mitigation requirements);
- identify any risks of non-compliance with WFD objectives and associated requirements for further detailed impact assessment and/or mitigation design; and
- identify potential enhancement opportunities to support the delivery of WFD objectives.

This report summarises the proposed scheme and the assessment methodology and results. The assessment has been undertaken in accordance with relevant guidance (see Appendix A) and has involved a desk-based study using readily available Environment Agency (EA) WFD baseline information and existing available site visit information.

This report summarises the proposed scheme and the assessment methodology and results. The assessment has been undertaken in accordance with relevant guidance produced by the EA and The Planning Inspectorate.¹

2.3 Legislative Context

The EU WFD² has been in force since 2000 and is currently the largest and most influential piece of EU legislation relating to the water environment. The Directive was transposed into UK law by The Water Environment (Water Framework Directive) (England and Wales) Regulations (amended 2017)³. The EA is the competent authority responsible for delivering the Directive in England.

The WFD establishes a legislative framework for the protection of surface waters and groundwater across all EU Member States, and the UK. It takes an integrated approach to the sustainable management of water by considering the interactions between surface water, groundwater and water-dependent ecosystems.

Under the WFD, ‘water bodies’ are the basic management units and are defined as all or part of a river system or aquifer. These water bodies form part of a larger River Basin District (RBD), for which River Basin Management Plans (RBMPs) are developed and environmental objectives are set. These RBMPs are produced every six years, in accordance with the river basin management planning cycle.

The WFD requires all signatories to classify the current condition or ‘status or potential’ of surface water and groundwater bodies and to set a series of objectives for maintaining or improving conditions so that water bodies reach and / or maintain ‘good status or potential’. These overall Environmental Objectives are to:

- prevent the deterioration of (and where possible enhance) the status of surface water bodies, ground water bodies and their ecosystems;
- aim to achieve at least ‘Good’ status for all water bodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve Good status by 2021 or 2027;
- meet the requirements of Water Framework Directive Protected Areas;
- promote sustainable use of water as a natural resource;
- conserve habitats and species that depend directly on water;
- progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to surface water (particularly the aquatic environment);

¹ The Planning Inspectorate, June 2017. *Advice Note Eighteen: The Water Framework Directive*. [Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf]

² European Commission, 2000. *Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy*

³ *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 No. 407*. [Available at: <https://www.legislation.gov.uk/uksi/2017/407/contents/made>]

- progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- contribute to mitigating the effects of floods and droughts.

All new (and current on-going) activities in the water environment now need to be guided by the requirements of the WFD. This includes ensuring that no changes occur that causes a deterioration of current status of a water body or prevents the achievement of the future status objectives of a water body. This principle is now integrated into the planning permission application process for proposed schemes / activities.

Further background information regarding the determination of WFD status and the WFD compliance assessment requirements for new schemes/developments is provided in Appendix A1.

3 WFD Assessment Methodology

3.1 General Scope of WFD Assessment Methodology

The assessment comprises of up to three stages, as recommended by The Planning Inspectorate⁴, to assess the potential for each proposed activity (individually and in combination) to impact on individual (or multiple) WFD quality elements. At each screening and scoping stage, if effects are ruled out, no further assessment is required:

1. Screening – baseline assessment to exclude any activities that do not need to go through the scoping or detailed assessment stages;
2. Scoping – preliminary assessment to identify the quality elements that are potentially at risk from the proposed activity and need further detailed assessment; and
3. Detailed Assessment – detailed impact assessment (and application of Article 4.7 where applicable) to consider the potential impacts of an activity on bodies of surface and ground water, identify ways to avoid or minimise impacts, and identify if an activity may prevent the water body achieving good status or cause deterioration.

These key process steps are described in detail in Appendix A2 of this report.

3.2 Scope of this Assessment

This assessment comprises the screening and scoping assessment elements of process to support the detailed planning application for the proposed. Due to the findings of this report it is considered that further detailed assessment, as per Stage 3 in Section 3.1, including completion of baseline field surveys or monitoring, are not required at this stage.

The spatial scope of the assessment includes all WFD designated surface water and groundwater bodies potentially affected by the proposed scheme. The assessment considers the potential impacts of the proposed scheme on all of the relevant quality elements associated with the surface water and groundwater bodies affected, at the water body scale.

The assessment focuses on the permanent impacts of the proposed scheme.

Temporary impacts are not considered to result in deterioration in WFD status and so have not been considered within the assessment in accordance with current guidance⁵. In this sense, impacts are not considered to result in a deterioration of the status if the water body:

⁴ The Planning Inspectorate, June 2017. *Advice Note Eighteen: The Water Framework Directive*. [Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf]

⁵ Natural Resources Wales, 2017. *Guidance for assessing activities and projects for compliance with the Water Framework Directive*

- is only impacted for a short time period;
- is likely to recover within a short time period; and/or
- is likely to recover without the need for any restoration measures.

3.3 Data Sources

The following data sets and resources are readily available online and have been used to inform this assessment:

- Cycle 2 River Basin Management Plan (RBMP), North West River Basin District⁶
- Cycle 2 RBMP water body status classification and status objectives data, RNAG (reasons for not achieving good) data, WFD protected area data⁷;
- Historic OS maps⁸;
- Biological Monitoring Data: Ecology & Fish Data Explorer⁹;
- Water quality data archive¹⁰;
- Ordnance Survey (OS) Open Data¹¹; and
- DEFRA ‘MAGIC’ map (providing authoritative geographic information about the natural environment from across government)¹².

In addition to the above, the EA holds internal datasets including extended water body reports regarding the RNAG investigations and mitigation measures identified to support the achievement of water body status objectives. This data was requested and has also been used to inform this assessment.

⁶ Environment Agency and DEFRA, 2015. *North West River Basin Management Plan 2015*. [Available at: <https://www.gov.uk/government/collections/river-basin-management-plans-2015>]

⁷ Environment Agency, 2017 *Catchment Data Explorer* [Available at: <http://environment.data.gov.uk/catchment-planning/>]

⁸ National Library of Scotland. *Historical OS maps*. [Available at: <http://maps.nls.uk/os/>]

⁹ Environment Agency and DEFRA. *Ecology and Fish Data Explorer*. [Available at: <https://environment.data.gov.uk/ecology/explorer/>]

¹⁰ Environment Agency. *Water Quality Data Archive*. [Available at: <https://environment.data.gov.uk/water-quality/view/landing>]

¹¹ Ordnance Survey. *Open Data maps*. [Available at: <https://www.bing.com/mapspreview>]

¹² DEFRA. *MAGIC map*. [Available at: <https://magic.defra.gov.uk/magicmap.aspx>]

4 Scheme Background & Description

4.1 Site Location

The Proposed Scheme site is situated in Kirkby, Merseyside. The proposed station and car park site are situated in an area of green space adjacent to the A506 to the west and Headbolt Lane to the north (Grid Ref: SJ 41308 99815). The site lies approximately 900 m north east of the centre of Kirkby, Liverpool.

The proposed station and car park site is fringed by Headbolt Lane to the north and the A506 to the west. There is a railway line, operated by Northern Rail, located to the south of the Site running in a south-west to north-east alignment.

The proposed station and car park site is predominately greenfield land with large housing estates to the north of Headbolt Lane and to the south adjacent to the existing railway line. The railway corridor between the existing Kirkby Station and the proposed new station is bordered by residential areas to the south and north.

Kirkby Brook, runs east-west across the proposed station and car park site. Kirkby Brook continues west and flows into Simonswood Brook which runs north-south under the railway corridor works to the east of the proposed station and car park site (Figure 1).

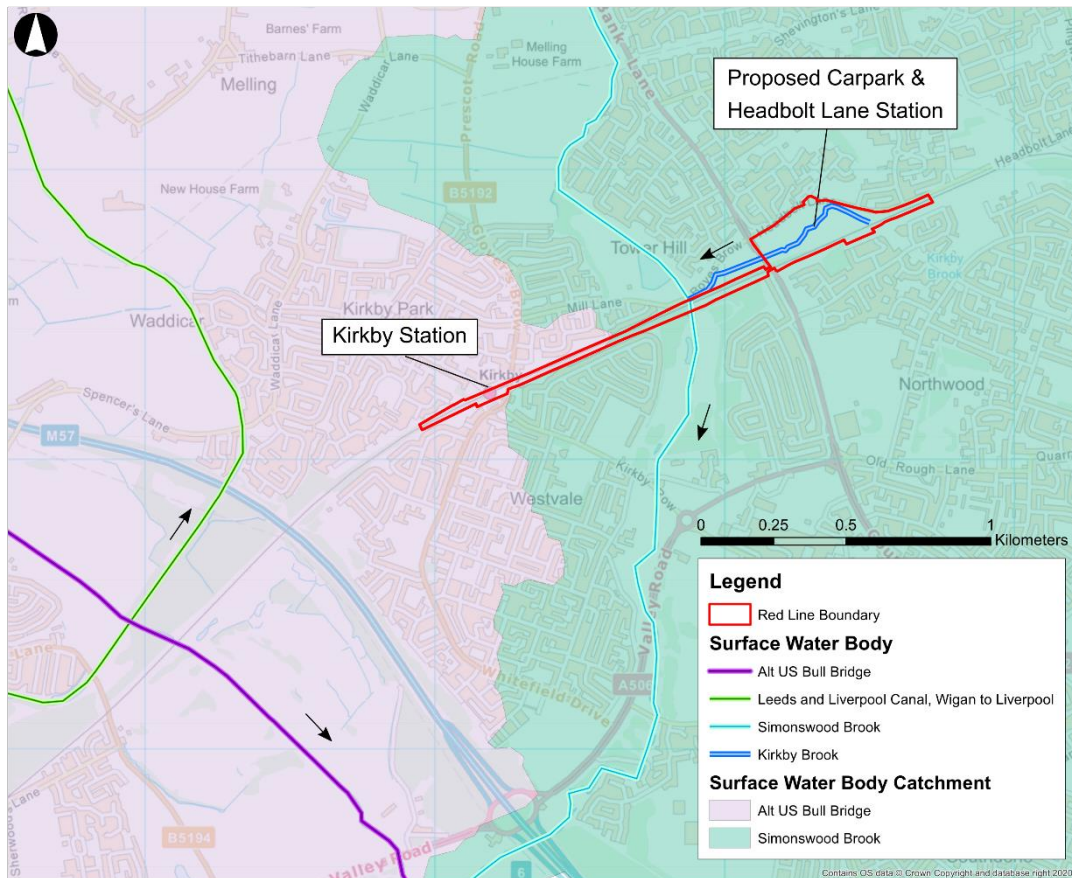


Figure 1: Site location plan showing the location of the existing Kirkby Station, rail corridor works and the proposed station and car park site, alongside Kirkby Brook, Simonswood Brook, Alt US Bull Bridge and the Leeds and Liverpool Canal.

4.1.1 Location of Rail Corridor Upgrades and Kirkby Station

The railway upgrade element of the Proposed Scheme is on the existing Liverpool-Wigan rail corridor between the existing Merseyrail Kirkby station to the proposed Headbolt Lane station. The alignment of the rail corridor is roughly south-west to north-east. For the majority of its length the existing rail corridor is bounded by residential properties to the north and south (shown in Figure 1).

The site for works on the existing Kirkby Station is located within 1.4 km of the River Alt, and 0.9 km east of the Leeds-Liverpool Canal. The rail line traverses Simonswood Brook via a pre-existing bridge and runs 50 m parallel to Kirkby Brook for approximately 500 m before terminating at the proposed Headbolt Lane Station.

4.2 Existing Site Conditions

4.2.1 Watercourses

The works to extend the rail line from the existing Kirkby Station to the new Headbolt Lane Station span both WFD water bodies ‘Alt US Bull Bridge’ (Alt upstream of Bull Bridge) (GB112069061441) and ‘Simonswood Brook’

(GB112069060630). The rail line traverses Simonswood Brook via a pre-existing rail bridge and runs 50 m parallel to Kirkby Brook (within the WFD water body Simonswood Brook) for approximately 500 m before terminating at Headbolt Lane Station. One road bridge, two new footbridges and one existing footbridge will cross Kirkby Brook, an unnamed tributary of Simonswood Brook in WFD, at Headbolt Lane Station. The watercourse at the site is heavily modified with low morphological diversity. The site is near the WFD artificial water body 'Leeds and Liverpool Canal, Wigan to Liverpool (GB71210083).

4.2.2 Geology

The British Geological Survey (BGS) 1:50,000 scale mapping indicates that in terms of superficial deposits, the site is underlain by the Shirdley Hill Sand Formation (aeolian Quaternary sand deposits), and under Kirkby Station it is underlain by Devensian Glacial Diamicton (poorly sorted Quaternary glacial till).

The British Geological Survey (BGS) 1:50,000 scale mapping indicates that the bedrock beneath the site comprises the Wilmslow Sandstone Formation consisting of Triassic interbedded sands and evaporites of mixed arid desert and shallow detrital marine/lagoon facies.

4.2.3 Groundwater

The site is underlain by the groundwater body 'Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers' (GB41201G101700).

The site is located within an EA designated groundwater source protection zone (SPZ).

4.2.4 Ground Conditions

A mining risk assessment report for the site concludes that the site is not considered to be underlain by shallow workings that would pose a risk to the development of the site and no further action in relation to shallow mine workings is required.

4.3 The Proposed Scheme

Relevant details of the proposed scheme as per the Environmental Statement Chapter 2: Development Description¹³ are given in this section. Further details and corresponding figures are provided in Appendix B1.

4.3.1 Overview of the Proposed Scheme

The proposed station and car park comprises the following elements:

- a new station located on land at Headbolt Lane;

¹³ Arup, 2021. Chapter 2: Development Description (Environmental Statement), 170248 Headbolt Lane New Station GRIP 4

- a new 300 space car park and associated structures (signage, waiting shelters and car park lighting) and to service the new station;
- supply bulk point and substation to accommodate electrification of rail corridor upgrades and for the new station;
- new vehicular and pedestrian access including two footbridges over Kirkby Brook and a road bridge to access each section of the car park; and
- associated landscaping.

Works to the railway corridor comprises the following:

- railway line upgrade to a twin track and associated infrastructure to extend the Merseyrail electrification to the proposed station (including the extension of the existing third line electrification network and a new substation); and
- decommissioning works to the existing Kirkby Station.

Further scheme details are provided below.

4.3.2 Existing Kirkby Station works

The existing Northern Rail platform at Kirkby will be decommissioned, made safe from public access and will be partially removed. The removed section of the platform will be between Over Bridge 57 (Glovers Brow / B5192 road bridge) and the end of the back of platform retaining wall. The walkway that currently connects the Northern Rail platform will be removed with reconstruction of a maintenance walkway taking its place. This new maintenance walkway will include surfacing, channel drain, handrails, fencing, gated access and steps to track level.

The eastern end of the Merseyrail platform will be fenced off to stop public accessing the operational railway. The remainder of the existing Kirkby Station will remain fully operational.

An extension to the Merseyrail third rail network is proposed through the Kirkby Station continuing through to Headbolt Lane. To meet the third rail safety case a segregated access walkway will be provided through Over Bridge 57 and the redundant Northern Rail platform.

4.3.3 Rail Corridor Works

The existing rail corridor comprises a single line. The Merseyrail network will be extended east from the existing terminating station at Kirkby by removing the existing buffer stops and connecting these with new trackwork. A new railway switch will split the tracks from a single alignment into a new twin-track arrangement.

As part of these works the existing embankment will be widened and strengthened to accommodate the twin track arrangement. The embankment will be widened by 3.4 m to the north of the track and 2.6 m to the south of the track within the extent of the rail corridor and within the Network Rail owned land boundary. This

widening will also allow for the introduction of safe walkways beside the tracks and to accommodate Low Voltage (LV) and High Voltage (HV) cables.

To facilitate the new twin-track arrangement, vegetation removal will be required along the existing railway corridor. Details of the vegetation removal can be found in the Arboricultural Impact Assessment (document ref. no.: 170248-BGC-SVY-EEN-000004).

As part of the rail corridor works, work is needed to be carried out on Underbridge 55 (crossing the A506 and County Road) and Underbridge 56 (crossing Simonswood Brook and a public footpath).

Underbridge 55 currently spans over both the A506 (Span 1 and 2) and County Road (Span 3). The proposed modifications to Underbridge 55 are to remove the existing bridge pier and foundations between County Road and the A506 and replace with a portal frame pier which falls under LPA / local highways land. Span 1 and 2 over the A506 will be replaced by a new single span which will be a twin Network Rail painted steel U-type deck extending the new single span over A506 to 18 m and 5.3 m in height which will be done within both the Network Rail and local highway boundary.

Underbridge 56 (crossing Simonswood Brook and a public footpath) is a two-span natural stone masonry arch bridge. Spans are 4.6 m long. The bridge deck is approximately 9.3 m wide. Span 1 crosses a public footpath, and span 2 crosses Simonswood Brook. In order to accommodate the twin track configuration and to provide additional safety features it is proposed that a concrete trough will be placed on the existing bridge to house the new track alignment and to strengthen the bridge. As a result, Underbridge 56 will extend by 1 m on either side due to this concrete trough and the addition of steel walkways for safety and maintenance with all works being undertaken within both the Network Rail and local highway boundary.

The existing Merseyrail third rail network will be extended to the proposed station. The existing Northern Rail network will be shortened as a result of it stopping up at the proposed Station rather than its current stopping up point at the Kirkby Station. To facilitate this third rail extension, a new substation is required that will be located in the vicinity of the proposed station and car park site (see Figure 4, Appendix B1).

The entire length of the rail corridor will be bound by fencing which will be 1.8 m high. This fencing will be a mixture of existing fencing which already meets the height requirements and new fencing to ensure safety along the whole route of the major rail corridor.

The total distance of the major rail corridor works (including the third rail extension works) will be approximately 1.9 km.

4.3.4 Substation

To facilitate the third rail extension and the proposed Station, a new sub-station is proposed. The new substation will occupy an area of land to the west of the

proposed Station and will amount to a total footprint of 0.09 ha (see Figure 4, Appendix B1).

The substation will consist of all the components needed for the rail corridor works with most of the assets being housed in the substation building which is up to 3.04 m in height, 6.3 m in length and 2.3 m in width. Outdoor transformers, not able to be stored in the substation building will be located adjacent to the building and will be up to 2.4 m in height and 3.1 m in width.

4.3.5 Proposed Station

The proposed station will comprise three platforms, with two platform faces (Platform 1 and 2) serving Merseyrail located on the northern side of the rail corridor and a single platform face (Platform 3) serving Northern Rail on the south side of the rail corridor. Buffer stops will be provided to Merseyrail and Northern Rail to indicate the two Train Operating Companies. The platforms will be connected by a cross station access platform (which will be the same height as platforms 1 – 3), replicating the operational interchange functionality at the existing Kirkby station. This cross-station access platform will run adjacent to an obscuration screen, which will be installed between the buffer stops of each railway line so that oncoming trains are not affected by lighting produced by oncoming trains in the opposite direction. This obscuration screen will be approximately 2.9 m in height and 20 m in length.

A single station building will be provided, with mess facilities for station staff and train crew. The station building will be staffed and will have facilities for customers to purchase tickets. Ticket vending machines will be available on the platform for customers who approach the station on foot from south of the railway line. The proposed station building will have a height of 8 m and total footprint of approximately 190 m² and will be finished in brickwork and white render with extensive glazing.

4.3.6 Proposed Car Park

The approximate area for the station and car park is 5.9 ha (see Figure 2.8) and comprises approximately 300 spaces. The proposed car park will be split into two; the main car park consisting of 270 spaces located north of Kirkby Brook, and an accessible car park consisting of 30 spaces (15 accessible bays and 15 enlarged bays) located south of Kirkby Brook adjacent to the proposed station building.

Three staff spaces and two Network Rail maintenance bays are to be provided, along with a parking area for five motorcycles. Provision of electric charging points will be in-line with Knowsley Council policy. A short stay pick-up / drop-off area is also proposed outside the station building, with space for four vehicles. Covered parking facilities for 100 cycles will be provided.

4.3.7 Vehicular Access

A new signalised junction is proposed on Headbolt Lane providing access to the proposed station and car park site. The junction will be positioned at the existing

junction between Fallowfields and Headbolt Lane, creating a ‘four-armed’ junction. Controlled pedestrian crossings are to be provided on each ‘arm’ of the junction.

Headbolt Lane and Fallowfields are public highways maintained by KMBC. Junction works will therefore be subject to technical approval by KMBC.

A proposed internal road links the junction with Headbolt Lane to the proposed station forecourt, which includes two bus stops and a drop-off area for four private vehicles. Bus stops have been sized for 12 m long buses based on Merseytravel requirements. The layout of the internal road is shown in Figure 4, Appendix B1.

A new road bridge is required to span the access road over Kirkby Brook, which will be 4 m above existing ground level at its highest point and will have an under bridge clearance of 1.4 m, and can be seen in Figure 4, Appendix B1.

4.3.8 Pedestrian / Cycle Access

The main access road mentioned in Section 4.3.7 above includes 2 m footways on each side and a bi-directional 3 m cycleway on the east side of the access road.

The cycle route is diverted around the accessible parking area to provide a more direct route to cycle storage areas at the proposed station and avoid conflicts with pedestrian movements. Where pedestrian routes intersect access roads, zebra crossings are provided to promote pedestrian priority through the site.

The existing footpath, which crosses the site from east to west will be diverted and incorporated into the site access proposals. The existing western footbridge over Kirkby Brook shall be removed and the eastern footbridge retained. An additional footbridge is proposed over Kirkby Brook to the east of the station building. The eastern bridge provides a link to the eastern section of Headbolt Lane and allows pedestrians arriving from this area to easily cross Kirkby in order to reach the station building (see Figure 4, Appendix B1).

4.3.9 Drainage

The proposed station and car park surface water drainage has been divided into two networks, north and south of Kirkby Brook as further detailed in the Flood Risk Assessment for Headbolt Lane¹⁴.

The northern catchment consists of the main 270 space car park and northern portion of the access road up to the road bridge. This area will be drained to an attenuation tank beneath the car park, discharging into Kirkby Brook via a flow control device and petrol interceptor. At the request of the client, this catchment shall also be sized to accommodate a potential future extension to the car park of 200 spaces (470 total) whilst still maintaining a maximum discharge rate of 5l/s. This means that for the base scenario (270 spaces) the drainage network would not be utilised at full capacity and the discharge rate will likely be less than the maximum allowable rate. (Figure 6, Appendix B1). This means that for the base

¹⁴ Arup, 2021, Flood Risk Assessment, Headbolt Lane New Station

scenario (270 spaces) the drainage network would not be utilised at full capacity and the discharge rate will likely be less than the maximum allowable rate.

The southern catchment consists of the proposed station forecourt, accessible parking area, southern access roads, drop off area, public realm, station building and platforms. This catchment will also be drained to an attenuation tank beneath the car park, discharging into Kirkby Brook via a flow control device and petrol interceptor (Figure 6, Appendix B1). An under-track crossing (UTX) is required to connect the southern Merseyrail platform into the downstream drainage network.

Track drainage is also proposed as part of the proposed station, drainage catch pits 1.1 m x 6 m will be used along the track section at the proposed station (see Figure 7, Appendix B1).

An external foul drainage network for sanitary appliances in the station building, at a peak discharge rate of 2.55 l/s, is proposed to discharge into the United Utilities foul sewer running through the site (subject to application).

4.3.10 Landscaping

Landscaping will form an important part of the proposed Scheme and will consist of a combination of hard landscaping, soft landscaping and street furniture (Figure 8, Appendix B1).

Soft landscaping dominates the landscaping plan for the proposed Scheme and consists of the following features;

- improved habitat area (consisting of methods such as shrub planting) which is focussed around the proposed car park and the pick up drop off areas of the proposed station;
- native planting which is found directly adjacent to Kirkby Brook and will focus on the existing landscaping found within the 8 m working buffer from the watercourse as per the EA's policy;
- ornamental shrubs and grasses which are proposed to be utilised between the platforms of the Proposed Station and in between staff parking bays and the pick up drop off system; and
- wildflower meadows which are proposed in the land west of the proposed car park and in land between the proposed station building and the proposed substation.

Landscaping and planting will also be utilised along Headbolt Lane to screen the proposed Scheme from nearby receptors and will be used trackside, especially on the widened embankment, to also help screen the rail corridor works from nearby receptors.

4.3.11 Footprint of Activity

The footprint of the car park is 5.9 hectares (ha).

The footprint of the new station is approximately 190 m² (0.019 ha).

The length of track upgraded is approximately 1.9 km.

4.3.12 Construction Programme and Hours

It is anticipated that the construction of the Proposed Scheme will commence in Q4 2021 and take approximately 1.5 years to complete.

Construction activities would include the following phases:

- preliminary works and site establishment;
- earthworks;
- civil engineering work;
- rail systems works within the railway corridor; and
- buildings and substation construction.

It is anticipated that normal construction working hours would be followed (Monday to Friday 08:00 to 18:00 and Saturday 08:00 to 13:00 with no working on Sundays or bank holidays). Should construction works need to be conducted outside these normal construction working hours they would be agreed in advance with Knowsley Council and would comply with any restrictions imposed by the planning consent, and in particular regarding control of noise and traffic.

4.4 Construction Phase Mitigation

4.4.1 CEMP

For the purposes of this preliminary assessment, it is assumed that a Construction Environmental Management Plan (CEMP) will be developed for the proposed scheme during the detailed design stage prior to construction. This document should outline environmental issues identified within the proposed scheme site; provide a register of relevant legislation and consents requirements; define agreed mitigation measures in work method statements to ensure compliance with current legislation, works licences and permits, planning approvals, and best practice guidance. It is assumed that this document will be adopted and adapted during the construction phase by the appointed contractor(s).

4.4.2 General Good Practice Guidance

The CEMP should include measures to avoid and minimise impacts to the water environment during construction of the proposed scheme, in alignment with EA guidance and best practice. For the basis of this assessment, it is assumed at this stage that reference will be made in the CEMP, where necessary, to the environmental good practice advice in the Pollution Prevention Guidelines (PPG)¹⁵, together with the replacement guidance series, Guidance for Pollution Prevention (GPP) as and when this becomes available. Whilst PPGs and GPPs do

¹⁵ See: <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>

not provide regulatory guidance in England, they form environmental good practice guidance for the whole UK. The PPG/GPPs listed below are of particular relevance to the proposed scheme:

- PPG1: Understanding your environmental responsibilities - good environmental practices;
- PPG 3: Use and design of oil separators in surface water drainage systems;
- GPP 5: Works and maintenance in or near water;
- PPG 6: Working at construction and demolition sites;
- GPP 8: Safe storage and disposal of used oils;
- PPG 18: Managing fire water and major spillages;
- GPP 21: Pollution incident response planning; and
- GPP 22: Dealing with spills.

4.4.3 Pollution control

Control of sediment runoff

It is assumed that best practice will be adopted in line with GPP 5¹⁶ to minimise the risk of silt pollution to nearby watercourses during construction activities. This will involve the identification of potential sources and pathways to Kirkby Brook and Simondswood Brook in the WFD catchment Simonswood Brook, and the River Alt in the WFD catchment Alt US Bull Bridge, and the application of appropriate measures, where necessary, to avoid or control silt runoff. For example, this may include:

- seeding or covering exposed ground and sediment stockpiles;
- only removing vegetation from areas that need to be exposed in the near future;
- minimising the amount of time soil stockpiles are exposed for;
- all plant and wheel washing to be carried out in a designated area at least 10m from any water body or surface drain;
- runoff to be collected in lagoons or settlement tanks (or similar) to allow suspended solids to settle and be removed to appropriate levels before discharge to the nearby watercourse;
- any runoff water containing silt or other pollutants to be treated appropriately before discharge back to the water environment.

Spillages

A pollution risk assessment should be carried out for the proposed site ahead of construction, considering both the storage and transportation of materials used. This would identify potentially hazardous materials or activities and assess the

¹⁶ NRW, NIEA, & SEPA (2018), *Guidance for Pollution Prevention: Works and maintenance in or near water*: GPP 5.

probability and magnitude of potentially harmful effects. From this, a pollution incident response plan (see GPP 21¹⁷) would be compiled to identify the specific measures needed to reduce the likelihood of a spillage happening, and to minimise the impact of any spills that may occur.

Soil

The properties of any materials being added to soils for soil mixed columns should be considered to ensure a pollution risk is not created. The properties of any soil stabilisation materials being added should be considered to ensure a pollution risk is not created in accordance with the EA's Groundwater Protection guidance¹⁸.

Managing contamination risk

The site history and previous ground investigation data suggest that the made ground beneath the site may contain a range of contaminants including localised areas of asbestos and Polycyclic aromatic hydrocarbons (PAHs). Whilst it is not anticipated that the geo-environmental risks at the proposed scheme pose a risk to the water environment appropriate controls and good practice measures should be implemented through the construction contractors CEMP. This should include further ground investigation to help inform a detailed risk assessment, remediation options appraisal and remediation strategy (if appropriate) and inspection of materials for any evidence of further contamination.

Should any further evidence of contamination be identified this should be further assessed and tested as appropriate to enable any required additional controls/works to be determined. Such measures should mitigate potential environmental impacts associated with the potential mobilisation of contaminated soils at the site during construction.

4.4.4 Minimising disturbance

Appropriate measures should be included within the work method statements to reduce potential environmental impacts of in-channel and marginal construction activities. This should include measures to:

- minimise the footprint of any in-channel works as far as reasonable possible to reduce the degree of physical disturbance of the river bed and banks;
- reinstate any impacted marginal habitats where necessary; reduce associated noise, vibration, and any artificial lighting impacts where possible; and
- control the timing of works so that any in-channel works are programmed to take place outside of sensitive times of year for juvenile fish and migratory fish (addressed in agreement with the EA via a Flood Risk Activity Permit).

¹⁷ NRW, NIEA, & SEPA (2017), *Guidance for Pollution Prevention: Pollution Incident Response Plans: GPP 21*.

¹⁸ Environment Agency (2017) *Groundwater protection guides covering: requirements, permissions, risk assessments and controls* (previously covered in GP3) (online) Accessible from: <https://www.gov.uk/government/collections/groundwater-protection>

4.4.5 Biosecurity

Good biosecurity practices are vital for preventing the spread of invasive non-native species and pathogens such as waterborne fish diseases. Measures should be adopted so that the construction activities do not lead to the spread of invasive non-native species or pathogens. For further details on the invasive species identified on site see the Preliminary Ecological Appraisal (Document ref. no.: 170248-BGC-REP-EEN-000001).

An Invasive Species Management Plan and a Soils Management Plan will be prepared by the contractor. All site personnel and site visitors should be informed that Japanese knotweed is present within the vicinity of the proposed scheme and that they are jointly responsible for preventing its spread/impacts. They should be made aware of what this species looks like, so they can avoid it where possible and take appropriate actions. Biosecurity measures will be in place to prevent the spread of Japanese knotweed throughout the construction area. This will include clearing and disinfection of (but not limited to): all equipment; footwear; clothing; vehicle parts (wheels, tracks, buckets); pumps; pipework; any other equipment in contact with the watercourse of river banks.

5 WFD Baseline (Screening)

5.1 Overview

A screening and baseline assessment has been undertaken to identify the relevant WFD water bodies affected by the proposed scheme and to collate the latest available EA Cycle 2 WFD baseline data, in order to inform a scoping assessment of the likely effects of the scheme on WFD status and objectives (see Section 6).

5.2 Relevant Water Bodies

The proposed scheme is located within the Alt Operational Catchment, within the North West River Basin District (RBD). The WFD status, status objectives and programme of measures derived by the EA for water bodies located within this RBD are outlined within the 2015 Cycle 2 North West RBMP¹⁹.

The zone of influence of the scheme includes the physical footprint of the works and the WFD surface water bodies that run through the site and the WFD groundwater body that underlies the site.

The following WFD water bodies in Table 1 have the potential to be affected by the scheme and are therefore considered in the assessment. Their map extents are shown in Appendix C. The latest available WFD baseline information for these water bodies is summarised in the below sections.

¹⁹ DEFRA and Environment Agency (2015). North West River Basin District, River Basin Management Plan. Available from:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718335/North_West_RBD_Part_1_river_basin_management_plan.pdf

Table 1: WFD water bodies present at the site of the proposed scheme

Water Body Name	Water Body ID	Water Body Type	Hydro-morphological Designation	Catchment Area/ Length
Simonswood Brook	GB112069060630	Surface water body (river)	Heavily modified	31.504 km ²
US Alt Bull Bridge	GB112069061441	Surface water body (river)	Heavily modified	38.184 km ²
Leeds and Liverpool Canal, Wigan to Liverpool	GB71210083	Surface water body (canal)	Artificial	67.943 km
Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	GB41201G101700	Groundwater body	N/A	627.529 km ²

5.2.1 Water bodies Screened Out

There are no significant below ground workings associated with the preferred option and therefore no impacts are anticipated on this groundwater body. Consequently, the groundwater body has been screened out of the assessment.

Further, there are no pathways for impact identified from the site to the canal, as the canal is not within the water body catchment where new works are occurring (Simonswood Brook), and is at a distance from the Kirkby Station and rail track expansion sites where upgrades to existing assets are occurring (Alt US Bull Bridge). Therefore, the canal has also been screened out of the assessment.

5.3 Simonswood Brook (GB112069060630)

The site for the new Headbolt Lane Station crosses Kirkby Brook, which in the WFD is an unnamed tributary that feeds directly into the WFD river water body Simonswood Brook (GB112069060630). The rail line between Headbolt Lane Station and Kirkby Station crosses Simonswood Brook via a rail bridge. The present land use around the brook is urban greenway with semi-improved grassland, as can be seen on the map extract outputs of a riverine assessment of the area provided in Appendix E.

A Preliminary Ecological Appraisal (PEA)²⁰ has also been undertaken at the proposed scheme. Japanese knotweed and Himalayan balsam were identified at the site. It is understood that the invasive species will be professionally removed.

²⁰ NGL Ecology Ltd. (2020) *Headbolt Lane, Kirkby, Preliminary Ecological Appraisal*

It is recommended that a method statement is produced to identify any residual presence and control measures prior to construction.

5.3.1 Status and objectives

The water body is designated as a Heavily Modified Water Body (HMWB), owing to physical modifications by human activity and a resultant substantial change in character (flood protection). The water body currently has an Overall Status of 'Moderate' with an Ecological Potential of 'Moderate' and a Chemical Status of 'Fail'. A breakdown of the current status and status objectives of the water body is provided in Table 2. The water body is also currently failing its Mitigation Measure Assessment (Moderate or less), as a result of measures identified for the water body not being in place.

Table 2: Cycle 2 RBMP WFD status and objectives for the Simonswood Brook (GB112069060630) river water body

	Status	Objective (as of 2019)
OVERALL STATUS	MODERATE	GOOD BY 2027
ECOLOGICAL POTENTIAL	MODERATE	GOOD BY 2027
Biological quality elements	Poor	Good by 2027
Invertebrates	Poor	Good by 2027
Macrophytes and Phytobenthos Combined	Good	Good by 2015
Fish	Poor	-
Physicochemical quality elements	Moderate	Good by 2027
Ammonia (Phys-Chem)	High	Good by 2027
Biochemical Oxygen Demand (BOD)	-	-
Dissolved oxygen	High	Good by 2015
pH	High	Good by 2015
Phosphate	Moderate	Good by 2027
Temperature	High	Good by 2015
Specific pollutants	High	Not assessed by 2015
Copper	High	High by 2015
Triclosan	-	-
Zinc	High	High by 2015
Hydromorphological Supporting Elements	Supports Good	Supports Good by 2015
Hydrological Regime	Supports Good	Supports Good by 2015
Supporting elements (surface water)	Moderate	Good by 2027
Mitigation Measure Assessment	Moderate or less	Good by 2027
CHEMICAL STATUS	FAIL	GOOD BY 2015
Priority substances	Good	Does not require assessment by 2015

	Status	Objective (as of 2019)
Priority hazardous substances	Fail	Does not require assessment by 2015
Other Pollutants	Does not require assessment	Does not require assessment by 2015

5.3.2 Reasons for not achieving good (RNAG)

The EA's RNAG dataset suggests that sewage discharge originating from point sources (wastewater treatment) is a reason for Simonswood Brook not achieving Good status for invertebrates and phosphate. It also indicated that the water body is not achieving a Good status for phosphate due to poor nutrient management associated with livestock agriculture, and due to point source pollution associated with misconnections.

Furthermore, measures identified by the EA to address physical modification pressures associated with flood protection are not currently in place. This is preventing the Mitigation Measures Assessment element from achieving a Good status.

The RNAGs for the water body identified in the Cycle 2 RBMP are summarised in Table 3.

Table 3: Reasons for not achieving good (RNAG) status identified for the Simonswood Brook (GB112069060630) water body.

Failing element	RNAG					
	ID	Category	Business	SWMI	Activity	Pressure Tiers
Mitigation Measures Assessment	480080	Local and Central Government	Not applicable	Physical modification	Other	Flood protection; Physical modification
Invertebrates	483454	Water Industry	Waste water treatment	Point source	Sewage discharge (continuous)	Ammonia
Phosphate	489637	Industry	Other industry, manufacturing and Business	Point source	Misconnections	Phosphate
	489636	Agriculture and rural land management	Agriculture - Livestock	Diffuse source	Poor nutrient management	Phosphate

	482807	Water Industry	Waste water treatment	Point source	Sewage discharge (continuous)	Phosphate
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5.3.3 WFD Protected Areas

WFD Protected Areas are areas that have been designated under other EU legislation as requiring special protection for surface waters or groundwaters, or for protected habitats and species depending directly on water. Where a WFD water body falls within or forms all or part of a designated WFD Protected Area, the water body is subject to additional environmental objectives (and associated monitoring regimes, risk assessments, and regulations) in accordance with the relevant, previous Directive(s).

The Simonswood Brook water body is located within a Nitrate Vulnerable Zone (NVZ) as designated under the Nitrates Directive. The 'Alt' NVZ (ID S642, protected area label ALT NVZ S642) covers a 231.97 km² area north of Liverpool. The footprint of the Proposed Scheme sits entirely within this protected area.

5.3.4 EA Monitoring Sites

EA biological monitoring data is available for Simonswood Brook within the water body extent, including fish and invertebrate data. A summary of this monitoring data and the location of the EA's monitoring sites within the water body catchment is provided in Appendix D.

According to the available online data, there are no EA fish monitoring sites within the water body extent. The closest EA macrophyte monitoring site within the waterbody is located at SJ4072897961, approximately 1.5 km downstream of the site for Headbolt Lane Station & Car Park, and 1.3 km downstream of the rail bridge over Simonswood Brook. The closest EA diatom monitoring site within the waterbody is located at SJ4019597607, approximately 1.9 km downstream of the site for Headbolt Lane Station & Car Park, and 1.5 km downstream of the rail bridge over Simonswood Brook. The closest EA invertebrate monitoring site within the waterbody is located at SJ4022997359 approximately 2.0 km downstream of the site for Headbolt Lane Station & Car Park, and 1.6 km downstream of the rail bridge over Simonswood Brook.

The EA also monitor water quality at two locations within the water body at Kirkby Brook above Confluence with Simonswood Brook (SJ 4101299685) approximately 0.2 km downstream of the proposed site at Headbolt Lane Station & Car Park and 70 m from the rail line between Headbolt Lane Station and Kirkby Station, and at Simonswood Brook above confluence with Kirkby Brook (SJ 4083599638) 0.4 km downstream of the proposed site at Headbolt Lane Station & Car Park and 90 m from the rail line between Headbolt Lane Station and Kirkby Station.

5.3.5 Measures and Actions

Arup are aware that the EA has identified a number of measures and actions relevant to the Simonswood Brook water body as part of the Cycle 2 RBMP to address pressures on current status and support the achievement of the water body's status objectives. This includes measure actions to tackle point source sewage discharges, physical modification pressures, phosphate pressures and diffuse source nutrient management pressures summarised in Section 5.3.2 above.

The EA have identified additional mitigation measures to those listed above in the Extended Waterbody Summary Report for this water body, namely: maintenance measures to manage woody debris, measures to maintain channel bed/margins, measures to retain habitats, vegetation control measures, selective vegetation control measures, and vegetation control measures which are timing dependent.

5.4 Alt US Bull Bridge (GB112069061441)

The site for works on the existing Kirkby Station is located within 1.4 km of the River Alt, which is located within the Alt US Bull Bridge (GB112069061441) WFD river water body, directly downstream of Simonswood Brook.

5.4.1 Status and objectives

The water body is designated as a Heavily Modified Water Body (HMWB), owing to physical modifications by human activity and a resultant substantial change in character (flood protection, land drainage and urbanisation). The water body currently has an Overall Status of 'Moderate' with an Ecological Potential of 'Moderate' and a Chemical Status of 'Fail'.

A breakdown of the current status and status objectives of the water body is provided in Table 4. The water body is also currently failing its Mitigation Measure Assessment (Moderate or less), as a result of measures identified for the water body not being in place.

Table 4: Cycle 2 RBMP WFD status and objectives for the Alt US Bull Bridge (GB112069061441) river water body

	Status	Objective (as of 2019)
OVERALL STATUS	MODERATE	GOOD BY 2027
ECOLOGICAL POTENTIAL	MODERATE	GOOD BY 2027
Biological quality elements	Bad	Good by 2027
Invertebrates	Poor	Good by 2027
Fish	Bad	Good by 2027
Physicochemical quality elements	Moderate	Good by 2027
Acid Neutralising Capacity	High	Good by 2015
Ammonia (Phys-Chem)	High	Good by 2027
Biochemical Oxygen Demand (BOD)	-	-

	Status	Objective (as of 2019)
Dissolved oxygen	High	Good by 2021
pH	High	Good by 2015
Phosphate	Poor	Good by 2027
Temperature	High	Good by 2015
Specific pollutants	High	High by 2015
Copper	High	High by 2015
Triclosan	-	-
Zinc	-	-
Hydromorphological Supporting Elements	Supports Good	Supports Good by 2015
Hydrological Regime	Supports Good	Supports Good by 2015
Supporting elements (surface water)	Moderate	Good by 2027
Mitigation Measure Assessment	Moderate or less	Good by 2027
CHEMICAL STATUS	FAIL	GOOD BY 2015
Priority substances	Fail	Good by 2015
Priority hazardous substances	Fail	Good by 2015
Other Pollutants	Does not require assessment	Does not require assessment by 2015

5.4.2 Reasons for not achieving good (RNAG)

The EA's RNAG dataset suggests that point source sewage discharge associated with the water industry is a reason for the Alt US Bull Bridge water body not achieving a Good status for tributyltin compounds, dissolved oxygen, phosphate, invertebrates, and ammonia (phys-chem). It also indicated that the water body is not achieving a Good status for phosphate, invertebrates, and ammonia (phys-chem) due to misconnections associated with both industry, and domestic general public use.

Contaminated land associated with industry (point source) and urban and transport (diffuse source) is a reason for the water body not achieving a Good status for invertebrates, fish, and tributyltin compounds. Poor nutrient management associated with agriculture and rural land management is listed as a reason for the water body not achieving a Good status for invertebrates.

Measures identified by the EA to address drainage, urbanisation, and flood protection physical modification pressures within the water body are not currently in place. This is preventing the Mitigation Measures Assessment element from achieving a Good status.

The RNAGs for the water body identified in the 2015 Cycle 2 RBMP are summarised in Table 5.

Table 5: Reasons for not achieving good (RNAG) status identified for the Alt US Bull Bridge (GB112069061441) water body.

Failing element	RNAG					
	ID	Category	Business Sector	SWMI	Activity	Pressure Tiers
Tributyltin Compounds	489883	Water Industry	Not applicable	Point source	Sewage discharge (continuous)	Chemicals
Dissolved oxygen	508959	Water Industry	Waste water treatment	Point source	Sewage discharge (continuous)	Dissolved oxygen (DO)
Mitigation Measures Assessment	480162	Sector under investigation	Not applicable	Physical modification	Other	Urbanisation; Physical modification
Mitigation Measures Assessment	480160	Sector under investigation	Not applicable	Physical modification	Other	Flood protection; Physical modification
Mitigation Measures Assessment	480161	Sector under investigation	Not applicable	Physical modification	Other	Land drainage; Physical modification
Invertebrates	489881	Agriculture and rural land management	Agriculture - Arable	Diffuse source	Poor nutrient management	Organic pollution; Organic pollution
Invertebrates	489880	Urban and transport	Urban	Diffuse source	Contaminated land	Ammonia; Ammonia
Ammonia (Phys-Chem)	482017	Domestic General Public	Not applicable	Point source	Misconnections	Ammonia
Invertebrates	482837	Industry	Other industry, manufacturing and Business	Point source	Misconnections	Ammonia; Ammonia
Invertebrates	482833	Domestic General Public	Not applicable	Point source	Misconnections	Ammonia; Ammonia

Failing element	RNAG					
	ID	Category	Business Sector	SWMI	Activity	Pressure Tiers
Tributyltin Compounds	482022	Industry	Other industry, manufacturing and Business	Point source	Contaminated land	Chemicals
Phosphate	482020	Domestic General Public	Not applicable	Point source	Misconnections	Phosphate
Phosphate	482021	Water Industry	Not applicable	Point source	Sewage discharge (continuous)	Phosphate
Phosphate	482019	Industry	Other industry, manufacturing and Business	Point source	Misconnections	Phosphate
Invertebrates	489882	Water Industry	Waste water treatment	Point source	Sewage discharge (continuous)	Organic pollution; Organic pollution
Ammonia (Phys-Chem)	489879	Water Industry	Not applicable	Point source	Sewage discharge (continuous)	Ammonia
Fish	526862	Urban and transport	Urban	Diffuse source	Contaminated land	Ammonia; Ammonia

5.4.3 WFD Protected Areas

The Alt US Bull Bridge water body is located within a Nitrate Vulnerable Zone (NVZ) as designated under the Nitrates Directive. The 'Alt' NVZ (ID S642, protected area label ALT NVZ S642) covers a 231.97 km² area north of Liverpool. The footprint of the Proposed Scheme sits entirely within this protected area.

Furthermore, two areas protected under the Urban Waste Water Treatment Directive (UWWTD) are associated with the Alt US Bull Bridge water body. These are on the Leeds to Liverpool Canal (ID UKENRI5) and the River Alt (ID UKENRI95).

5.4.4 EA Monitoring Sites

EA biological monitoring data is available for Simonswood Brook within the water body extent, including fish and invertebrate data. A summary of this

monitoring data and the location of the EA's monitoring sites within the water body catchment is provided in Appendix D.

According to the available online data, the closest EA monitoring site for invertebrates, macrophytes and diatoms is located at SJ3832698886, approximately 1.7 km downstream of Kirkby Station. The closest EA fish monitoring site is located at SJ3836798847, approximately 1.7 km downstream of Kirkby Station.

The EA also monitor water quality upstream of Kirkby Station at River Alt At Bull Bridge Aintree (SJ3835198854) approximately 1.4 km from Kirkby Station, and downstream of Kirkby Station at Kirkby (Little) Brook above Confl Alt (SJ4025897642) approximately 1.3 km from Kirkby station.

5.4.5 Measures and Actions

Arup are aware that the EA has identified a number of measures and actions relevant to the Simonswood Brook water body as part of the Cycle 2 RBMP to address pressures on current status and support the achievement of the water body's status objectives. This includes measure actions to tackle point source sewage discharges, physical modification pressures, diffuse and point source contaminated land issues, point source misconnections and diffuse source nutrient management pressures summarised in Section 5.4.5 above.

The EA have not identified additional mitigation measures in the respective Extended Water Body Summary Report.

6 Scoping Assessment

The anticipated effects of each of the components of the proposed scheme on the WFD quality elements of the Simonswood Brook and Alt US Bull Bridge water bodies are detailed in this section.

6.1 Overview

A scoping assessment has been undertaken to establish the likely impacts of the proposed scheme on the WFD status elements of the relevant WFD water bodies present within the zone of influence of the site. This assessment has taken into account relevant measures embedded within the design and outline construction strategy for the proposed scheme.

Impacts have been considered with regard to the risk of the proposed scheme:

- causing a deterioration in current status of the water body; and/or
- preventing the future achievement of water body status objectives.

6.1.1 RAG Rating Method

The assessment process for determining the potential risk of status deterioration uses the following traffic light rating system to assign the magnitude of the likely effect anticipated on each of the quality elements of the affected water bodies:

Table 6: Scoping Assessment traffic light rating system of risk before and after mitigation

Scoping Assessment: The assessment has used the following risk-based traffic light rating system to assign a magnitude of the effect anticipated on each of the quality elements of the affected water body before and after mitigation:	
	Dark Blue: beneficial effect of a scale sufficient to increase status class at the water body scale.
	Light Blue: minor/localised beneficial effect resulting in a localised improvement for quality elements, but insufficient to increase status class at the water body scale.
	Green: negligible effect with no measurable change to status at water body scale.
	Yellow: minor/localised adverse effect on quality elements, but insufficient to affect status at the water body scale. Continued WFD/geomorphology/aquatic ecology input to design and continued consultation required to reduce local impacts and any potential cumulative effects.
	Amber: an adverse effect is possible with the potential to deteriorate status class at water body scale or prevent/inhibit future achievement of status objectives. Further WFD assessment recommended in consultation and additional mitigation measures may be required to reduce impact/risk. Continued WFD/geomorphology/aquatic ecology input into option development and design required.

Scoping Assessment:	
The assessment has used the following risk-based traffic light rating system to assign a magnitude of the effect anticipated on each of the quality elements of the affected water body before and after mitigation:	
	Red: an adverse effect is certain, of a sufficient scale to deteriorate status class at a water body scale or prevent future achievement of status objectives. Option should be avoided or re-designed to avoid non-compliance with WFD objectives and reassessed in consultation.

Where adverse (amber or red) effects on quality elements with a risk of causing deterioration of status or preventing future attainment of the objectives are identified, the assessment identifies additional mitigation requirements and the resultant residual effect.

Where any residual adverse (amber or red) effects remain following consideration of additional mitigation Article 4.7 derogation assessment requirements should be considered in consultation with the EA.

6.2 Relevant Components of the Proposed Scheme

The following components of the proposed scheme have been assessed with regards to the potential to impact upon the current status and/or status objective of the surface water bodies present at the site:

- Construction activities affecting the water body (water quality);
- Construction activities affecting the water body (physical disturbance / damage);
- Permanent physical modifications to the water body;
- Permanent changes to surface water discharge to the water body; and
- Foul water discharge.

At this stage, the preliminary assessment of the magnitude of effects of the construction phase activities has assumed that best practice control and mitigation measures summarised in Section 4.4 will be developed and implemented throughout the construction phase of the proposed scheme to avoid and reduce the impact of construction phase activities on the water environment.

6.3 Potential Impacts on Current Status

6.3.1 Construction Activities Affecting the Water Body

6.3.1.1 Water Quality

There is the potential for pollutant spills and/or the release of sediments (and any associated contaminants) to Simonswood Brook and Kirkby Brook and/or the River Alt during the construction phase. This could adversely impact upon aquatic biota, physicochemical parameters, and the concentrations of specific pollutant and/or priority substances within the water body. The release of fine sediments may lead to elevated levels of suspended sediment within Simonswood Brook and Kirkby Brook and/or the River Alt and impact upon benthic habits by covering gravel substrates at and downstream of the site. However, these impacts would be temporary in nature and any depositions of fine sediment resulting from construction works are likely to be transported and dispersed during high flow events following construction.

The development of a CEMP and the implementation of pollution prevention and silt control measures during the construction phase (as outlined in Section 4.4.3) should prevent excessive inputs of sediment or pollution spillages to the channel. These measures should be developed in line with relevant environmental permitting guidance, Pollution Prevention Guidelines (PPG) principles, and via continued consultation with the EA. Taking these measures into account, the risk to the status of both water bodies from any residual temporary impacts is considered negligible.

Due to the partially unknown history of industrial and commercial land use on the site, made ground may be beneath the site which may contain a range of contaminants including asbestos, heavy metals, hydrocarbons, PAHs, PCBs, VOCs and SVOCs.

Provided that appropriate controls and good practice measures are then implemented during the construction phase, the risk to the status of both water bodies from is considered negligible. Should any further evidence of contamination be identified on site during construction, this should be further assessed and tested as appropriate to enable any required additional controls/works to be determined.

6.3.1.2 Physical Disturbance

The construction of the proposed scheme is not anticipated to cause any physical disturbance and damage to the channel of Simonswood Brook and Kirkby Brook and/or the River Alt, because there will be no works within the 8 m working buffer from the watercourse as per the Environment Agency's policy²¹.

There is the potential for indirect disturbance of fish and other biota during the construction phase as a result of noise, vibration (from piling activities) and the potential use of artificial lighting. Invasive species removal will occur at the site as outlined in Environmental Statement Vol I, Chapter 7: Ecology. Removal at the site could potentially affect and spread to vegetation on the riparian corridor.

The impacts mentioned above would be temporary in nature and, provided the best practice mitigation measures are developed and implemented via a CEMP to minimise disturbance (as outlined in Section 4.4.4), the risk to the status of both water bodies is considered to be negligible. The measures should involve the appropriate programming of the construction works where possible to avoid or reduce the risk of disturbance during ecologically sensitive periods, including salmonid spawning migration periods (October – March). Provided the best practice mitigation outlined in the LEMP are implemented, the risk of invasive species spread to the riparian corridor will be reduced.

6.3.2 Permanent Changes to the Water Body

6.3.2.1 Physical Modifications

The construction of the proposed scheme is not anticipated to result in any physical modifications to Simonswood Brook and Kirkby Brook and/or the River Alt at the site. Headbolt Lane Station and Car Park, and expansion on the rail track will be set back from the river edge by an 8 m buffer zone or more, as requested by the EA. The proposed new footbridges over Kirkby Brook will have footings set back from the channel on both sides, with no piers or abutments proposed within the river channel. All lighting will be designed to minimise light spill to the river.

²¹ Arup, 2021. Chapter 2: Development Description (Environmental Statement), 170248 Headbolt Lane New Station GRIP 4

6.3.2.2 Permanent Changes to Surface Water Discharge in the Water Body

As summarised in Section 4.3.9, the proposed scheme will change surface water runoff patterns across the site.

6.3.2.3 Foul water discharge

As summarised in Section 4.3.9, the station building foul flows are proposed to discharge into the United Utilities foul sewer running through the site. No impact on water body status is therefore expected as a result.

6.3.3 Summary of Effects on Current Status

The anticipated effects of each of the operational components of the proposed scheme on the WFD quality elements of the waterbodies Simonswood Brook and Alt US Bull Bridge are summarised in Table 7.

Overall, the proposed scheme is not anticipated to cause a deterioration in the current status of these surface water bodies present at the site.

The potential impacts relating to the construction activities at the site will be temporary in nature and are considered to be negligible at the water body scale; provided that appropriate best practice measures to avoid and minimise the risk of impacts to the water environment are developed within a CEMP (and associated construction method statements) for the proposed scheme in consultation with the EA, and implemented during the construction phase.

The permanent components of the proposed scheme are anticipated to have only a negligible effect on the waterbodies Simonswood Brook and Alt US Bull Bridge at the water body scale. This relates to localised changes in surface water runoff characteristics at Headbolt Lane and discharge to Kirkby Brook (a tributary of Simonswood Brook), relative to the existing condition. The design of the surface water drainage strategy for the site, including the use of oil interceptors and opportunities for integrating SuDs features (to be developed further at detailed design), will ensure no significant impacts on the quantity and water quality of Simonswood Brook. It also relates to the construction of new bridges across the waterbody, and possible riparian vegetation/ habitat removal. As stipulated by the EA, an 8 m working buffer zone is embedded in design, meaning no permanent bridge structures in or near the water course, and no riparian habitat removal is required for construction.

Table 7: Summary of the anticipated effects of the proposed scheme against WFD objectives for the WFD water bodies Simonswood Brook and Alt US Bull Bridge.

Scheme Component/ Activity	Potential Impact Description	WFD Quality Element Impacted	Embedded Design Mitigation	Magnitude of Effect (RAG category)	Compliance Outcome and Justification
Bridges at Headbolt Lane Station	Structures in or at the side of the water body causing ongoing changes to water flows (deflection) and sediment fluxes (erosion and deposition)	Hydro-morphology	Presently, the design encompasses an 8 m buffer zone around the perimeter of the water body as stipulated by the Environment Agency, and as such, does not incorporate hard structures in the channel or on the channel margin.	Green: negligible effect with no measurable change to status at water body scale.	Compliant. Provided the embedded mitigation outlined is implemented, these activities pose a negligible risk to the water environment. Therefore, this activity is determined to not result in a decline in any WFD quality elements or prevent their potential in attaining Good status in the future.
Drainage	Faster and/or flashier run-off into water bodies from increase in paved surfaces (car parks and roads) on floodplain, increasing high flow volumes in the water body, thereby altering channel morphology.	Hydro-morphology	The design has integrated a SuDS strategy (described in Section 4.3.9) to appropriately manage run-off rates from the proposed scheme. This includes the use of permeable paving, bioretention and attenuation systems, and petrol filters prior to outfall back into Kirkby Brook.	Green: negligible effect with no measurable change to status at water body scale.	Compliant. Provided the embedded mitigation outlined is implemented, these activities pose a negligible risk to the water environment. Therefore, this activity is determined to not result in a decline in any WFD quality elements or prevent their potential in attaining Good status in the future.
Run-off from paved surfaces	Heavy metals & fuel leakage run-off from motor vehicles in car park, pick-up/ drop-off area and road over bridge.	Chemical	The design has integrated a SuDS strategy (described in Section 3.3.9) to appropriately manage run-off rates from the proposed scheme. This includes the use of permeable paving, bioretention and	Green: negligible effect with no measurable change to status at water body scale.	Compliant. Provided the embedded mitigation outlined is implemented, these activities pose a negligible risk to the water environment. Therefore, this activity is determined to not result in a decline in any WFD quality

Scheme Component/ Activity	Potential Impact Description	WFD Quality Element Impacted	Embedded Design Mitigation	Magnitude of Effect (RAG category)	Compliance Outcome and Justification
			attenuation systems, and petrol filters prior to outfall back into Kirkby Brook. Pedestrian and cycle access will also be maintained to deter users from arriving in motor vehicle where possible.		elements or prevent their potential in attaining Good status in the future.
Bridges at Headbolt Lane Station	Shading from bridge crossings	Ecological & Physico-chemical	Presently, the design encompasses an 8 m buffer zone around the perimeter of the water body as stipulated by the Environment Agency, and as such, does not emplace hard structures near the channel margin or water line. Further, bridge designs have not made bridges wider than necessary, and the scheme does not require additional culverting of the water body.	Green: negligible effect with no measurable change to status at water body scale.	Compliant. Provided the embedded mitigation outlined is implemented, these activities pose a negligible risk to the water environment. Therefore, this activity is determined to not result in a decline in any WFD quality elements or prevent their potential in attaining Good status in the future.
General site near water body	Footprint habitat loss (channel and riparian zone)	Ecological	Presently, the design encompasses an 8 m buffer zone around the perimeter of the water body as stipulated by the Environment Agency, and does not involve permanent in-channel structures. As such, it does not impact habitat on the riparian margin of the water body. In this buffer zone, only invasive species will be	Green: negligible effect with no measurable change to status at water body scale.	Compliant. Provided the embedded mitigation outlined is implemented, these activities pose a negligible risk to the water environment. Therefore, this activity is determined to not result in a decline in any WFD quality elements or prevent their potential in attaining Good status in the future.

Scheme Component/ Activity	Potential Impact Description	WFD Quality Element Impacted	Embedded Design Mitigation	Magnitude of Effect (RAG category)	Compliance Outcome and Justification
			cleared (to enhance the bankside); other riparian vegetation will not be cleared.		Further enhancement opportunities present themselves in the LEMP, whereby there is an opportunity to improve the nearby vegetation and increase footprint habitat via additional tree and shrub planting (following Biodiversity Net Gain principles).

Potential Impact on Status Objectives

Measures/actions identified by the EA to address existing pressures on the current status of the waterbodies Simonswood Brook and Alt US Bull Bridge water bodies, and so support the achievement of the water body's status objectives, are not anticipated to be inhibited by the proposed scheme.

These will include water industry measures to reduce the impacts of point source sewage discharges, phosphate concentrations, diffuse source nutrient management pressures, and fish (Simonswood Brook only) within the water body. The proposed scheme is not expected to inhibit the implementation of such measures within the water body catchment.

The EA are also assessing the potential to address physical modification pressures associated with flood protection, urbanisation (Alt US Bull Bridge only) and land drainage (Alt US Bull Bridge). Opportunities for such measures within the vicinity of the proposed scheme are limited due to the (sub)urbanised nature of the river corridor through Kirkby. The proposed scheme is therefore not expected to inhibit the implementation of measures to enhancement in-channel diversity and/or restore floodplain connectivity along the water body catchment in the future. In addition, the implementation of the proposed scheme will involve the removal of invasive non-native species, which will provide a minor improvement over existing conditions with regards to bank-side habitat and biodiversity.

Compliance Summary

The proposed scheme is considered to be compliant with the following overarching assessment objectives identified by the EA:

- The proposed scheme does not cause deterioration in the Status of the relevant water bodies;
- The proposed scheme does not compromise the ability of the relevant water bodies to achieve their WFD status objectives;
- The proposed scheme does not cause a permanent exclusion or compromised achievement of the WFD objectives in other water bodies within the same RBD; and

Whilst the proposed scheme will not directly contribute towards the delivery of the WFD status objectives for Simonswood Brook and/or Alt US Bull Bridge at the site, it will not cause their deterioration or inhibit their potential for improvement.

To enhance the scheme further, there is also the potential opportunity for the integration of further SuDs features than those planned at the site through the detailed design stage (including green roofs and further bioretention features such as tree pits/planters), which could help attenuate and improve the water quality of surface water runoff from the site to the Kirkby Brook. Further, there is potential for planned riverscaping to provide a greener space in the area surrounding the

river by planting more trees and shrubs as per Biodiversity Net Gain principles (see Biodiversity Net Gain Report, document ref. no.: 170248-ARU-REP-EEN-000025). It is recommended that this, together with further enhancement opportunities, are reviewed in more detail at the detailed design stage in consultation with the EA and Local Authority.

7 Summary and Conclusions

This WFD compliance assessment has established the zone of influence of the scheme and, provided the embedded mitigation measures listed in Table 7 are implemented, it is determined that the scheme should not cause deterioration to the status of any WFD water body or prevent a water body from achieving either Good Ecological Status or Potential by 2027.

The assessment is based on a desk study of the currently available site and design information, available EA data, and assumptions regarding best practice and mitigation measures to be developed via a CEMP for the proposed scheme prior to construction. No WFD baseline surveys/ monitoring or detailed assessments have been undertaken at this stage.

Opportunities for further enhancement of this scheme present themselves through the LEMP, whereby there is an opportunity to improve the nearby vegetation and increase footprint habitat via tree and shrub planting (riverscaping following Biodiversity Net Gain principles).

Based on the currently available information, the proposed scheme is not anticipated to cause a deterioration in the current status of either of the water bodies. Embedded mitigation has been proposed to reduce risks to an acceptable level. The development is also not expected to prevent the future achievement of the status objectives of the Simonswood Brook and Alt US Bull Bridge water body, with regard to the implementation of measures identified by the EA to address existing pressures on quality elements status.

This assessment has been based on currently available WFD baseline data and design information for the scheme. It is considered a 'live' document and should be reviewed and updated during detailed design and construction, particularly if:

- The EA update or provide additional WFD baseline data for the relevant water bodies; and/or
- Significant changes to the nature, spatial extent, scale or construction methods of the scheme are made.

The proposed scheme is considered to be compliant with the following overarching assessment objectives identified by the EA:

- The proposed scheme does not cause deterioration in the Status of the relevant water bodies;
- The proposed scheme does not compromise the ability of the relevant water bodies to achieve their WFD status objectives;

- The proposed scheme does not cause a permanent exclusion or compromised achievement of the WFD objectives in other water bodies within the same RBD.

Appendix A

Additional WFD Background / WFD Compliance Assessment Method Information

A1 WFD Background

A1.1 Determination of WFD Status

A1.1.1 Introduction

Surface water bodies and groundwater bodies are defined within WFD legislation. There are three types of surface water body, as follows:

- natural water bodies;
- heavily modified water bodies (HMWBs);
- artificial water bodies (AWBs).

The Overall Status of natural surface water bodies is determined on the basis of their Ecological Status and Chemical Status. The overall status of heavily modified and artificial water bodies is classified based on their ecological potential and chemical status. The overall status of groundwater bodies is determined on the basis of their Quantitative Status and Chemical Status.

Groundwater bodies are defined within WFD legislation as Groundwater Management Units (GWMU) and Water Resource Management Units (WRMU) and their status is determined on the basis of quantitative and chemical sub-elements.

The means by which these determinations are made for both surface water and ground water bodies is described in this section.

A1.1.2 Surface water bodies

A1.1.2.1 Ecological status

Ecological Status is defined by the overall quality of the structure and functioning of aquatic ecosystems associated with surface waters, i.e. the condition of the watercourse. This is assigned on a scale of high, good, moderate, poor or bad, and on the basis of four classification elements or 'tests', as follows:

- Biological - this test is designed to assess the status indicated by a biological quality element such as fish, invertebrates, macrophytes or phytobenthos (diatoms). The biological quality elements can influence an overall water body status from bad through to high. It is also important to note that the presence of invasive species prevents a water body from achieving high status when all other elements attain high;
- Physicochemical - this test is designed to assess the status indicated by physicochemical quality elements such as dissolved oxygen, phosphorus and ammonia, against environmental standards. The physicochemical quality elements can only influence an overall water body status from moderate through to high;

- Specific pollutants - this test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic. As with the physicochemical test, the specific pollutant assessment can only influence an overall water body status from moderate through to high; and
- Hydromorphology - for natural surface water bodies this test is undertaken by the EA during classification when the biological and physicochemical tests indicate that a water body may be of high Overall Status. It specifically assesses hydromorphological quality elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological quality elements do not support high Ecological Status, then the status of the water body is limited to good Overall Status. Hydromorphological assessments are used to determine 'high' Overall Status only and are not be used to drive a water body status class below good. The 'does not support good' classification should be reported for the purposes of identifying water bodies which fail the flow test.

The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system. This system is summarised in Figure 2.

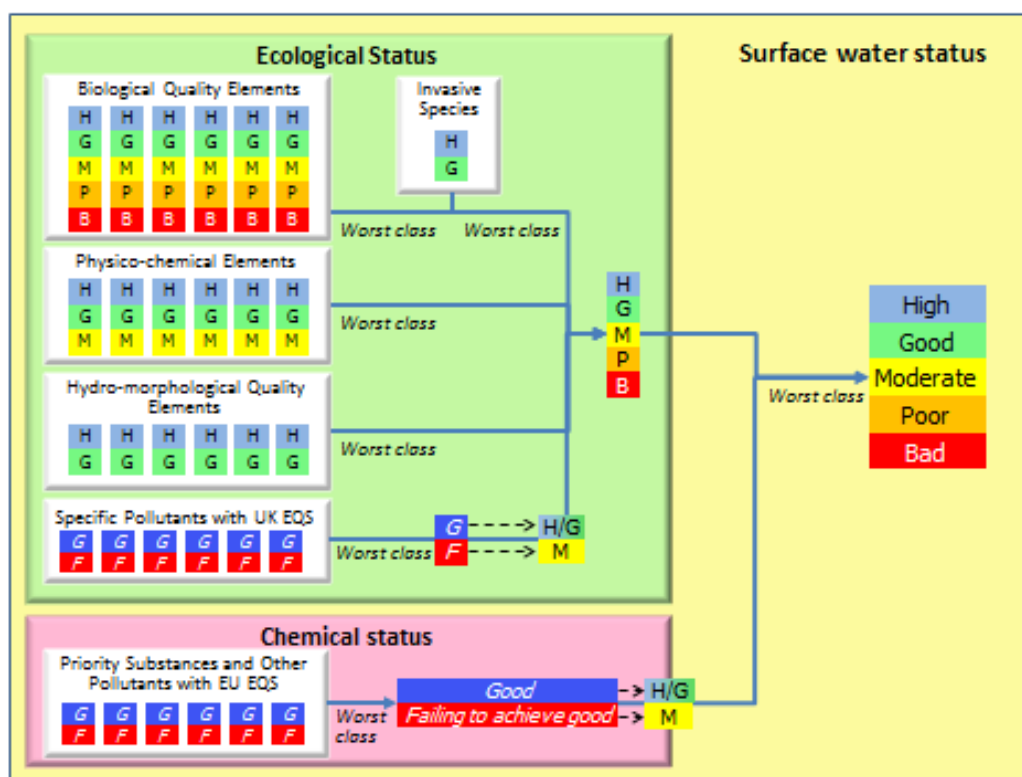


Figure 2: Ecological status classification process (Source: Environment Agency (2015)²²

²² Environment Agency (2015), *Rules for assessing Surface Water Body Status and Potential*, V2.0

A1.1.2.2 Chemical status

Chemical Status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC)²³. This is assigned on a scale of good or fail.

Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise surface water bodies are reported as being of good Chemical Status.

A1.1.2.3 Ecological potential for heavily modified (and artificial) water bodies

Ecological Potential is assigned to AWB (such as reservoirs and canals), or natural water bodies which, as a result of physical alterations by human activity, are substantially changed in character. The latter are termed HMWB. The term 'ecological potential' is used to classify AWBs and HMWBs as it may be impossible for these water bodies to achieve good Ecological Status (GES) because of their creation or modification for a specific use, such as navigation, water supply or flood protection. The Ecological Potential of an AWB or HMWB represents the degree to which the quality of the water body approaches the optimum condition it could achieve given its artificial or heavily modified state.

AWB and HMWB are subject to an additional set of rules that need to be implemented prior to running the one-out-all-out process. These rules determine which biological quality elements should be used in the water body Ecological Potential classification. Under normal circumstances, AWB and HMWB are classified according to an assessment of mitigation measures, which defines good Ecological Potential (GEP) in water bodies where all applicable mitigation is in place, and moderate ecological potential in water bodies where some or all relevant mitigation is missing. However, to prevent AWB and HMWB being incorrectly classified as good potential in situations where all mitigation is in place, but other pressures are causing an impact (e.g. nutrient enrichment or pollution from toxic substances), the methodology adopted in the UK additionally considers biological indicators providing they are not sensitive to the heavily modified nature of the water body.

AWB and HMWB hydromorphological elements are assessed using a three-stage process, firstly looking at flow, then mitigation measures and biological quality elements.

Flow conditions are assessed initially on a fail or pass basis to determine which of the biological and physicochemical quality elements should be used in the classification of Ecological Potential.

²³ Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008; *on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council*. Strasbourg, European Parliament and European Council

Where the flow conditions are unaffected by the physical modification (flow conditions pass), the water body Ecological Potential is determined by the worst of either the mitigation measures assessment, or any element that is not sensitive to the modified nature of the water body.

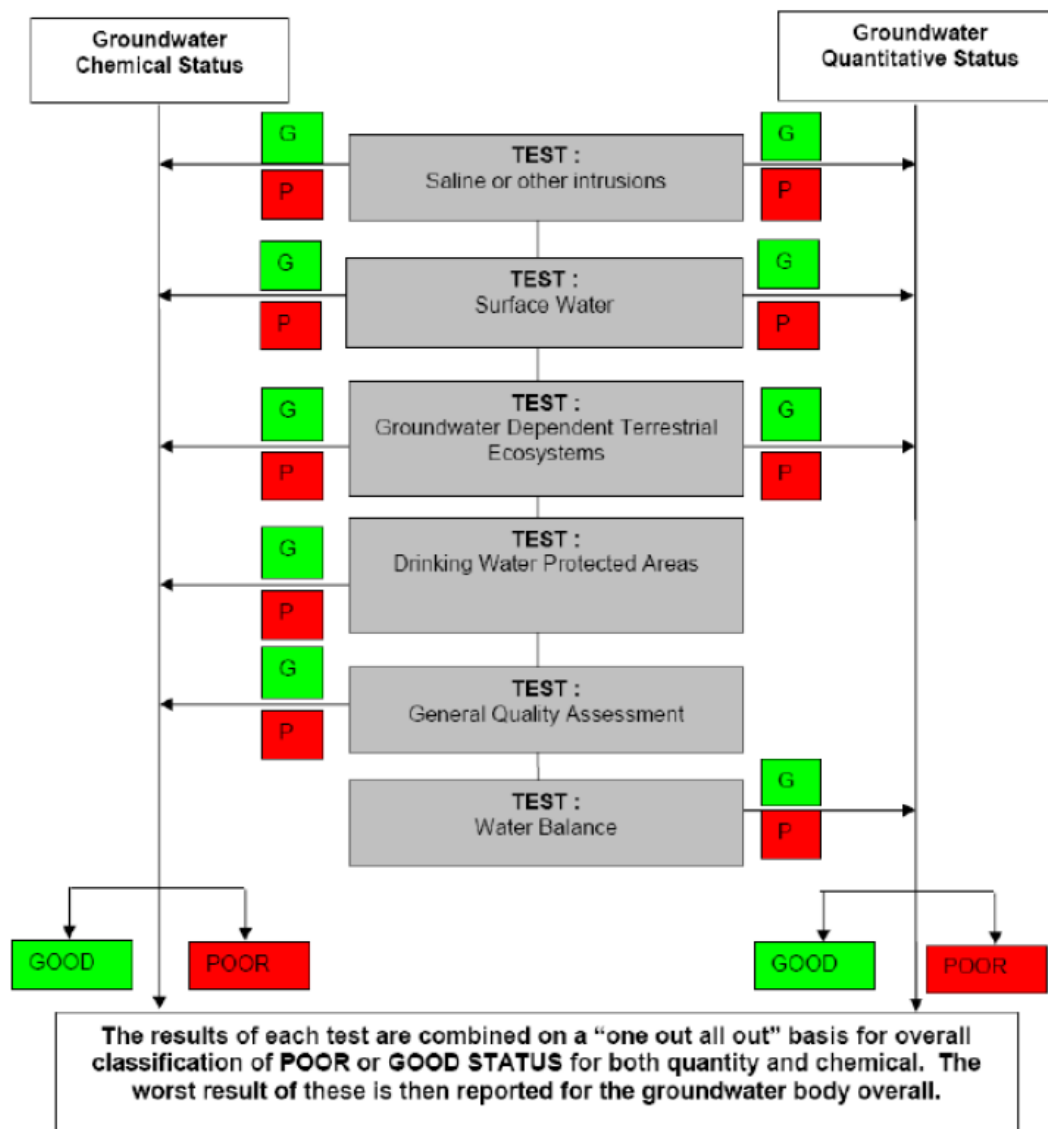
Where the flow conditions are significantly impacted by the physical modification (flow conditions fail), the water body Ecological Potential is determined by the worst of any of the mitigation measures assessments or the assessment of biological quality elements, physicochemical quality elements or specific pollutants.

Where a water body is designated as artificial or heavily modified for water resources usage, either solely or jointly with other uses, the flow condition is assumed to be good (pass).

A1.1.3 Groundwater bodies

Under the WFD, groundwater body Overall Status is classified on the basis of Quantitative Status and Chemical Status. The groundwater bodies are separated into GWMU and WRMU. GWMU are sub-divisions of the groundwater to aid the resource assessment process. WRMU are sub-divisions according to the water resource availability and the management of water.

The worst-case classification dictates the Overall Status, via a ‘one-out all-out’ system. This system is summarised below in Figure 3.

Figure 3: Groundwater body status classification (Source: UKTAG (2012)²⁴)

A1.1.3.1 Quantitative status

Quantitative Status is defined by the quantity of groundwater available as base flow to watercourses and water-dependent ecosystems and as 'resource' available for use as drinking water and other consumptive purposes. It is assigned on a scale of good or poor, and on the basis of four classification elements or 'tests' as follows:

- saline or other intrusions - this test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions;

²⁴ UKTAG (2012), *Paper 11b(ii): Groundwater Quantitative Classification for purposes of the Water Framework Directive*, V3.1

- surface water - this test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the Ecological Status of associated surface water bodies;
- Groundwater Dependent Terrestrial Ecosystems (GWDTE) - this test is designed to identify groundwater bodies where groundwater abstraction is leading to significant damage to associated GWDTE; and
- water balance - this test is designed to identify groundwater bodies where groundwater abstraction exceeds the 'available groundwater resource', defined as the rate of overall recharge to the groundwater body itself less the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTE.

A1.1.3.2 Chemical status

Chemical Status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of good or poor, and on the basis of five classifications elements or 'tests', as follows:

- saline or other intrusions - this test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions;
- surface water - this test is designed to identify groundwater bodies where groundwater is leading to a significant diminution of the Chemical Status of associated surface water bodies;
- GWDTE - this test is designed to identify groundwater bodies where groundwater is leading to significant damage to associated GWDTE;
- Drinking Water Protected Areas (DrWPA) - this test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future. The aim is no deterioration in quality of waters for human consumption, and
- general quality assessment - this test is designed to identify groundwater bodies where widespread deterioration in quality has, or will, compromise the strategic use of groundwater. The aim is no significant impairment of human use of groundwater and no significant environmental risk from pollutants across a groundwater body. Status is assessed primarily using data collected from the EA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread diffuse pollution.

A1.1.4 Environmental standards

Under the WFD, a range of environmental standards and condition limits are applied in order to help the classification of water body status and the setting of

status objectives via the RBMP process. These environmental standards define the range of environmental conditions that support “healthy” aquatic life. For instance, standards are set for the composition of biological communities, the physicochemical water quality parameters, the concentration of pollutants, and the level of flows in rivers (as described above).

These standards²⁵ inform the EA on the implementation of the RBMP process, including the identification of measures required to support the achievement of the GES / GEP objectives, as well as underpinning efforts to protect the water environment by helping to regulate activities that could cause adverse impacts.

A1.2 WFD Assessment requirements for new developments

To ensure compliance with the WFD, decision makers must consider whether proposals for new developments have the potential to:

- cause a deterioration of a water body from its current status or potential;
- prevent future attainment of good status or potential where not already achieved;
- impact on protected or priority species and habitats; and/or
- provide opportunities to improve the water environment.

A ruling by the European Union Court of Justice on 1 July 2015²⁶ has significant implications for projects that may impact water bodies, namely:

- consent for development must not be granted by an authorising authority – unless a derogation is granted - where the project may cause a deterioration in the status of a body of surface water or where it jeopardises the attainment of good Ecological Status or of good Ecological Potential and good Chemical Status by the date laid down in the Directive;
- that deterioration of the status of the relevant body of surface water includes a fall by one class of any element of the quality elements within the meaning of Annex V of the WFD even if the fall does not result in a fall of the classification of the body of surface water as a whole; and
- if the quality element is already in the lowest class, any deterioration of that element represents deterioration of status within the meaning of Article 4(1)(a)(i).

A1.2.1 Guidance

Whilst there is no established methodology for assessing compliance with WFD legislation, the WFD Compliance Assessment will be based upon expert judgement, established best practice and consultation with the EA and will be

²⁵ The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015

²⁶ Case 461/13 Bund für – Umwelt Und Naturschutz Deutschland v Bundesrepublik Deutschland (‘the Bund case’) concerning the interpretation of Article 4(1)(a)(i) to (iii) of the Water Framework Directive 2000/60/EC (WFD)

undertaken in accordance with relevant EA guidance²⁷ and the recent advisory guidance provided by The Planning Inspectorate²⁸.

A2 WFD Assessment Process

A2.1 Overview

WFD Compliance Assessment is undertaken as an iterative, stepped process, which typically includes the following:

- Step 1: Baseline assessment (screening);
- Step 2: Preliminary assessment (scoping);
- Step 3: Detailed impact assessment (where required); and
- Step 4: Application of Article 4.7 (where applicable).

These key process steps are described in further detail in the following sections. Consultation with regulatory authority should be undertaken to share the findings of each step, where necessary/applicable.

A2.2 Baseline assessment (screening)

The key objective of the baseline (screening) assessment is to identify the relevant WFD surface water and groundwater bodies (including any undesignated tributary watercourses) potentially affected by the proposed scheme and to establish their baseline condition.

The water body baseline condition of relevant water bodies has been identified via desk-top assessment, utilising readily available information and environmental, asset and operations data obtained from relevant stakeholders, including the EA, Natural England, and Yorkshire Water.

WFD baseline datasets have been obtained from the EA's Catchment Data Explorer website²⁹. This includes:

- RBMP Cycle 2 current status and status objectives data;
- WFD Protected Areas data;
- Reasons for not achieving good status (RNAG) data;
- Measures data.

The 2015 and 2016 EA WFD water body status data has been used to inform the assessment. These data are considered to provide the current best estimate of status and the formal baseline against which the EA will assess compliance with the 'no deterioration' objective. Where baseline data is limited, professional

²⁷ Environment Agency, (2010), *Assessing new modifications for compliance with WFD: detailed supplementary guidance*.

²⁸ The Planning Inspectorate (2017), *Advice note eighteen: The Water Framework Directive*.

²⁹ See: <http://environment.data.gov.uk/catchment-planning/>

judgement has been used in the assessment and a precautionary approach taken with regard to screening.

The relevant WFD water bodies present within the potential zone of influence of the proposed scheme are taken through to the subsequent preliminary assessment (scoping) stage.

A2.3 Preliminary assessment (scoping)

The objective of the preliminary (scoping) assessment is to establish the relevant likely effects of the proposed scheme on the WFD status elements of the relevant WFD surface water and groundwater bodies. This includes identification of potential impact types and any relevant mitigation measures embedded within the design of proposed scheme at this stage.

The preliminary assessment considers both the beneficial and adverse effects of the relevant elements of the proposed scheme and applies a risk-based method in line with existing EA and NRW guidance.

Effects are considered with regard to the risk of the proposed scheme causing a deterioration in current status and/or a failure to achieve status objectives. The assessment identifies those scheme components / impacts that pose a risk current status or status objectives and thus may require more detailed impact assessment.

The preliminary assessment therefore comprises two parts, as follows:

- likely effects on current status or potential, involving:
 - identification of relevant scheme components with potential to impact upon water body status;
 - identification of likely potential impact and magnitude of effects of the relevant scheme components on the current status of the water body (taking account of any ‘embedded’ mitigation; and
 - identification of potential risks of deterioration in current status and associated requirements for additional mitigation and/or further detailed assessment.
- likely effects on status objectives, involving:
 - scoping of the relevant scheme components to identify where the proposed scheme may pose a risk of worsening existing pressures responsible for current status failures (RNAGs) and/or prevent the implementation of measures identified by the EA to address existing status failures; and
 - scoping of relevant scheme components against any available EA HMWB/AWB ‘mitigation measure assessment’ outputs, in order to identify where the proposed scheme may pose a potential risk of inhibiting the implementation of measures derived to mitigate the impacts of existing physical modifications and operational regimes to support the achievement of good Ecological Potential objectives.

A2.4 Detailed impact assessment

Where deemed required, the objective of the detailed impact assessment is to establish the nature and anticipated magnitude of the effects of relevant elements of the proposed scheme on the WFD quality elements of the surface water and groundwater bodies affected. These effects are considered in terms of the potential for deterioration of current status and/or the prevention of status objectives. This detailed assessment may be based on targeted baseline surveys, monitoring or modelling assessments completed at the impact sites.

As with the preliminary assessment stage, the detailed impact assessment is therefore comprised of two key parts, as follows:

- assessment of effects on current status of quality element; and
- assessment of effects on status objectives, with regards to any water body RNAG or measures/actions identified as potentially being at risk from the proposed scheme under the preceding preliminary (scoping) assessment. This is done via expert judgement and consultation with the EA, based on the currently available information.

Where significant effects are identified with regard to the risk of status deterioration and/or the prevention of status objectives, the assessment should identify ‘further mitigation’ required in order to avoid and/or minimise risks and the residual effects on quality elements at the water body scale.

The detailed impact assessment will also identify if Article 4.7 tests need to be prepared for affected water bodies, where a residual risk to status deterioration and/or prevention of future status objectives has been identified.

A detailed impact assessment has not been deemed required for the proposed scheme, based on the information available at this stage.

A2.5 Article 4.7 tests

Article 4.7 of the WFD states that Member States will not be in breach of the Directive when failure to meet its environmental objectives is the result of either new modifications to the physical characteristics of a water body or as a result of new human sustainable development, on the proviso that the modifications or new development proposed are compliant with the four key conditions listed below. In doing so, Article 4.7 provides a means whereby a derogation for a proposed modification or sustainable development may be granted where it meets these four conditions.

1. all practicable steps have been taken to mitigate the adverse impact on the status of the water body;
2. the reasons for the modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development; and

3. the beneficial objectives served by the modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option.
4. the reasons for the modifications or alterations are clearly identified to the EA, so that they can be specifically set out and explained in the relevant RBMP (as required under Article 13).

Article 4.7 tests are not deemed required for the proposed scheme, based on the information available at this stage.

Appendix B

Proposed Scheme Key Design Details

B1 Proposed Scheme Key Design Details

The following description and figures of the proposed scheme can also be found the Environmental Statement Chapter 2: Development Description³⁰.

B1.1 The Site

B1.1.1 Site Location

B1.1.1.1 Station and Car Park

The proposed station and car park is situated on an area of green space off Headbolt Lane (Grid Ref: SJ 41308 99815). The proposed station and car park is bound to the north and east by Headbolt Lane, to the south by the railway line and to the west by the A506. The proposed station and car park lies approximately 900 m north-east of the centre of Kirkby (shown in Figure 4). The area of the proposed station and car park is approximately 5.9 ha.

³⁰ Arup, 2021. Chapter 2: Development Description (Environmental Statement), 170248 Headbolt Lane New Station GRIP 4

B1.1.2 Rail Corridor

The proposed railway corridor upgrade element of the proposed Scheme is on the existing Liverpool-Wigan rail corridor extending from 200 m to the west of the existing Kirkby station to 120 m to the east of the proposed station and car park site. The alignment of the rail corridor is roughly south-west to north-east. For the majority of its length the existing rail corridor is bounded by residential properties to the north and south (shown in Figure 4). The railway corridor is approximately 1.9 km in length and approximately 4.1 ha in area.

B1.1.3 Site History

The existing railway line is shown in its present-day alignment on the earliest mapping reviewed which dates from 1850. The line was initially constructed as a two-track railway as part of the Liverpool to Bury line which opened in 1848.

Historical mapping indicates the line reduced from a two to a one track railway between 1962 and 1972. Overbridge 57 (Glovers Brow / B55192 road bridge), Underbridge 56 (over Simonswood Brook) and the existing western span of Underbridge 55 (over County Road and the A506) were constructed when the original railway line was established. Record drawings indicate that the western span of Underbridge 55 (over County Road), was constructed in 1847. The original superstructure was replaced with the existing deck in 1930. In 1970 the remaining two spans of Underbridge 55 (over A506), intermediate pier and eastern abutment were built as part of works associated with the construction of the present day A506.

Significant strengthening works were undertaken on the intermediate pier in 1990 due to deterioration, thought to be the result of Alkali-Silica Reaction (ASR).

The earliest mapping reviewed, dating from 1850, shows the proposed station and car park site to be occupied by agricultural land with a sandstone quarry identified as Mercer's Delf located within the centre of the site, to the north of Kirkby Brook which is shown flowing through the centre of the site from east to west. A small building identified as Tanpit House is shown to be located in the centre north of the site off Headbolt Lane. Mapping dating from 1902 shows the quarry to be no longer present and further development of buildings on the northern boundary of the site adjacent to Headbolt Lane. As the quarry is no longer evident it is assumed to have been infilled.

Mapping from 1972 shows the western portion of Kirkby Brook to have been realigned to its present-day alignment; presumably as part of works for construction of the A506, and Headbolt Lane which bounds the site in its present-day alignment. The footpath which currently crosses the site from east to west is also shown. Mapping dating from 1990 no longer shows Tanpit House to be present. The crest of the hill on the northern boundary with Headbolt Lane appears to have moved southwards, suggesting a change of ground levels.

B1.1.4 Existing Uses

The boundary for the proposed Scheme is shown in Figure 4.

B1.1.4.1 Station and Car Park

The proposed station and car park is located in an area of undulating, amenity grassland and is also an area of Urban Greenspace/ Education Land, called Mercers Dell, as allocated by Knowsley Council's Local Plan. A designated Public Right of Way (PRoW) is located within the north-eastern corner of the area running southwards from Headbolt Lane, via a non-designated footpath, before heading south-east along the banks of Kirby Brook. The non-designated footpath bisects Mercers Dell connecting Headbolt Lane in the north east to the A506 County Road in the south-west. A series of existing bridges along the non-designated footpath provide crossings over Kirby Brook. The amenity grassland is frequently used by dog walkers.

The proposed station and car park is on an area of undulating grassland bounded to the south by the Liverpool-Wigan railway line, to the north and east by Headbolt Lane, and to the west by the A506, Back Lane. The ground levels within the proposed car park area gently slope from the north and south forming a shallow valley centred on Kirby Brook.

Kirby Brook bisects the proposed car park area, entering the east of the site from the south via a culvert beneath the railway. The brook flows north-west to the centre of the site before diverting to the south-west exiting the site to the west beneath the A506.

B1.1.4.2 Rail Corridor

The railway corridor comprises the existing Liverpool-Wigan railway line. On the approach to Kirby Station the existing rail alignment is situated in cutting, transitioning to embankment to the east of Kirby Station. The rail alignment remains on embankment for the majority of the proposed Scheme length. Within the vicinity of the proposed station the rail alignment transitions briefly to at-grade, before entering a section of low-height embankment and cutting to the east.

B1.1.5 Existing Access

Headbolt Lane runs adjacent to the north of the proposed station and car park. There is currently no vehicular access onto the proposed station and car park site. Users of the amenity space access the land on foot. Headbolt Lane connects to the A506, Bank Lane to the west, with the A506 connecting to the M58 at Junction 1 at its northern extent and continues south through Kirby Centre connecting to the M57 at Junction 6.

Vehicular access at the existing Kirby Station is via the B5192, Whitefield Drive, through a one-way system through the station car park, and exiting back onto the B5192 Whitefield Drive and B5192 Glovers Brow junction. There are three existing pedestrian accesses to the existing Kirby Station; two at the

vehicular entrance and exit points and a further one from the B5192 Glovers Brow via existing footbridge 57A.

B1.1.6 Sensitive Receptors

Key environmental constraints and receptors are shown on Figure 5.

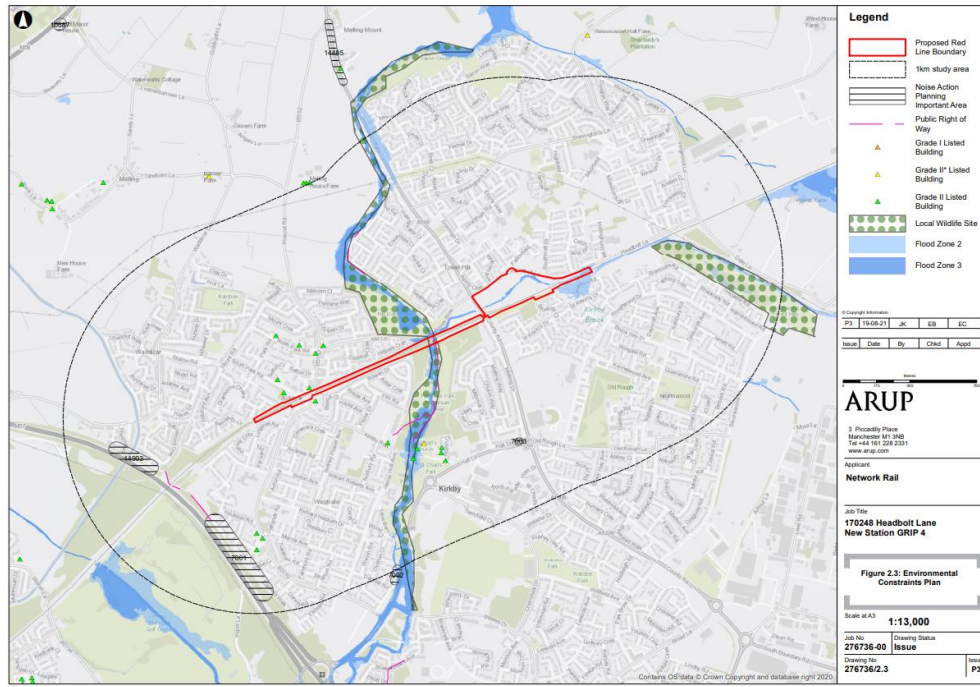


Figure 5: Environmental Constraints Plan.

Notable receptors in the area include residential properties. There are large housing estates to the north of Headbolt Lane, adjacent to the proposed station and car park site and to the south, adjacent to the existing railway line. There are also residential properties located directly adjacent to the existing Kirkby Station and to the south and north of the railway line between the existing Kirkby Station and the proposed station at Headbolt Lane.

There are 18 designated heritage assets within 1 km of the proposed Scheme boundary, the closest of which are:

- six Listed Buildings associated with St Chad's Church and grounds and St Chads Park, notably Church of St Chad (Grade II* Listed Building) located approximately 750 m to the south-west of the proposed station and car park site; and
- Carter Arms Public House Waverley House (Kirkby Conservative Club) and 1 and 3 Mill Lane (Grade II Listed Buildings) are located adjacent to the existing Kirkby railway station.

Kirkby Brook/Mill Brook Local Wildlife Site (LWS) is a non-statutory ecological designated site which is located adjacent to Simonswood Brook situated below the existing elevated railway line and runs through the proposed station and car park site. One further non-statutory ecological designated site is located within a 2km

of the proposed scheme is Northwood Forest Hills LWS which is located approximately 640 m to the east.

The habitats recorded on site are relatively common and widespread and support commonly occurring botanical species comprising semi-improved neutral grassland, tall ruderal, scrub, amenity grassland, bare ground and running water.

Kirkby Brook runs through the proposed station and car park site and is designated by the EA as a main river. Kirkby Brook feeds directly into Simonswood Brook which is located approximately 300 m to the west of the proposed station and car park.

Simonswood Brook is a designated Water Framework Directive (WFD) waterbody (GB112069060630), has a classification of Moderate (Ecological score of Moderate and Chemical score of Fail) and flows under the existing railway bridge (Underbridge 56).

There are areas of Flood Risk Zones 2 (between a 1 in 100 and 1 in 1,000 annual probability of river flooding) and 3 (1 in 100 or greater annual probability of river flooding) on the land immediately adjacent to Kirkby Brook within the proposed station and car park site. The rail corridor is situated entirely within Flood Zone 1 (land assessed as having a less than 1 in 1,000 annual probability of river flooding).

There are two historic landfills within 1 km of the proposed Scheme boundary; Bank Lane site, located adjacent to the A506 (Bank Lane) approximately 600 m to the north of the proposed railway corridor works and Stopgate Lane located at Simonswood Industrial Estate approximately 980 m to the east of the proposed station and car park site.

The EA classifies the land beneath the entire proposed Scheme as a Principal Bedrock Aquifer, an aquifer which can provide a high level of water storage and may provide water supply and/or base river flow on a strategic scale. The entire proposed Scheme is located within a groundwater Source Protection Zone (SPZ) 3, with several abstractions located to the north and south. The nearest groundwater abstractions are located approximately 2 km to the north of the rail corridor.

B1.2 The Proposed Scheme

B1.2.1 Overview of the Proposed Scheme

The proposed station and car park comprises the following elements:

- a new station located on land at Headbolt Lane;
- a new 300 space car park and associated structures (signage, waiting shelters and car park lighting) and to service the new station;
- supply bulk point and substation to accommodate electrification of rail corridor upgrades and for the new station;

- new vehicular and pedestrian access including two footbridges over Kirkby Brook and a road bridge to access each section of the car park; and
- associated landscaping.

Works to the railway corridor comprises the following:

- railway line upgrade to a twin track and associated infrastructure to extend the Merseyrail electrification to the proposed station (including the extension of the existing third line electrification network and a new substation); and
- decommissioning works to the existing Kirkby Station.

Further scheme details are provided below.

B1.2.2 Existing Kirkby Station works

The existing Northern Rail platform at Kirkby will be decommissioned, made safe from public access and will be partially removed. The removed section of the platform will be between Over Bridge 57 (Glovers Brow / B5192 road bridge) and the end of the back of platform retaining wall. The walkway that currently connects the Northern Rail platform will be removed with reconstruction of a maintenance walkway taking its place. This new maintenance walkway will include surfacing, channel drain, handrails, fencing, gated access and steps to track level.

The eastern end of the Merseyrail platform will be fenced off to stop public accessing the operational railway. The remainder of the existing Kirkby Station will remain fully operational.

An extension to the Merseyrail third rail network is proposed through the Kirkby Station continuing through to Headbolt Lane. To meet the third rail safety case a segregated access walkway will be provided through Over Bridge 57 and the redundant Northern Rail platform.

B1.2.3 Rail Corridor Works

The existing rail corridor comprises a single line. The Merseyrail network will be extended east from the existing terminating station at Kirkby by removing the existing buffer stops and connecting these with new trackwork. A new railway switch will split the tracks from a single alignment into a new twin-track arrangement.

As part of these works the existing embankment will be widened and strengthened to accommodate the twin track arrangement. The embankment will be widened by 3.4 m to the north of the track and 2.6 m to the south of the track within the extent of the rail corridor and within the Network Rail owned land boundary. This widening will also allow for the introduction of safe walkways beside the tracks and to accommodate Low Voltage (LV) and High Voltage (HV) cables.

To facilitate the new twin-track arrangement, vegetation removal will be required along the existing railway corridor.

As part of the rail corridor works, work is needed to be carried out on Underbridge 55 (crossing the A506 and County Road) and Underbridge 56 (crossing Simonswood Brook and a public footpath).

Underbridge 55 currently spans over both the A506 (Span 1 and 2) and County Road (Span 3). The proposed modifications to Underbridge 55 are to remove the existing bridge pier and foundations between County Road and the A506 and replace with a portal frame pier which falls under LPA / local highways land. Span 1 and 2 over the A506 will be replaced by a new single span which will be a twin Network Rail painted steel U-type deck extending the new single span over A506 to 18 m and 5.3 m in height which will be done within both the Network Rail and local highway boundary.

Underbridge 56 (crossing Simonswood Brook and a public footpath) is a two-span natural stone masonry arch bridge. Spans are 4.6 m long. The bridge deck is approximately 9.3 m wide. Span 1 crosses a public footpath, and span 2 crosses Simonswood Brook. In order to accommodate the twin track configuration and to provide additional safety features it is proposed that a concrete trough will be placed on the existing bridge to house the new track alignment and to strengthen the bridge. As a result, Underbridge 56 will extend by 1 m on either side due to this concrete trough and the addition of steel walkways for safety and maintenance with all works being undertaken within both the Network Rail and local highway boundary.

The existing Merseyrail third rail network will be extended to the proposed station. The existing Northern Rail network will be shortened as a result of it stopping up at the proposed Station rather than its current stopping up point at the Kirkby Station. To facilitate this third rail extension, a new substation is required that will be located in the vicinity of the proposed station and car park site (see Figure 4).

The entire length of the rail corridor will be bound by fencing which will be 1.8 m high. This fencing will be a mixture of existing fencing which already meets the height requirements and new fencing to ensure safety along the whole route of the major rail corridor.

The total distance of the major rail corridor works (including the third rail extension works) will be approximately 1.9 km..

B1.2.4 Substation

To facilitate the third rail extension and the proposed Station, a new sub-station is proposed. The new substation will occupy an area of land to the west of the proposed Station and will amount to a total footprint of 0.09 ha.

The substation will consist of all the components needed for the rail corridor works with most of the assets being housed in the substation building which is up to 3.04 m in height, 6.3 m in length and 2.3 m in width. Outdoor transformers, not able to be stored in the substation building will be located adjacent to the building and will be up to 2.4 m in height and 3.1 m in width.

B1.2.5 Proposed Station

The proposed station will comprise three platforms, with two platform faces (Platform 1 and 2) serving Merseyrail located on the northern side of the rail corridor and a single platform face (Platform 3) serving Northern Rail on the south side of the rail corridor. Buffer stops will be provided to Merseyrail and Northern Rail to indicate the two Train Operating Companies. The platforms will be connected by a cross station access platform (which will be the same height as platforms 1 – 3), replicating the operational interchange functionality at the existing Kirkby station. This cross-station access platform will run adjacent to an obscuration screen, which will be installed between the buffer stops of each railway line so that oncoming trains are not affected by lighting produced by oncoming trains in the opposite direction. This obscuration screen will be approximately 2.9 m in height and 20 m in length.

A single station building will be provided, with mess facilities for station staff and train crew. The station building will be staffed and will have facilities for customers to purchase tickets. Ticket vending machines will be available on the platform for customers who approach the station on foot from south of the railway line. The proposed station building will have a height of 8 m and total footprint of approximately 190 m² and will be finished in brickwork and white render with extensive glazing.

B1.2.6 Proposed Car Park

The approximate area for the station and car park is 5.6 ha (see Figure 4) and comprises approximately 300 spaces. The proposed car park will be split into two; the main car park consisting of 270 spaces located north of Kirkby Brook, and an accessible car park consisting of 30 spaces (15 accessible bays and 15 enlarged bays) located south of Kirkby Brook adjacent to the proposed station building.

Three staff spaces and two Network Rail maintenance bays are to be provided, along with a parking area for five motorcycles. Provision of electric charging points will be in-line with Knowsley Council policy. A short stay pick-up / drop-off area is also proposed outside the station building, with space for four vehicles. Covered parking facilities for 100 cycles will be provided.

B1.2.7 Vehicular Access

A new signalised junction is proposed on Headbolt Lane providing access to the proposed station and car park site. The junction will be positioned at the existing junction between Fallowfields and Headbolt Lane, creating a ‘four-armed’ junction. Controlled pedestrian crossings are to be provided on each ‘arm’ of the junction.

Headbolt Lane and Fallowfields are public highways maintained by KMBC. Junction works will therefore be subject to technical approval by KMBC.

A proposed internal road links the junction with Headbolt Lane to the proposed station forecourt, which includes two bus stops and a drop-off area for four private

vehicles. Bus stops have been sized for 12 m long buses based on Merseytravel requirements.

A new road bridge is required to span the access road over Kirkby Brook, which will be 4 m above existing ground level at its highest point and will have an under bridge clearance of 1.4 m.

B1.2.8 Pedestrian / Cycle Access

The main access road mentioned in Section B1.2.7 above includes 2 m footways on each side and a bi-directional 3 m cycleway on the east side of the access road.

The cycle route is diverted around the accessible parking area to provide a more direct route to cycle storage areas at the proposed station and avoid conflicts with pedestrian movements. Where pedestrian routes intersect access roads, zebra crossings are provided to promote pedestrian priority through the site.

The existing footpath, referenced in detail in Section B1.1.4 above, which crosses the site from east to west will be diverted and incorporated into the site access proposals. The existing western footbridge over Kirkby Brook shall be removed and the eastern footbridge retained. An additional footbridge is proposed over Kirkby Brook to the east of the station building. The eastern bridge provides a link to the eastern section of Headbolt Lane and allows pedestrians arriving from this area to easily cross Kirkby in order to reach the station building (see Figure 4).

B1.2.9 Drainage

The proposed station and car park surface water drainage has been divided into two networks, north and south of Kirkby Brook. The northern catchment consists of the main car park and northern portion of the access road up to the road bridge. This area will be drained to an attenuation tank beneath the car park, discharging into Kirkby Brook via a flow control device and petrol interceptor with a maximum discharge rate of 5 l/s.

The southern catchment consists of the proposed station forecourt, accessible parking area, station building and platforms. This catchment will also be drained to an attenuation tank beneath the car park, discharging into Kirkby Brook via a flow control device and petrol interceptor.

Track drainage is also proposed as part of the proposed station, drainage catch pits 1.1 m x 6 m will be used along the track section at the proposed station.

The drainage plans for the scheme are shown in Figure 6 and Figure 7.

B1.2.10 Landscaping

Landscaping will form an important part of the proposed Scheme and will consist of a combination of hard landscaping, soft landscaping and street furniture (Figure 8).

Soft landscaping dominates the landscaping plan for the proposed Scheme and consists of the following features;

- improved habitat area (consisting of methods such as shrub planting) which is focussed around the proposed car park and the pick up drop off areas of the proposed station;
- native planting which is found directly adjacent to Kirkby Brook and will focus on the existing landscaping found within the 8 m working buffer from the watercourse as per the EA's policy;
- ornamental shrubs and grasses which are proposed to be utilised between the platforms of the Proposed Station and in between staff parking bays and the pick up drop off system; and
- wildflower meadows which are proposed in the land west of the proposed car park and in land between the proposed station building and the proposed substation.

Landscaping and planting will also be utilised along Headbolt Lane to screen the proposed Scheme from nearby receptors and will be used trackside, especially on the widened embankment, to also help screen the rail corridor works from nearby receptors.



Figure 8: Headbolt Lane Station Car Park Proposed Landscape site Plan

B1.2.11 Lighting, Security and Information

Lighting for the proposed station and car park will typically take the form of post-mounted low powered LED lighting on columns up to a height of 5 m above ground level and finished in a light grey colour. The lighting will utilise warmer colour temperate light as this has much less blue light component - proven to be less disturbing to sleep patterns for humans (and many mammals).

All lights will be designed to have sensors and dimming to reduce light levels during low occupancy off-peak times. Lighting columns will also be designed to be minimised in height, reducing the visibility of the light sources from beyond the proposed station and car park.

Footbridge lighting will not use lighting columns, instead handrail level lighting will be used. This focuses light onto the deck which reduces light spill over the water.

The proposed car park will include a 1.5 m roll top mesh perimeter fence to provide a clear boundary to the site while maintaining an open and attractive layout. Low profile fencing (e.g. knee rail) shall be provided at the extents of the accessible car park and access routes to discourage pedestrian access to other areas. However, due to the open aspect of the site and multiple entry points, it is not proposed to provide a secure boundary fence between station access routes and the adjacent areas of grassland. Where steep slopes or vertical drops are

present (e.g at bridges and abutments) parapets will be provided to prevent falls from height.

The existing boundary fence along the length of the rail corridor works will be replaced with a 2.4 m high king post fence in line with Network Rail standards.

The video surveillance system to be provided as part of the proposed Scheme will consist of Dome, Box and Pan and Tilt and Zoom cameras. There will be a total of 58 cameras installed within the proposed station and car park site.

There will also be Long Line Public Address System installed as part of the Proposed Scheme, allowing automatic train departure announcements to be made to the Merseyrail and Northern Rail platforms and inside the proposed station building.

57 loudspeakers will be arranged in the following zones to provide coverage at the proposed station:

- Platform 1 – 17 Loudspeakers to be configured into Day/Night zones;
- Platform 2 – 19 Loudspeakers to be configured into Day/Night zones;
- Platform 3 – 19 Loudspeakers to be configured into Day/Night zones; and
- Ticket Office – two Loudspeakers configured on a single zone.

The loudspeakers will either be mounted within passenger waiting shelters or mounted onto lighting columns on the platforms with a minimum height of 2.5 m.

Customer Information System (CIS) displays shall be installed at the Proposed Station and will provide passengers with train running information, the Displays shall incorporate white Light Emitting Diodes (LEDs).

Appendix C

WFD Water Body Extent Maps

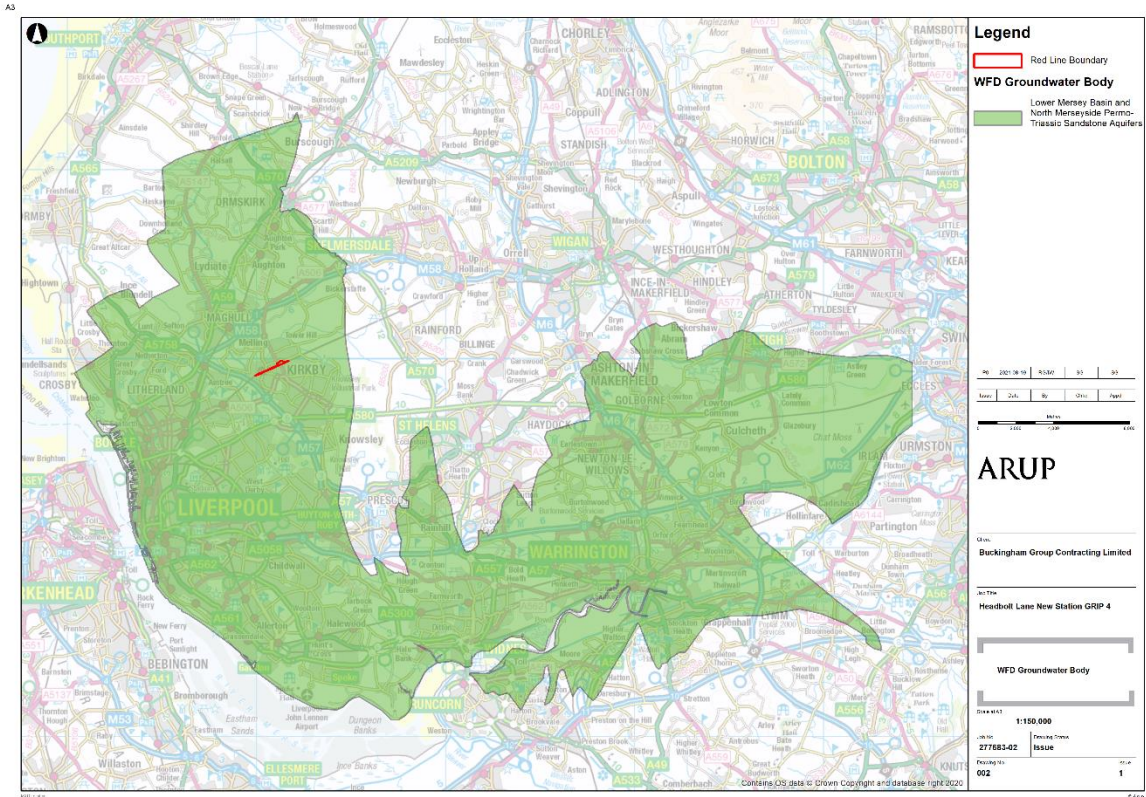
Legend

- Red Line Boundary
- Surface Water Body**
 - Alt US Bul Bridge
 - Leeds and Liverpool Canal
 - Wigan to Liverpool
 - Simonswood Brook
- Surface Water Body Catchment**
 - Alt US Bul Bridge
 - Simonswood Brook

Map Details:

- Scale:** 1:50,000
- Scale Bar:** 0 100 200 300 400 500
- Project Information:**
 - Client: Buckingham Group Contracting Limited
 - Job Title: Headbolt Lane New Station GRIP 4
 - WFD Surface Water Bodies
 - Issue: 277683-02
 - Drawing No: 001
 - Page: 1

C2 Groundwater bodies



Appendix D

WFD EA BQE Monitoring Data

D1 WFD EA BQE Monitoring Data

The following data were obtained from the Biological Monitoring Data: Ecology & Fish Data Explorer³¹ and the water quality data archive³² for the vicinity of the scheme (within both WFD waterbodies Simonswood Brook and Alt US Bull Bridge) to gain an understanding of the baseline quality elements in WFD.

D1.1 Fish

No fish monitoring data is currently available.

³¹ Environment Agency and DEFRA. *Ecology and Fish Data Explorer*. [Available at: <https://environment.data.gov.uk/ecology/explorer/>]

³² Environment Agency. *Water Quality Data Archive*. [Available at: <https://environment.data.gov.uk/water-quality/view/landing>]

D1.2 Invertebrates

Data since 2010 shown

Site/Station Name	NGR	Sample Date	BMWP Total	BMWP - ASPT	WHPT - ASPT	Life – Family Index	PSI – Family Score
ALT	SJ3956896336	2016-09-14	46	3.54	3.21	5.82	4.35
KNOWSLEY BROOK	SJ4022997359	2016-10-18	78	4.33	4.81	6.76	43.24

D1.3 Macrophytes

Data since 2010 shown

Site/Station Name	NGR	Sample Date	RMHI	RMNI	RN A TAXA	N RFG	RFA PC
SIMONSWOOD BROOK	SJ4072897961	2017-08-30	7.22	7.53	5	5	37.5

D1.4 Diatoms

Data since 2010 shown

Site/Station Name	NGR	Sample Date	TOTAL UNITS FOUND LM	TD15LM	TOTAL TD15LM CELLS	TD15LM % PLANKTONIK	TD15LM % MOTILE	TD15LM % PTV	TD15LM % SALINITY
KIRKBY BROOK	SJ4019597607	2017-05-19	319	64.09	304	0	46.08	66.14	0.63
		2017-10-18	332	60.84	313	5.72	55.12	45.18	0.9

D2 Water Quality Data

Most recent publicly available data shown

Determinant	KIRKBY BROOK ABOVE CONFLUENCE WITH SIMONSWOOD BROOK (SJ 41012 99686) ID: NW-88002849	SIMONSWOOD BROOK ABOVE CONFLUENCE WITH KIRKBY BROOK (SJ 40834 99639) ID: NW-88002850
	25 Sep 2019, 12:13	25 Sep 2019, 12:05
Lead (dissolved), µg/l	< 2	< 2
pH	7.93	7.11
Temperature of water, °C	15.5	14.5
Conductivity at 25 C, µs/cm	695	459
Cadmium (dissolved), µg/l	0.31	0.73
Ammoniacal Nitrogen as N, mg/l	0.27	0.066
Nitrogen, Total Oxidised as N, mg/l	3.9	8.7
Nitrate as N, mg/l	3.81	8.68
Nitrite as N, mg/l	0.092	0.025
Ammonia un-ionised as N, mg/l	0.00629	0.00022
Alkalinity to pH 4.5 as CaCO ₃ , mg/l	170	88
Orthophosphate, reactive as P, mg/l	0.11	0.16
Magnesium, Dissolved, mg/l	7.9	9.2
Calcium, Dissolved, mg/l	94	58
Carbon, Organic, Dissolved as C :- {DOC}, mg/l	8.5	31
Zinc, Dissolved, µg/l	13	19
Chromium, Dissolved, µg/l	1.4	1.3
Nickel, Dissolved, µg/l	2.7	3.4
GCMS Screen : Target Based multi-residue screening : Semi Quantitative, text-based	1	1
Triphenyl Tin as Cation, µg/l	< 0.002	< 0.002

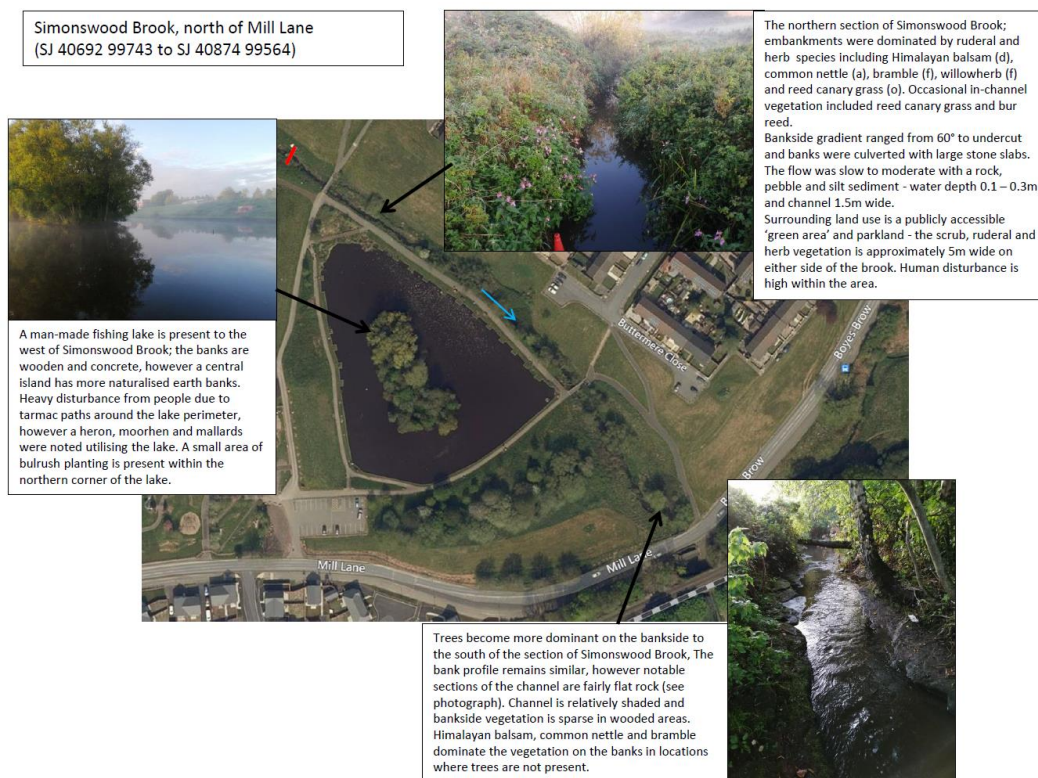
Determinant	KIRKBY BROOK ABOVE CONFLUENCE WITH SIMONSWOOD BROOK (SJ 41012 99686) ID: NW-88002849	SIMONSWOOD BROOK ABOVE CONFLUENCE WITH KIRKBY BROOK (SJ 40834 99639) ID: NW-88002850
	25 Sep 2019, 12:13	25 Sep 2019, 12:05
Tetrabutyl Tin as Cation, µg/l	< 0.0005	< 0.0005
Dibutyl Tin as Cation, µg/l	< 0.012	< 0.002
Aluminium, Dissolved, µg/l	65	250
Copper, Dissolved, µg/l	6.5	9.7
Tetraphenyl Tin as Cation, µg/l	< 0.0005	< 0.0005
Tributyl Tin as Cation, µg/l	0.0048	< 0.0005
Oxygen, Dissolved, % Saturation, %	87	71.9
Oxygen, Dissolved as O ₂ , mg/l	8.66	7.31

Appendix E

Baseline Survey Data / Outputs

E1 Baseline Survey Data / Outputs

A riverine assessment was undertaken by NGL Ecology Ltd³³, extracts of which are provided below.



³³ NGL Ecology Ltd. (2020) *Headbolt Lane, Kirkby, Riverine Assessment*

