

A5036 Port of Liverpool Access Scheme

Environmental Impact Assessment Scoping Report



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ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT

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1 INTRODUCTION

1.1 Background to and Purpose of this Report

- 1.1.1 Highways England (the Applicant) has been developing options to relieve congestion and improve journey times along the A5036 between the Port of Liverpool and the Switch Island Interchange with the M57 and M58.
- 1.1.2 The Port of Liverpool has been expanded with a new deep-sea container berth, known as Liverpool 2, to enable it to function as the UK's national gateway and transshipment hub for Ireland. The A5036 between the port and the M57/M58 Switch Island interchange is already congested. This situation will get worse as the area is developed and the Port of Liverpool becomes busier.
- 1.1.3 Due to its importance in supporting future economic growth, improved access to the Port of Liverpool is a priority for the Liverpool City Region and is a key part of the Liverpool City Region Growth Strategy (Liverpool City Region Local Enterprise Partnership, 2016).
- 1.1.4 Highways England announced on 31 August 2017 the preferred solution consisting of:
- A new bypass solution through the Rimrose Valley area linking the Princess Way section of the A5036 to the south and Broom's Cross Road to the north, including new junctions, bridges and footbridges; and
 - An upgrade to dual carriageway on Broom's Cross Road between the new bypass and the Switch Island Interchange.
 - De-trunking of the existing A5036 between the Switch Island Interchange and the Princess Way section of the A5036.
- 1.1.5 The preferred solution is hereafter referred to as the 'Scheme'. The geographical context of the Scheme is shown on Figure 1.1. Figure 1.2 demonstrates the proposed solution and Figure 1.3 presents the Scheme boundary (shown on the figure as a red line boundary). Figure 1.4 identifies land required for temporary use during construction, replacement land and permanent land take.
- 1.1.6 The Scheme is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 as amended. An application for Development Consent Order (DCO) will be submitted by Highways England to the Secretary of State (SoS) for Transport via the Planning Inspectorate (PINS). The application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 Statutory Instrument (SI) No. 2017/572 (hereafter referred to as the 'EIA Regulations').
- 1.1.7 The purpose of this Scoping Report is to establish the scope of the ES and to support the request for a scoping opinion under Regulation 10(1) of the EIA Regulations.
- 1.1.8 The EIA Regulations set out the requirements for an applicant who proposes to request a scoping opinion from the Secretary of State. Regulation 10(3) of the EIA Regulations states that a request for a scoping opinion must include:

- A plan sufficient to identify the land;
- A description of the proposed development, including its location and technical capacity;
- An explanation of the likely significant effects of the development on the environment; and
- Such other information or representations as the person making the request may wish to provide or make.

1.1.9 PINS Advice Note 7: EIA: Preliminary Environmental Information, Screening and Scoping (PINS, March 2015) provides advice on the information that should be provided in the Scoping Report. Appendix A lists the suggested information requirements and identifies where they are presented within this Scoping Report. Note this advice note is due to be updated imminently.

1.2 Introduction to the Scheme and its Location

1.2.1 Figure 1.1 shows the location of the Scheme and the surrounding road network. Figure 1.2 presents the Scheme. Figure 1.5 presents the environmental constraints of the application site.

1.2.2 The existing A5036 (Dunnings Bridge Road) links the Port of Liverpool with the Switch Island interchange of the M57 and M58, which in turn links to the M62 and M6 respectively. Urban in character and of dual carriageway standard, the A5036 already suffers from a high level of congestion and with significant development pressures on the route for much needed regeneration and the expansion of the Port of Liverpool, the situation is expected to worsen.

1.2.3 The Scheme will improve access to the eastern side of the Port of Liverpool from the motorway network by:

- Introducing a new dual carriageway road from the existing A5036 through Rimrose Valley Park for approximately 4.5km (2.8 miles) connecting the existing A5036 to Broom's Cross Road; and
- Upgrading the existing Broom's Cross Road from a single carriageway (9m wide) to a dual carriageway for 1.7km (1.1 miles) connecting the new carriageway to Switch Island Interchange.

1.2.4 The Scheme lies within the administrative boundary of Sefton Metropolitan Borough Council (SMBC).

1.2.5 The Scheme passes through open farmland, playing fields and a historic landfill (Whabb's Tip). The Scheme is located in an area which has a high water table and is also situated in a Critical Drainage Area (CDA). The Brookvale Local Nature Reserve (LNR) is located at the southern end of the Scheme within Rimrose Valley Country Park. There are several priority habitats present across Rimrose Valley Country Park including: reedbeds, lowland fens, grazing marsh grasslands and deciduous woodland.

1.3 The Preliminary Environmental Information Report (PEIR)

1.3.1 The aim of EIA is to protect the environment by ensuring that the decision maker,

when deciding whether to grant permission for a scheme which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision-making process.

- 1.3.2 Between production of this Scoping Report and the submission of the ES with the DCO application, the Preliminary Environmental Information Report (PEIR) will be produced. This is required for statutory consultation.

1.4 EIA Screening Summary

- 1.4.1 Based on early assessments undertaken during the development of the Scheme, 'significant effects' on the environment cannot be ruled out at this time.

- 1.4.2 Therefore, it is considered that the Scheme constitutes EIA Development in accordance with Schedule 2, Article 10 (f) (Construction of Roads) of the EIA Regulations and an ES will be prepared to support the DCO application.

1.5 The Scheme Team

- 1.5.1 The current Scheme Team members are summarised in Table 1-1.

Table 1-1 The Scheme Team

Organisation	Role
Highways England	The Applicant
Arcadis	Design, EIA, stakeholder management and engagement, traffic modelling.

2 DESCRIPTION OF THE SCHEME

2.1 Background to the Scheme

- 2.1.1 The Port of Liverpool is the busiest sea-port in the north west and the sixth largest nationally in terms of total freight tonnage.
- 2.1.2 The Port currently handles about 800,000 TEU (Twenty-Foot Equivalent Unit) a year, although this is expected to increase to 2.5 million TEU by 2030 due to the new deep-water container terminal (Liverpool2).
- 2.1.3 Liverpool2 enables the Port of Liverpool to house two 13,500 TEU post-Panamax vessels simultaneously, creating the capacity to handle the next generation of container ships, empowering the Port of Liverpool to be the UK's national gateway and transshipment hub for Ireland.
- 2.1.4 The Liverpool City Region and Peel Ports have recognised that a multi-modal solution is essential for Port access, incorporating improved connections by water, rail and road. Due to its importance in supporting future economic growth, improved access to the Port of Liverpool is a priority for the Liverpool City Region.
- 2.1.5 The Highways Agency (now Highways England) produced a Port of Liverpool Access Feasibility Study in 2014 (Highways Agency, 2014, referred to as the Feasibility Study), which concluded that there was a need for an increased highway capacity between the Port of Liverpool and the motorway network.
- 2.1.6 Following the Feasibility Study, a scheme to provide a 'comprehensive upgrade to improve traffic conditions on the main link between the Port of Liverpool and the motorway network' was included in the Government's 'Road Investment Strategy: for the 2015/16 – 2019/20 Road Period' (Department for Transport (DfT) and Highways Agency, 2014). The Port of Liverpool Access Scheme was then included in Highways England's Delivery Plan for the period 2015 to 2020.
- 2.1.7 Options were developed by Highways England as documented in Chapter 3, and a Preferred Route Announcement made on 31 August 2017 confirming an offline bypass solution for the Scheme.

2.2 Scheme Objectives

- 2.2.1 The Scheme objectives are:
- To improve the traffic conditions on the main link between the Port of Liverpool and the motorway network to facilitate economic growth;
 - To improve safety for all road users and road workers;
 - To reduce requirements for future maintenance interventions;
 - To minimise the detrimental environmental effects, and seek to protect and enhance the environment;
 - To improve local connectivity and the local network for all types of road user; and
 - To provide value for money.

2.3 Scheme Overview

2.3.1 The Scheme is shown on Figure 1.2. The Scheme includes the following components:

- A new offline bypass of 2.8 miles (4.5km) dual carriageway road through the Rimrose Valley connecting the A5036 (Princess Way) to the Broom's Cross Road at the new Brickwall Lane Junction.
- Upgrading the existing Broom's Cross Road from a single carriageway (9m wide) to a dual carriageway for 1.1 miles (1.7km) between the new Brickwall Lane Junction and the Switch Island junction.
- Creation of two new junctions:
 - Princess Way Junction on the A5036; and
 - Brickwall Lane Junction on Broom's Cross Road.
- Five new footbridges;
- Creation of two new structures:
 - Edge Lane Bridge; and
 - Lydiate Lane Bridge;
- Converting the existing A5036 between the new Princess Way Junction and the Switch Island Interchange to a de-trunked carriageway in agreement with SMBC.

2.3.2 The Scheme is expected to require three construction compounds located close to:

- Edge Lane;
- Lydiate Lane; and
- Brickwall Lane Junction.

2.3.3 The Scheme will also require associated works for temporary access, temporary lay-down, work areas and ancillary works.

2.3.4 The design speed will be 50 miles per hour (mph), 85 kilometres per hour (kph).

2.3.5 The Scheme would have a design life of 40 years.

2.4 Scheme Alignment

2.4.1 The Scheme commences with a new 3-way signal junction on the A5036 (Princess Way) between the Liverpool to Southport railway line (Merseyrail Northern line) and the existing signalised half hamburger junction to the north east. This new junction would include provision for Non-Motorised Users (NMU). The final layout will depend upon the results of traffic modelling.

2.4.2 There is potential for the final design to directly impact upon the abutments of the existing rail bridge should the proposed junction require enlargement. This junction is the low point of the Scheme. The existing ground levels along the entire new route range between approximately 5 m Above Ordnance Data (AOD)

and 19 m AOD.

- 2.4.3 The operation of this junction will need to be considered in conjunction with the existing bridge road signalled roundabout and the Sandy Road junction as they are in such close proximity that any queue at one of these junctions will have an effect on the others.
- 2.4.4 From the new Princess Way Junction, an all-purpose dual carriageway would run roughly parallel to the Leeds and Liverpool Canal through the Rimrose Valley Country Park.
- 2.4.5 The route would pass under Edge Lane at Chainage (Ch) 3450 and Lydiate Lane at Ch 4150 before rising to meet the existing Broom's Cross Road at its existing junction with Brickwall Lane at Ch 4620. The Scheme proposes to improve the existing signal controlled cross road with an additional signalled controlled junction for the A5758/A565, with the primary route being the new A5036 through Rimrose Valley Park.
- 2.4.6 From Ch 4260, Broom's Cross Road will be upgraded from a single two-way carriageway to a dual carriageway by constructing the additional two lanes on its north side. This will follow the same alignment, tying into the existing signalised junction at Switch Island.
- 2.4.7 It is proposed to provide a service road with an NMU route between the B5422 Brickwall Lane and Chapel Lane on the north side of the route.
- 2.4.8 Existing NMU access on sections of Broom's Cross Road will be removed and the existing pedestrian crossing point at Chapel Lane will be replaced by a shared use footbridge.
- 2.4.9 Existing footways and access tracks in Rimrose Valley Country Park will be maintained via new footbridges.

2.5 Earthworks Design

- 2.5.1 An at-grade vertical alignment is the current design, however variations to this will be considered during design development. The at-grade is considered to be the worst case scenario for the more sensitive environmental issues surrounding the Scheme, namely noise and landscape.
- 2.5.2 The alignment follows the existing ground or is slightly above ground level. This alignment has a combination of 2m high earthwork bunds with a 2m high environmental fence on top, or 4m high environmental fences.
- 2.5.3 A revised alignment will be explored to provide a softer and greener solution.
- 2.5.4 Between Ch 1000 and 2400, Whabbs Tip, an existing historic landfill site, is present. The vertical alignment will be designed to limit excavation into this area. The alignment could be lowered under the Edge Lane and Lydiate Lane bridges to minimise approach earthworks and the visual intrusion of potentially 8m high structures.
- 2.5.5 A buildability review is being undertaken due to the high water table in the area. Additional geotechnical investigations are required to determine the condition of the land, for which options to gain access are currently being explored.

2.6 Highways Structures

2.6.1 The Table 2-1 below is a list of all the structures proposed for the Scheme.

Table 2-1 Proposed Structures

Name of Structure	Details of Proposed Works
Beach Road footbridge	New foot/cycle overbridge connecting between Beach Road footpath and the railway underpass.
Rimrose Brook culverts	New culverts to maintain the existing brook, passing under the new carriageway at Ch 240, Ch 280 and Ch 380
Rimrose Brook culverts	New culverts to maintain the existing brook, passing under the new carriageway at Ch 700 and Ch 840
Rimrose Valley Park footbridge	New foot/cycle overbridge maintaining the existing footpath over the new carriageway at Ch 990
Rimrose Valley Park footbridge	New foot/cycle overbridge maintaining the existing footpath over the new carriageway at Ch 1880
Rimrose Brook culverts	New culverts to maintain the existing brook, passing under the new carriageway at Ch 2660. New culvert along the side of the carriageway running between Ch 2660 and Ch 2740
Rimrose Valley Park footbridge	New foot/cycle overbridge maintaining the existing footpath over the new carriageway at Ch 2860
Edge Lane overbridge	Construction of 2 Span (35m,35m) bridge at Ch 3480
Lydiat Lane overbridge	Construction of 2 Span (37m,37m) bridge at Ch 4140
Chapel Lane footbridge	New foot/cycle overbridge connecting Chapel Lane either side of the new carriageway and maintaining NCN 62 at Ch 5780

2.6.2 Construction details of all proposed structures will be determined through the design phase.

2.7 Highways Drainage

2.7.1 The new highway drainage would be designed to meet the requirement of Highways England as well as stakeholders including the Environment Agency (EA), SMBC and United Utilities. It is envisaged that along the length of the new route attenuation ponds will be used to reduce flow into outfalls/ connections to United Utilities piped network.

2.7.2 The section of carriageway which follows Broom's Cross Road (between Switch Island and Brickwall Lane) would have a drainage network matching the extents of those on the Broom's Cross Road. It would discharge into Netherton Brook and Moor Hey Brook attenuation ponds. The Netherton Brook attenuation pond

will be extended to accommodate the increased capacity. Due to the location of the new offline carriageway to the east of the existing Broom's Cross Road, the Moor Hey Brook attenuation ponds will have to be relocated further east adjacent to the new carriageway. The attenuation ponds will also be increased in size to accommodate the increase in capacity.

2.7.3 Between Broom's Cross Road, Lydiate Lane and Edge Lane the highway drainage network will discharge to a new attenuation pond to the north of the road, which will outfall into the Lydiate or Edge Lane highway drainage. This will be subject to hydraulic modelling of the existing highway drainage to determine which is the most appropriate.

2.7.4 South of Lydiate Lane in Rimrose Valley Country Park, the drainage would discharge into several attenuation ponds. These will in turn outfall into the surface watercourse known as Rimrose Brook, upstream of their discharge point into culverted box combined sewer. It is anticipated there will be two outfalls into the watercourse, one near to Nazeby Avenue, to the north west of the pond, the other to the south east near to Beech Road. Where the new road connects to the existing A5036 adjacent to the railway line, the highway drainage for approximately 300m will discharge into the existing highway drainage network along the A5036.

2.8 Highways Lighting

2.8.1 Lighting would be required at junctions only. However, the lighting design is currently being developed and therefore the actual extent of new lighting is not yet confirmed.

2.8.2 The lighting design would minimise light pollution which can cause sky glow, glare and light trespass. The design of the lighting would take into account potential landscape and ecological effects.

2.8.3 The existing de-trunked A5036 will be reviewed with possible improvement works to be completed as agreed with SMBC.

2.9 Non-Motorised User (NMU) Provision

2.9.1 Where the proposed route would affect the existing Public Rights of Way (PRoW), network provision would be made to ensure that the route remains open, by providing overbridges or suitable diversions.

2.9.2 Additional cycleway/ footway crossing provisions will be provided at junctions.

2.9.3 All NMU provisions on the existing A5036 shall be maintained with possible improvements that will be agreed with SMBC.

2.10 Flood Risk Assessment (FRA)

2.10.1 A minor proportion of the study area is in Flood Zone 2 as presented by Figure 13.2 and the remainder of the study area, which occupies an area greater than one hectare, is in a CDA. It is thought that Rimrose Brook is culverted in a combined sewer under the historic Whabbs Tip landfill. Wetlands, fed by groundwater and surface water, have outfalls that enter the combined sewer to the west of the new carriageway, and also in the south west corner of the

Scheme.

- 2.10.2 An FRA is required to support the scheme. The FRA will assess flood risk from all sources to ensure no increase in flood risk from the Scheme within the Scheme boundary or to third party areas as a result of the Scheme.

2.11 Construction

- 2.11.1 Construction is anticipated to last for approximately three years and would commence in March 2020. A Construction Traffic Management Plan (CTMP) will be produced that will consider the movement of materials, waste and labour to and from site. It will consider modes for transporting materials to and from site, and also the capacity of landfill areas. An outline version would be developed for submission with the ES.

A5036 Princess Way Junction

- 2.11.2 Construction of the new junction at the interface of Princess Way would require off peak traffic management lane closures to allow the new carriageway to be constructed offline to interface with the existing carriageway. Due to the railway overbridge and its piers, there are no options to allow widening to be able to divert traffic off the existing carriageway to provide additional work areas. Options would be to divert traffic or limit works to lane closures.

New Dual Carriageway within Rimrose Park

- 2.11.3 Works will require significant excavations and or a significant volume of fill material to achieve the required vertical profile. Interfaces with existing footpaths throughout the Rimrose Park area would have to be managed. The majority of the carriageway can be constructed in a sterile site.

Edge Lane Overbridge

- 2.11.4 The purpose of the bridge is to maintain the existing Edge Lane through the Rimrose Park area. It is proposed to construct the new bridge offline, providing an improved alignment whilst maintaining the existing road. Once construction is complete the traffic would then be diverted onto the new bridge to allow the existing road to be excavated to allow the new road to be constructed in this location.

Lydiate Lane Overbridge

- 2.11.5 The purpose of this bridge is to maintain the existing Lydiate Lane through the Rimrose Park area. It is proposed to construct this bridge in-line with the existing carriageway. Options to carry out this section of construction would be to either close Lydiate Lane and divert traffic via Edge Lane for the period of construction or a temporary road would have to be constructed alongside to allow traffic to be diverted.

Brickwall Lane Junction

- 2.11.6 The majority of the proposed junction will be able to be constructed offline around the existing traffic signalled junction. As work progresses traffic can be moved onto the newly constructed carriageway to allow the rest of the junction to be constructed.

Broom's Cross road widening.

- 2.11.7 The new eastbound carriageway and service road will be constructed offline alongside the existing Broom's Cross Road carriageway. Once complete, traffic will be diverted onto the new carriageway to allow the rest of the construction to be completed to form the new dual carriageway.

2.12 Demolition

- 2.12.1 There may be a need for demolition at the southern interface with A5036 Princess Way to allow the new interface to be constructed. The extents of demolition required will be explored during design development.
- 2.12.2 A partial demolition of a wall at Brickwall Lane may be required, depending on the proposed amendments to the junction.

2.13 Services and Utility Diversions

- 2.13.1 There is a limited amount of utilities equipment present along the proposed route, however, the route does cross major statutory undertakers' equipment including:
- Two Scottish Power Energy Networks 132kV overhead cables; it is currently envisaged that these will not be affected, however if diversion is required this would be considered within the EIA;
 - Scottish Power Energy Networks 132kV underground cable running adjacent to the proposed route which may require protection works; and
 - United Utilities combined sewer culvert; the details of this are currently unavailable. Given the ground levels it is likely to be lower than the proposed road avoiding the need to divert. Protection works are likely to be required.

2.14 Contaminated Land

- 2.14.1 The main potential sources of contamination that have been identified include landfills, tips, unspecified industrial and engineering works, former quarries, breweries, tanneries, garage, scrap metal yards, timber yard, builders yard, tar distillery, rubber works and a metal plating factory. These potential contaminative sources can be found at a variety of locations within the study area along the proposed route from Brickwall Lane through Rimrose Valley Park to Princess Way junction.
- 2.14.2 More specifically, there is one historic landfill site which will be paid particular attention. This is Whabbs Tip (1956 to 1982) located approximately 500m from the start of the proposed offline route (Princess Way) and is approximately 1.5km in length.

2.15 Waste Management

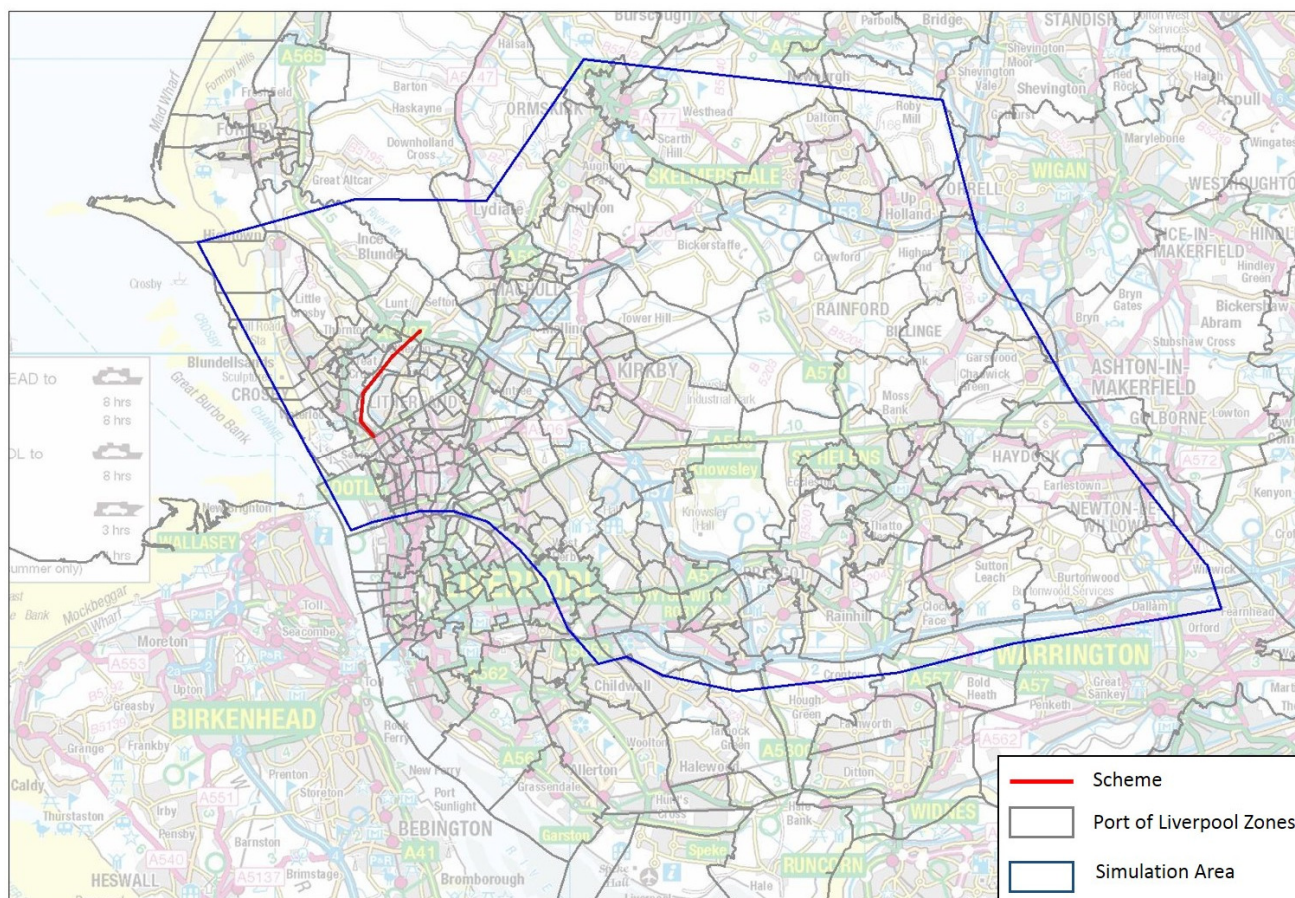
- 2.15.1 A Site Waste Management Plan (SWMP) and a Materials Management Plan (MMP) will be prepared following the protocols within the CL:AIRE Definition of Waste: Development Industry Code of Practice to ensure that excavated materials are re-used appropriately, sustainably and remain outside the waste hierarchy.

2.16 Traffic Forecasting

- 2.16.1 The traffic model geographical coverage concentrates on the area immediately surrounding the A5036 between the Switch Island Interchange and the Port of Liverpool.
- 2.16.2 The full simulation area of the model covers an area from Liverpool in the west to the M6 motorway in the east, Formby, Ormskirk and Appleby Bridge to the north, and Speke / Widnes and Warrington to the south. The model has been developed using the SATURN suite of software.
- 2.16.3 The highway traffic model has been developed at two levels of detail:
- Simulation coding of junctions / links in the urban area; and
 - Buffer coding of links in outer rural areas.
- 2.16.4 Simulation coding enables explicit and detailed modelling of junctions and allows the model to output information about queuing and delays for each movement at the junctions. This level of detail requires specific data to be available for junction operation including geometry, lane usage, and where traffic signals are used the staging and timing data relating to the signal operation. As a result, whilst simulation coding is data intensive it provides a more robust basis to model network operations, especially in urban networks.
- 2.16.5 All major motorways are included in the model to capture longer distance freight traffic travelling through the study area.
- 2.16.6 Insert 2-1 below shows the model area boundary as well as locations of the proposed Scheme and the existing A5036.
- 2.16.7 The future demand for travel within the model study area will be affected by several key factors. These include:
- Change in population and employment levels;
 - Change in the number of households; and
 - Change in the level of car ownership.
- 2.16.8 An extensive programme of traffic data collection was undertaken by a specialist survey company from September to November 2015. This includes the following survey types:
- Roadside Interview Surveys, providing origin, destination and trip purpose information;
 - Automatic Traffic Counts (ATCs);
 - Manual Classified Counts; and
 - Automated Number Plate Recognition.
- 2.16.9 Travel time information was also sourced from DfT in the form of Trafficmaster data.
- 2.16.10 ATCs were undertaken at 59 sites. 8 of these sites (24 directions) were used as independent validation counts. The ATC sites were selected to inform the model validation exercise, as well as providing evidence of the daily variations in traffic

flows across the study area.

Insert 2-1 Traffic Model Simulation Area



2.17 Environmental Design

- 2.17.1 Highways England has a duty under the Highways England Licence (DfT, 2015) to minimise the environmental impacts of operating, maintaining and improving the strategic road network.
- 2.17.2 The Scheme design is an iterative process which will take into consideration the key significant effects on environmental receptors and the mitigation proposed. In addition, the impacts of a changing climate on Scheme resilience will also affect the Scheme design. Climate change adaptation measures will be identified and incorporated where relevant.
- 2.17.3 Highways England’s Biodiversity Plan (Highways England, June 2015), details the biodiversity aims and obligations to be delivered as part of the Government’s Road Investment Strategy (RIS): 2015 to 2020 (DfT and Highways Agency, 2014). Highways England is expected to ensure that road schemes reduce impacts on the environment by reducing in habitat fragmentation and enhancing biodiversity value. Habitats should be actively managed to ensure high species diversity and reduced fragmentation.
- 2.17.4 Environmental design and mitigation guidance is provided within the Design Manual for Roads and Bridges (DMRB) Volume 10. Dependant on the nature of

the impact, the design measures would be incorporated to address effects on different environmental receptors. Examples of these measures are detailed further below:

- Developing a Landscape Strategy to integrate the Scheme within the local character of the surrounding landscape and soften the visual impact. This strategy should aim to maintain local vegetation patterns and landform. The Scheme design includes earth bunding and fencing in order to screen the Scheme and soften the visual impact.
- Incorporating measures to control water pollution and methods to drain surface water from the site effectively to minimise potential impacts on the water environment. This could include surface water outfalls, soakaways, and the creation of balancing ponds
- Scheme design should include opportunities for habitat creation and enhancement, particularly for species of nature conservation value. Understanding the impacts on habitats and the species they support at an early stage can help inform the design process so that linkages between habitats and new wildlife corridors may be incorporated within Scheme design. This area will be explored in Scheme design, with particular reference to the Brookvale LNR.

2.17.5 The Scheme will be constructed through an area of open space, most notably through the Rimrose Valley Country Park, and the design will be required to identify areas of replacement land to replace the land lost due to the Scheme. The requirement to identify and provide replacement land is required by Section 106 (Planning Obligations) of the Town and Country Planning Act 1990, as amended by Section 174 (Planning Obligations) of the Planning Act.

2.17.6 In terms of providing replacement playing fields, Sport England sets out a requirement within Policy P1, to carefully quantify current and future needs of existing provision or replace with an equivalent or better quality/quantity, in a suitable location and subject to equivalent or better management arrangements, prior to the commencement of development.

2.17.7 Similarly, with regards to areas of open space, at the discretion of the Local Planning Authority (LPA), land of sufficient quality and/or quantity needs to be provided to compensate for affected land. Sections 131 and 132 of the Planning Act state that in order for a DCO to authorise the compulsory acquisition of land, 'replacement land has been or will be vested in the prospective seller and subject to the same rights, trust and incidents as attached to the order land'.

2.17.8 At this early stage the location and types of replacement land that would be required have not been identified. Discussions will continue and proposals for the replacement land will be considered as part of the EIA.

Land Instability

2.17.9 Land instability in relation to effects such as landslides, subsidence or ground heave could cause harm to human health, local property, associated infrastructure and the wider environment if not considered during design development.

- 2.17.10 A preliminary assessment of ground instability will be undertaken, including investigation to ascertain that the site is and would remain stable or that any issues can be dealt with as part of the design.
- 2.17.11 Design measures may be required to ensure structures can cope with any anticipated movements or hazards such as ground gases.

2.18 The Rochdale Envelope

- 2.18.1 PINS Advice Note 9: 'Using the 'Rochdale Envelope' (PINS, 2012) provides guidance regarding the degree of flexibility that may be considered appropriate within an application for development consent under the Planning Act 2008. The advice note acknowledges that there may be parameters of a Scheme's design that are not yet fixed and, therefore, it may be necessary for the ES to assess likely worst-case variations to ensure that the likely significant environmental effects of the Scheme have been assessed.
- 2.18.2 Within this Scoping Report, the early concept design for the Scheme is presented. The Scheme is to be developed further through the reference design and this would form the basis for the DCO application. Therefore, when presenting the Scheme design in the ES and the accompanying assessment, the requirements of Advice Note 9 would be reflected. This would ensure that the likely significant effects of the Scheme are assessed. Furthermore, the reference design would be informed by the EIA with the design reflecting iterative working between the designers and the environmental specialists.

3 ALTERNATIVES

- 3.1.1 The ES will include a description of the reasonable alternatives studied by the Applicant, which are relevant to the proposed development and its specific characteristics. This will also include an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.

4 CONSULTATION

4.1 Introduction

4.1.1 This chapter briefly outlines the consultation that has been undertaken to date in relation to the Scheme's development during the identification and appraisal of options. It also outlines the consultation that will continue as part of the preparation of the ES for the Scheme.

4.2 Consultation Undertaken to Date

4.2.1 A non-statutory public consultation ran for six weeks from 16 January 2017 to 27 February 2017. The events were publicised through a combination of leaflet drops, formal letters, 'wrap around' adverts and press releases as well as through the scheme website, local community groups and large local employers. Consultation questionnaires were also placed in local libraries.

4.2.2 Five public exhibition events were also held during the consultation period in 2017:

- Tuesday 24 January 2017 – 11am to 5 pm, The Park Hotel, Dunnings Bridge Road, Netherton, L30 6YN
- Friday 27 January 2017 – 2pm to 8pm, St Faith's Church Hall, Milton Road, Waterloo, L22 4RF
- Monday 30 January 2017 – 10am to 5pm, Play Football, Drummond Road, Crosby, L23 9YP
- Wednesday 1 February 2017 – 3pm to 8pm Litherland Royal British Legion, Orrell Road, Litherland, L21 8NU
- Saturday 4 February 2017 – 11 am to 5pm, SING Plus Centre, Cambridge Road, Seaforth, L21 1EX

4.2.3 These exhibitions were attended by 729 visitors. In total 2229 responses were received, including 512 postal questionnaires and 377 emails and letters. 72% of questionnaires were received online using the scheme's webpage.

4.2.4 One online options and one offline option were presented for consultation. Overall 44% of consultees preferred the online option, 31% of consultees preferred the offline options, 9% rejected both options and 16% expressed no preference.

4.3 Environmental Consultation

4.3.1 As part of the environmental assessment process to date, a number of topic specific consultations have been undertaken which are outlined in chapters 7-17.

4.3.2 The PEIR will be consulted upon as part of the statutory consultation as required under Section 42 of Planning Act 2008.

4.3.3 Under section 42 of the Planning Act 2008, the applicant must consult:

- Statutory consultees (i.e. 'prescribed persons' listed in Schedule 1 to the

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009;

- Local authorities prescribed in section 43 of the Planning Act 2008; and
- The persons prescribed in section 44 of the Planning Act 2008 including owners, lessees, tenants, and those with an interest in the land.

4.3.4 Following this, ongoing non-statutory consultation will continue with a range of organisations to inform the methodologies used in the assessment, to collate baseline data and to inform the emerging design.

4.3.5 Details of all consultation and how this has informed the EIA will be presented in the ES. It is also intended that Statements of Common Ground will be prepared as the preparation of the ES progresses to confirm agreement to aspects of the EIA process.

5 EIA METHODOLOGY

5.1 Introduction

5.1.1 This chapter outlines the main stages of the EIA process and the regulatory context, explains the general methodology that will be followed for the EIA for this Scheme and briefly introduces the assessment of cumulative effects and the Habitats Regulations Assessment (HRA) screening that will also be undertaken for the Scheme. The focus of the EIA methodology is to ensure a robust and proportionate approach.

5.2 The EIA Process

5.2.1 The main stages in the EIA are as follows:

- Data Review - draw together and review available data;
- Scoping - identify significant issues and determine the subject matter of the EIA;
- Baseline Surveys – collate baseline data, undertake baseline surveys and monitoring to confirm the existing conditions;
- Consultation - seek feedback from consultees and the public in relation to key environmental issues, methodology adopted and design approaches;
- Assessment and iteration - assess likely effects of the Scheme, evaluate alternatives, provide feedback to design team on adverse impacts, incorporate mitigation, assess effects of mitigated development; and
- Preparation of the ES and the Non-Technical Summary.

5.2.2 During the EIA process, opportunities to deliver enhancements will be explored in consultation with appropriate stakeholders.

5.3 The EIA Regulatory Context

5.3.1 The legal basis for EIA is formed within the European Community Directives, which set out requirements for EIA for certain types of projects where they are likely to have significant effects on the environment.

5.3.2 The original 1985 Directive on the assessment of the effects of certain public and private projects on the environment (85/337/EEC) has been subsequently amended twice and those amendments have been codified in Directive 2011/92/EU in December 2011 and further amended by Directive 2014/52/EU in April 2014.

5.3.3 This forms the EIA regime in Europe and was transposed into UK law for NSIPs under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This Scoping Report has been prepared in line with the requirements of these regulations.

5.4 The Planning Act

5.4.1 Part 3 of the Planning Act 2008 and the subsequent amendments to Section 22 of the Planning Act 2008 contained within the Highway and Railway (NSIP) Order

2013, state that a scheme can be defined as an NSIP if it consists of highway-related development. A project under this category then needs to meet one of the following criteria.

- a) 'construction of a highway in a case within subsection (2),
- b) improvement of a highway in a case within subsection (3), or
- c) alteration of a highway in a case within subsection (4).'

5.4.2 Subsection 2 (below) further defines the clauses that enable the project to meet the above criteria for construction of a highway.

5.4.3 '(2) Construction of a highway is within this subsection only if the highway will (when constructed) be wholly in England and—

- a) the highway will (when constructed) be wholly in England,
- b) the Secretary of State will be the highway authority for the highway, and
- c) the area of development is greater than the relevant limit set out in subsection (4).

5.4.4 Subsection 4 (below) clarifies the limits set out in subsection (2)(c):

5.4.5 (4) For the purposes of subsections (2)(c) and (3)(c) the relevant limit —

- a) in relation to the construction or alteration of a motorway, is 15 hectares,
- b) in relation to the construction or alteration of a highway, other than a motorway, where the speed limit for any class of vehicle is expected to be 50 miles per hour or greater, is 12.5 hectares, and
- c) in relation to the construction or alteration of any other highway is 7.5 hectares.'

5.4.6 The Scheme would comply with Subsection (4)(b) and therefore satisfies the criteria to be defined as an NSIP. As an NSIP, the Scheme would be treated as a development for which a DCO is required under Part 4 of the Planning Act 2008 which states:

"Consent under this Act ("development consent") is required for development to the extent that the development is or forms part of a nationally significant infrastructure project."

5.4.7 PINS, which is responsible for examining an application for development consent, would use the information contained within the ES in making a recommendation to the SoS about whether the Scheme should be consented. The SoS would also rely upon the ES in coming to a decision on the application.

5.4.8 The National Policy Statement for National Networks (NN NPS) (DfT and Highways Agency, 2014) sets out the policy which will be used by PINS and the SoS to decide on all major road and rail projects. The Applicant would have regard to this and the preparation of this Scoping Report has been informed by the NPS. The NN NPS will also guide the design of the Scheme.

5.5 Guidance – Design and Assessment

5.5.1 The development of major highways, is governed through guidance and

standards set out in 15 volumes of the Design Manual for Roads and Bridges (DMRB).

- 5.5.2 Environmental design and mitigation guidance is provided within DMRB, Volume 10.
- 5.5.3 DMRB, Volume 11 provides guidance on EIA, including the level of assessment and reporting of environmental effects. Highways England also issues Interim Advice Notes (IANs) when new guidance emerges which is yet to be incorporated in volumes 1-15 of DMRB.
- 5.5.4 Should any IANs or revisions to DMRB be issued between scoping and reporting of the EIA, they will be used where appropriate.
- 5.5.5 Based on DMRB Volume 11, Section 1, Part 1 (Highways Agency, 2009) and the requirements of the EIA Regulations 2017 the following topics are considered when scoping this EIA:
- Air Quality;
 - Cultural Heritage;
 - Biodiversity;
 - Landscape;
 - Noise and Vibration;
 - People and Communities;
 - Road Drainage and the Water Environment;
 - Geology and Soils;
 - Materials;
 - Heat and Radiation;
 - Climate; and
 - Cumulative Effects.
- 5.5.6 More details of the methods to be used for each individual topic are provided in Chapters 7 to 17 of this Scoping Report. Where DMRB does not provide topic specific guidance, alternative sources of guidance have been proposed for use in the assessments.
- 5.5.7 PINS also produce a series of Advice Notes that are intended to inform appropriate parties about a range of process matters in relation to the Planning Act 2008. These advice notes have been reviewed during preparation of this Scoping Report; in particular Advice Note 7: Preliminary Environmental Information, Screening and Scoping (currently being updated).
- Each of the chapters within this Scoping Report will:
 - Define the study area of the assessment;
 - Detail the requirements of the NN NPS for the assessment;
 - Present the consultations undertaken and proposed relevant to the topic;

- Explore the baseline information that has been collected and provide information on further baseline information to be collated through desk study or surveys;
- Identify key receptors;
- Outline the potential significant effects that will occur and describe the potential mitigation measures;
- Describe proposed level and scope of assessment;
- Detail the methodology that will be used to assess potentially significant effects; and
- Identify any assumptions and limitations.

5.6 Study Areas

5.6.1 The study areas for the assessment are individually defined for each environmental topic based on the geographical scope of the potential impacts on receptors/ resources and the relevant topic specific criteria. For some topics, the study area is defined using changes in traffic flows and therefore relies upon the outcomes of the traffic modelling exercise. The study areas for each topic are further described in Chapters 7 to 17.

5.7 Baseline Data Gathering

5.7.1 An understanding of the baseline environment without the Scheme is necessary to inform environmental assessment.

5.7.2 To gather a fully comprehensive descriptive summary of the baseline environment, each topic will use data gathering methods as appropriate and follow any topic specific guidelines. This will involve conducting desk studies, undertaking specialist surveys as appropriate and engaging with stakeholders both to agree those methods of data collection and also to obtain data they may hold.

5.7.3 The EIA Scoping Opinion will also inform the data gathering and the surveys that need to be undertaken.

5.7.4 When describing the baseline environment, it is important to identify receptors that may be affected by the Scheme and also their 'value' and 'sensitivity'.

5.8 Future Baseline

5.8.1 For each of the topics it is also necessary to project the baseline forwards and consider what changes there may be to the baseline conditions by the time construction of the Scheme commences. This is referred to as the 'Future Baseline' and is considered in each topic chapter.

5.9 Assessment of Effects

Defining Assessment Years, Scenarios and Phases

5.9.1 The assessment of effects involves comparing the situation with and without the Scheme. Dependent upon the topic, the effects need to be assessed for the Do

Minimum and Do Something scenarios in the baseline year and a future assessment year (for example 15 years after 2023 which is the year of opening for the Scheme - 2038). The years to be considered in the ES are:

- Baseline Year - 2015
- Opening Year - 2023
- Design Year - 2038

5.9.2 The ES will assess the construction and operational effects of the Scheme. The construction of the Scheme is expected to last three years and this duration will be considered in the assessment.

5.9.3 The Scheme would be designed to maximise the scope for materials re-use in the event of decommissioning of its components, however due to the long design life of the Scheme (40 years for new carriageway), it is not considered appropriate for decommissioning to form part of each environmental topic assessment.

5.10 Identifying Potential Impacts

5.10.1 A description of the likely significant environmental effects of the Scheme including the existence of the development, the use of natural resources and the emission of pollutants, the creation of nuisances and the elimination of waste, is required under Schedule 4 of the EIA Regulations.

5.10.2 The effects may be negative or positive and can be described as:

- Direct or Primary Impacts: caused by activities which are an integral part of the Scheme resulting in a change in environmental conditions, for example loss of a hedgerow;
- Indirect or Secondary Impacts: due to activities that affect an environmental condition or receptor, which in turn affects other aspects of the environment or receptors, for example settlement of a feature as a result of dewatering during construction;
- Cumulative: comprising multiple effects from different sources within the Scheme, or in combination with other developments, on the same receptors;
- Residual: effects that remain after the positive influence of mitigation measures are taken into account; or
- Temporary: effects that would last for a limited duration, for example a closure of a footpath during part of the construction phase.

5.11 Assessing Significance

5.11.1 DMRB Volume 11, Section 2, Part 5 HA 205/08 (Highways Agency, 2008) defines typical criteria for assigning the significance of the potential environmental effect as a function of the 'value' of the receptor and the 'magnitude' or 'scale' of the impact. This is shown below by Table 5-1.

Table 5-1 Typical Matrix for the Assessment of Significance of Effects

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

5.11.2 In arriving at the significance of effect, the assessor will also consider whether the effect is positive or negative, permanent or temporary, direct, indirect, secondary, cumulative, short, medium or long-term.

5.11.3 This is the broad approach used when assessing significance of effects, however for certain topics such as air quality and noise, the above criteria or approach is not used. Instead environmental impacts can be quantified against thresholds defined using numerical values to identify impacts. This quantification is done through calculations or computer modelling.

5.11.4 Although as a minimum, all impacts are defined according to the following broad descriptors:

- Adverse or beneficial (i.e. they are undesirable effects, or they represent an improvement over the baseline situation);
- Short-term or long-term (This is defined differently dependent on the topic it refers to and the sensitivity of the receptors);
- Construction or operational (i.e. caused by the construction of the Scheme, or by the operation of the Scheme after opening); and
- Significant or not significant.

5.11.5 The identification of the significance of the effect will differ between topics, with regards to scales, terminology, criteria and the overall approach. The specific significance criteria and methods proposed for each topic within the scope of this Scheme assessment are explained in Chapters 7-17.

5.12 Mitigation Measures, Enhancements and Residual Effects

5.12.1 Mitigation of adverse environmental effects will be an iterative part of the Scheme development following the hierarchy below:

- Avoidance – incorporate measures to avoid the effect, for example, alternative design options or modifying the Scheme programme to avoid

environmentally sensitive periods;

- Reduction – incorporate measures to lessen the effect, for example, fencing off sensitive areas during construction, use of a Construction Environmental Management Plan (CEMP); and
- Compensation and/or Remediation – where it is not possible to avoid or reduce a significant effect then offsetting measures should be considered, for example the provision of replacement of habitat to replace that lost to the Scheme.

5.12.2 There may be a requirement for a range of mitigation measures and as the Scheme develops they would be discussed with statutory consultees and third parties. Only those mitigation measures that are either a firm commitment or likely to be delivered would be considered in the assessment.

5.12.3 There may also be scope for enhancement measures to be delivered through the Scheme that may not be targeted at a specific adverse environmental impact. These should be identified as beneficial impacts of the Scheme.

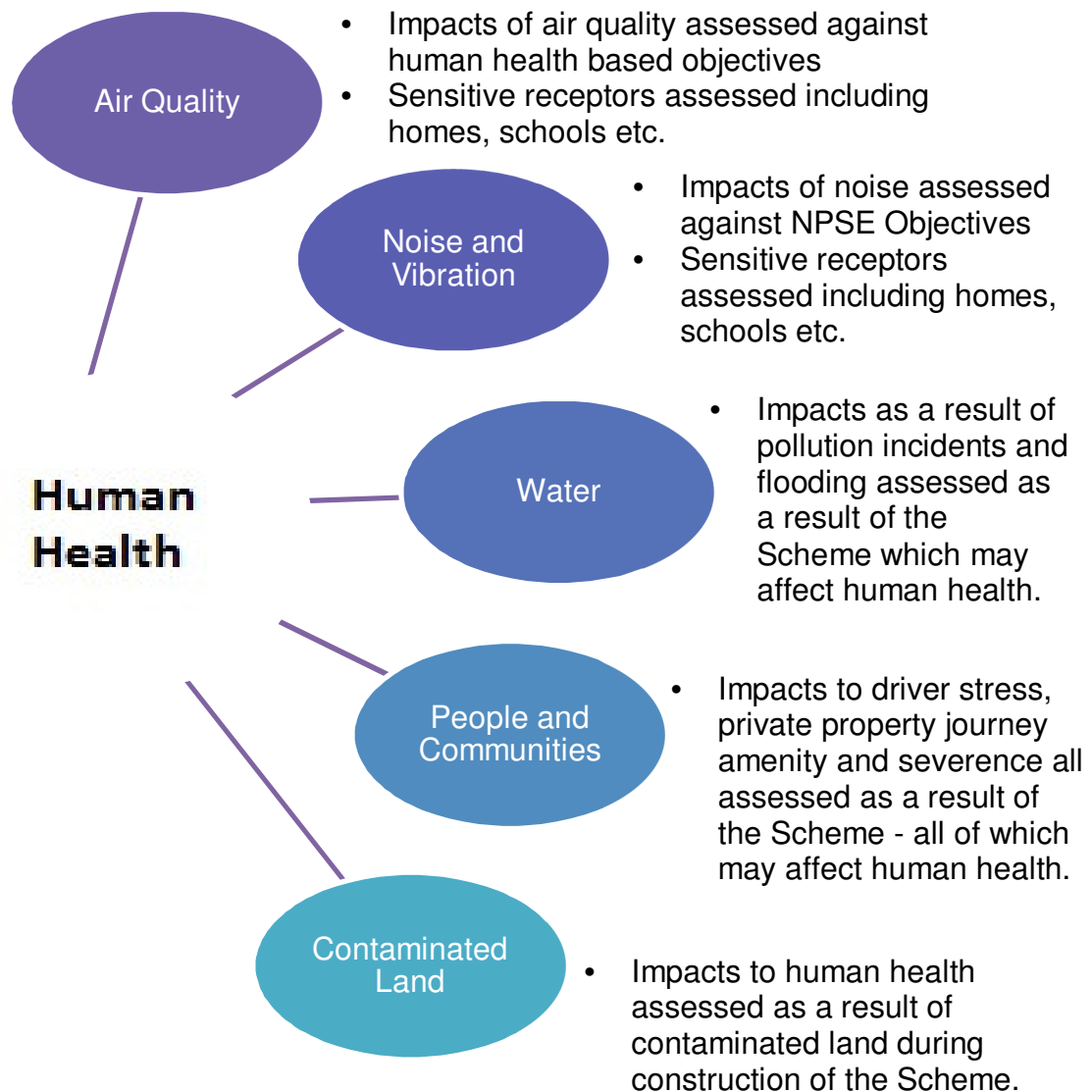
5.12.4 Impacts that remain after mitigation are referred to as residual impacts. The assessment of the significance of the residual effects after mitigation is therefore the key outcome of the EIA.

5.13 Coverage of Population and Human Health

5.13.1 As a result of the 2017 EIA Regulations, Population and Human Health is now required to be considered within EIA. These topics are inherently covered within existing topics as follows:

- Population - covered within People and Communities
- Human Health - covered within Air Quality, Noise and Vibration, Road Drainage and the Water Environment, People and Communities and supplemented with information from Geology and Contaminated Land. Insert 5-1 presents linkages between existing topics and human health

Insert 5-1 Linkages Between Existing EIA Topics and Human Health



5.13.2 The reporting of population effects would be provided within the People and Communities ES chapter and reporting of human health effects would be reported within the relevant topics noted above. Where human health effects from more than one topic occur, a qualitative description of the overall population/community and human health effects would be provided within the Cumulative Effects ES chapter.

5.14 Major Accidents and Disasters

5.14.1 During the development of the design and production of the ES, accidents and disasters (hereafter referred to as 'events') that could occur on or near to the Scheme will be identified that are relevant to the project and its location. This may include both man-made and naturally occurring events. Consideration will be given to likelihood of these events occurring and to the severity of any environmental damage that could be caused in order to identify a set of 'major'

events.

5.14.2 Where the event is likely to have an interaction with an environmental topic, commentary will be provided to describe how the Scheme has responded to the risk posed.

5.14.3 For example, it is expected that the design adaptation, mitigation or operational management measures required in response to the threat of a major fuel spill would be commented upon within the Road Drainage and Water Environment Chapter and the Biodiversity Chapters.

5.15 Assessment of Cumulative Effects

5.15.1 The assessment of cumulative effects will identify where two or more sources of impact interact, to give rise to impacts on environmental resources or receptors. There are two types of cumulative effects which are assessed:

- The combined action of interrelated Scheme specific environmental effects causing impacts on a single resource/receptor.
- The combined action of the Scheme and other planned developments environmental effects in combination on a single resource/receptor.

5.15.2 The approach to assessing cumulative effects is based upon the Cumulative Effects Assessment (CEA) PINS Advice Note 17 (December, 2016). This sets out a staged process for CEA for NSIPs. The scope of the approach and how it will be applied to this Scheme is provided in Chapter 17.

5.16 Habitats Regulations Assessment Screening

5.16.1 A Habitats Regulations Assessment (HRA) screening assessment was prepared (Assessment of Implications on European Sites, Atkins Ltd, 2017) based on the HRA relevant to NSIPs (PINS Advice Note 10, Version 7 (January, 2016)).

5.16.2 The purpose of the HRA screening assessment was to determine whether the Scheme would result in potential significant effects on protected habitats and European sites. It was concluded at that stage there would be no significant effects on the identified European sites and protected species, therefore, it is currently anticipated that a No Significant Effects Report will be prepared to present the findings of the HRA.

5.16.3 The HRA screening identified the following European designated sites (also shown on Figure 1.5):

- Mersey Narrows and North Wirral Foreshore Special Protection Area (SPA);
and
- Ribble and Alt Estuaries SPA.

6 TOPICS AND ELEMENTS OF TOPICS TO BE SCOPED IN AND OUT

6.1 Topics and Elements Scoping

- 6.1.1 Highways England has prepared a non-statutory Environmental Assessment Report (EAR, Highways England, 2017) which was used to inform the decision on a preferred option. The EAR characterised the existing baseline by environmental topic and provided an assessment of environmental effects as a result of the Scheme. This process has greatly contributed to the development of the scope of the forthcoming ES.
- 6.1.2 Based on the EAR it is considered that themes of certain topics can be scoped out as there are unlikely to be significant effects in these areas as a result of the Scheme. Justification for the scope of each topic is provided within Chapters 7 – 17 and a summary is provided in Table 6-1.
- 6.1.3 The decision to scope out these items (and any others following the completion of the desk study and survey work) will be reviewed following consultations, the receipt of the scoping opinion and as the Scheme design progresses.

Table 6-1 Topics to be scoped in and out with justification

Topic	Themes Scoped into the ES	Themes Scoped out of the ES
Air Quality	<p>Local Air Quality Assessment: Given that there is potential for the annual mean nitrogen dioxide (NO₂) Air Quality Strategy (AQS) Objective to be exceeded at some roadside receptors in the Scheme opening year, it is proposed that a detailed assessment is undertaken for the local air quality assessment.</p> <p>The local air quality assessment will cover NO₂ and particulate matter (PM₁₀) during operation.</p> <p>Regional Assessment (change in emissions as a result of the Scheme including carbon).</p> <p>Transport Appraisal Guidance (WebTAG) assessment (overall change in exposure as a result of the Scheme).</p> <p>NIN NPS Compliance Assessment: Assessment of the risk of the Scheme impacting on the UK's ability to comply with the EU Air Quality Directive (EU Limit Values).</p>	<p>Construction Impacts: Effects as a result of construction are intended to be scoped out of the assessment. Significant effects would not be expected as a result of the Scheme where best practice management measures are employed.</p> <p>Construction air quality effects would be mitigated through a CEMP. For completeness, the map required by paragraph 3.45 of DMRB Volume 11, Section 3, Part 1 HA 207/07 Air Quality, presenting sensitive receptors within 200m of the construction site along with good practice mitigation would be included in the ES.</p> <p>PM_{2.5} would not be reported in accordance with DMRB Volume 11, Section 3, Part 1 (HA207/07) and IAN 174/13.</p>
Cultural Heritage	<p>Assessment of direct and indirect effects on statutory and non-statutory designated heritage assets (including listed buildings and structures).</p> <p>Targeted assessments of the buried archaeological resource both known and unknown.</p> <p>The assessment would cover construction and operation.</p>	<p>Historic Landscape: The Scheme passes through the Rimrose Valley, an area characterised by both small areas of agricultural land with a post enclosure field pattern and later 20th century housing estates, allotments and some recreation grounds. Much of the southern extent of the Rimrose Valley is formed of reclaimed land; historically the southern extent</p>

Topic	Themes Scoped into the ES	Themes Scoped out of the ES
Biodiversity	<p>The assessment reported in the ES would be a detailed assessment and cover both the construction and operation phases for the following receptors:</p> <ul style="list-style-type: none"> • Mersey Narrows & North Wirral Foreshore SPA; • Mersey Narrows & North Wirral Foreshore proposed Ramsar site; • Sefton Coast Special Area of Conservation (SAC); • Ribble and Alt Estuaries SPA; • Ribble and Alt Estuaries Ramsar site; • Mersey Narrows Site of Special Scientific Interest (SSSI); • Brookvale LNR; • Local Wildlife Sites (LWS); • Grey Squirrel Control Zone; • Red Squirrel Buffer Zone; • Assessment of effects on S41 habitats; • Protected and notable plants (including 	<p>of the valley being used as a landfill site. In addition, the land uses are common to rural/urban fringes nationally. The landscape is therefore of a limited heritage interest, and is not considered to be a heritage asset (Highways England, 2017).</p> <p>Therefore, historic landscape has been scoped out of the assessment.</p> <p>Based on desk studies and surveys undertaken to date it is proposed that the following are scoped out of further assessment as none of the following species were present during previous survey efforts within the study area:</p> <ul style="list-style-type: none"> • Otters: Otter has been scoped out due to the lack of suitable habitats within the Scheme boundary and their presence was not identified during the baseline survey effort. • Badgers: Badger have been scoped out at this stage due to the lack of presence; however, pre-construction checks for the species will be undertaken. <p>It is proposed that the following designations are scoped out of further assessment as a result of the baseline survey effort not identifying any of the qualifying features of the two sites within the Scheme boundary.</p> <ul style="list-style-type: none"> • Liverpool Bay / Bae Lerpwl (England) SPA

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Topic	Themes Scoped into the ES	Themes Scoped out of the ES
	<p>fungi);</p> <ul style="list-style-type: none"> • Invasive flora; • Amphibians; • Aquatic invertebrates; • Fish; • Terrestrial Invertebrates; • Water Voles; • Reptiles; • Birds; • Bats; and • Red Squirrel. <p>The assessment will cover construction and operation.</p>	<p>(Wales); and</p> <ul style="list-style-type: none"> • Sefton Coast SSSI. <p>Effects on features of lower than local importance (i.e. application site importance) will not be assessed within the EIA.</p>
Landscape	<p>Detailed assessment of effects on landscape, townscape and visual amenity.</p> <p>The assessment will cover construction and operation.</p>	<p>No themes are scoped out at this stage.</p>
Noise and Vibration	<p>The assessment of noise and airborne vibration effects during construction and operation.</p>	<p>With regard to road traffic induced vibration, extensive research on a wide range of buildings of various ages and types has been carried out (Watts G.R, 1990), with no evidence found to support the theory that traffic induced vibrations are a source of significant damage to buildings. DMRB states: “significant ground-borne vibrations may be generated by irregularities in the road surface. Such vibrations are unlikely to be important when considering disturbance from new roads</p>

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Topic	Themes Scoped into the ES	Themes Scoped out of the ES
People and Communities	<p>The construction effects of the Scheme will be considered in relation to land use (including loss of community facilities and agricultural land) and change to journey length and pattern.</p> <p>The operational effects of the Scheme will be considered in relation to:</p> <ul style="list-style-type: none"> • Journey length and pattern; • Journey amenity; • New severance from community facilities; • Relief from existing severance; • View from the road; and • Driver Stress. 	<p>and an assessment would only be necessary in exceptional circumstances".</p> <p>Given the advice in DMRB relating to ground borne vibration and the fact that the proposal is for a new road Scheme where surface irregularities would be minimised, no impacts from ground borne road traffic vibration would be assessed within the scope of the noise and vibration chapter.</p> <p>No People and Communities themes have been scoped out at this stage.</p>
Road Drainage and the Water Environment	<p>The assessment will cover effects on flooding, hydrology, surface water, groundwater, water quality and water resources.</p> <p>The assessment will cover construction and operation.</p>	<p>No themes are scoped out at this stage.</p>
Geology and Soils	<p>Assessment of effects on hydrogeology and</p>	<p>No geologically protected sites have been</p>

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Topic	Themes Scoped into the ES	Themes Scoped out of the ES
	<p>contaminated land. The assessment will cover construction only.</p>	<p>identified during the baseline study and the geology across the Scheme is considered to be of low value.</p> <p>Therefore it is proposed to scope out this element and consideration of geology in construction or operation will not be included in the scope of the ES.</p> <p>It is proposed to scope out all Geology and Soils receptors from the operational phase of the Scheme. The main impact is likely to be from contaminated land and potential effects on hydrogeology which will be dealt with during the construction phase.</p> <p>During operation, the road once constructed will act as a barrier to underlying ground conditions, and road users or residents will not come into contact with it on a day to day basis. It has been assumed that road users will not be exposed to material within Whabbs Tip or any leachate from this area. This will be managed through the design development process.</p>
<p>Materials</p>	<p>Assessment of effects of the Scheme on waste management during construction, with particular regards to hazardous waste.</p>	<p>No significant effects are anticipated as a result of the Scheme in relation to waste policy and strategy, materials resources to be used by the Scheme and the Highway Network.</p> <p>It is therefore assumed that information regarding materials to be used during construction would be included within the</p>

Topic	Themes Scoped into the ES	Themes Scoped out of the ES
Climate	<p>Climate change adaptation: The vulnerability of the scheme to climate change and incorporation of appropriate adaptation measures into the scheme design will be part of the iterative design process.</p> <p>Assessment of effects on climate (greenhouse gas emissions and carbon): An assessment will be undertaken based on a Life Cycle (LC) approach. Further details can be found in Section 16.8 of this document. This assessment will cover the following LC elements:</p> <p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> • Transport of construction materials from the factory gate to the construction site; and • Construction processes. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> • Carbon sequestration from tree planting; 	<p>Scheme Description of the ES. This text would include how waste materials will be managed through the design process and impacts would be assessed within topic specific chapters.</p> <p>In addition, it is anticipated that only minor quantities of operational waste would be produced during the lifetime of the Scheme therefore it is proposed that an assessment of operational waste would be scoped out of the assessment.</p> <p>Assessment of effects on climate (greenhouse gas emissions and carbon): Due to predicted low GHG emissions, the following are not intended to be included within the scope of the LC-based assessment:</p> <p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> • Product manufacturing; • Preliminary desk-based studies; and • Transport of construction plant equipment to and from site. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> • Operational water use; and • Other operational processes. <p><u>Post-Operation:</u></p> <ul style="list-style-type: none"> • End of life deconstruction, demolishing and decommissioning, transport and waste

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Topic	Themes Scoped into the ES	Themes Scoped out of the ES
	<ul style="list-style-type: none"> • Operation of the Scheme; and • Maintenance, repair, replacement and refurbishment. <p>The ES Chapter will cover both during construction and operation.</p>	<p>processing and disposal.</p>
Cumulative Effects	<p>The assessment will cover the following effects:</p> <p>Intra-Scheme Effects – The combined action of a number of different environmental topic specific effects upon a single resource/receptor.</p> <p>Inter-Scheme Effects – The combined action of a number of different projects, in combination with the project being assessed, on a single resource/receptor.</p>	<p>No themes are scoped out at this stage.</p>
Heat and Radiation	<p>This topic is not relevant to the construction or operation of the Scheme and therefore has been scoped out. The Scheme would not introduce any sources of radiation, and would generate limited amounts of heat from minor elements such as lighting.</p>	

7 AIR QUALITY

7.1 Introduction

- 7.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on local air pollutant concentrations and reporting potential significant effects on air quality.
- 7.1.2 The key pollutants in relation to the Scheme are nitrogen dioxide (NO₂) and particulate matter (PM₁₀). These pollutants are most important with respect to human health.
- 7.1.3 There may be interrelationships related to the potential effects on air quality and other disciplines comprising:
- Chapter 9: Biodiversity; and
 - Chapter 12: People and Communities

7.2 Study Area

Local Air Quality Assessment

- 7.2.1 The study area for the local air quality assessment is defined using the traffic change-based criteria defined in DMRB Volume 11, Section 3 Part 1 HA 207/07 Air Quality (Highways Agency, 2007).
- 7.2.2 Traffic flows for the Opening Year Do Something scenario will be compared to the Do Minimum scenario. Roads that meet the criteria are defined as 'affected roads', all of which together comprise the Affected Road Network (ARN).
- 7.2.3 The study area for the local air quality assessment covers receptors and ecological designated sites within 200m of the ARN.
- 7.2.4 The DMRB traffic change criteria used to defined the ARN are as follows:
- Road alignment will change by 5m or more; or
 - Daily traffic flows will change by 1,000 Annual Average Daily Traffic (AADT) or more; or
 - Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
 - Daily average speed will change by 10 km/hr or more; or
 - Peak hour speed will change by 20 km/hr or more.
- 7.2.5 Early work indicates the study area for the Scheme is likely to extend beyond the boundaries of Sefton Metropolitan Borough Council (SMBC) into the areas of Liverpool City Council (LCC), Knowsley Metropolitan Borough Council (KMBC), St Helens Council (SHC) and Warrington Borough Council (WBC).
- #### Compliance with the EU Ambient Air Quality Directive
- 7.2.6 For the assessment of compliance with the EU Ambient Air Quality Directive 2008/50/EC, the study area is determined by comparing the ARN (used for the local air quality assessment) to the PCM model network as modelled by Defra. Where the two networks overlap, this is known as the compliance risk road

network (CRRN) and forms the basis of the assessment of compliance risk.

7.3 NN NPS Requirements

7.3.1 Within the NN NPS, air quality aspects are presented from paragraphs 5.3 through to paragraph 5.15.

7.3.2 Paragraphs 5.6 to 5.9 provide information regarding what should be included in the applicant's assessment.

7.3.3 Paragraph 5.7 states that:

'The Environmental Statement should describe:

- *Existing air quality levels;*
- *Forecasts of air quality at the time of opening, assuming that the Scheme is not built (the future baseline) and taking account of the impact of the Scheme;*
- *Any significant air quality effects, their mitigation and any residual effects, distinguishing between the construction and operation stages and taking account of the impact of road traffic generated by the Scheme'.*

7.3.4 Paragraph 5.11 states that air quality considerations are likely to be particularly relevant where schemes are proposed:

- Within or adjacent to Air Quality Management Areas (AQMA); roads identified as being above Limit Values or nature conservation sites (including Natura 2000 sites and SSSIs, including those outside England); and
- Where changes are sufficient to bring about the need for a new AQMA; or change the size of an existing AQMA; or bring about changes to exceedances of the Limit Values, or where they may have the potential to impact on nature conservation sites.

7.3.5 Limit Values noted above are outlined in the Air Quality Standards Regulations 2010. They are identical to the UK National Air Quality Strategy (AQS) Objectives, which are set out in the Air Quality (England) Regulations 2000, the Air Quality (England) (Amendment) Regulations 2002. Both the EU Limit Values and AQS Objectives are presented in Table 7-1 for human health and Table 7-2 for vegetation and ecosystems. AQMA's are declared by local authorities where human health AQS Objectives are not achieved.

Table 7-1 Air Quality Strategy Objectives and EU Limit Values for Human Health

Air Quality Objectives and European Directives for the protection of human health					
Air Quality Strategy Objectives				EU Limit Values	
Pollutant	Concentration	Averaging Period	Compliance Date	Concentration	Compliance Date
NO ₂	200 µg.m ⁻³	1-hour mean (not to be exceeded more than 18 times per year)	31 December 2005	200 µg.m ⁻³ (1-hour mean (not to be exceeded more than 18 times per year))	1 January 2010
	40 µg.m ⁻³	annual mean	31 December 2005	40 µg.m ⁻³	1 January 2010
PM ₁₀	50 µg.m ⁻³	24-hour mean (not to be exceeded more than 35 times per year)	31 December 2010	50 µg.m ⁻³ (24-hour mean (not to be exceeded more than 35 times per year))	1 January 2005
	40 µg.m ⁻³	annual mean	31 December 2004	40 µg.m ⁻³	1 January 2005

Table 7-2 Air Quality Strategy Objectives and EU Limit Values for Vegetation and Ecosystems

Air Quality Objectives and European Directives for the Protection of Vegetation and Ecosystems					
Air Quality Objectives				EU Limit Values	
Pollutant	Concentration	Averaging Period	Compliance Date	Concentration	Compliance Date
NO _x	30 µg/m ³	annual mean	31st December 2000	30 µg/m ³	19th July 2001

7.3.6 Paragraphs 5.12 and 5.13 provide advice to the SoS when determining whether

a scheme should receive consent:

“The Secretary of State must give air quality considerations substantial weight where, after taking into account mitigation, a project would lead to a significant air quality impact in relation to EIA and / or where they lead to a deterioration in air quality in a zone/agglomeration.

The Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will:

- *Result in a zone/agglomeration which is currently reported as being compliant with the Air Quality Directive becoming non-compliant; or*
- *Affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported to the European Commission at the time of the decision”.*

7.3.7 The air quality assessment will be undertaken in line with DMRB and associated IANs as described in Section 7.9 to allow the assessment to comply with the requirements of the NN NPS. This will determine whether the Scheme impacts on air quality are considered significant and identify any risk of a scheme impacting on the achievement of compliance with the EU Ambient Air Quality Directive (2008/50/EC).

7.4 Consultation Undertaken and Proposed

7.4.1 Local authorities in the study area will be contacted to obtain the most recent air quality monitoring data to further establish the baseline conditions, agree methodology, disseminate initial results, mitigation measures and progressing drafting Statements of Common Ground.

7.4.2 Table 7-3 notes proposed consultation to be undertaken.

Table 7-3 Details of Consultations Undertaken

Date	Consultation Proposed
TBC	SMBC, LCC, KMBC, SHC and WBC will be contacted to obtain up to date baseline data where this is unavailable from online sources.

7.5 Baseline Information

Baseline Information Obtained and Surveys Undertaken

7.5.1 The ARN and study area identified in previous studies has been used to inform this Scoping Report. The study area for the air quality assessment is expected to cover the following local authority’s administrative areas:

- SMBC;
- LCC;
- KMBC;
- SHC; and

- WBC.

7.5.2 There are six AQMAs within this study area as shown on Figure 7.1. Four of the AQMAs are discrete areas identified by SMBC. One AQMA consists of the entirety of the LCC area. A further AQMA falls within WBC area and runs along the M62 corridor between the M6 to the boundary of SHC.

7.5.3 Four of the six AQMAs declared within the study area are for annual mean NO₂ only (SMBC AQMA 2, 4 and 5, and Liverpool City AQMA). The remaining two AQMAs are designated for both annual mean NO₂ and 24 hour mean PM₁₀ (SMBC AQMA 3 and WBC AQMA No.1).

7.5.4 There are eight automatic monitoring stations in the study area. In 2015, an exceedance of the annual mean NO₂ AQS objective was measured at the SMBC Princess Way roadside station within the Scheme boundary (CMS4). The station is located at the intersection of the A5036 and A565 and measured an annual mean concentration of 40.6 µg/m³.

7.5.5 Diffusion tube monitoring for NO₂ is also widely undertaken across the study area. Based on the diffusion tube and automatic monitoring data, key traffic corridors where exceedances of the annual mean AQS objective for NO₂ were measured in 2015 included:

- A5036 (SMBC area)
- A565 Rimrose Road/Derby Road Millers Bridge (SMBC area)
- A506/A59 (LCC area)
- Routes west of the A5058 (LCC area), including the A57 and A5080.

7.5.6 Monitored concentrations ranged between 26µg/m³ and 61µg/m³ in 2015 at these locations.

7.5.7 Stanley Bank Meadows SSSI is within the assessment study area and is shown on Figure 7.1, and contains habitats which will be sensitive to changes in nutrient nitrogen deposition. The Air Pollution Information System (APIS) website contains information on existing rates of nitrogen deposition and nitrogen critical loads (i.e. exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem) for ecological designated sites. APIS data indicates that existing rates of nitrogen deposition exceed the critical load for the most sensitive habitats present in Stanley Bank Meadows SSSI. The critical load values for nutrient nitrogen deposition are provided on the APIS website ranging between 8-25 kgN/ha/yr for the various habitats within the SSSI. Current background nitrogen deposition is 18.6 kgN/ha/yr (grassland) and 29.8 kgN/ha/yr (woodlands) (2013-2015).

Highways England Air Quality Monitoring

7.5.8 A 12-month Scheme specific NO₂ diffusion tube survey was undertaken from April 2015 to May 2016 and covered 12 sites. The locations of these scheme specific monitors are displayed on Figure 7.2. The locations were chosen to supplement the air quality monitoring data available from local authorities.

7.5.9 All of the sites monitored annual mean NO₂ concentrations below the AQS

objective, other than at Princess Way, Seaforth, a co-located site at the SMBC automatic station CMS4, described in paragraph 7.5.4.

Defra EU Compliance Reporting

- 7.5.10 Department for Environment, Food and Rural Affairs (Defra) is responsible for reporting on UK compliance with the Ambient Air Quality Directive 2008/50/EC. The UK is split into a number of zones / agglomerations for the purpose of the reporting. A zone is deemed compliant with the Ambient Air Quality Directive when pollutants are predicted or measured to be below the EU Limit Values.
- 7.5.11 As part of the reporting on compliance with the Ambient Air Quality Directive, Defra is responsible for reporting the date that zones and agglomerations will become compliant with the EU Limit Values. Defra utilises both monitoring and modelling through their Pollution Climate Mapping (PCM) model to determine when the zone/agglomeration will become compliant. Representative links in the zone are used to predict pollutant concentrations.
- 7.5.12 The Scheme is located in the Liverpool Urban Area zone. The UK Plan for tackling roadside NO₂ concentrations was published by Defra in July 2017. This includes the latest PCM model results for a number of scenarios, Baseline (assuming no measures), with Clean Air Zone (CAZ) and CAZ plus additional measures. The latest data from Defra will be obtained when undertaking the compliance risk assessment during the assessment of the Scheme. The study area for the options stage coincided with PCM within the Liverpool Urban Area agglomeration. The latest Defra PCM data suggests by 2023 there will be no exceedances of the EU Limit Values.

Other Baseline Information to be Obtained

- 7.5.13 Air quality monitoring data gathered from local authorities to date extends up to the year 2015, and year 2016 data will be obtained to update the baseline information reported in the ES chapter.

7.6 Value of Environmental Resources and Receptors

Air Quality Criteria

- 7.6.1 For NO₂ and PM₁₀, there are two sets of ambient air quality criteria for the protection of public health, namely those set by the EU and transposed in to UK law by The Air Quality Standards Regulations 2010 and those implementing the UK National Air Quality Strategy (AQS).
- 7.6.2 The criteria set out in the AQS include standards and objectives for local authorities to work towards achieving. These apply in locations with relevant public exposure which as per the Defra technical guidance LAQM.TG(16), is defined as locations where members of the public are likely to be exposed for a period of time similar to the averaging period of the objective. For example, an annual mean standard applies at the facade of residential properties.
- 7.6.3 The standards set by the EU are legally binding mandatory limit values (LV) requiring national Government compliance. Failure in compliance (for a compliance agglomeration zone) can lead to infraction proceedings by the EU against the Member State.

7.6.4 Local air quality criteria relevant to the air quality assessment for the Scheme are summarised in Table 7-1 and Table 7-2. PM_{2.5} has not been reported in accordance with DMRB.

Receptors

7.6.5 Receptors that are potentially sensitive to changes in air quality are defined in DMRB Volume 11, Section 3 Part 1 HA 207/07 Air Quality (Highways Agency, 2007) as housing, schools, hospitals and designated species or habitats within a designated ecological site, located within 200m of the ARN or construction sites.

7.7 Potential Effects including Mitigation Measures

Construction

7.7.1 There is the potential for air quality impacts to occur at receptors within 200m of construction works due to dust generated from activities such as earthworks and material stockpiling. However, any effects on air quality would be temporary (i.e. limited to the period of the construction works only) and could be minimised and controlled through best practice mitigation measures. Early assessments have concluded that with the employment of appropriate dust management and mitigation measures, the likely impact would be negligible.

7.7.2 There is also the potential for construction traffic vehicle emissions to lead to air quality impacts as a result of exhaust emissions. These impacts would depend on the duration, location and frequency of construction traffic movements, but would be temporary (i.e. during the period of the construction works only). It is considered that these would be suitably minimised by the application of standard and appropriate mitigation measures outlined within the CEMP.

Operation

7.7.3 The Scheme has the potential to affect local air quality, during operation in the following ways:

- Air quality could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition) as a result of the Scheme; and
- Air quality could also be affected by any changes to the distance between sources of emissions and air quality sensitive receptors, both from the offline new route and changes to the existing road network to accommodate the Scheme.

7.7.4 The Scheme is likely to affect traffic on roads that are within AQMAs. Early assessments undertaken during the options stage indicated that there is the potential for the annual mean NO₂ AQS objective to be exceeded at some roadside receptors. The predictions did however suggest that these impacts were not likely to be significant when taking into account the magnitude of change in air quality and number of receptors affected. There was also predicted to be a low risk of the Scheme affecting compliance with the EU Directive on ambient air quality (2008/50/EC).

7.7.5 As the critical load of Stanley Meadows SSSI is currently being exceeded, and the Scheme has the potential to add to this loading; there may be adverse effects on this receptor.

Mitigation Potential

Construction

- 7.7.6 Mitigation measures to control dust and emissions would be required during the construction phase and outlined in the CEMP.
- 7.7.7 Mitigation measures could include development of a site layout to position dust generating activities as far away as possible from receptors, seeding or covering long term stockpiles and damping down surfaces. A stakeholder communication plan and regular inspections would assist in monitoring the success of any mitigation measures employed.
- 7.7.8 In order to mitigate the potential air pollution impact from construction vehicles, measures could include use of less polluting construction vehicles such as HGVs that are Euro VI 1 equivalent.

Operation

- 7.7.9 Should a significant impact (as defined in Section 7.9) or risk of impacting on compliance with the Directive be identified, a Scheme Air Quality Action Plan (SAQAP) would be prepared to reduce the Scheme impacts. Measures are likely to be targeted at reducing the increase in traffic in areas where receptors are significantly affected.

7.8 Proposed Level and Scope of Assessment

- 7.8.1 Given that there is potential for the annual mean NO₂ AQS Objective to be exceeded at some roadside receptors in the Scheme opening year, it is proposed that a detailed assessment is undertaken for the operational local air quality assessment following the methodology outlined in Section 7.9.

7.9 Proposed Methodology Including Significance

Guidance

- 7.9.1 Potential effects on local air quality resulting from both the operation of the Scheme will be assessed in accordance with the relevant guidance documents listed below:
- Highways England (2007) DMRB Volume 11, Section 3, Part 1, HA207/07 Air Quality;
 - Highways Agency (2013) IAN 170/12 v3 Updated air quality advice on the assessment of future NO_x and NO₂ projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07), (or latest update available at the time of the assessment);
 - Highways Agency (2013) IAN 174/13 Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07) (or latest update available at the time of the assessment);

¹ Euro IV relates to the emission standard of the vehicle (i.e. the pollution limit for exhaust emissions)

- Highways Agency (2013) IAN 175/13 Updated advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07) (or latest update available at the time of the assessment);
- Highways England (2015) IAN 185/15 Updated traffic, air quality and noise advice on the assessment of link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07) and Volume 11, Section 3. Part 7 Noise (HD 213/11);
- Defra (2016) Local Air Quality Management Technical Guidance (LAQM.TG(16)), where appropriate; and
- DfT (2015) Air Quality Sub Objective, TAG Unit A3 Environmental Impact Appraisal.

7.9.2 DMRB guidance requires a number of different types of assessments to be undertaken including:

- Construction Assessment (proposed to be scoped out as per Section 7.8);
- Local air quality assessment (predicting concentrations of pollutants for comparison against the AQS Objectives at sensitive receptors e.g. residential, schools and ecological sites, with and without the Scheme);
- Regional assessment (change in emissions as a result of the Scheme including carbon);
- Transport Appraisal Guidance (WebTAG) assessment (overall change in exposure as a result of the Scheme); and
- Assessment of the significance of the Scheme's impact on local air quality in accordance with IAN174/13.
- Assessment of the risk of the Scheme impacting on the UK's ability to comply with the EU Air Quality Directive (EU Limit Values) in accordance with IAN 175/13.

7.9.3 As required by DMRB the air quality assessment should be based on the most likely forecast traffic flows.

Proposed Assessment Methodology

Local Air Quality Assessment

7.9.4 The Atmospheric Dispersion Modelling System (ADMS-Roads) software will be used to determine the effect of Scheme.

7.9.5 The key scenarios to be modelled are:

- The existing base situation, which will be used for model verification purposes;
- Do Minimum Scenario, which assumes that the Scheme would not be in operation in the opening year but accounts for committed developments in the future (expected to be 2023); and

- Do Something Scenario, which assumes that the Scheme would be in operation in the opening year and also accounts for committed developments in the future (expected to be 2023).

7.9.6 The local air quality assessment compares current and predicted air quality concentrations against the AQS Objectives as presented in Table 7-1 and Table 7-2. To determine whether the Scheme would have a significant impact on air quality, the local assessment results are utilised in accordance with IAN 174/13.

7.9.7 The local air quality results are also used to assess whether the Scheme represents a risk to compliance with the EU Ambient Air Quality Directive. The assessment utilises information published by Defra (namely their PCM modelled data) to determine whether compliance with the EU Limit Values would be affected by the Scheme in accordance with IAN 175/13.

7.9.8 Whilst AQS Objectives and EU Limit Values are identical in relation to the concentrations that are applied, they are different and it is important to understand how they are interpreted and therefore assessed. Local authorities are required to demonstrate best efforts to achieve the AQS Objectives whereas the UK government is legally required to achieve the EU Limit Values.

Regional Assessment

7.9.9 The regional assessment is undertaken to determine the contribution of the Scheme to regional air quality based on the total annual emission of pollutants over the road network. The pollutants considered are:

- NO_x ;
- PM₁₀; and
- Carbon Dioxide (CO₂).

7.9.10 The latest version of the Defra Emission Factor Toolkit (EFT) will be used in the regional assessment calculations which uses the traffic characteristics (flows, average vehicle speeds and percentage HDVs for each period) and road length for each affected road in the study area.

Transport Appraisal Guidance (WebTAG) Appraisal (Plan Level)

7.9.11 DMRB guidance states that the assessment of air quality should report the results of a local air quality WebTAG appraisal (plan level), as completed in line with the guidance in the Air Quality Sub Objective, TAG Unit A3 Environmental Impact Appraisal (DfT, December, 2015).

7.9.12 The methodology quantifies the change in exposure at properties in the opening year of the scheme. The assessment calculates the change in concentrations at receptors adjacent to all roads included in the ARN and an overall assessment score for NO₂ and PM₁₀.

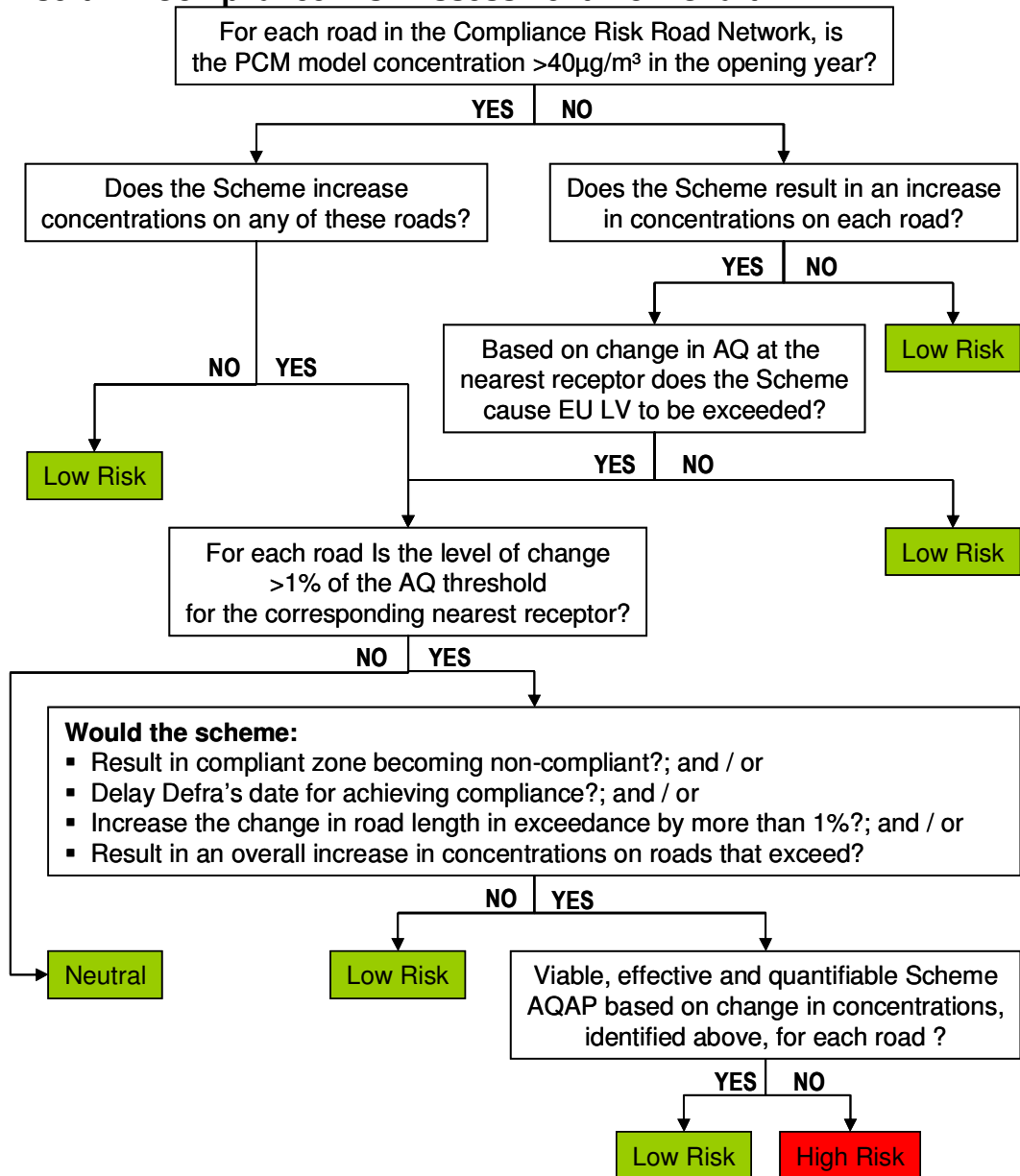
Compliance with the EU Ambient Air Quality Directive

7.9.13 Defra utilises the PCM model to report for the purposes of compliance with the EU Ambient Air Quality Directive 2008/50/EC. The model provides predicted concentrations for each link in a number of years at five-year intervals. The most recent iteration of the PCM model will be used to complete the compliance risk

assessment.

- 7.9.14 The impact of the Scheme (i.e. the change in concentrations at receptors) on compliance is undertaken in accordance with IAN 175/13, whereby the concentrations in the Defra PCM model for the opening year of the Scheme are used to determine which roads exceed the EU Limit Value.
- 7.9.15 The assessment of compliance with the Directive is undertaken using both monitoring (Defra AURN Network) and modelling from Defra's PCM model. The Scheme modelling is much more locally focused and, as such, is verified at a local level rather than a national level. Consequently, there are differences in the results. However, as the Defra PCM modelling is used to inform compliance, it has to be used as the basis to determine whether the Scheme is a risk to compliance.
- 7.9.16 IAN 175/13 provides the flow chart reproduced in Insert 7-1 to help determine the compliance risk of the Scheme.

Insert 7-1 Compliance Risk Assessment Flow Chart



7.9.17 A zone can only become compliant when locations throughout the zone meet the relevant EU Limit Value. IAN175/13, however, considers the impact of a scheme on the individual links in the PCM model within the zone. Mitigation is required where a scheme results in an overall worsening on links that exceed the EU limit Value. In those circumstances, mitigation is required in the form of a Scheme Air Quality Action Plan (SAQAP). Therefore, an SAQAP may be required even if a Scheme does not affect the worst link in the zone.

7.9.18 If a Scheme is assessed as having a high risk of non-compliance, the IAN provides guidance on the production of an SAQAP containing actions designed to further mitigate impacts and so reduce the risk of the scheme impacting on compliance.

Assessment Periods/Scenarios

Operation

- 7.9.19 The Opening Year (2023) will be used to undertake the predictions for the Local Air Quality assessment.
- 7.9.20 The Regional Air Quality assessment will use both the Opening Year (expected to be 2023) and Design Year (2038) traffic data.

Future Baseline

- 7.9.21 The future baseline will use traffic data for the Opening Year in the Do Minimum scenario. Speed band emission factors (in accordance with IAN 185/15) will be used to generate Opening Year emissions predictions.
- 7.9.22 As there is evidence showing that emissions from vehicles, particularly diesels, do not perform to their prescribed European emission standards it is now agreed amongst many air quality professionals that future predictions of NO₂ concentrations may be underestimated based on the use of the Defra modelling tools alone. Highways England issued advice in IAN 170/12v3 which is to be followed when undertaking assessments in accordance with DMRB. The latest version of this advice would be used to ensure that the future baseline projections presented in the air quality assessment are not overly optimistic.
- 7.9.23 Whilst there is an expectation that there would be a substantial improvement in real world emissions from Euro 6/VI vehicles compared to previous Euro Standards, IAN 170/12v3 makes allowance for potential under-estimates in the emissions from the latest Euro 6/VI vehicles currently entering the UK fleet.

Significance Criteria

- 7.9.24 IAN174/13 will be used to determine whether the Scheme impacts are considered significant. It is noted that there are other guidance documents in relation to the evaluation of significance in air quality assessments, namely the Institute of Air Quality Management (IAQM) Land-Use Planning and Development Control: Planning for Air Quality January 2017. The IAQM guidance makes clear, however, that it is not appropriate to follow this methodology in the context of road schemes. Paragraph 6.3 of the IAQM guidance states:

“As set out in the introduction in Chapter 1, this guidance document is not intended to replace guidance that exists for certain types of development, notably:

- *Industrial developments that require a Permit;*
- *Highway schemes promoted by Highways England; or*
- *Activities associated with sources of dust (e.g. mineral extraction, waste handling, construction) or odours.*

Separate guidance is available for these sources. Clearly, where new developments are located in the vicinity of such sources, the potential impacts of their operation on the proposed development will need to be considered.”

- 7.9.25 Paragraph 6.4 of the IAQM guidance then states:

“The guidance provided by the Environment Agency and Highways England

has a formal status, reflecting the connections these organisations have with Government departments. This EPUK/IAQM guidance has no such status and is not intended as a substitute for the formal guidance.”

- 7.9.26 IAN 174/13 was prepared in order to determine the significance of air quality effects and establish whether a significant impact is triggered for the purposes of paragraph 5.12 of the NN NPS (as discussed in Section 7.3.6 of this chapter).
- 7.9.27 Receptors which are predicted to exceed AQS Objectives in the Opening Year, either with or without the Scheme are used to inform the evaluation of significance. The change in air pollutant concentrations predicted at these receptors (either an improvement or deterioration), is used to determine whether the Scheme impacts are significant.
- 7.9.28 Table 2.1 in IAN 174/13 presents the magnitude of change criteria to be applied to annual average NO₂ and PM₁₀ concentrations.
- 7.9.29 Following DMRB methodology, there remain residual uncertainties as to the impact of the Scheme on air quality, referred to in the IAN as the Measure of Uncertainty (MoU). This is due to the inherent uncertainty in air quality monitoring, modelling and in the modelled traffic data used in the air quality assessment.
- 7.9.30 Where the differences in concentrations are less than 1% of the air quality threshold (e.g. less than or equal to 0.4µg/m³ for annual average NO₂), the changes at these receptors are considered to be imperceptible as defined in the IAN, and are scoped out of the evaluation on significance. These changes are still reported in the air quality assessment.
- 7.9.31 Any changes in concentrations above the threshold of imperceptibility are assigned to one of the six categories presented in Table 2.1 of IAN 174/13. The total number of receptors are then aggregated, in order to calculate the number of receptors in each of the six categories.
- 7.9.32 The IAN provides guidelines on the number of receptors for each of the magnitude of change categories that might result in a significant effect, as presented in Table 7-4. These are guideline values only, and are to be used to inform professional judgement in determining whether the Scheme would generate significant air quality effects.

Table 7-4 Guideline to Number of Properties Constituting a Significant Effect (Highways England IAN 174/13)

Magnitude of Change in Annual Average NO ₂ or PM ₁₀ (µg/m ³)	Number of Receptors with:	
	Worsening of air quality objective already above objective or creation of a new exceedance	Improvement of an air quality objective already above objective or the removal of an existing exceedance
Large (>4)	1 to 10	1 to 10
Medium (>2)	10 to 30	10 to 30
Small (>0.4)	30 to 60	30 to 60

- 7.9.33 Where the number of receptors fall below the lower guideline bands to inform significance, the Scheme is deemed not to have a significant impact. Schemes which affect receptors within the guideline bands require justification based on professional judgement to determine whether the impact is significant.
- 7.9.34 For ecological receptors, IAN 174/13 and DMRB Volume 11, Section 3, Part 1 HA 207/07 Annex F are used to for the air quality assessment of ecologically designated sites and determination of significant effects.

7.10 Assumptions and Limitations

- 7.10.1 Air quality modelling undertaken to inform the ES would be based on the A5036 traffic model and its assumptions.

8 CULTURAL HERITAGE

8.1 Introduction

8.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on cultural heritage and reporting potential significant effects.

8.1.2 There may be interrelationships related to the potential effects on cultural heritage, and other disciplines comprising:

- Chapter 10: Landscape;
- Chapter 11: Noise and Vibration;
- Chapter 13: Road Drainage and the Water Environment; and
- Chapter 14: Geology and Soils.

8.2 Study Area

8.2.1 The study area has been defined as a 1km corridor for designated heritage assets (500m offset from the Scheme boundary) and a 500m corridor (250m offset from the Scheme boundary) for non-designated heritage assets (Figures 8.1, 8.2 and 8.3).

8.2.2 This study area has been defined in line with DMRB Volume 11 Section 3 Part 2 HA208/07 Cultural Heritage (Highways Agency, 2007), which states that once a route option has been identified a study area would usually comprise any new land take plus an area extending at least 200m either side. The use of a 1km and 500m corridor creates a study area of sufficient size to meet this requirement and capture assets that have the potential to experience significant impacts from the Scheme.

8.3 NN NPS Requirements

8.3.1 The NN NPS defines considerations around the historic environment and heritage assets, both designated and non-designated, including requirements to assess their significance together with any contribution made by setting. Assessments should be based on documentary research, desk-based assessment, and where necessary field evaluations.

8.3.2 The Secretary of State should consider the impact of the proposed development on the heritage assets, giving great weight to the assets' conservation, and considering the desirability of sustaining and, where appropriate, enhancing the significance of said heritage assets. The contribution of their settings to the significance of the asset, and the positive contribution that their conservation can make to sustainable communities, including their economic viability, should also be considered. The Secretary of State should also consider the desirability of new development making a positive contribution to the character and local distinctiveness of the historic environment.

8.3.3 The NN NPS outlines that any harmful impact on the significance of a heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage assets, the greater

the justification that will be needed for any loss.

8.4 Consultation Undertaken and Proposed

8.4.1 To date consultation has been undertaken as presented in Table 8-1.

Table 8-1 Details of Consultations Undertaken

Aim of consultation	Date	Response
Consultation was undertaken with Historic England to establish the potential for impacts on Grade I and Grade II* listed buildings and scheduled monuments.	October 2016	Historic England stated that they do not require consulting again at pre-application stage unless, as the Scheme develops, there are material changes which would have an impact on the historic environment.
The Planning Archaeologist at Merseyside Environmental Advisory Service (MEAS) was consulted in relation to the potential impacts of the proposed schemes, and the potential for unknown archaeology within the study area.	15 August 2015	The Planning Archaeologist stated that the Scheme would not directly affect any known designated or non-designated archaeological assets. Assets adjacent to the site would not be affected by the present Scheme, but may be if the land take is larger than currently proposed. In addition, the Planning Archaeologist added, the presence of peat at the southern end of Rimrose Valley presents potential for Prehistoric paleoenvironmental remains to be discovered if reached by construction impacts.

8.4.2 Further consultation with stakeholders will be undertaken during future assessment stages. Details of proposed consultation is presented in Table 8-2.

Table 8-2 Details of Consultation Proposed

Consultations Proposed	Date	Information to be Obtained
Liverpool City Archaeologist	During preparation of desk-based assessment	To help determine requirements of any pre-application archaeological investigation including evaluation. To identify potential DCO requirements.
Conservation officer for Liverpool City Council (LCC)	During preparation of desk-based assessment	To help determine requirements of any assessment for built or upstanding remains.

8.5 Baseline Information

Baseline Information Obtained/Surveys Undertaken

8.5.1 Baseline data was obtained from the following sources:

- National Heritage List of England (NHLE) (designated heritage assets);
- Merseyside Historic Environment Record (HER) (non-designated heritage assets and historic landscape character data);
- SMBC (conservation areas); and
- A site walkover was undertaken on 9 September 2015. This included assessing the settings of designated heritage assets from publicly accessible land. No buildings or private grounds were accessed.

Other Baseline Information to be Obtained

- 8.5.2 During pre-application ground investigation works, an archaeological watching brief will be carried out and recorded.

8.6 Value of Environmental Resources and Receptors

- 8.6.1 A preliminary assessment of the value of heritage assets within the study area was previously undertaken based on the guidance provided in DMRB HA208/07 to establish the value for heritage assets and Historic England guidance.

Designated Assets

- 8.6.2 The following designated assets are present within the study area and presented within Figure 8.1 (see also the Gazetteers within Appendix D):
- One scheduled monument (SM1) of high value;
 - One Grade II* Listed Building (LB7) with a high value;
 - 26 Grade II Listed Buildings (LB1-6, LB8-26) with a medium value;
 - Two areas of heritage at risk (CA1, CA2) with a medium value; and
 - Three Conservation Areas (CA1, CA2, CA3) with a medium value.

Non-Designated Assets

- 8.6.3 The following non-designated assets which have potential to be affected by the Scheme are present within the study area and presented on Figures 8.2 and 8.3 (see also the Gazetteers within Appendix D):
- A medieval moated site (117) has a medium value;
 - Six assets (75, 80, 126, 134, 115, 101,) have a low value;
 - Two assets (HER 103, 88) have a negligible value; and
 - Five non-designated built heritage (151, 27, 17, 122, 107) assets with a low value.

Other Baseline Information to be Obtained

- The assessment will collect baseline data from the following sources:
- Inspection of aerial photographs held by the Historic England Archive, and LiDAR sources;
- Historic Ordnance Survey and pre-Ordnance Survey mapping;

- Local and regional cultural heritage literature;
- Documentary sources held at relevant local record offices or archives;
- A walkover survey to determine the effects of the Scheme on archaeological remains and historic buildings; and
- Consultation with appropriate heritage advisors to identify the need for, nature scope and scale of site-based evaluation required in support of the application.

8.7 Potential Effects including Mitigation Measures

Construction

- 8.7.1 Activities within the construction phase have the potential to cause both permanent and temporary impacts to heritage assets. Impacts to heritage assets will arise from both direct physical changes to the asset and impacts arising from changes in their setting.
- 8.7.2 All direct physical impacts would occur during construction, and would be permanent. Such impacts can include partial or total removal of heritage assets by construction activity and compaction of archaeological deposits by construction traffic and structures.
- 8.7.3 Impacts arising from changes to the setting of assets resulting from construction activity would mostly be temporary in nature.
- 8.7.4 Construction activities would have the potential to cause adverse impacts on several assets prior to mitigation including:
- A temporary adverse impact on one scheduled monument (SM1) through construction activity having a detrimental impact on its setting;
 - A temporary adverse impact on six Listed Buildings (LB3, LB4, LB5, LB8, LB10, LB25) through construction activity having a detrimental impact on their settings;
 - A temporary adverse impact on Sefton Conservation Area (CA3) through construction activity having a detrimental impact on its setting;
 - Temporary adverse impact on the heritage at risk are Waterloo Park (CA2); and
 - Permanent adverse impacts on four non-designated (101, 60, 95, 25) archaeological assets due to potential removal in whole or part of the asset by construction activity.

Operation

- 8.7.5 Operation of the Scheme has the potential to result in impacts arising from changes to the settings of heritage assets. In many cases, these would commence during construction of the Scheme, and continue during operation.
- 8.7.6 Such impacts can include changes to the surroundings of heritage assets or the general character of their setting and changes to the viability of heritage assets. Noise, dust, and vibration can also be a consideration to changes in the setting

of an asset.

8.7.7 The operational phase of the Scheme would have the potential to cause adverse impacts on several assets prior to mitigation, which are likely to include:

- Permanent adverse impact on four Listed Buildings (LB3, LB4, LB5, LB8) through operational activity having a detrimental impact on their settings;
- Permanent adverse impact on one non-designated built heritage asset (152); and
- Permanent beneficial impact on one listed building (LB25).

Mitigation Potential

8.7.8 Mitigation through design or preservation by record would reduce the potential impacts from both the construction and operational phases of the Scheme.

8.7.9 Design mitigation may include reduction of the Scheme footprint, use of local materials and boundary treatments, and landscaping and planting where appropriate.

8.7.10 Mitigation measures may also include preservation by record through archaeological excavation and recording.

8.8 Proposed Level and Scope of Assessment

8.8.1 The proposed level and scope of assessment will be a simple assessment, in line with the requirements of DMRB. This assessment will comprise a desk-based assessment (DBA) of the baseline archaeological resource for the study area and an ES chapter assessing the potential impacts and effects of the Scheme on archaeology and historic buildings.

8.8.2 Should they be deemed necessary, the assessment will include targeted archaeological investigations and if the desk-based assessment alone is deemed insufficient to determine the impacts of the Scheme.

8.9 Proposed Methodology Including Significance

Guidance

8.9.1 The assessment of the Scheme will be conducted in line with DMRB Volume 11, Section 3, Part 2 HA208/07 Cultural Heritage and will also consider relevant guidance documents including 'Historic Environment Good Practice Advice 3: The Setting of Heritage Assets' (Historic England, 2015). The assessment would meet the requirements of the NN NPS and EIA regulations.

Proposed Assessment Methodology

8.9.2 The assessment will consider the impacts and resulting effects presented by the Scheme to the cultural heritage resource including:

- The buried archaeological resource both known and unknown; and
- Historic buildings.

8.9.3 As part of the assessment, it may be necessary to undertake site based intrusive and non-intrusive investigations to aid in the identification and assessment of

known and unknown heritage assets. These works may include:

- Archaeological field-walking;
- Geophysical survey;
- Geoarchaeological sampling; and
- Archaeological evaluation trenching (based on the results of geophysical survey).

8.9.4 Any archaeological surveys would be based on discussions with the relevant local authority and the results of the DBA.

8.9.5 Following the DBA, the ES chapter will further assess the impacts and effects of the Scheme based on the results of the DBA and associated investigations. This assessment will be in line with the impact assessment methodology outlined in DMRB HA208/7.

Assessment Periods/Scenarios

8.9.6 The assessment will cover the construction and operational phases.

Future Baseline

8.9.7 Due to the nature of the cultural heritage resource it is unlikely that the future baseline would change to any great degree, although Historic England will be consulted regarding any potential changes to the status of Heritage Assets (e.g. new listings/de-listings) and Local Planning Authorities will be consulted regarding new archaeological discoveries and changes to the status of any conservation areas (e.g. changes to existing boundaries, new conservation areas etc.).

Significance Criteria

8.9.8 The significance and value of assets will be assessed in line with Historic England guidance ‘Conservation Principles, Policies, and Guidance’ (Historic England 2014) and the guidance laid out in DMRB HA208/7.

8.9.9 Table 8-3 presents the values that will be assigned to archaeological assets.

Table 8-3 Criteria for determining the value of archaeological assets

Value	Example
Very High	World Heritage Sites (including nominated sites) Assets of acknowledged international importance Assets that can contribute significantly to acknowledged international research objectives
High	Scheduled Monuments (including proposed sites) Non-designated assets of Schedulable quality and importance Assets that can contribute significantly to acknowledged national research objectives

Value	Example
Medium	Designated or non-designated assets that contribute to regional research objectives
Low	Designated and non-designated assets of local importance Assets compromised by poor preservation and/or poor survival of contextual associations Assets of limited value, but with potential to contribute to local research objectives
Negligible	Assets with very little or no surviving archaeological interest.
Unknown	The importance of the resource has not been ascertained

8.9.10 Table 8-4 presents the values that will be assigned to built heritage assets.

Table 8-4 Criteria for determining the value of built heritage assets

Value	Example
Very High	Structures inscribed as of universal importance as World Heritage Sites Other buildings of recognised international importance
High	Scheduled Monuments with standing remains Grade I and Grade II* Listed Buildings Other Listed Buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade Conservation Areas containing very important buildings Undesignated structures of clear national importance
Medium	Grade II Listed Buildings Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations Conservation Areas containing buildings that contribute significantly to its historic character Historic townscape or built up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Low	'Locally Listed' buildings Historic (unlisted) buildings of modest quality in their fabric or historical association Historic townscape or built up areas of limited historic integrity in their buildings or built settings (e.g. including street furniture and

Value	Example
	other structures)
Negligible	Buildings of no architectural or historical note; buildings of intrusive character
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance

8.9.11 The determination of magnitude of impact upon a heritage asset has been based on the vulnerability of the study area, the current state of survival/condition and the nature of the impact upon it. The survival and extent of archaeological deposits is often uncertain and consequently, the magnitude of impact can be difficult to predict with any certainty. Table 8-5 presents the magnitude of impact criteria related to archaeological assets.

Table 8-5 Criteria for Determining the Magnitude of Impact on archaeological assets

Magnitude of Impact	Example
Major	Change to most or all key archaeological materials, such that the resource is totally altered Comprehensive changes to setting
Moderate	Changes to many key archaeological materials, such that the resource is clearly modified Considerable changes to setting that affect the character and significance of the asset
Minor	Changes to key archaeological materials, such that the asset is slightly altered Slight change to setting that affects its significance
Negligible	Very minor changes to archaeological materials, or setting
No Change	No change

8.9.12 Table 8-6 presents the magnitude of impact criteria related to historic buildings.

Table 8-6 Criteria for Determining the Magnitude of Impact on built heritage assets

Magnitude of Impact	Example
Major	Change to key historic building elements, such that the resource is totally altered Comprehensive changes to the setting

Moderate	Change to many key historic building elements, such that the resource is significantly modified Changes to the setting of an historic building, such that it is significantly modified and its significance is affected
Minor	Change to key historic building elements, such that the asset is slightly different Change to setting of an historic building, such that it is noticeably changed and its significance is affected
Negligible	Slight changes to historic building elements or setting that hardly affect it
No Change	No change to fabric or setting

8.9.13 Table 8-7 illustrates how information on the value of the asset and the magnitude of impact have been combined to arrive at an assessment of the significance of effect. However, the matrix is not intended to ‘mechanise’ judgement of the significance of effect but to act as a check to ensure that judgements regarding value, magnitude of impact and significance of effect are reasonable and balanced. In order to allow for professional judgement, in some cases the matrix allows a choice of significance of effect when a magnitude of impact and a value are combined. In these cases the individual attributes of a specific asset, along with any relevant site specific factors and consideration of other influencing elements, have been taken into account when considering which the most appropriate significance of effect is.

Table 8-7 Criteria for Determining the Significance of Effects

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Value	Very High	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
	High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large/ Very Large
	Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
	Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
	Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight

8.10 Assumptions and Limitations

- 8.10.1 All data and assessment in this report is based on data obtained from third party sources and the prediction of effects is dependent on the accuracy of the data received.
- 8.10.2 Due to the nature of archaeological remains, their identification and assessment necessarily requires an element of assumption. In particular, the nature, extent, survival, and even the precise location, of buried archaeological remains are often uncertain, as the majority of such sites have never been subject to archaeological investigation to modern standards.

9 BIODIVERSITY

9.1 Introduction

- 9.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on biodiversity and reporting potential significant effects.
- 9.1.2 Government policy for the natural environment aims to reduce overall biodiversity loss, support healthy, well-functioning ecosystems and to establish coherent ecological networks (Natural Environment White Paper (NEWP) (2014)).
- 9.1.3 There are interrelationships between the biodiversity and other environmental topics comprising:
- Chapter 7: Air Quality;
 - Chapter 11: Noise and Vibration; and
 - Chapter 13: Road Drainage and the Water Environment.

9.2 Study Area

- 9.2.1 The study area for biodiversity includes the Scheme footprint and extends to 1km for non-statutory designated sites and records relating to protected/notable species and habitats which may support protected/notable species.
- 9.2.2 The 2km study area for statutory designated sites was developed in accordance with DMRB Volume 11, Section 3, Part 4, Nature Conservation (Highways Agency, 2003).
- 9.2.3 Field surveys, proposed and undertaken have been on the land situated within the Scheme footprint and all accessible land within a 1km route corridor surrounding the Scheme (i.e. 500m either side of the Scheme). Please refer to Figure 9.1 Field Survey Area.

9.3 NN NPS Requirements

- 9.3.1 Within the NN NPS, biodiversity and ecological conservation aspects are presented from Paragraph 5.20 to Paragraph 5.38. The general assessment principles, which include the requirements for EIA and HRA, both of which are pertinent to biodiversity, are included in Section 4 - Assessment Principles, (Paragraph 4.15 to Paragraph 4.21 and Paragraph 4.22 to Paragraph 4.27 (respectively)). This also includes the consideration of alternatives, as required for both EIA and HRA.
- 9.3.2 The NN NPS provides information regarding what should be included in the applicant's assessment in Paragraph 5.22 and Paragraph 5.23, which state that:
- “Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers*

the full range of potential impacts on ecosystems.

The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests”.

9.3.3 In order to comply with the requirements of the NN NPS the following guidance will be used when undertaking the Ecological Impact Assessment:

- DMRB Volume 11, Section 3, Part 4 (Highways Agency, 1993);
- IAN 130/10 (Highways Agency, 2010); this IAN updates DMRB criteria for the assessment of Ecology and Nature Conservation;
- IAN 141/11 (Highways Agency, 2011); which provides updated guidance for the Assessment of Implications on European Sites and the Planning Act 2008; and
- Guidelines for ecological impact assessment in the UK and Ireland, terrestrial, freshwater and coastal (EcIA) (The Chartered Institute for Ecology and Environmental Management (CIEEM), 2016).

9.4 Consultation Undertaken and Proposed

9.4.1 Table 9-1 and

9.4.2

9.4.3 Table 9-2 provide the details of the consultation undertaken to date and the consultation that is proposed during the EIA.

Table 9-1 Details of Consultation Undertaken

Consultations Undertaken	Date	Information Obtained
Merseyside Biobank	May 2014 and July 2016	Records of protected and notable species and locations of non-statutory designated sites.
Natural England (Discretionary Advice Service agreement No. DAS2162)	May 2016	Agreement on survey methodologies for 2016 surveys and potential mitigation measures.
Merseyside Environmental Advisory Service	January 2015	Provided their views on the project, advice on methodologies and baseline information including species identified and the Rimrose Regeneration Scheme.
British Trust for Ornithology (BTO)	December 2016	Information relating to breeding birds and over wintering birds within 1 kilometre of the proposed development site.

Table 9-2 Details of Consultation Proposed

Consultations Proposed	Date	Information to be Obtained
Natural England	September 2017	To agree the bat roosting survey approach for the remaining trees within Rimrose Valley Park due to the health and safety issues, to discuss the earlier HRA screening assessment, Discussion regarding potential Water Vole presence and survey approach, and stating intent to progress State of Common Ground (SoCG).
Merseyside Environmental Advisory Service	September 2017	To inform on the survey methodologies agreed with Natural England and discuss their views going forward.
Merseyside Biobank	October 2017	Updated the records of protected and notable species and locations of non-statutory designated sites.

9.5 Baseline Information

Baseline Information Obtained/Surveys Undertaken

- 9.5.1 Existing baseline knowledge of the scheme has been derived from ecological assessment work undertaken as part of the options development from 2015 to 2017. During this options phase a desk study was undertaken for the study area which comprised:
- A review of the Multi-agency Geographic Information Centre (MAGIC) - magic.defra.gov.uk to determine the location of international/national nature conservation designated sites, habitats registered on the Priority Habitat Inventory and registered European Protected Species Licence applications;
 - A review of Ordnance Survey mapping and online aerial imagery; and
 - A review of local biodiversity action plans.
- 9.5.2 An ecological walkover survey of the Scheme was undertaken in March 2015 and updated in February 2016, broadly following the Phase 1 habitat survey methodology as set out in Joint Nature Conservation Committee guidance (JNCC, 2010). The walkover survey records information on the habitats within the survey area but is extended to include a search for evidence of presence, and an assessment of each habitats potential to support, notable and protected species, as recommended by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013). Where access to private land was not available, these areas were assessed from the highway, footpaths, and other publicly accessible areas, where possible. The survey method included:

- Potential roosting sites for bats within trees and structures within the survey footprint (identification of suitable cracks and crevices, etc.) – surveys at this stage were undertaken from ground only. Trees and buildings were recorded as having ‘negligible’, ‘low’, ‘moderate’ or ‘high’ potential to support roosting bats or as confirmed roosts;
- Assessing the potential of land and waterbodies within the survey area to support great crested newts, where access allowed;
- Searching for signs of badger activity including setts, tracks, snuffle holes and latrines within the survey area;
- Assessing the suitability of habitats for nesting birds (including recording the presence of old nests), reptiles, water vole, otter, white-clawed crayfish, dormice and invertebrates; and
- Checking for invasive plant species subject to legal control such as Japanese knotweed *Fallopia japonica*, giant knotweed *Fallopia sachalinensis*, hybrid knotweed, giant hogweed *Heracleum mantegazzianum*, rhododendron sp and Himalayan balsam *Impatiens glandulifera*, within the survey footprint.

Statutory and Non-Statutory Designated Sites

- 9.5.3 Table 9-3 lists the statutory and non-statutory designated sites identified during the desk study, the distance and direction of the sites from the Scheme. Figure 1.5 presents a number of the identified statutory and non-statutory designated sites.
- 9.5.4 Within the table below, Annex I and Annex II habitats and species (respectively) listed within the European Community Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (EC 1992a) (the Habitats Directive). All member states are required to implement a network of protected sites and maintain their ecological integrity and contribute to a coherent European ecological network of protected sites by designating SACs for habitats listed on Annex I and for species listed on Annex II. These measures are also to be applied to SPAs classified under Article 4 of The European Council Directive on the Conservation of Wild Birds 79/409/EEC (as amended, and codified by Directive 2009/147/EC) (the ‘Birds Directive’). Together SACs and SPAs make up the Natura 2000 network
- 9.5.5 It should be noted that there are nine criteria for identifying Wetlands of International Importance as per the Ramsar Convention 1971. Ramsar sites, although not subject to the same legal protection as Natura 2000 sites, are of international importance and it is UK Government policy that Ramsar sites should have the same level of protection as SPAs and SACs.

Table 9-3 Biodiversity Assessment – Statutory and Non-Statutory Designated Sites

Site Name	Reason for designation	Distance and Direction from Scheme
Sefton Coast SAC	<p>Annex I habitats that are a primary reason for selection:</p> <ul style="list-style-type: none"> Embryonic dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (“white dunes”) Fixed coastal dunes with herbaceous vegetation (“grey dunes”) Dunes with <i>Salix repens</i> Humid dune slacks <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection:</p> <ul style="list-style-type: none"> Atlantic decalcified fixed dunes (<i>Calluno-Ullicetea</i>) <p>Annex II species that are a primary reason for selection:</p> <ul style="list-style-type: none"> Petalwort <p>Annex II species present as a qualifying feature, but not a primary reason for selection:</p> <ul style="list-style-type: none"> Great crested newt 	1.3km to the west
Ribble and Alt Estuaries SPA	<p>Article 4.1 qualification:</p> <p>During the breeding season the area regularly supports: ruff and little tern;</p> <p>Over winter the area regularly supports: Bewick’s swan, whooper swan, bar-tailed godwit and golden plover.</p> <p>Article 4.2 qualification:</p> <p>During the breeding season the area regularly supports: lesser black-backed gull, black-headed gull;</p> <p>Over winter the area regularly supports: pintail, teal, wigeon, pinkfooted goose, scaup, sanderling, dunlin, knot, Eurasian oystercatcher, black-tailed godwit, common scoter, Eurasian curlew, cormorant, grey plover, shelduck, redshank and lapwing.</p> <p>On passage the area regularly supports: sanderling, common ringed plover, whimbrel and redshank.</p> <p>Article 4.2 qualification: an internationally important assemblage of birds:</p> <p>During the breeding season the area regularly</p>	1.3km to the west

Site Name	Reason for designation	Distance and Direction from Scheme
	<p>supports: 29236 seabirds. Over winter the area regularly supports: 323861 waterfowl.</p>	
<p>Ribble and Alt Estuaries Ramsar site</p>	<p>The site qualifies as a Ramsar site under criteria 2, 5 and 6. Ramsar criterion 2 This site supports up to 40% of the Great Britain population of natterjack toads <i>Bufo calamita</i>. Ramsar criterion 5 Assemblages of international importance: Species with peak counts in winter: 222038 waterfowl (5-year peak mean 1998/99-2002/2003) Ramsar criterion 6 Species/populations occurring at levels of international importance</p>	<p>1.3km to the west</p>
<p>Liverpool Bay / Bae Lerpwl SPA</p>	<p>Article 4.1 Qualification (79/409/EEC) Over winter the area regularly supports: red-throated diver <i>Gavia stellata</i> (Northwestern Europe - wintering) 5.4% of the GB population 5-year peak mean 2001/02 - 2006/07 (nb Insufficient data recorded for period 2003/2004) Article 4.2 Qualification (79/409/EEC) Over winter the area regularly supports: red-common scoter <i>Melanitta nigra</i> (Western Siberia/Western & Northern Europe/North-western Africa) 3.4% of the population 5-year peak mean 2001/02 - 2006/07 (nb Insufficient data recorded for period 2003/2004) Article 4.2 Qualification (79/409/EEC): An Internationally Important Assemblage of Birds Over winter the area regularly supports: 55597 waterfowl 5-year peak mean 1991/92-1995/96) Including: <i>Gavia stellata</i>, <i>Melanitta. nigra</i></p>	<p>1.3km to the west</p>
<p>Mersey Narrows and North Wirral Foreshore SPA</p>	<p>Article 4.1 qualification: Over winter the site regularly supports: bar-tailed godwit; On passage the site regularly supports: little gull, common tern; In the breeding season the site regularly supports: common tern.</p>	<p>620m to the west</p>

Site Name	Reason for designation	Distance and Direction from Scheme
	<p>Article 4.2 qualification: Over winter the site regularly supports: red knot; Article 4.2 qualification - an internationally important assemblage of birds: In the non-breeding season the site regularly supports: 32,366 individual waterbirds, including: cormorant, Eurasian oystercatcher, grey plover, sanderling, red knot, dunlin, bar-tailed godwit and common redshank.</p>	
<p>Mersey Narrows and North Wirral Foreshore Ramsar site</p>	<p>The site qualifies under Criterion 4 because it regularly supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions: During 2004/05 - 2008/09 the Mersey Narrows and North Wirral Foreshore Ramsar site supported important numbers of non-breeding little gulls and common terns. The site qualifies under Criterion 5 because it regularly supports 20,000 or more waterbirds: During the winters 2004/05 - 2008/09, the Mersey Narrows and North Wirral Foreshore Ramsar site supported an average peak of 32,402 individual waterbirds. The site qualifies under Criterion 6 because it regularly supports 1% of the individuals in the populations of the following species or subspecies of waterbird in any season: During the winters 2004/05 - 2008/09, the Mersey Narrows and North Wirral Foreshore Ramsar site supported 2.4% of the islandica subspecies, W Europe/Waddensea/Britain/Ireland (non-breeding) population of knot and 2.8% of the lapponica subspecies W Europe/NW Africa (non-breeding) population of bar-tailed godwits.</p>	<p>620m to the west</p>
<p>Mersey Narrows SSSI</p>	<p>Notified for its large areas of intertidal sand and mudflats, which support internationally important populations of turnstone, redshank and nationally important populations of cormorant.</p>	<p>620m to the west</p>
<p>Sefton Coast SSSI</p>	<p>Extends for over 20 km between Southport and Crosby. The site is of special interest for: Intertidal mud and sandflats, embryonic shifting dunes, mobile dunes, dunes with creeping willow, humid dune</p>	<p>1.3km to the west</p>

Site Name	Reason for designation	Distance and Direction from Scheme
	<p>slacks, fixed dunes, dune grasslands and dune heath. Assemblages of vascular and non-vascular plants. Populations of internationally important wintering waterfowl and its nationally and, in some cases, internationally important populations of individual waders. Populations of sand lizard, natterjack toad and great-crested newt. Populations of the Red Data Book species, sandhill rustic moth. Coastal geomorphology, in particular for the large, mobile dune system and the multiple sand bars that occur on the foreshore.</p>	
Brookvale LNR	Established wetland community with an abundance of bird life, dragonflies and water voles (as described above in 2.1.3 and 2.1.4).	Within the application site
Non – Statutory designated sites within 1km		
LWS – Rimrose Valley and Leeds-Liverpool Canal	Area linking Bootle with open countryside at Thornton. Of significant nature conservation importance for the habitats and species that are present. Large areas of wetland and grasslands, e.g. Brookvale LNR and the Canal, are highly significant for breeding birds, dragonflies and extensive orchid displays.	Within the application site
LWS – Switch Island, south-east section, Maghull	Part of the Switch Island Interchange. A good mosaic of habitats from ditch to damp grasslands to scrub at a key entry point to Merseyside.	Within the application site
LWS – Former Sefton Hall, Sefton Village	Several areas of wet grasslands, ponds and unmanaged grasslands which are BAP habitats surrounded by hawthorn hedges. The plant species complement includes a nationally rare plant, northern yellowcress (<i>Rorippa islandica</i>) and several locally rare plants. The site also contains the remains of the moat around the former Sefton Hall.	Within the application site
LWS – Edge Farm Rookery	Rookery in woodland. One of two sites in Sefton.	Within the application site

Site Name	Reason for designation	Distance and Direction from Scheme
LWS – Pond and Open Space north of Copy Lane, Netherton	An area of regenerated arable land now surrounded by housing. Dominated by scrub and neutral grassland with high plant diversity.	100m to the south
LWS – Leeds and Liverpool Canal	The canal is a slow moving water body with good aquatic and marsh communities. This site continues on from the canal in Rimrose Valley. Water voles are present.	360m to the east
LWS – Open space and brook, west of A59, Maghull	This site is one of the largest neutral grassland habitats left in Sefton, many others have been subject to tree planting. There is high species diversity of predominantly native species with few rarities. Priority biodiversity action plan and regionally important habitats include: neutral grassland; swamp and acidic grasslands. Other habitats include tall herbs, scrub and wetland communities. The site is edged by and includes Dover’s Brook and Melling Brook.	460m to the north east
LWS – Crosby Marine Lake, Park and Shore	Relict sand dune habitats with coastal lagoon. Blown sand and public use has increased the diversity of habitats present. Forms part of the coastal corridor of sites for over-wintering and passage bird populations.	680m to the west
LWS – Whinney Brook	The brook crosses Maghull from east to west and comprises a mix of wetland, woodland, scrub and grassland habitats. Water voles are present along its length. The site has good plant species diversity with few rarities recorded and the presence of neutral grassland adds to the habitat interests.	950m to the north east

9.5.6 The Scheme boundary is within the 'Red Squirrel Buffer Zone'. This is an area which surrounds a red squirrel refuge and comprised largely of habitat that is hostile to squirrels and therefore defendable against grey squirrel incursion. The Scheme is also immediately adjacent to the 'Grey Squirrel, Control Zone', which forms an extended project area for the control of grey squirrels.

Priority Habitats

9.5.7 There were six priority habitats identified within 1km of the Scheme boundary. Four of which were identified within the application site during the desk study. However, following survey work it was identified that only lowland mixed deciduous woodland and reedbeds are now present within the application site. The remaining habitats are now limited to within the 1km study area of the Scheme these were:

- Lowland Fen
- Coastal and Floodplain Grazing Marsh
- Mudflats
- Saline lagoons

9.5.8 In addition, local (North Merseyside) Biodiversity Action Plan (BAP) habitats were identified within and 1km of the Scheme. The BAP habitats were as follows:

- Reedbeds
- Sand dunes
- Lowland acid grassland
- All woodland
- Neutral grassland
- Calcareous grassland
- Lakes
- Ponds
- Hedgerows

Terrestrial Ecology

9.5.9 To inform options development, ecological survey work was undertaken for the following ecological features from 2015 onwards:

- Phase 1 Habitat Survey
- National Vegetation Classification (NVC) Survey
- Terrestrial Invertebrates
- Amphibians
- Reptiles
- Wintering/Breeding Birds

- Bats
- Badger
- Otter
- Water vole

9.5.10 Table 9-4 provides a summary of the existing baseline knowledge for habitats and protected/notable species.

Table 9-4 Biodiversity Assessment- Summary of Existing Baseline Knowledge

Receptor	Date	Summary of Baseline Data
Phase 1 Habitat Survey	March 2015 then updated in February 2016	Habitats within the Scheme boundary to the south within Rimrose Valley Country Park and Brookvale LNR predominantly consisted of poor semi-improved grassland and broad-leaved woodland, with scattered/dense scrub and tall ruderal. A section of swamp habitat is located to the north of Rimrose Valley. The north of the Scheme is predominantly arable land and amenity grassland. Residential land is located to the east, west and south of the Scheme boundary.
NVC Survey	June to August 2016	NVC surveys have identified a wet woodland community and two fen vegetation communities within Brookvale LNR. In addition to a reed-bed and swamp community within Rimrose Valley Country Park. The W6d woodland community, S26d tall-herb fen community and S4b swamp and reed-beds community are considered to conform to 'wet woodland', 'lowland fen' and 'reedbeds' respectively, which are Habitats of Principal Importance for the Conservation of Biodiversity in England included in the England Biodiversity List.
Terrestrial Invertebrates	July to September 2016	A total of 290 invertebrate taxa were recorded. One UK BAP butterfly (<i>Coenonympha pamphilus</i>), one Lower Risk (Near Threatened) flat-footed fly, one Red Data Book leaf beetle, and eight Nationally Scarce (Notable or pNationally Scarce) Coleoptera or Diptera were found. The presence of several rare and uncommon species suggested that the site has good invertebrate interest.
Amphibians	June 2016 to June 2017	Environmental DNA (eDNA) surveys were undertaken in 2016 at all ponds within 500m of the Scheme boundary. A positive result for great crested newt <i>Triturus cristatus</i> was recorded at two ponds with an additional inconclusive result from another. These ponds were subjected to presence/absence surveys in 2017. No great crested newts were identified within the ponds during these surveys but common frog <i>Rana temporaria</i> and smooth newt <i>Lissotriton</i>

Receptor	Date	Summary of Baseline Data
		vulgaris.
Reptiles	May to September 2016	Although small areas of the Scheme are suitable habitat for reptiles, no reptiles were identified during the seven survey visits.
Wintering Birds	February 2015 to May 2017	<p>Wintering birds surveys frequently recorded curlew <i>Numenius arquata</i> flocks feeding on arable fields along Broom's Cross Road. Over wintering curlew is a qualifying feature for Ribble and Alt Estuaries SPA.</p> <p>Smaller number of lapwing <i>Vanellus vanellus</i> (also a qualifying feature for Ribble and Alt Estuaries SPA) and oystercatcher <i>Haematopus ostralegus</i>, a qualifying feature for Ribble and Alt Estuaries SPA, Mersey Narrows and North Wirral Foreshore SPA and Mersey Narrows and North Wirral Foreshore Ramsar site were recorded but no pink-footed geese.</p>
Breeding Birds	April to July 2016	<p>A total of 10 species with a recognised conservation status were recorded as either probable or possible breeding within the Scheme boundary. None of the species recorded were qualifying features to any of the statutory designated sites.</p> <p>Grey partridge <i>Perdix perdix</i>, lapwing, skylark <i>Alauda arvensis</i> and linnet <i>Carduelis cannabina</i> were recorded at the arable fields along Broom's Cross Road</p> <p>Grasshopper warbler <i>Locustella naevia</i>, song thrush <i>Turdus philomelos</i>, mistle thrush <i>Turdus viscivorus</i> and bullfinch <i>Pyrrhula pyrrhula</i> were recorded within Rimrose Valley.</p> <p>Dunnock <i>Prunella modularis</i> was recorded throughout site and reed bunting <i>Emberiza schoeniclus</i> was recorded within the arable fields between Broom's Cross Road and Rimrose Valley.</p>
Bats	March 2016 to July 2017	<p>All of the trees within the application site have been subject to bat roost potential assessments and 15 trees were identified to require further assessment. The trees have only been subject to a climbing inspection owing to the health and safety restrictions at Rimrose Valley.</p> <p>Activity surveys have been undertaken throughout the application site. The application site was split into two sections with the cut-off the A5207 Lydiate Lane. Habitats to the north of the A5207 Lydiate Lane were assessed to be of low value habitat and habitats to the south (including Rimrose Valley Country Park) were assessed to be of high habitat value. A walked transect and static deployment was</p>

Receptor	Date	Summary of Baseline Data
		undertaken to the northern section; however, the southern subject was only subject to static deployment due to health and safety issues.
Badger	March 2015 then updated in February 2016	No signs of badger were identified during the surveys.
Otter	August 2016	No evidence of otter was recorded during the survey.
Water vole	August 2016	No evidence of water vole was recorded during the survey.

Other Baseline Information to be Obtained

- 9.5.11 A review of the data gathered during the surveys summarised in Table 9-4 has informed the scope of any additional baseline information to be obtained.
- 9.5.12 Bat roosting surveys need to be completed at Edge Farm, additionally surveys for roosting bats within the 15 trees at Rimrose Valley will need to be completed. Survey methodology for the tree roosting surveys needs to be agreed with Natural England due to the health and safety issues within Rimrose Valley.
- 9.5.13 At this time, no further surveys are proposed for habitats, terrestrial and aquatic invertebrates, amphibians, reptiles, breeding/wintering birds, otter, badger, red squirrel and fish as the habitats in the study area have not changed in composition or suitability for these species groups therefore the baseline data from previous survey work in 2015-2017 is valid.
- 9.5.14 To establish the ecological baseline pre-construction, further survey effort is required for bats and water voles. The full suite of survey results will inform the baseline assessment, mitigation and/or compensation requirements at the pre-construction phase.

Future Baseline

- 9.5.15 To account for changes in the future baseline, it is common that a future 'do nothing' scenario (also referred to as the 'Do Minimum scenario') be considered for the ES. This will provide a forecast of what the future baseline conditions would be, accounting for all factors but without the particular development under consideration. To enable direct comparison between this and the 'post Scheme' impact predictions made during the EIA, this future scenario will be set at the opening year of the Scheme.
- 9.5.16 The majority of the Scheme crosses land currently managed as recreational and agricultural land. In the absence of the Scheme, it will be assumed that the management of the land will remain unchanged.

9.6 Value of Environmental Resources and Receptors

9.6.1 It is acknowledged that there has been an update to the CIEEM EIA Guidelines (CIEEM, 2016). This states that the term ‘key environmental receptors’ has been replaced with ‘Important Ecological Features’. The latter term is used hereinafter throughout this Chapter. Table 9-5 presents a list of important ecological features along with their associated value that were identified during the assessments undertaken during options development.

Table 9-5 Biodiversity Assessment - Value of important ecological features

Important Ecological Feature	Value
Mersey Narrows & North Wirral Foreshore SPA	Very High Value
Mersey Narrows & North Wirral Foreshore proposed Ramsar site	Very High Value
Sefton Coast SAC	Very High Value
Ribble and Alt Estuaries SPA	Very High Value
Ribble and Alt Estuaries Ramsar site	Very High Value
Liverpool Bay / Bae Lerpwl (England) SPA (Wales)	Very High Value
Sefton Coast SSSI	High Value
Mersey Narrows SSSI	High Value
Brookvale LNR	Medium Value
LWS's	Medium Value
Grey Squirrel Control Zone	Slight Value
Red Squirrel Buffer Zone	Slight Value
Priority Habitats	Very High Value
Local BAP Species and Habitats	High Value

Important Ecological Feature	Value
Habitats	Slight Value
Terrestrial Invertebrates	Slight Value
Aquatic Invertebrates	Slight Value
Amphibians	Slight Value
Reptiles	Slight Value
Birds	Slight Value
Bats	Medium Value
Water Vole	Slight Value
Red Squirrel	Medium Value
Fish	Slight Value

9.6.2 This is a preliminary assessment of value, which will be reviewed and refined if required, subject to data gathering of existing records, further field surveys and consultation at the detailed assessment stage.

9.7 Potential Effects including Mitigation Measures

Terrestrial Ecology

Construction

9.7.1 The construction of highways can affect application site-specific features (habitats or wild flora) and mobile features (populations of wildlife). Impacts can occur through several mechanisms, including:

- Indirect harm through construction disturbance, air quality, vibration, noise or hydrological effects
- Direct loss of wildlife habitats through land-take
- Severance, by dividing habitats or wildlife corridors
- Direct mortality through construction activities
- Disruption of local watercourses and drainage patterns

- Indirect effects through construction disturbance, light, air quality, vibration, noise or hydrological effects

9.7.2 Disturbance resulting from construction can affect sensitive species. This could lead to abandonment of young, increased competition, predation risk, use of critical energy reserves, etc.

Loss of functionally linked land associated with designated sites

9.7.3 Habitats that had potential to be used by qualifying features of European sites were surveyed from 2015 to 2017. The low number of birds that were found to occur within the Scheme boundary indicated that the agricultural land was not of significant value as a functionally linked parcel of land to any of the European designated sites.

Direct loss of wildlife habitat through land-take

9.7.4 Inevitably loss of habitat leads to loss of resources, that may be critical at a single stage or several stages of a given species life cycle. The construction phase would lead to the loss of the statutory designated site Brookvale LNR. The loss would be mitigated for by the enhancement of habitats within other sections of the Scheme and the creation of balancing ponds. No other statutory designated sites would be directly affected by the Scheme.

9.7.5 The construction phase of the Scheme would result in the loss of sections of non-statutory designated sites Rimrose Valley and Canal LWS, and Edge Farm Rookery LWS.

9.7.6 The construction phase of the Scheme would result in a loss of the lowland mixed deciduous woodland and reedbed priority habitats.

9.7.7 In addition, there would be the potential for direct loss of habitats which are common in the local and wider environment:

- Amenity grassland
- Broad-leaved plantation woodland
- Broad-leaved semi-natural woodland
- Scattered broad-leaved trees
- Standing water
- Swamp
- Arable
- Flowing water

9.7.8 The loss of any habitat utilised by European protected species could result in mitigation being required via a development licence issued by Natural England.

Severance, by dividing habitats or wildlife corridors

9.7.9 Given the predominantly parkland and arable landscape along the Scheme, and in the absence of mitigation, the severance (including temporary severance during construction) of existing wildlife corridors within that landscape (such as watercourses, woodland, field margins, hedgerows and tree lines) could affect

species' ability to move between habitat units, potentially resulting in their isolation. The effects of this could include reduced foraging success, increased competition, genetic isolation, inbreeding and possible localised extinction.

- 9.7.10 Severance would begin during the application site clearance and the effects may continue during operation, as in the absence of mitigation the road may act as a barrier across the landscape to a range of species including bats, birds and terrestrial mammals.

Direct mortality through construction activities

- 9.7.11 Less mobile species, or animals that are young or hibernating, are likely to be those most vulnerable to direct mortality during construction. The effects of individual mortality erode the population, which can lead to local extinctions once the population falls beneath a critical threshold. These population-level effects of direct mortality can take considerable time to become apparent. Often it is the longer-lived species which struggle to recover from the loss of individuals resulting from construction activities.

Disruption of local water courses

- 9.7.12 This could include effects from pollution, increased silt levels through to culverting or diverting a water course.
- 9.7.13 Effects on local water courses would be limited to the brook within Rimrose Valley and the swamp habitats. Aquatic species are the most vulnerable to these effects, although, follow-on impacts can occur in populations of species that are dependent on, for example, aquatic invertebrates as a feeding resource.

Operational Phase

- 9.7.14 The operation of the Scheme has the potential to affect both application site-specific and mobile receptors in the following ways:
- Direct mortality through traffic collisions;
 - Polluted road runoff affecting the water environment;
 - Impacts on vegetation from polluted spray from road traffic;
 - Impacts on species through road lighting; and
 - Barrier effect on movement of animals caused by the new road which broadly bisects the existing habitat on a north south axis (thereby restricting movement east west and vice versa).

Mitigation Potential

- 9.7.15 Based on the current understanding of the nature conservation constraints the following preliminary mitigation measures have been identified:
- The creation of new habitats which are of biodiversity value to replace the habitats being lost through the scheme. This would include a mosaic of habitats to replace those being lost in the LNR/LWS as well as the enhancement of existing habitats and the creation of new habitats. These habitats would seek to increase the biodiversity value of the local environment and provide improved habitats to attract a wider variety of

species into Rimrose Valley.

- Due to the Scheme's location through the centre of Rimrose Valley, without mitigation, this would result in the severing of the valley for amphibian and mammal movements. Therefore, mitigation in the form of underpasses, oversized footbridges and wildlife ledges through culverts would be considered.
- The assessment has confirmed the potential roosting opportunities for bats within Rimrose Valley and the surrounding area. Further baseline information is required to determine the value of roosting bats within the Scheme; once known a development licence could be required pre-construction. The potential for small numbers of other protected species to be present during construction remains. A precautionary method of working (PMW) for protected species during construction would therefore be implemented. Should a protected species be encountered the PMW would ensure that the necessary measures are in place to protect it.
- Construction works would be undertaken in accordance with a Construction Environmental Management Plan (CEMP). The CEMP will set out the measures to be undertaken during construction to avoid impacts upon the environment. Ongoing monitoring would be carried out throughout the construction phase to make sure than no new ecological constraints arise during this time.
- For some protected species, impacts can be avoided/minimised through the timing of works to avoid sensitive periods. For example, vegetation clearance would be minimised and undertaken outside the core bird nesting season (1st March and 31st August) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season would require an inspection of vegetation to be cleared for breeding birds and their occupied nests by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey they would be left in situ for their entire nesting period and alternative approaches to the work proposed. This may include leaving an exclusion zone around the nests to avoid disturbance.
- Protected species development licences may be required based on current survey findings. However, additional baseline information regarding bats is required. There is potential, if required, to create new water features, such as ponds to deliver biodiversity improvements. This could include grading of the depth of waterbodies, providing scalloped and irregular edges, as well as planting. Such measures could increase the diversity of habitats and attraction of the features for fauna and flora.
- Post construction monitoring is also likely to be required, however this is dependent on the important ecological features present and the mitigation and/or compensation that would be required for the Scheme. Details of the post-construction monitoring requirements would therefore be confirmed in the ES.

9.8 Proposed Level and Scope of Assessment

9.8.1 The CIEEM Guidelines require the assessment to scope the assessment to concentrate on ecological features that are considered to be ‘key’ (i.e. those ecological resources that are considered could experience significant effects – that is, those that could adversely affect the integrity of the habitat or the favourable conservation status of a species’ local population) and which are identified as being of sufficient value to be material to decision-making (District/Borough level or above).

9.8.2 The following ecological features will be assessed:

- Mersey Narrows & North Wirral Foreshore SPA
- Mersey Narrows & North Wirral Foreshore proposed Ramsar site
- Sefton Coast SAC
- Ribble and Alt Estuaries SPA
- Ribble and Alt Estuaries Ramsar site
- Mersey Narrows SSSI
- Brookvale LNR
- LWS’s
- Grey Squirrel Control Zone
- Red Squirrel Buffer Zone
- Priority Habitats
- Local BAP Species and Habitats
- Habitats
- Terrestrial Invertebrates
- Aquatic Invertebrates
- Amphibians
- Reptiles
- Birds
- Bats
- Water Vole
- Red Squirrel
- Fish

9.9 Proposed Methodology Including Significance

9.9.1 For the purpose of the EIA the potential for significant effects of the Scheme on the identified important ecological features will be assessed primarily using the

CIEEM Guidelines, (CIEEM 2016).

- 9.9.2 The CIEEM Guidelines define a significant effect as ‘an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general’.
- 9.9.3 Where a significant effect is identified, the importance of the ecological feature is used to help determine the geographical scale at which the effect is significant.
- 9.9.4 If significant adverse effects are considered likely, the assessment would present mitigation measures that may be required to avoid or minimise a significant adverse effect. The detail of such mitigation would be informed by additional survey data and in agreement with statutory consultees. If, after implementation of mitigation measures, a residual effect is anticipated, potential compensation measures may be required. The approach to determining the importance of ecological features and the significance of effects described above is in accordance with the CIEEM Guidelines. Table 9-6 provides a comparison of the approach for ecology in accordance with IAN 130/10 when defining significance of impacts on Important Ecological Features.

Table 9-6 Biodiversity Assessment - CIEEM guidelines significance, compared to IAN 130/10 (Highways England 2010)

Significance Following CIEEM Guidance	IAN 130/10 (HE 2010) Significance category
Significant at the international level	Very large
Significant at the national level	
Significant at the regional level	Large
Significant at the county level	Moderate
Significant at the local level	Slight
Not significant	Neutral

9.10 Assumptions and Limitations

- 9.10.1 The assessment will rely on the results of ecological surveys and desk studies undertaken to date by third parties. Ecological surveys are limited by a variety of factors which affect the presence of flora and fauna (e.g. climatic variation, season and species behaviour). A lack of evidence of a protected species during a survey does not mean that the species is absent; hence the surveys would also record and assess the ability of habitats to support such species. The time frame in which surveys are undertaken provide a snapshot of activity within the survey area and do not necessarily detect all evidence of use by a species.

10 LANDSCAPE

10.1 Introduction

- 10.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on landscape, townscape and visual amenity and reporting potential significant effects.
- 10.1.2 The landscape and townscape resource are considered to be entities in their own right. These are areas and places which have evolved over time and their inherent features give them their distinctive character. Visual amenity is a linked but separate resource which considers the views experienced by people within the landscape and townscape resource.
- 10.1.3 The importance and value of the landscape and townscape resource is considered at the international, national, regional and local level, and is embodied in the overarching European Landscape Convention as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.”
- 10.1.4 There may be interrelationships related to the potential effects on landscape and other disciplines comprising:
- Chapter 8: Cultural Heritage;
 - Chapter 9: Biodiversity;
 - Chapter 11: Noise and Vibration; and
 - Chapter 12: People and Communities.

10.2 Study Area

- 10.2.1 The criteria set out in IAN 135/10 for the landscape and townscape study area should cover the application site and the wider landscape context within which the Scheme may influence landscape and townscape character. The study area should also include the full extent of neighbouring areas and /or features of special value such as landscape, heritage and biodiversity designations, community facilities and cultural recognition.
- 10.2.2 The criteria in IAN 135/10 for the visual amenity study area should cover the whole of the area from which the Scheme could be visible i.e. the Zone of Visual Influence (ZVI); and for the purposes of the landscape, townscape and visual amenity assessment a study area extending out 1km on either side of the Scheme boundary is considered appropriate.
- 10.2.3 The ZVI used in the landscape and visual amenity assessment will also be utilised in the cultural heritage assessment to identify any other significance cultural heritage features that have the potential to experience a setting effect and so should be included within the assessment.

10.3 NN NPS Requirements

- 10.3.1 The NN NPS sets out the Government’s policies to deliver the development of NSIPs on the national road and rail networks in England. The Secretary of State

(SoS) uses the NN NPS as the primary basis for making decisions on DCO applications. The need to consider the likely significant effects on the landscape and townscape resource, and visual amenity is identified in Paragraph 5.144. This paragraph also makes reference to the following:

- Landscape Institute, 2013. Guidelines for Landscape and Visual Impact Assessment, 3rd Edition;
- Natural England profiles for National Character Areas;
- Reference to any landscape character assessment and associated studies; and
- Relevant local development plans and policies.

10.3.2 DMRB Volume 11, Section 3, Part 1 HA 207/07 and the associated IAN 125/15 are the guidance documents used when assessing the impacts of road schemes. Following this guidance allows the assessment to comply with the requirements of the NN NPS. It also allows the determination of whether the scheme impacts are considered significant on the landscape and townscape resource and on visual amenity.

10.3.3 The NN NPS provides information regarding what should be included in the applicant's assessment in Paragraphs 5.145 to 5.146. These paragraphs state that;

10.3.4 The assessment should consider:

- Significant effects during construction and operation on landscape components and landscape character (including historic landscape characterisation);
- Visibility and conspicuousness of the project during construction and operation and potential impacts on views and visual amenity; and
- Any noise, light pollution effects, including on local amenity, tranquillity and nature conservation.

10.3.5 With reference to Paragraph 5.145 the assessment of effects on the historic landscape will form part of Section 8: Cultural Heritage. However, the landscape assessment, when determining the value of the landscape resource will consider the presence of cultural heritage assets as part of this process.

10.3.6 With reference to Paragraph 5.146 light pollution effects will be based on the Guidance Notes on the Reduction of Obtrusive Light guidelines (Institution of Lighting Engineers, 2005) which identify Environmental Zones that define the broad night-time characteristics of areas in terms of relative brightness or darkness. In addition impacts on tranquillity will consider the combined effects of traffic noise and visual intrusion for rural recreational receptors within the Rimrose Valley Country Park and adjacent to Leeds and Liverpool Canal.

10.3.7 With regard to paragraph 5.147 and 5.148 the Scheme would not affect any designated landscapes.

10.3.8 In relation to decision making Paragraph 5.149 requires the assessment to consider the following;

- The nature of the existing landscape likely to be affected;
 - The nature of the effect likely to occur;
 - Designed carefully, having regard to siting, operational and other relevant constraints; and
 - Avoid or minimise harm to the landscape, providing appropriate mitigation.
- 10.3.9 In relation to decision making in other areas Paragraph 5.157 states the SoS should consider the Scheme:
- Is designed carefully, having regard to siting, operational and other relevant constraints; and
 - Avoids adverse effects on landscape or minimises harm to the landscape, including by appropriate mitigation.
- 10.3.10 In relation to decision making on visual impact Paragraph 5.158 states:
The SoS will have to judge whether the visual effects on sensitive receptors, such as local residents; and other receptors such as visitors to a local area outweighs the benefits of the development.
- 10.3.11 In relation to landscape and visual mitigation Paragraphs 5.160 and 5.161 state:
- *Adverse landscape and visual effects may be minimised by appropriate siting of infrastructure, design (including choice of materials) and landscaping schemes; and*
 - *It may be appropriate to undertake landscaping off site, although if such landscaping is proposed to be consented by the development consent order, it would have to be included within the order limits of the application.*

10.4 Consultation Undertaken and Proposed

- 10.4.1 To date, no consultation specifically related to landscape, townscape and visual amenity have been undertaken. However, landscape and visual impacts did form part of previous route options consultations.
- 10.4.2 As noted in Table 10-1, the local authority will be contacted to discuss and agree landscape, townscape and visual desk based data, landscape characterisation, other developments to be considered as part of either the future baseline data or to form part of any cumulative assessment, representative viewpoints and photomontages.

Table 10-1 Details of Consultation Proposed

Consultations Proposed	Information to be Obtained
SMBC	<p>Agree representative viewpoints for assessment and the location for photomontages, extent of study area, receptors to be assessed.</p> <p>Trees protected by Tree Protection Orders within and adjacent to the Scheme</p>

	boundary.
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10.5 Baseline Information

Baseline Information Obtained/Surveys Undertaken

- 10.5.1 During options development, baseline landscape, townscape and visual amenity information was gathered from Natural England resources and SMBC’s published assessment of Landscape Character. The Scheme would traverse one National Character Area (NCA) and pass through six local authority local character areas. These are listed in Table 10-2 and presented within Figures 10.1 and 10.2.
- 10.5.2 The Scheme would lie within and pass through open countryside and the Rimrose Valley. These act as important local recreational area for the adjacent urban areas of Kirby and Litherland and fall within the Mersey Forest. Important recreational features include the Rimrose Valley County Park, Brookvale LNR, the Leeds and Liverpool Canal and Woodlands Park.
- 10.5.3 The Scheme would pass through green belt and near to areas and features which are designated for their biodiversity and heritage value (see Section 8: Cultural Heritage and Section 9: Biodiversity). These include a LNR, listed buildings and conservation areas.
- 10.5.4 The study area is experienced by local residents at the urban edge, within rural villages and isolated rural properties, by users of National Cycle Routes 810 and 62, Trans Pennine Trail and Cheshire Ring Walk which run concurrently, visitors and users of the Rimrose Valley County Park, Brookvale LNR, Leeds and Liverpool canal; and Woodlands Park as well as recreational users on the local PRoW network, bridleways and Open Access Land.
- 10.5.5 The Scheme would also pass close to community facilities including playing fields and allotments.
- 10.5.6 Six Tree Protection Orders (TPO) have been identified within the study area. The Scheme could affect one TPO (TPO100: Edge Farm).

Other Baseline Information to be Obtained

- 10.5.7 As the Scheme design develops further focused landscape, townscape and visual surveys will be undertaken to inform the design process, the assessment of effects on landscape character, visual amenity, and the identification of appropriate mitigation.
- 10.5.8 The ZVI will also be updated and visual receptors which may be affected would be identified. Further work will also be undertaken on the identification of representative viewpoints and associated photography during winter and summer and at night-time and the preparation of photomontages.
- 10.5.9 The scope of this work will be agreed in discussion with SMBC and will form part of the assessment visualisations.

10.6 Value of Environmental Resources and Receptors

- 10.6.1 The key landscape and townscape resources and their value are set out in Table

10-2 and indicated on Figures 10.1 and 10.2.

Table 10-2 Landscape Assessment - Landscape and Townscape Resource

Resource	Features	Value / Sensitivity
NCA 58: Merseyside Conurbation	Mersey Forest, Estate farmlands, Carr Farmlands Urban – Rimrose Valley, Bootle (Seaforth) Crosby (Waterloo Park, Great Crosby, Thornton), Litherland (Ford, Buckley Hill, Netherton), Lunt, Sefton, Maghull	See below
LCA LE04 Sefton	Mersey Forest, Villages of Lunt & Sefton Arable Farmland, Open Access Land, Long Distance Path / National Cycle Route, Woodland Park, Thornton Cemetery, Playing fields, A5758 corridor, TPO Edge Farm & Edge Lane	Mersey Forest Policy S10, S11 & S12 Green belt, Countryside recreation, Lunt and Sefton conservation areas. Local nature site. Medium value at the regional level. Moderate sensitivity
LCA LC09 Upper Alt Levels	Mersey Forest, A5758 corridor / M57/M58 Switch Island Junction, Long Distance Path / National Cycle Route	Mersey Forest Policy S11 & S12 Green belt, local nature site, Long distance path / national cycle route. Moderate value at the regional level Moderate sensitivity
LCA LU02 Rimrose Valley	Mersey Forest, Rimrose Valley County Park, Leeds and Liverpool Canal, National Cycle Route	Mersey Forest Policy S10, Green belt, Countryside recreation, local nature site, open space. High value at the regional level. High sensitivity
LCA LU03 Rimrose Valley	Mersey Forest, Rimrose Valley Country Park, Brookvale LNR, National Cycle Route, TPO Glenwyllian Road	Mersey Forest Policy S10, Green belt, Countryside recreation, local nature site, open space. High value at the regional level High sensitivity
LCA LU04 Seaforth A5036 / railway corridor	Mersey Forest, Townscape and open space adjacent to A5036 / railway corridor / Seaforth & Litherland railway station	Mersey Forest Policy S1, Regeneration area, station park and ride, open space Low value at the local level Low Sensitivity

10.6.2 The key visual amenity receptors and their value are set out in Table 10-3 and

indicated on Figure 10.3. These visual amenity receptors have been identified using a ZVI developed using LiDAR data to identify properties that could have a view of the Scheme. This will provide a starting point for undertaking the visual impact assessment, and the identification and assessment of viewpoints.

Table 10-3 Landscape Assessment - Visual Amenity Receptors

Location	Receptor	Sensitivity
Mersey Forest (LU 02, Rimrose Valley)	Rimrose Valley Country Park, Public Rights of Way, Leeds and Liverpool Canal	High
Mersey Forest (LU 03, Rimrose Valley)	Brookvale LNR, Public Rights of Way, National Cycle Route 810	High
Mersey Forest (LCA LE04 Sefton)	Woodland Park. Public Rights of Way, Open Access Land, Trans Pennine Trail / Cheshire Lines Path / National Cycle Route 62, rural settlements, (Sefton and Lunt), Rural scattered residential properties,	High
Mersey Forest (LCA LE04 Sefton)	Future residential properties – housing allocation land (Thornton)	High
Mersey Forest (LCA-LC08) Sefton Meadows) – Open Access Land	Open Access Land, Trans Pennine Trail / Cheshire Lines Path / National Cycle Route 62	High
Mersey Forest (LCA LC09 Alt Upper Levels – Public Rights of Way	Trans Pennine Trail / Cheshire Lines Path / National Cycle Route 62	High
LCA LU01 Crosby / Litherland	Urban edge residential properties adjacent to Rimrose Valley (Great Crosby, Thornton, Buckley Hill, Ford)	High
LCA LU01 Litherland	Urban edge residential properties adjacent to LCA LE04 & LCA LC09 (Netherton)	High
LCA LU04 Seaforth A5036 / railway corridor	Residential properties adjacent to railway & A5036	High
LCA SU10 - Crosby	Urban edge residential properties adjacent to Rimrose Valley (Waterloo Park & Seaforth)	High
LCA SU10 - Crosby	Residential adjacent to A5036 corridor (Seaforth)	High

10.7 Potential Effects including Mitigation Measures

Construction Phase

10.7.1 There is potential for significant adverse effects during the construction phase in

relation to landscape character, including the high sensitivity land identified as green belt within the Rimrose Valley and associated high sensitivity visual amenity receptors including residential properties, visitors to users of the Rimrose Valley Country Park, Brookvale LNR, the Leeds and Liverpool Canal, national cycle route network and the local PRow network. These effects, taking account of the duration of the construction phase would vary between temporary, short and medium term (i.e. during the phase of the construction works only).

Operational Phase

- 10.7.2 There is potential for significant short to long term and permanent adverse effects during the operation phase in relation to landscape character, including the high sensitivity land identified as green belt within the Rimrose Valley and associated high sensitivity visual amenity receptors including residential properties, visitors and users of the Rimrose Valley Country Park, Brookvale LNR, the Leeds and Liverpool Canal, the national cycle route network and the local PRow network. Some of these effects would be suitably minimised by the application of standard and appropriate mitigation measures.

Potential Mitigation Measures

Construction Phase

- 10.7.3 A number of standard mitigation measures could be implemented to help screen or minimise the visual intrusion of construction activities on nearby visual receptors and would be included in the CEMP. These could include:
- Appropriate siting of compound buildings and construction access routes, tall structures i.e. batching plants and silos, and working and storage areas away from residential properties and to avoid and protect areas of mature vegetation which would help to screen the work;
 - The creation of grassed earth storage mounds and appropriate hoarding (perimeter security fencing);
 - Introduce a night time lighting strategy to avoid light pollution such as glare and light spill in relation to night time working areas compounds; and
 - Reinstatement of construction areas outside the operational areas of the Scheme to agricultural use and/or for nature conservation interest.

Operation Phase

- 10.7.4 A number of mitigation measures would be investigated to help integrate the Scheme with the landscape and townscape resource. These would include opportunities to minimise impacts on tranquillity for recreational areas from noise and visual intrusion, and to screen or minimise the visual intrusion in views from visual receptors. A number of these measures would also form part of the mitigation for other chapters such as Chapter 8: Cultural Heritage, Chapter 9: Biodiversity and Chapter 11: Noise and Vibration and will be based on DMRB Volume 10, Good Roads Guide. These measures would be incorporated into an Environmental Masterplan and could include:
- New tree and shrub planting (native and ornamental species) appropriate to the area and to achieve their environmental objective;

- Retention of established trees and hedgerows to aid integration;
- Replacement of trees protected by TPO;
- Reinstatement and enhancement of wetland and open grasslands;
- Provision of well-designed environmental barriers which help integrate the Scheme in to the landscape;
- Provision of well-designed and routed boundary and security fences which are integrated in to the landscape;
- Maintaining and enhancing character of drains, ditches, ponds (existing field ponds and proposed attenuation ponds) and waterways (Rimrose Brook) and their relationship to boundaries, trees or other features;
- Provision of well-designed leisure and recreational features;
- Creation of false cuttings i.e. the creation of artificial earthworks to help screen the Scheme, typically between 2 and 4m high;
- Re-grading engineered earthworks to smooth flowing contours and / or shallow slopes so that they can be returned to agriculture and thereby reducing the overall footprint of the Scheme and aid integration, visual; screening or to aid woodland establishment;
- Maximise the use of cuttings to help screen traffic, particularly high side vehicles;
- Green tunnels and short tunnels to aid human and nature conservation connectivity and maintain separation between settlements;
- Offsite planting (but included within the Scheme boundary) to screen more distant views from high sensitivity locations and visual receptors; and
- Opportunities for land art, subject to the cut and fill balance for the Scheme.

10.8 Proposed Level and Scope of Assessment

- 10.8.1 In accordance with IAN 135/10 Landscape and Visual Effects Assessment, this scoping exercise has determined that the Scheme is likely to give rise to significant landscape and visual effects. On that basis, a detailed Landscape and Visual Effects Assessment will be prepared to assess whether it is likely that any of these effects would be significant. The scope for a detailed landscape and visual assessment is defined within IAN 135/10.

10.9 Proposed Methodology Including Significance

Guidance

- 10.9.1 Potential effects on the landscape and townscape resource and visual amenity receptors will be assessed in accordance with the guidance documents as listed below:
- DMRB Volume 11, Section 2, Part 5 HA 205/08: Assessment and Management of Environmental Effects (Highways Agency, 2008);

- IAN 135/10 sets out the requirements for Highways England and the Service Providers for the assessment and reporting of the effects of highways projects on landscape character and on views from sensitive visual receptors. It has been prepared in accordance with the principles set out in DMRB Volume 11 Section 2 providing a methodology for considering the significance of identified effects;
- Guidelines for Landscape and Visual Impact Assessment Third edition (Institute of Environmental Management and Assessment and the Landscape Institute, 2013); and
- Advice Note 01/11 'Photography and Photomontage in Landscape and Visual Impact Assessment (Landscape Institute.2011)'.

10.9.2 The guidance requires a number of different types of assessments to be undertaken including:

- Construction assessment on the landscape, townscape resource and on visual amenity receptors (assuming construction activities during peak period and night time construction activities and associated lighting);
- Operational assessment on the landscape, townscape resource and on visual amenity receptors, at Year of Opening (Winter) and Design Year 15 (Summer) when landscape planting mitigation would be reasonably effective; and
- Operational assessment on the night time landscape resource and views using the Institution of Lighting Professionals guidelines which identify Environmental Zones that define the broad night-time characteristics of areas in terms of relative brightness or darkness.

Construction Phase

10.9.3 IAN 135/10 identifies the following landscape, townscape and visual amenity construction impacts to be examined:

10.9.4 Details contained in the Scheme design that could cause temporary or permanent direct impacts, such as the location of any demolition and other construction activity and vegetation clearance; and

10.9.5 Works such as site compounds, borrow pits, access routes and numbers of heavy construction vehicles etc.

Operational Phase

10.9.6 IAN 135/10 identifies the following landscape, townscape and visual amenity operational impacts to be examined:

- Details contained in the Scheme design that could cause temporary or permanent direct impacts such as the nature and extent of proposed land take, the location of any elevated parts of the works, vegetation clearance, drainage, lighting, signage and the treatment of kerbs, paving and other finishes;
- The height, scale, form (and lighting) of any gantries and road signs, together with other operational elements associated with the Scheme such

as service areas, laybys, treatment lagoons, noise barriers etc;

- The impact of traffic, including the proportion or frequency of high sided vehicles, and of vehicle headlights at night;
- Lighting, both as a permanent visual feature during the day and as a potentially intrusive element at night; and
- Aspects of the Scheme that have the potential for indirect impacts, such as changes to the economic viability of the area and consequential impacts such as hedgerow removal and field amalgamation.

Assessment Periods / Scenarios

Construction Phase

10.9.7 It is anticipated the construction phase will be a three year period. IAN 135/10 requires the assessment to take account of the following:

- Assume a maximum visibility or maximum perceived change situation (i.e. when construction activity is at its peak for any given view), and noting how long that phase would be likely to last.

Operational Phase

10.9.8 IAN 135/10 requires the assessment to be undertaken for both day and night time situations using the following scenarios.

- In the winter of the year of opening (Year 2023) (to represent a maximum effect situation, before any planted mitigation can take effect), taking account of the completed Scheme and the traffic using it, and
- In the summer of the fifteenth year after Scheme opening (Design Year 2038), (to represent a least effect scenario, where any planted mitigation measures can be expected to be reasonably effective), taking account of the completed Scheme and the traffic using it.

Future Baseline

10.9.9 The future baseline (i.e. the Do Minimum scenario) will take account of potential changes in the day and night time landscape and townscape resource and visual amenity through a review of new planning applications and other proposed developments within the study area. In terms of the impact of traffic this will utilise the traffic data provided by the traffic team for the Opening Year 2023 and in Design Year 2038.

Significance Criteria

10.9.10 The guidance in IAN135/10 or any subsequent update of this document will be used to determine whether the Scheme impacts are considered significant.

10.9.11 For effects on the landscape and townscape resource, the assessment of their significance is determined by considering the magnitude of impact arising from the Scheme on each of the features and elements that make up the character of the resource, bearing in mind the value of the landscape (and/or of specific features and elements), and the ability of the landscape to accommodate change of the type proposed (i.e. its sensitivity).

- 10.9.12 For effects on visual amenity, the assessment of their significance is determined by considering the sensitivity of the visual receptor to the magnitude of impact on visual amenity arising from the Scheme.
- 10.9.13 The magnitude of impact on the landscape and townscape resource and visual amenity is the degree of change that would arise if the Scheme were to be completed (i.e. 'Do Something'), as compared with a 'Do Minimum' situation. Factors to consider are the scale of the impact, the nature of the impact, whether it is an adverse or beneficial change, and the timescale involved (i.e. temporary, short, medium or long term / permanent).
- 10.9.14 Indicative criteria guidance in IAN 135/10 for the landscape and townscape resource and for visual amenity are provided in Table 10-4 and Table 10-5 respectively. IAN 135/10 makes it clear that they are not prescriptive and in making judgements the landscape professional needs to be able to demonstrate to others a consistent and justifiable argument.

Table 10-4 Landscape and Townscape Resource - Magnitude and Nature of Impact and Typical Descriptors

Magnitude of Impact	Typical Criteria Descriptor
Major Adverse	Total loss or large scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features and elements.
Moderate Adverse	Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements.
Minor Adverse	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
Negligible Adverse	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
No Change	No noticeable loss, damage or alteration to character or features or elements.
Negligible Beneficial	Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Minor Beneficial	Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Moderate Beneficial	Partial or noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic and noticeable features and elements, or by the addition of new characteristic features.

Magnitude of Impact	Typical Criteria Descriptor
Major Beneficial	Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features

Table 10-5 Visual Amenity - Magnitude and Nature of Impact and Typical Descriptors

Magnitude of Impact	Typical Criteria Descriptor
Major	The Scheme, or a part of it, would become the dominant feature or focal point of the view.
Moderate	The Scheme, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The Scheme, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view
Negligible	Only a very small part of the Scheme would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view
No Change	No part of the Scheme, or work or activity associated with it, is discernible.

10.9.15 Landscape sensitivity will depend on the character of the receiving landscape, the nature of the proposed Scheme and the type of change. Visual sensitivity is categorised by the sensitivity of the visual receptor, and will include people in their homes, users of PRow and other areas of open space or recreational landscapes, people at work and people travelling along roads or railway lines. Indicative sensitivity criteria guidance for the landscape and townscape resource and for visual amenity set out in IAN 135/10 are provided in Table 10-6 and Table 10-7 respectively. As with the determination of magnitude of impact, these are not prescriptive and in making judgements the landscape professional needs to be able to demonstrate to others a consistent and justifiable argument.

Table 10-6 Landscape and Townscape Resource – Sensitivity and Typical Descriptor and Examples

Sensitivity	Typical Descriptor and example
High	Landscapes which by nature of their character would be unable to accommodate change of the type proposed. Typically, these would be; Of high quality with distinctive elements and features making a positive contribution to character and sense of place. Likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale.

Sensitivity	Typical Descriptor and example
	<p>Areas of special recognised value through use, perception or historic and cultural associations.</p> <p>Likely to contain features and elements that are rare and could not be replaced.</p>
Moderate	<p>Landscapes which by nature of their character would be able to partly accommodate change of the type proposed. Typically, these would be;</p> <p>Comprised of commonplace elements and features creating generally unremarkable character but with some sense of place, locally designated, or their value may be expressed through non-statutory local publications.</p> <p>Containing some features of value through use, perception or historic and cultural associations.</p> <p>Likely to contain some features and elements that could not be replaced.</p>
Low	<p>Landscapes which by nature of their character would be able to accommodate change of the type proposed. Typically, these would be;</p> <p>Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place.</p> <p>Not designated.</p> <p>Containing few, if any, features of value through use, perception or historic and cultural associations.</p> <p>Likely to contain few, if any, features and elements that could not be replaced.</p>

Table 10-7 Visual Amenity – Sensitivity and Typical Descriptor and Examples

Sensitivity	Typical Descriptor and example
High	<p>Residential properties.</p> <p>Users of PRow or other recreational trails (e.g. National Trails, footpaths, bridleways etc.).</p> <p>Users of recreational facilities where the purpose of that recreation is enjoyment of the countryside (e.g. Country Parks, National Trust or other access land etc.).</p>
Moderate	<p>Outdoor workers</p> <p>Users of scenic roads, railways or waterways or users of designated tourist routes.</p> <p>Schools and other institutional buildings, and their outdoor areas.</p>
Low	<p>Indoor workers</p> <p>Users of main roads (e.g. trunk roads) or passengers in public transport on main arterial routes.</p> <p>Users of recreational facilities where the purpose of that recreation is not related to the view (e.g. sports facilities).</p>

10.9.16 In terms of the significance of the effect IAN 135/10 indicates:

- A major magnitude of change on a highly sensitive receptor will produce an effect of high significance;
- A minor magnitude of change on a less sensitive receptor will produce an effect of low or negligible significance; and
- Major changes for less sensitive receptors and minor changes for more sensitive receptors could also produce significant levels of effect.

10.9.17 IAN 135/10 notes:

“that it is not possible to set out a precise formula for the determination of the significance of effect as every case is different, and it is therefore important that the significance level determined is supported by reasoned justification in the form of a written explanation (supported by photographs and other illustrations as appropriate), so that the basis for the assessment is clear. This is particularly important where a highly sensitive receptor experiences a moderate magnitude of impact, justification for the assessment of either a moderate or large degree of significance should be given”.

10.10 Assumptions and Limitations

10.10.1 No consultation has been undertaken with SMBC in the preparation of this chapter.

11 NOISE AND VIBRATION

11.1 Introduction

11.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on noise and vibration, and reporting potential significant effects.

11.1.2 There may be interrelationships between the noise and vibration assessment and other environmental topics comprising:

- Chapter 8: Cultural Heritage;
- Chapter 9: Biodiversity;
- Chapter 10: Landscape; and
- Chapter 12: People and Communities.

11.2 Study Area

11.2.1 Study areas for the different aspects of the noise assessment will be defined in accordance with appropriate guidance as detailed below.

Construction Noise and Vibration Study Area

11.2.2 The study area for the construction noise assessment will comprise an area up to 300m from the Scheme boundary. This is determined in accordance with relevant guidance and using professional judgement. The predicted noise levels when undertaken in accordance with British Standard 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' Part 1 (BS5228) may be incorrect at distance greater than 300m because of the increasing importance of meteorological effects.

11.2.3 For the consideration of construction noise impacts, specific sensitive receptors will be identified within this 300m study area, in association with the Local Authority.

11.2.4 The study area for the construction vehicle movement assessment will consider road traffic noise changes within 300m of any road/route identified as experiencing an increase in noise of greater than 1dB as a result of the Scheme during the construction phase.

Operational Road Traffic Noise and Vibration Study Area

11.2.5 The operational noise study area will be derived in accordance with the requirements of DMRB Volume 11 Section 3 Part 7 HD213/11 'Noise and Vibration' Detailed Assessment methodology.

11.2.6 The study area in accordance with DMRB HD213/11 is defined by the following process:

- A - Identify the start and end points of the physical works associated with the road Scheme;
- B - Identify the existing routes that are being bypassed or improved, and any proposed new routes, between the start and end points;
- C - Define a boundary one kilometre from the carriageway edge of the

- routes identified in (B) above;
- D - Define a boundary 600m from the carriageway edge around each of the routes identified in (B) above and also 600m from any other affected* routes within the boundary defined in (C) above. The total area within these 600m boundaries is termed the 'calculation area';
*An affected route is one where there is the possibility of a change of 1dB(A) or more between the Do Minimum and Do Something scenarios in the short-term or 3dB(A) or more in the long term;
- E - Identify any affected routes beyond the boundary defined in (C) above; and
- F - Define a boundary 50m from the carriageway edge of the routes identified in (E) above.

11.2.7 Defra defined Noise Important Areas (NIAs) within the DMRB defined study area will also be assessed. As part of the proposed Scheme methods of mitigation will be investigated to reduce road traffic noise levels in these areas.

11.2.8 Airborne traffic induced vibration will be assessed at all residential receptors within 40m of the Scheme as specified within the methodology presented in DMRB.

11.3 NN NPS Requirements

11.3.1 NN NPS paragraphs 5.186 to 5.200 contain relevant noise guidance. Specifically, paragraph 5.188 sets out factors that will likely determine noise impacts from a Scheme, including:

- *“construction noise and the inherent operational noise from the proposed development and its characteristics;*
- *the proximity of the proposed development to noise sensitive premises (including residential properties, schools and hospitals) and noise sensitive areas (including certain parks and open spaces);*
- *the proximity of the proposed development to quiet places and other areas that are particularly valued for their tranquillity, acoustic environment or landscape quality such as National Parks, the Broads or Areas of Outstanding Natural Beauty; and*
- *the proximity of the proposed development to designated sites where noise may have an adverse impact on the special features of interest, protected species or other wildlife.”*

11.3.2 Paragraph 5.189 of the NN NPS quantifies what is required to be considered within any noise assessment of a Scheme that is subject to EIA and has the potential for significant noise impacts to occur. These considerations should form part of any noise study and ES:

- *“a description of the noise sources including likely usage in terms of number of movements, fleet mix and diurnal pattern. For any associated fixed structures, such as ventilation fans for tunnels, information about the noise sources including the identification of any distinctive tonal, impulsive or low frequency characteristics of the noise.*

- *identification of noise sensitive premises and noise sensitive areas that may be affected.*
- *the characteristics of the existing noise environment.*
- *a prediction on how the noise environment will change with the proposed development:*
 - *In the shorter term such as during the construction period;*
 - *in the longer term during the operating life of the infrastructure;*
 - *at particular times of the day, evening and night as appropriate.*
- *an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas.*
- *measures to be employed in mitigating the effects of noise. Applicants should consider using best available techniques to reduce noise impacts.*
- *the nature and extent of the noise assessment should be proportionate to the likely noise impact.”*

11.3.3 Paragraph 5.190 specifies in addition to the considerations outlined above that “The potential noise impact elsewhere that is directly associated with the development, such as changes in road and rail traffic movements elsewhere on the national networks, should be considered as appropriate.”

11.3.4 Section 5.195 sets out the main aims of the NN NPS with regard to Government Policy on sustainable development, and details that the Secretary of State “should not grant development consent unless satisfied that the proposals will meet, the following aims”:

- *“avoid significant adverse impacts on health and quality of life from noise as a result of the new development;*
- *mitigate and minimise other adverse impacts on health and quality of life from noise from the new development; and*
- *contribute to improvements to health and quality of life through the effective management and control of noise, where possible.”*

11.3.5 The NN NPS also considers mitigation, outlining that mitigation could be necessary during both construction and operational phases, but should be “proportionate and reasonable”. The NN NPS specifically requires consideration of mitigation measures on any identified Defra NIAs.

11.3.6 Additionally, the NN NPS qualifies that where relevant the Noise Insulation Regulations (NIR) will apply to national network Schemes.

11.4 Consultation Undertaken and Proposed

11.4.1 Consultation was undertaken with officers from the Environmental and Technical Services Department of SMBC at a meeting on the 27 January 2015. SMBC provided relevant background on existing noise levels and mitigation measures.

11.4.2 As noted in Table 11-1, the Environmental Health Department of SMBC will be

contacted to discuss the scope and methodology of the assessment.

Table 11-1 Details of Consultation Proposed

Consultations Proposed	Information to be Obtained
SMBC Environmental Health Department	To agree baseline noise monitoring locations and durations; and noise and vibration assessment methodology.

11.5 Baseline Information

Existing Noise Climate

11.5.1 A noise measurement survey was undertaken between 16 and 20 May 2016, with further measurements undertaken at selected locations on Sunday 16 September 2016. The survey was carried out to gather information about the existing noise climate and levels in the area.

11.5.2 The following noise monitoring was undertaken:

- Noise measurements were made at a total of 14 positions as shown in Figure 11.1.
- Each measurement was undertaken for a period of 15 minutes which was considered to be representative of the hourly noise level. Multiple measurements were undertaken at each position at different times to determine the ambient noise levels over a typical 24-hour weekday;
- All measurements were undertaken in free-field conditions at a height of 1.5 metres above the local ground with the exception of position 4 which was a façade measurement. Façade noise levels are expected to be 2.5dB higher than free-field noise levels as per the prediction methodology of the Calculation of Road Traffic Noise, Department of Transport Welsh Office, 1988 (CRTN); and
- The weather on the days of the survey was noted to be dry and mostly clear with light cloud. Wind speeds throughout the day were between 0.5m/s and 3.5m/s. The roads and surfaces were dry, with no evidence of rain, fog, or frost.

11.5.3 A summary of measured noise levels available to date is provided below in Table 11-2.

Table 11-2 Summary of Noise Surveys Undertaken to Date

Measurement position (Refer to Figure 11.1)	Address	Period	Noise level dB $L_{Aeq, 15 \text{ minute}}$	Noise level dB $L_{A10, 15 \text{ minute}}$
1	Sefton Cottage,	Day (0700 -19:00)	73	77

Measurement position (Refer to Figure 11.1)	Address	Period	Noise level dB LAeq, 15 minute	Noise level dB LA10,15 minute
	Brickwall Lane	Evening (19:00 - 23:00)	71	75
		Night (23:00 – 07:00)	60	52
2	The Lodge, Chapel Lane	Day (0700 -19:00)	63	62
		Evening (19:00 - 23:00)	56	58
		Night (23:00 – 07:00)	48	51
3	39 Cumberland Gate	Day (0700 -19:00)	62	65
		Evening (19:00 - 23:00)	62	65
		Night (23:00 – 07:00)	61	62
4	19 Sandiways Avenue	Day (0700 -19:00)	60	63
		Evening (19:00 - 23:00)	-	-
		Night (23:00 – 07:00)	58	59
5	101 Poulson Drive	Day (0700 -19:00)	56	60
		Evening (19:00 - 23:00)	55	58
		Night (23:00 – 07:00)	48	45
6	313 Church Road	Day (0700 -19:00)	65	69
		Evening (19:00 - 23:00)	60	63
		Night (23:00 – 07:00)	60	62
7	51 Church Road	Day (0700 -19:00)	68	73
		Evening (19:00 - 23:00)	-	-
		Night (23:00 – 07:00)	63	63
8	5 Moorhead Close	Day (0700 -19:00)	53	51
		Evening (19:00 - 23:00)	52	54
		Night (23:00 – 07:00)	49	47

Measurement position (Refer to Figure 11.1)	Address	Period	Noise level dB L _{Aeq, 15 minute}	Noise level dB L _{A10,15 minute}
9	12 Green Lane	Day (0700 -19:00)	65	68
		Evening (19:00 - 23:00)	62	66
		Night (23:00 – 07:00)	63	66
10	3 Rydal Avenue	Day (0700 -19:00)	55	54
		Evening (19:00 - 23:00)	-	-
		Night (23:00 – 07:00)	41	44
11	39 Rimrose Valley	Day (0700 -19:00)	49	49
		Evening (19:00 - 23:00)	-	-
		Night (23:00 – 07:00)	44	36
12	11 Coney Crescent (rear on Drummond Road)	Day (0700 -19:00)	57	52
		Evening (19:00 - 23:00)	-	-
		Night (23:00 – 07:00)	39	38
13	41 Runnells Lane	Day (0700 -19:00)	45	47
		Evening (19:00 - 23:00)	42	44
		Night (23:00 – 07:00)	34	36
14	Buckley Hill Lane	Day (0700 -19:00)	65	69
		Evening (19:00 - 23:00)	62	67
		Night (23:00 – 07:00)	58	54

- 11.5.4 The measured noise levels indicate that noise levels at properties close to the existing A5036 are currently in the range of 63 to 73dB L_{A10, 15 minute}. The lowest noise level was measured at Sandiways Avenue, which included the benefit of a 2-metre noise barrier. The highest noise level was measured at 51 Church Road at around 10 metres from the carriageway.
- 11.5.5 Average daytime noise levels at the edges of Rimrose Valley ranged from 47dB L_{A10, 15 minute} to 69dB L_{A10, 15 minute} (the latter close to Buckley Hill Lane).
- 11.5.6 At Brickwall Lane (Position 1, north of Broom’s Cross Road) a level of 77dB L_{A10},

15 minute was recorded; this is due to the close proximity of the measurement position to the roadside.

11.5.7 Table 11-3 presents a summary of the noise measurements undertaken on Sunday 6 September 2016 at selected locations.

Table 11-3 Summary of Measured Daytime Noise Levels on a Sunday

Measurement position (Refer to Figure 11.1)	Address	dB LAeq, 15 minute	dB LA10, 15 minute
2	The Lodge, Chapel Lane	54	57
3	39 Cumberland Gate	62	64
6	313 Church Road	61	64
9	12 Green Lane	62	65
11	39 Rimrose Valley	56	56
14	Buckley Hill Lane	62	66

Noise Sources in the Area

11.5.8 From baseline information collated to date, it is known that:

- With regard to Rimrose Valley it was observed that natural noise sources (e.g. bird song) predominate, with some road traffic noise just audible to the west/north-west;
- Adjacent to the A5036 which would be by-passed as a result of the Scheme, the noise environment is dominated by road traffic noise from the A5036;
- Noise barriers are present along the A5036 at the Princess Way section; and
- In built-up residential streets, distant road traffic noise is only just audible due to screening from buildings.

Noise Important Areas

11.5.9 NIAs are locations in England where the top 1% of the population that are affected by the highest noise levels are located according to the results of the strategic noise mapping undertaken by Defra under the terms of the Environmental Noise (England) Regulations 2006.

11.5.10 The NIAs in Table 11-4 have been identified within 1km of the Scheme alignment and bypassed routes which are the responsibility of Highways England and are presented in Figure 11.1:

Table 11-4 Highways England NIAs

NIA Identification Number	Location
462	A5036
463	A5036
465	A5036
466	A5036
467	A5036
472	A5036
564	A5036
6912	M58

11.5.11 The NIAs in Table 11-5 have been identified within 1km of the Scheme alignment and bypassed routes which are the responsibility of SMBC and are presented in Figure 11.1;

Table 11-5 SMBC NIAs

NIA Identification Number	Location
10686	A565 Crosby Road N
471	A565 Crosby Road N
473	A565 Crosby Road S
474	A565 Crosby Road S
475	A565 Rimrose Road
479	A5090 Hawthorne Road
486	A5038 Netherton Way
492	A59 Ormskirk Road

11.6 Value of Environmental Resources and Receptors

11.6.1 In terms of noise, a methodology has not yet been developed to assign the value of a receptor, currently this is defined based upon professional judgement and the guidance notes of the NPSE. Therefore, based upon professional judgement the value of a receptor will be defined using the criteria provided in Table 11-6.

Table 11-6 Determining the Importance / Sensitivity of Resource

Importance/Sensitivity of Receptor	Criteria
High	Residential dwelling.

Importance/Sensitivity of Receptor	Criteria
	Hospitals Schools Community facilities Designated areas (e.g. AONB, National Park, SAC, SPA, SSSI, Scheduled Monument (SM)) Places of Worship Public Rights of Way
Medium	Offices Bars/cafes/restaurants where external noise may be intrusive
Low	Factories and working environments with existing high noise levels Night clubs

11.6.2 In addition, Significant Observed Adverse Effect Level (SOAEL) is a concept defined within NPSE, along with No Observed Effect Level (NOEL) and Lowest Observed Adverse Effect Level (LOAEL), which are based upon toxicology and define effects of noise upon health and quality of life. Specifically, with regard to the definition of SOAEL the NPSE states that:

11.6.3 “It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

11.6.4 As such within the scope of the assessment the operational road traffic noise levels of SOAEL and LOAEL at residential properties have been based upon road scheme assessments such as the A14, A19 and M4. The assumed levels of SOAEL and LOAEL are as presented in Table 11-7.

Table 11-7 Levels of LOAEL and SOAEL Assumed for Operational Road Traffic Noise

Time Period	Adverse effect level	LAeq noise level (dB)	LA10 noise level (dB)
Day	LOAEL	50	55
Day	SOAEL	63	68*
Night	LOAEL	40	n/a
Night	SOAEL	55	n/a

Time Period	Adverse effect level	LAeq noise level (dB)	LA10 noise level (dB)
*+5dB correction to LA10 based on LAeq to LA10 of +2dB from BS 8233:2014 <i>Guidance on sound insulation and noise reduction for buildings</i> and façade correction of +2.5dB			

11.6.5 For construction noise, the approach used on other large infrastructure scheme assessments such as the Silvertown Tunnel Scheme, Bank Station Capacity Upgrade Scheme and HS2 has been considered. The construction noise SOAEL for residential properties is defined within Table 11-8.

Table 11-8 Levels of LOAEL and SOAEL Assumed for Construction Noise

Time Period	LOAEL LAeq,T (dB)	SOAEL LAeq,T (dB)
Daytime 07:00 – 19:00 Monday to Friday. 07:00 – 13:00 Saturday.	60	75
Evening and Weekends 19:00 – 23:00 Monday to Friday. 13:00 – 23:00 Saturday. 07:00 – 23:00 Sunday.	55	65
Night 23:00 – 07:00 Monday to Sunday.	45	55

11.6.6 These definitions of SOAEL as defined within Table 11-7 and Table 11-8 have been used within the definition of receptor value as defined within Table 11-6.

11.6.7 The location of all sensitive receptors will be defined once the detailed study area is defined (in accordance with DMRB for operational noise and BS5228 for construction noise) as the two are intrinsically linked.

11.7 Potential Effects

Construction

11.7.1 There is potential for adverse noise and vibration effects during the Scheme construction phase. It is anticipated that construction noise effects could occur due to the following:

- Noise from the operation of construction plant; and
- Noise from HGV movements on the public highways to and from the site.

11.7.2 It is anticipated that construction vibration effects could occur due to the following construction activities:

- Percussive piling activities; and
- Vibratory piling activities.

11.7.3 Rotary bored piling operations are considered to generate inherently low vibration levels even at close proximity, and it is not anticipated that any significant effects from this type of piling activity would occur.

11.7.4 The time of day that construction activities occur would also be considered to have the potential to create a significant noise and vibration effect.

Operation

11.7.5 The Scheme has the potential to affect existing ambient noise, during operation in the following ways:

- Increase in road traffic noise levels at sensitive receptors within close proximity to the Scheme alignment; and
- Noise could be affected (positively or negatively) by changes in vehicle flow, speed and composition on the existing road network as a result of the Scheme.

11.8 Mitigation Potential

11.8.1 Specific mitigation measures would be considered and recommended where required and practicable based upon the findings of the noise assessment.

11.8.2 However, where necessary the following generic noise mitigation measures would be considered within the scope of the noise study to control noise impacts in accordance with the requirements of the NN NPS aims.

Construction

11.8.3 Measures to minimise noise and vibration impacts from the construction phase would involve adopting Best Practicable Means' (BPM) (as outlined in Section 72 of the Control of Pollution Act 1974) and the recommendations of good practice presented in BS 5228-1:2009+A1:2014.

11.8.4 These methods would be implemented through a CEMP.

11.8.5 Road closures which may reduce adverse noise and vibration effects will be considered as part of the construction strategy.

Operation

11.8.6 The following measures would be considered where appropriate within the operational noise assessment with regard to road traffic noise:

- Thin wearing course/low-noise surfacing: the application of this type of surface can reduce noise levels by up to 3.5dB(A) where the average speed of the traffic is above 75 kph. Below this speed there is a reduced benefit from these surface system types due to the increased prominence of vehicle engine noise contributing to the overall road traffic noise level. This measure would be incorporated into the design of the Scheme.
- Noise Barriers: The use of noise barriers can reduce the noise level at dwellings by reducing sound propagation. To be most effective, barriers are required to be either very close to the source (the road) or the receptor (the dwellings). The effectiveness of noise barriers as a mitigation measure would depend on site specific circumstances. Where a noise barrier is

located close to the road, the effect on noise propagation is usually effective to about 300m. It may not always be possible to locate barriers close to the road as they can have adverse effects on pedestrian environment and on visibility splay for drivers and cyclists in junction situations. Barriers would be included within the Scheme design where necessary associated with new or altered highways.

- Speed Limits: A reduction in the average speed of vehicles can result in a reduction in generated traffic noise.

11.8.7 The Scheme design that was part of the PRA consultation and announcement assumes a 4m high 'barrier' either side of the offline section of carriageway. This would be made up of a mixture of embankment and fencing as required.

11.9 Proposed Level and Scope of Assessment

11.9.1 The noise and vibration assessment will be a "detailed" level assessment as defined within DMRB HD213/11 and will cover both the construction and operational phases. This is based upon the advice contained within DMRB which recommends that a detailed assessment is undertaken where it is clear that any of the threshold values (noise change of 1dB(A) or more in the short-term or 3dB(A) or more in the long term) are expected to be exceeded. Based upon the assessments undertaken to date, the introduction of the Scheme would have the potential to generate increases in road traffic noise levels of greater than the specified threshold values.

11.9.2 In regard to road traffic induced vibration extensive research on a wide range of buildings of various ages and types has been carried out (Watts G.R, 1990), with no evidence found to support the theory that traffic induced vibrations are a source of significant damage to buildings. DMRB states:

"significant ground-borne vibrations may be generated by irregularities in the road surface. Such vibrations are unlikely to be important when considering disturbance from new roads and an assessment would only be necessary in exceptional circumstances".

11.9.3 Given the advice of DMRB relating to ground borne vibration and the fact that the proposal is for a new road Scheme where surface irregularities would be minimised, no impacts from ground borne road traffic vibration will be assessed within the scope of the noise and vibration chapter.

11.10 Proposed Methodology Including Significance Construction Noise and Vibration Assessment

11.10.1 Construction noise and vibration will be assessed using the guidance set out in British Standard BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Noise' (BS5228-1) and also BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration' (BS5228-2).

11.10.2 Part 1 of BS 5228-1 provides guidance on predicting and measuring construction noise and assessing its impact on the environment.

- 11.10.3 Part 2 of BS 5228-2 provides recommendations for basic methods of vibration control and methods of assessing its effects on the environment relating to construction where work activities/operations generate significant vibration levels.
- 11.10.4 Specifically, regarding the assessment and consideration of construction noise and vibration effects the following assessment methodologies will be used:
- Noise: In line with precedents set on other NSIP applications, the BS5228: 2009 +A1: 2014 ABC method will be used within the scope of the Scheme assessment in order to establish construction noise limits for the purposes of environmental impact assessment.
 - Vibration: BS5228-2 Annex B provides guidance on human response to vibration in buildings in terms of peak particle velocity (PPV). This will be used as the methodology for the assessment and consideration of construction generated ground borne vibration.

Operational Road Traffic Noise Assessment

- 11.10.5 Road traffic noise calculations will be undertaken in accordance with the methodology contained within the CRTN as required under the appropriate parts of DMRB and the NN NPS (Paragraph 5.191). The prediction of road traffic noise effects will be undertaken using a proprietary and appropriately validated 3-dimensional noise mapping software package such as IMMI or SoundPLAN 7.5/8.0.
- 11.10.6 Within the scope of the assessment the following comparisons will be made for road traffic noise levels to consider the impacts of the Scheme in both the short and longer terms. These comparisons are a requirement of the detailed level assessment:
- Do Minimum scenario in the baseline year against Do Minimum scenario in the future assessment year (long term).
 - Do Minimum scenario in the baseline year against Do Something scenario in the baseline year (short term).
 - Do Minimum scenario in the baseline year against Do Something scenario in the future assessment year (long term).
- 11.10.7 For the consideration of night-time noise impacts, in accordance with DMRB only comparisons in the long term will be undertaken for receptors predicted to exceed an L_{night} , outside of 55 dB(A) or greater. The calculation of permanent road traffic noise impacts will be undertaken for the following comparisons:
- Do Minimum scenario in the baseline year against Do Minimum scenario in the future assessment year (long term).
 - Do Minimum scenario in the baseline year against Do Something scenario in the future assessment year (long term).
- 11.10.8 All predictions and comparisons will be presented in the reporting tables as specified in DMRB HD213/11 and assessed accordingly.

11.11 Assumptions and Limitations

- 11.11.1 There are no assumptions and limitations, the assessment will be undertaken in accordance with the relevant guidance and British standards.

12 PEOPLE AND COMMUNITIES

12.1 Introduction

12.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on people and communities.

12.1.2 This chapter draws on guidance from three main sections of DMRB as noted below, and presents these in one chapter in accordance with Interim Advice Note (IAN) 125/15 Supplementary Guidance for Users of DMRB Volume 11 'Environmental Assessment (October 2015) and Highways England Major Projects Instruction Environmental Impact Assessment: Implementing the Requirements of 2011/92/EU as amended by 2014/52/EU (EIA Directive) (May 2017).

12.1.3 The people and communities chapter considers the potential effects of construction and operation of the Scheme on:

- Land Use – effects on private property and associated land-take, land used by the community, development land and agricultural land (in accordance with DMRB Volume 11, Section 3, Part 6);
- Journey Length, Patterns and Amenity – changes to journey length, local travel patterns, journey amenity affecting pedestrians, cyclists and equestrians (in accordance with DMRB Volume 11, Section 3, Part 8);
- New Severance and Relief from Existing Severance; where changes to pedestrian journeys and traffic flows may affect severance from community facilities (in accordance with DMRB Volume 11, Section 3, Part 8); and
- Vehicle Travellers – changes in the view from the road and driver stress (in accordance with DMRB Volume 11, Section 3, Part 9).

12.1.4 There may be interrelationships between the People and Communities assessment and other disciplines, notably:

- Chapter 7: Air Quality;
- Chapter 10: Landscape;
- Chapter 11: Noise and Vibration; and
- Chapter 14: Geology and Soils.

12.1.5 The term 'community' has been interpreted to include facilities that provide services and resources for the local population (such as education, healthcare, places of worship, leisure facilities, community centres and areas of public open space).

12.2 Study Area

Land Use

12.2.1 The study area for direct impacts on private property, community facilities, development land and agricultural land will be restricted to the footprint of the Scheme, associated works and locations where access arrangements (for

example to private properties or community facilities) may be affected.

Journey Length, Patterns and Amenity

- 12.2.2 For the assessment of journey length, patterns and amenity, a 500m corridor either side of the Scheme will be used to identify PRow that could be affected.

Community Severance

- 12.2.3 For the assessment of new severance from community facilities and relief from existing severance, the study area will include PRow affected by the Scheme (new severance only) and the following roads:

- A5036, between the Switch Island Interchange and Princess Way;
- Broom's Cross Road between the Switch Island Interchange and the new junction at Brickwall Lane; and
- The new section of carriageway between Broom's Cross Road and the A5036, Princess Way.

Vehicle Travellers

View from the Road

- 12.2.4 The study area for this assessment will include the general extent of views from new sections of carriageway. The characterisation of general views from the road will be undertaken.

Driver Stress

- 12.2.5 Guidance does not define a study area for driver stress. The assessment will consider existing driver stress on the:
- A5036, between the Switch Island Interchange and Princess Way;
 - Broom's Cross Road between the Switch Island Interchange and the new junction at Brickwall Lane; and
 - The new section of carriageway between Broom's Cross Road and the A5036, Princess Way.

12.3 NN NPS Requirements

- 12.3.1 The following sections of the NN NPS are relevant to the People and Communities topic.

Land Use

- 12.3.2 Paragraph 5.165 of the NN NPS states that an ES should identify existing and proposed land uses near the Scheme, including the effects of replacing an existing development or use, or the effects associated with precluding a new development or use proposed in the development plan.

- 12.3.3 In relation to open space and recreation, paragraph 5.166 of the NN NPS states that:

“existing open space, sports and recreational buildings and land should not be developed unless the land is surplus to requirements or the loss would be

replaced by equivalent or better provision in terms of quantity and quality in a suitable location”.

12.3.4 With regards to agricultural land, paragraph 5.168 states that:

“Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality.”

Journey Length, Pattern and Amenity, and Community Severance

12.3.5 The NN NPS identifies key considerations and requirements in relation to accessibility, severance and non-motorised users, requiring schemes to minimise adverse impacts.

12.3.6 The NN NPS expects applicants to improve access on and around the national networks by designing and delivering schemes that take account of the accessibility requirements of everyone who uses, or are affected by the network. It advises all reasonable opportunities to deliver improvements in accessibility on and to the existing network should also be taken. Applicants are advised to seek to deliver improvements that reduce community severance and improve accessibility.

12.3.7 The NN NPS recognises the importance of Public Rights of Way (PRoW), National Trails and other rights of access to land for walkers, cyclists and equestrians. Where severance occurs, mitigation measures are required to address adverse effects. Where possible access should be improved. The character, use and attractiveness of the area need to be taken into consideration.

12.3.8 The NN NPS identifies there is a direct role for the national road network to play in helping pedestrians and cyclists. It states “the Government expects applicants to use reasonable endeavours to address the needs of cyclists and pedestrians in the design of new schemes”, particularly in relation to accessibility, safety and severance.

12.3.9 As part of this, evidence is required to show that projects have used reasonable endeavours to address any existing severance issues that act as a barrier to non-motorised users. It also requires applicants to identify opportunities to invest in infrastructure where the national road network severs communities and acts as a barrier to cycling and walking “by correcting historic problems, retrofitting the latest solutions and ensuring that it is easy and safe for cyclists to use junctions.”

12.3.10 The NN NPS sets out the duty of applicants to promote equality and comply with any obligations under the Equalities Act 2010.

12.3.11 The NN NPS also sets out requirements in relation to the impacts of projects on health, in particular if they affect access to key public services, local transport, opportunities for cycling and walking or the use of open space for recreation and physical activity.

12.3.12 Projects are required to identify and set out the assessment of any likely significant adverse health impacts.

Vehicle Travellers

- 12.3.13 The NN NPS acknowledges that traffic congestion can impact negatively on quality of life by leading to a marked deterioration in the experience of road users. Congestion can cause frustration and stress to those with time-pressured journeys.
- 12.3.14 There are no specific assessment requirements outlined for vehicle travellers in the NN NPS.

12.4 Consultation Undertaken and Proposed

- 12.4.1 Table 12-1 presents details of consultations undertaken to date during the options appraisal and sets out consultation proposed.

Table 12-1 Details of Consultation Undertaken and Proposed

Consultations Undertaken	Date	Information Obtained
Sport England	03/06/2016	Email sent from Sports England with the pre-application advice for sports pitches affected by the Scheme.
SMBC Health, Sport England	28/06/2016	Health impacts of the options on people and communities.
Consultations Proposed	Date	Information to be Obtained
SMBC	TBC	Information on footpaths and of amenity land.
Sport England	TBC	Information on playing pitches that may be affected by the Scheme.

12.5 Baseline Information

- 12.5.1 Baseline information is shown on Figure 12-1 (Land Use) and 12-2 (Rights of Way and Community Assets). Agricultural Land Classification is shown on Figure 12-3.

Land Use

- 12.5.2 Within the footprint of the Scheme the following private property receptors have been identified:
- Edge Farm commercial and residential property
 - Ash Road commercial and residential properties
 - Brookhouse Farmhouse Boarding Kennels (commercial property)

- Rushton Garden Centre (commercial property, however since the PRA an application for residential development was submitted for this plot)
- 12.5.3 Within the footprint of the Scheme the following community receptors have been identified:
- Rimrose Valley Country Park (designated as a 'Countryside Recreation Area')
 - Beach Road and Queensway Allotments
 - Buckley Hill Sports Field
 - Play Football Sports Ground
 - Chaffers Playing Fields
 - Brookvale Playing Fields
 - Green belt land
- 12.5.4 Important recreational features include the Rimrose Valley County Park, Brookvale Local Nature Reserve, the Leeds and Liverpool Canal and Woodlands Park. The Rimrose Valley area acts as an important local recreational area for the adjacent urban areas of Kirby and Litherland, and falls within the Mersey Forest.
- 12.5.5 Within the footprint of the Scheme the following development land has been identified within A Local Plan for Sefton (Sefton Metropolitan Borough Council, April 2017):
- Housing Allocation Zone MN2.27
- 12.5.6 There are no strategic employment or business locations identified within the Scheme footprint.
- 12.5.7 The ALC maps indicate that the Scheme runs mainly through areas of land classified as 'land predominantly in urban use'. However, just to the south and north of Lydiate Lane, near to the Broom's Cross Road, the land is classified as Grade 1 and 2 (excellent and very good). The National Planning Policy Framework (NPPF, March 2012) defines the best and most versatile land as Grades 1, 2 and 3a.

Journey Length, Patterns and Amenity

- 12.5.8 There are several PRoW which are located adjacent to, or intersect with, sections of the Scheme. The PRoW considered within the assessment have been identified from the Sefton Council definitive mapping. All PRoWs are classified as footpaths as detailed below and shown on Figure 12-2:
- Sefton N5 – 900 metre footpath between Brookhouse Farmhouse in Netherton, which runs north along Chapel Lane and Fouracres in Maghull. ProW is part of Trans Pennine Trail
 - Sefton N3 & N4 – 500 metre footpath between Chapel Lane which crosses Broom's Cross Road connecting to footpaths N4 & N5 in farmland
 - Sefton N4, N5 & N14 – 1.2 km footpath between Northern Perimeter Road

in Netherton which crosses Broom's Cross Road connecting to footpaths N4 in farmland with Bridges Lane in Sefton

- Litherland N8 - 1.2 km footpath between Edge Lane in Buckley Hill towards the Leeds and Liverpool Canal within Rimrose Valley
- Litherland N6, N10 & N11 – 550 metre footpath between Brindley Close in Litherland and which crosses the Leeds and Liverpool Canal and Rimrose Valley west towards Derwent Road in Crosby
- Litherland N12 – 200 metre footpath between Field Lane in Litherland and which crosses the Leeds and Liverpool Canal west into Rimrose Valley
- Litherland N1 & N2 & Crosby N19 – 550 metre footpath between Field Lane in Litherland, which crosses the Leeds and Liverpool Canal, west into Rimrose Valley and continuing under the railway line ending at Sandy Road in Seaforth

12.5.9 Along the existing A5036, shared use paths follow both sides of the A5036 for most of the way between Switch Island Interchange and the southern end of Bootle Golf Course, with on road signed cycle routes crossing the A5036 via a pedestrian crossing at Kirkstone Road and a cycle crossing at Beach Road/Penrhyn Avenue.

12.5.10 Some early NMU counts are available which show frequency of use of PRoW within the study area.

Community Severance

12.5.11 In addition to the community facilities noted above, the following additional facilities have been identified within the 500m study area for considering community severance:

- Sport and Leisure Facilities: Dunnings Bridge Road Allotments, Northern Perimeter Road Leisure Units, Bootle Golf Course, Litherland Sports Park, Switch Island Retail Park, Goals Liverpool North, Netherton Park Neighbourhood Centre
- Education: 16 Primary Schools, 5 Secondary Schools and Savio Salesian College
- Religious Buildings: numerous churches within residential areas;
- Commercial (Shopping Areas): Waterloo Primary Shopping Area and Town Centre
- Health and Emergency Services: Thornton Crematorium, Copy Lane Police Station, Dunningsbridge Centre.

Vehicle Travellers

View from the Road

12.5.12 The new carriageway would lie within and pass through the Rimrose Valley, including Rimrose Valley Country Park.

12.5.13 The existing A5036 passes through a largely built up area with limited views

beyond structures that block views of the surrounding area. There are some parts of this route with intermittent views of green spaces (parkland areas).

12.5.14 Road users on Broom’s Cross Road currently experience some wider, open views.

12.5.15 More details about the local landscape and townscape character can be found in Chapter 10.

Driver Stress

12.5.16 A quantitative analysis using preliminary traffic data was undertaken which demonstrated high existing levels of driver stress on the A5036 due to congestion.

12.6 Value of Environmental Resources and Receptors

12.6.1 The value or sensitivity of resources affected by the Scheme has been categorised based on the perceived type and value of the asset or facility using guidance from DMRB Volume 11, Section 3, Parts 6, 8 and 9 and professional judgement.

12.6.2 The value of each resource/ receptor will vary due to a number of factors including:

- The extent to which the resource/ receptor is duplicated in the locality, with alternative provision available on a comparative basis;
- The extent of the catchment area that is served by the resource/ receptor and mode of access;
- The proximity of the resource/ receptor to the scheme;
- The extent to which the operation of the resource/ receptor will be impacted; and
- The extent to which the resource/ receptor is central to/ directly affects quality of life.

Land Use and Journey Receptors

12.6.3 Table 12-2 provides a summary of the values / sensitivities assigned to the relevant groups of receptors within the study area.

Table 12-2 Value of Land Use, Community and Journey Receptors

Value	Description of Receptor
High	Residential or commercial buildings Buildings and land designated for use by the community e.g. schools, community halls, health facilities, playing fields Community land that attracts users nationally e.g. national parks Religious sites and cemeteries Land identified for residential development in local development plans Most versatile agricultural land – i.e. land classified as grades 1, 2 or 3a

Value	Description of Receptor
Medium	Residential or commercial land e.g. gardens. Land used by the community on a regional scale, e.g. country parks, forests and other land managed in such a way as to attract visitors from a regional catchment. Locally used community land, e.g. local parks and children’s play areas National and Regional recreational routes Lower quality agricultural land – grades 3b, 4 and 5
Low	Derelict or unoccupied buildings and land Locally used footpaths e.g. PRow

Vehicle Travellers

12.6.4 For the assessment of driver stress and traveller views there is no methodology for assigning a value to resources and receptors.

12.7 Potential Effects including Mitigation Measures

Land Use

Construction Phase

- 12.7.1 Construction of the Scheme is expected to directly affect Edge Farm, Ash Road and Seaforth Road commercial and residential properties and the housing allocations to the North of the Scheme.
- 12.7.2 The Scheme will pass though Rimrose Valley Country Park which will result in the loss of recreational land.
- 12.7.3 Sports fields which are likely to be affected (directly and indirectly) by the Scheme are:
- Buckley Hill Sports Field;
 - Play Football Sports Ground;
 - Chaffers Playing Fields; and
 - Brookvale Playing Fields.
- 12.7.4 The housing allocations identified within the study area may be encroached upon by the Scheme footprint.
- 12.7.5 Both Brookhouse Farmhouse Boarding Kennels and Rushton Garden Centre lie on the Scheme boundary, which may affect their use or access.
- 12.7.6 The Scheme will require temporary and permanent land take of agricultural land at Grade 1 and 2.
- 12.7.7 The Scheme would be developed to minimise permanent and temporary land-take where possible. The right to compensation and methods and / procedures for assessing appropriate levels of such, would be identified in relation to the National Compensation Code. Where necessary, continued consultation would be necessary with landowners, occupiers and agents, as the Scheme developers

manage and reduce impact on day-to-day activities as far as practicably possible. Mitigation for the loss of public open space and agricultural land will be determined through design, and discussion with Sport England and SMBC.

Journey Length, Patterns and Amenity, and Community Severance

Construction Phase (Journey Length only)

- 12.7.8 PRow which intersect the Scheme are all likely to be temporarily affected by the construction of the Scheme in some way, however most are likely to be temporarily diverted.
- 12.7.9 In order to minimise disruption to NMU routes and PRow temporary diversions would be put in place together with appropriate signage. Information in advance and during the closures would help to reduce any inconvenience caused to users of the PRow. This would be carried out in consultation with the local highways authority, Sefton MBC and other interested stakeholders.

Operation Phase

- 12.7.10 Several footpaths will be permanently changed by the Scheme. The new route may be perceived as a barrier to movement across the Rimrose Valley area.
- 12.7.11 Through design, there is an overall intention to leave a network of footpath connections and green space in place once the Scheme is constructed. The Scheme will also seek to improve existing footpaths within the area.
- 12.7.12 Footbridges and underpasses will be suitable for use by wheelchair users and consider the safety of vulnerable users. Rights of way would need to be accessible to all NMU users including people with disabilities.
- 12.7.13 There may be some relief from existing severance on the existing A5036 as a result of moving traffic from this congested area to a purpose-built route.

View from the Road

- 12.7.14 Travellers views are likely to be limited, as the Scheme will be within either cutting or false cutting depending on the vertical alignment. Where travellers views are restricted, innovative approaches to creating a positive environment through planting and lighting will be explored.

Driver Stress

- 12.7.15 As the proposed route provides a larger clearer road to travel on, driver frustration and fear of accidents is likely to reduce for users of the strategic road network.
- 12.7.16 However, the new route is currently designed for 50mph; but will have a high percentage HGVs compared to other roads due to it functioning for the port.
- 12.7.17 Driver stress could be minimised along the new route through ensuring minimised congestion, maximising safety and appropriate road signage.

12.8 Proposed Level and Scope of Assessment

- 12.8.1 The Scheme has the potential to result in significant effects on receptors in construction and operation. The phases and scenarios to be assessed are noted in Table 12-3.

Table 12-3 Phases and Scenarios for Assessment

Assessment	Phases for Assessment	Scenarios for Assessment
Land Use	Construction	n/a
Changes to Journey Length and Pattern	Construction Operation	Opening Year with the Scheme
Changes to Journey Amenity	Operation	Opening Year with the Scheme
New Severance	Operation	Opening Year with the Scheme
Relief from Existing Severance	Operation	Opening Year (Do Minimum, Do Something)
View from the Road	Operation	Opening Year, Design Year
Driver Stress	Operation	Opening Year (Do Minimum, Do Something)

12.9 Proposed Methodology Including Significance

12.9.1 The people and communities assessments follow the approach set out in DMRB Volume 11 'Environmental Assessment', Section 3, Part 6 'Land Use' Chapter 1 – 11, Section 3 Part 8 'Pedestrians, Cyclists and Equestrians and Community Effects', and Section 3 Part 9 'Vehicle Travellers'.

Land Use

12.9.2 The methodology for the Land Use assessment comprises a number of stages:

- Identify the importance (value) of receptors identified;
- Determine the magnitude of impact, both without mitigation and with consideration of any embedded measures; and
- The significance of effect is then derived by comparing the value of receptors with the magnitude of effect.

Baseline and Value of Receptors

12.9.3 The assessment of effects on land use would take into account demolition and/or land-take that will directly affect the land in question.

12.9.4 The baseline outlined in Section 1.5 will be reviewed and updated.

12.9.5 ALC has been identified as noted in Section 1.5. Site allocations within 'A Local Plan for Sefton' (SMBC, 2017) have been identified.

12.9.6 Planning applications within the footprint of the Scheme will be identified and those that are likely to be impacted by the Scheme or applications for major development will form part of the Land Use assessment. Minor householder applications will not be included.

12.9.7 Table 12-2 above will be used to identify the value of resource, with professional judgement applied where receptors are within more than one value category.

Magnitude of Impact

12.9.8 Unless otherwise specified, the definitions of magnitude of impact and significance of effect have been developed using professional judgement from those presented in the DMRB. Table 12-4 sets out how the magnitude of impacts will be assessed for the Land Use assessment.

Table 12-4 Magnitude of Impacts – Land Use

Score	Definition
Major Adverse	Loss of resource or severe damage to resource. For example: The demolition of buildings or significant loss of land (>50% of total footprint) Complete severance of access to private or commercial asset Permanent loss or degradation of over 20ha of best and most versatile land (BMVL), or entire regional resource of BMVL (ALC Grades 1, 2, 3a). Existing land-use would not be able to continue
Moderate Adverse	Where the extent of effects may be moderate. For example: Moderate loss of land (between 25% to 50% of total footprint) Major severance of access to private or commercial asset Permanent loss or degradation of 5-20ha of BMVL, or large proportion of regional resource of BMVL. Existing land-use would be able to continue but with major changes such as loss of yield, additional land management or increased use of fertilisers and herbicides.
Minor Adverse	Where the extent of effects are considered to be minor. For example: Minor loss of land (<25% of total footprint) Some partial or temporary severance of access to private or commercial asset Permanent loss or degradation of <5ha of BMVL, or small proportion of regional resource of BMVL. Existing land-use would be able to continue but with some changes such as loss of yield, additional land management or increased use of fertilisers and herbicides.
Negligible Adverse	Very minor detrimental alteration to the characteristics of one or more receptor(s) Permanent loss or degradation of non-BMVL BMVL. Short-term impacts to receptors with no impact on integrity. No material change to existing land-use
No change	No observable impact in either direction, positive or negative

Score	Definition
Negligible Beneficial	Very minor benefit, or positive addition to the characteristics of one or more receptor(s)
Minor Beneficial	Some measurable positive change for example in employment levels,
Moderate Beneficial	Where there may be moderate beneficial effects (for example improved access to local services and facilities)
Major Beneficial	Large scale or major improvement of resource; extensive enhancement (for example significant employment creation)

12.9.9 Table 12-5 sets out how assessments of significance would be made.

Table 12-5 Determination of the Significance of Impacts

Magnitude of Impact (Change)	Value/sensitivity of Receptor / Resource		
	High	Medium	Low
Major	Major	Major	Moderate
Moderate	Major	Moderate	Minor
Minor	Moderate	Minor	Minor
Negligible	Minor	Minor	Negligible

Journey Length, Patterns and Amenity

Changes to Journey Length and Patterns

- 12.9.10 In order to identify changes to journey length and pattern, key community facilities will be mapped and their relative catchment areas established.
- 12.9.11 Some early NMU counts are available which show user flows on PRow within the study area. The following average journey speeds will be assumed:
- 5 km/hr for people on foot;
 - 10 km/hr for equestrians; and
 - 20 km/hr for cyclists.
- 12.9.12 The PRow identified in Section 1.5 will be mapped, along with changes to these as a result of the Scheme and proposed mitigation measures. Road routes where traffic flows are anticipated to increase or reduce by greater than 30% in the opening year will also be highlighted.
- 12.9.13 Where a route to a community facility is severed, an alternative facility will be identified. The assessment will then provide a schedule of the lengths of journeys without the Scheme, with the Scheme and by using an alternative facility. An estimated of the number of people affected will be made for each case.

Changes to Journey Amenity

- 12.9.14 The assessment of changes to Journey Amenity will be approached qualitatively. Journey amenity is a factor of relative fear/safety (affected by traffic flows and distance from the road), noise, dirt and air quality, as well as the visual intrusion of the Scheme itself.
- 12.9.15 For each of the key journeys identified in the Journey Length and Pattern assessment, a description will be provided to give the overall impression of change in amenity and the estimated number of journeys affected.

Community Severance

New Severance

- 12.9.16 Temporary and permanent severance caused by the Scheme would be assessed in line with DMRB in terms of the change in access to community facilities. This assessment will take some of the information from the land use assessment regarding community facilities, and the changes to journey length and pattern assessment.
- 12.9.17 The scale of severance criteria in Table 12-6 is based on DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993) and uses multi-dimensional criteria covering the change in length to journeys, the type of crossing, and impacts on accessing community facilities.

Table 12-6 Description of New Severance Impacts

Scale	Description	Examples
Slight	Current journey pattern likely to be maintained, with some disturbance to the route	Pedestrian at-grade ² crossing of a new road carrying below 8000 vehicles per day (AADT); A new bridge would need to be climbed or a subway traversed; Journey distance would increase by up to 250 metres.
Moderate	Some residents would be dissuaded from making trips, other trips made longer or less attractive	Two or more of the hindrances set out under slight applying to single trips; Pedestrian at-grade crossing of a new road carrying between 8,000 – 16,000 vehicles per day (AADT) in the opening year; Journeys would be increased by 250-500 metres.
Severe	People likely to be deterred from making their trip to the point that they make	Pedestrian at-grade crossing of a new road carrying over 16,000 vehicles per day (AADT) in the opening year;

² Describing a junction or intersection where two or more transport axes cross at the same level (or grade). An at-grade intersection may require a traffic-control device such as a stop sign, traffic light or railway signal to manage conflicting traffic.

Scale	Description	Examples
	alternative arrangements of their habits, leading to a change in the location of centres of activity, or loss of a community. Would also include considerable hindrance to journeys	An increase in length of journeys of over 500 metres; Three or more of the hindrances set out under slight severance or two or more set out under moderate severance.

Relief from Existing Severance

12.9.18 The scale of relief from existing severance will be derived from AADT traffic flows and interpreted using criteria from DMRB Volume 11, Section 3 Part 8 – Relief from Existing Severance, as shown in Table 12-7. The roads identified for the assessment will be considered to be those within a built-up area.

Table 12-7 Level of Relief from Existing Severance

	Slight	Moderate	Substantial
Built-Up Area	c.30%	30-60%	60%+
Rural Area	60-75%+	75-90%+	90%+

Vehicle Travellers

View from the Road

12.9.19 These would be assessed through site visits to the proposed route undertaken by the landscape architect. The assessment would take account of the vertical alignment of the proposed carriageway in relation to existing ground level and mitigation measures (which could include environmental barriers (for noise and visual screening), false cutting and tree and shrub planting).

12.9.20 This would comprise a qualitative assessment considering changes in the view from the road both with and without the Scheme for users of the following roads identified in Section 1.2. In accordance with DMRB guidance Volume 11 Section 3 Part 9 (Highways Agency, 1993) with views from the road will be categorised as follows:

- No view – road in deep cutting or contained by earth bounds, environmental barriers or adjacent structures;
- Restricted view – frequent cuttings or structures blocking the view;
- Intermittent view – road generally at ground level but with shallow cuttings or barriers at intervals; and
- Open view – view extending over many miles, or only restricted by existing landscape features.

Driver Stress

12.9.21 The scale of driver stress will be assessed using the following criteria extracted from DMRB Volume 11, Section 3, Part 9 (Table 12-8 and Table 12-9).

Table 12-8 Driver Stress Ratings for Single Carriageway Roads

Average hourly flow per lane, in flow Units/1 hour	Average Journey Speed (km/h)		
	Under 50	50 – 70	Over 70
Under 600	High	Moderate	Low
600 – 800	High	Moderate	Moderate
Over 800	High	High	High

Table 12-9 Driver Stress Ratings for Dual Carriageway Roads

Average hourly flow per lane, in flow Units/1 hour	Average Journey Speed (km/h)		
	Under 60	60 - 80	Over 80
Under 1200	High	Moderate	Low
1200-1600	High	Moderate	Moderate
Over 1600	High	High	High

Future Baseline

12.9.22 Future baseline information would be collected in relation to predicted population and economic growth, as well as data relating to planning applications and development sites.

12.10 Assumptions and Limitations

12.10.1 No specific limitations have been identified at this stage.

13 ROAD DRAINAGE AND THE WATER ENVIRONMENT

13.1 Introduction

- 13.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on Road Drainage and the Water Environment, and reporting potential significant effects.
- 13.1.2 The Scheme has the potential to result in effects on road drainage and the water environment, particularly to the flood risk, water quality and water resource attributes of surface water and groundwater receptors within the study area.
- 13.1.3 There may be interrelationships related to the potential effects on road drainage and the water environment and other disciplines, comprising:
- Chapter 8: Cultural Heritage;
 - Chapter 9: Biodiversity; and
 - Chapter 14: Geology and Soils.

13.2 Study Area

- 13.2.1 DMRB Volume 11, Section 2, Part 5 HA205/08 requires study areas to be defined on a 'case-by-case basis, reflecting the Scheme and surrounding environment over which significant effects can be reasonably thought to have the potential to occur, both from that Scheme and in combination with other projects.' The study area for the potential effects on the road drainage and the water environment is therefore defined to include the entire application site as well as all surface water features within 500m of the Scheme boundary and all groundwater features within 1km of the Scheme boundary.
- 13.2.2 Based on professional judgement, these areas are considered sufficient to include all potentially affected groundwater and surface water receptors. However, if the Scheme has the potential to affect the water environment beyond these envelopes, the study area would be extended appropriately.

13.3 NN NPS Requirements

- 13.3.1 The NN NPS sets out the Government's policies to deliver the development of NSIPs on the national road and rail networks in England. The SoS uses the NN NPS as the primary basis for making decisions on DCO applications. The road drainage and water environment aspects of the NN NPS are presented in paragraphs 5.90 to 5.115 for flood risk and paragraphs 5.219 to 5.231 for water quality and resources.

Flood Risk

- 13.3.2 The NN NPS states that all projects in Flood Zones 2 and 3, medium and high flood risk respectively, should be accompanied by a Flood Risk Assessment (FRA) as well as all projects in Flood Zone 1, low flood risk, that are in a CDA and/or over one hectare in size. The study area contains areas of Flood Zone 2 and areas of Flood Zone 1 within a Critical Drainage Area (CDA), the EIA will therefore require the production of a site-specific FRA. The FRA will be produced in line with the NN NPS, with specific guidance outlined below. Paragraph 5.94

states that:

"In preparing a FRA the applicant should:

- Consider the risk of all forms of flooding arising from the project (including in adjacent parts of the UK), in addition to the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated so that the development remains safe throughout its lifetime;*
- Take the impacts of climate change into account, clearly stating the lifetime over which the assessment has been made;*
- Consider the vulnerability of those using the infrastructure including arrangements for safe access and exit;*
- Include the assessment of the remaining (residual) risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular project;*
- Consider if there is a need to remain operational during a worst-case flood event over the development's lifetime; and*
- Provide the evidence of the SoS to apply the Sequential Test and Exception Test, as appropriate."*

13.3.3 During the decision-making process, paragraphs 5.98 to 5.99 state that:

- "Where flood risk is a factor in determining an application for development consent, the SoS should be satisfied that, where relevant:*
- The application is supported by an appropriate FRA; and*
- 'The Sequential Test has been applied as part of site selection and, if required, the Exception Test.*

13.3.4 When determining an application, the SoS should be satisfied that flood risk will not be increased elsewhere and only consider development appropriate in areas at risk of flooding where it can be demonstrated that:

- Within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and*
- Development is appropriately flood resilient and resistant, including safe access and escape routes, where required, and that any residual risk can be safely managed, including by emergency planning, and priority is given to the use of sustainable drainage systems."*

Water Quality and Resources

13.3.5 The NN NPS provides information regarding what should be included in the applicant's assessment of water quality and resources in paragraph 5.221 to 5.223. Paragraph 5.223 states that:

- "Any environmental statement should describe:*
- The existing quality of waters affected by the proposed project;*

- Existing water resources affected by the proposed project and the impacts of the proposed project on water resources;
- Existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project, and any impact of physical modifications to these characteristics;
- Any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive (WFD) and source protection zones (SPZs) around potable groundwater abstractions; and
- Any cumulative effects.”

13.3.6 During the decision-making process for projects, paragraphs 5.225 to 5.226 state that:

- “The SoS will generally need to give impacts on the water environment more weight where a project would have adverse effects on the achievement of the environmental objectives established under the WFD.
- The SoS should be satisfied that a proposal has regard to the River Basin Management Plans and the requirements of the WFD and its daughter directives. In terms of WFD compliance, the overall aim of projects should be no deterioration of ecological status in watercourses.”

13.3.7 The NN NPS also states that mitigation measures put forward with applications (including water recycling, good pollution control practices and Sustainable Drainage Systems (SuDS)) should be considered alongside proposals within the decision-making process.

13.4 Consultation Undertaken and Proposed

13.4.1 As detailed in Table 13-1, the EA and SMBC, as the Lead Local Flood Authority (LLFA), will be contacted to obtain the most recent flood risk, water quality and water resource data, including modelled flood data, where available, to establish the baseline conditions.

13.4.2 United Utilities, the sewerage and water provider for the study area, will be consulted to provide baseline sewer, drainage and water network information.

Table 13-1 Details of Consultation Undertaken and Proposed

Consultee	Date	Information Obtained	Consultation Proposed
Environment Agency	September 2015	Baseline flood data and site information; Consultation responses on scheme options; Confirmation of the scope for earlier stage	Confirm the scope the Flood Risk Assessment, to agree study areas and to confirm if a WFD compliance assessment would be required; Confirm the necessary climate change allowances; and Collection of further baseline data.

Consultee	Date	Information Obtained	Consultation Proposed
		assessments.	
Sefton Metropolitan Borough Council	May 2016; September 2016; March 2017	Baseline flood data and site information; Confirmation of the scope for earlier stage assessments	Confirm the scope requirements/ design standards for highways drainage in a CDA; Confirm necessary climate change allowances; and, Collection of further baseline data on local sources of flood risk.
Canal & Rivers Trust	August 2016	Baseline flood data and site information.	N/A
United Utilities	None to date.	N/A	Collection of baseline data on the local sewerage, drainage and water networks.

13.5 Baseline Information

Baseline Information Obtained/Surveys Undertaken

- 13.5.1 The baseline information outlined below will be used to determine the value (sensitivity) of surface water receptors. The valuation of environmental receptors forms the basis of the assessment of the potential effects of the Scheme, which will be reported in the ES.
- 13.5.2 The baseline has been informed by previous studies to date and supplemented by consultation with relevant bodies and with readily available internet-based sources, including:
- Flood Estimation Handbook (FEH) Web Service;
 - Soilscales, interactive map;
 - What's In Your Backyard? interactive maps;
 - EA Catchment Data Explorer website;
 - MAGIC interactive map;
 - Ordnance Survey (OS) Explorer 1:25,000 maps;
 - 1:250,000 Soil Map of England and Wales; and
 - Geology of Britain Viewer, interactive map.

Surface and Groundwater Features

Surface Water

- 13.5.3 The Scheme is divided between the catchments of the River Alt in the north, and the Rimrose Brook in the south. In addition, the Leeds and Liverpool Canal is

- located between 150m and 1200m east of the Scheme, as shown on Figure 13.1.
- 13.5.4 The Scheme is located in the catchment of the River Alt for a 3km stretch of carriageway between the Switch Island Interchange (at the junction between the M57, M58, A59 and A5038), located at National Grid reference (NGR) 336784 400145, to the proposed new overbridge at Edge Lane, located at NGR 334108 400074.
- 13.5.5 The River Alt is an EA designated Main River that flows north westwards approximately 500m north of the Scheme and drains a catchment of over 100km² to the downstream limit of the study area. The Scheme crosses two tributaries of the River Alt in this stretch; a tributary of the Moor Hey Brook and the Netherton Brook; these are presented within Figure 13.1.
- 13.5.6 The Moor Hey Brook is an EA designated Main River that flows north westwards between 150m and 500m north of the Scheme. The Moor Hey Brook confluences with the River Alt approximately 850m west (downstream) of the Switch Island Interchange and to this point drains a catchment of approximately 2.8km². A surface water drain and minor tributary of the Moor Hey Brook, flows northwards approximately 550m west of the Switch Island Interchange and to the crossing by the Scheme, at NGR 336064 400471, drains a small, less than 1km², catchment.
- 13.5.7 The Netherton Brook is an EA designated Main River that flows northwards approximately 1km west of the Switch Island Interchange. The Netherton Brook confluences with the River Alt 1.1km north west (downstream) of the Switch Island Interchange and to this point drains a catchment of approximately 2km². The Scheme crosses the Netherton Brook 600m south (upstream) of the confluence, at NGR 335882 400546.
- 13.5.8 The Scheme is located in the catchment of the Rimrose Brook for a 3km stretch of carriageway from the overbridge at Edge Lane to the intersection with the A5036 (Princess Way), located at NGR 333320 397173.
- 13.5.9 The Rimrose Brook is an ordinary watercourse that flows in an anticlockwise arc along the Scheme route and drains a catchment of 4.0km² to the downstream limit of the study area. It is current thinking that the Rimrose Brook is culverted for approximately 1.3km through a combined sewer for a section of the Rimrose Valley Country Park, beneath the proposed carriageway route, from NGR 333214 399182 to NGR 332962 397900. The culvert crosses the entire historical landfill site, as identified in Chapter 14 Geology and Soils. The sewer is also fed by groundwater, surface water and local wetlands.
- 13.5.10 Upstream of the culvert, the alignment of the Scheme is proposed to follow the current route of the Rimrose Brook for approximately 300m, from 700m upstream of the culvert opening. Along this section, the Brook is proposed to be diverted towards an attenuation pond (centred at NGR 333591 399279), from NGR 333649 399506. The diversion requires an additional culvert to be created, centred at NGR 333549 399389, which redirects waters towards the attenuation pond.
- 13.5.11 The Rimrose Brook emerges from the culvert at NGR 332962 397900 and flows south eastwards towards the A5036. The alignment of the Scheme is proposed

to follow the current route of the Rimrose Brook and the watercourse is proposed to be diverted into an extant surface water drain, with the diversion located from NGR 333050 397560 to NGR 333071 397524. The diversion requires three additional culverts to be created from the original Rimrose Brook channel to the drain, centred at NGR 333053 397431, NGR 333105 397369 and NGR 333158 397329. Two additional culverts are required between the diversion and the culvert emergence, located at NGR 332925 397881 and NGR 332928 397727.

- 13.5.12 The Rimrose Brook is also culverted beneath the existing alignment of the A5036, between the Switch Island Interchange and the Princess Way roundabout, at NGR 335484 398485.
- 13.5.13 There are two ponds located in proximity to the Scheme, centred at NGR 334006 399971 and NGR 333479 399183, located in the Rimrose Valley County Park these are presented within Figure 13.1. The ponds are not located on the proposed route, but are within 100m of the proposed carriageway.
- 13.5.14 The Rimrose Brook catchment as well as much of the River Alt catchment is located within the Bootle CDA. Drainage issues within this area primarily relate to surface water and sewer flooding, in particular along the historical flow paths that would have fed the Rimrose Brook. Groundwater is also highlighted as a source of flood risk in the CDA, as reported in the Sefton Strategic Flood Risk Assessment.
- 13.5.15 The Leeds and Liverpool Canal flows in an anticlockwise arc approximately parallel to and between 150m and 1200m east of the Scheme. The Leeds and Liverpool Canal is crossed at two locations by the existing alignment of the A5036, between the Switch Island Interchange and the Princess Way roundabout, located at NGR 336477 399326 and NGR 333697 397398.

Geology and Soils

- 13.5.16 Most of the soils underlying the Scheme (>80%) consist of naturally wet very acid sandy and loamy soils. The natural wetness of these soils means they are more susceptible to leaching and therefore have the potential to open pollution pathways to underlying aquifers. The northern and southern boundaries of the study area are designated as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils with impeded drainage, with limited leaching potential.
- 13.5.17 Superficial geology over the study area consists of a combination of Alluvium – clay, silt, sand and gravel; Till, Devensian – Diamicton; and the Shirdley Hill Sand Formation – sand with potential peat layer. This geology supports a combination of Secondary A and Secondary (undifferentiated) aquifers. Secondary A aquifers are rock layers or drift deposits capable of supporting water supplies at local, rather than strategic, scales and may form an important source of base flow to rivers. Secondary (undifferentiated) aquifers are minor and non-aquifers in different locations, due to variable characteristics of the rock type.
- 13.5.18 The bedrock geology consists of sandstone from the Sellafeld Member and the Wilmslow Formations, which support a Principal aquifer (described in paragraph 13.5.19). Principal aquifers are rock layers with high permeability and therefore provide a high level of water storage and may support water supply and river

baseflow on a strategic scale.

Groundwater Quality and Resources

- 13.5.19 The Scheme is underlain by the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone (bedrock) Aquifer. The aquifer is designated with quantitative and chemical statuses of 'Poor', but targeting 'Good' by 2027.
- 13.5.20 The study area does not contain any Source Protection Zones (SPZs).
- 13.5.21 The methodology for assessment the impacts to geology and soils, and the potential for contamination of aquifers is presented in Chapter 14 of this report.

Surface Water Quality

- 13.5.22 The water quality of waterbodies within the study area has been characterised using data from the 2015 second cycle of the WFD. Within the study area, there are three WFD-assessed waterbodies:
- River Alt (GB112069061442), downstream of Bull Bridge;
 - River Alt (GB112069061441), upstream of Bull Bridge; and
 - Ditton Brook (GB112069061390), Halewood to Mersey Estuary.
- 13.5.23 The boundary between the River Alt WFD-assessed catchments is located at Bull Bridge, approximately 2.8km west of the Switch Island Interchange, located at NGR 335573 402525.
- 13.5.24 Both assessed reaches of the River Alt have an ecological status of 'Moderate' and a chemical status of 'Fail', both limited by priority hazardous substances – tributyltin compounds. The reaches are targeting 'Good' overall status by 2027.
- 13.5.25 The Ditton Brook reach has an ecological status of 'Moderate', targeting 'Good' by 2027, and a chemical status of 'Good'.
- 13.5.26 All reaches are designated under the Nitrates Directive³ (European Commission, 1991) and the River Alt reaches are further designated under the Urban Waste Water Treatment Directive⁴ (European Commission, 1991).
- 13.5.27 The surface water quality of the Netherton Brook, Moor Hey Brook and Rimrose Brook are not specifically assessed within the 2015 cycle of the WFD. Therefore, the surface water quality of these watercourses, targeting 'Good' status by 2027, has been inferred from the River Alt and Ditton Brook reaches.

Flood Risk

³ The Nitrates Directive (1991), a key component of the WFD, aims to protect water quality across Europe by ensuring the use of good farming practices to prevent nitrates, from agricultural sources, entering surface water and groundwater resources. Watercourses designated under the Nitrates Directive are those at risk of pollution or already polluted. The Nitrates Directives is linked to Nitrate Vulnerable Zones, which designates areas (zones) of land that drain to already polluted, or at risk, watercourses.

⁴ The Urban Waste Water Treatment Directive (1991) aims to protect the environment from the adverse effects of urban waste water, including domestic, industrial and mixed waters. The Directive requires the collection and treatment of all waste waters; pre-authorisation for all discharges; monitoring of receiving waters; and controls of sewage sludge disposal.

Fluvial

- 13.5.28 The EA Flood Map for Planning (Figure 13.2) indicates that most (over 95%) of the study area is in Flood Zone 1, low risk (land having a less than 1 in 1,000 annual probability) of flooding from rivers or the seas.
- 13.5.29 A small section in the north east of the study area, located at the Switch Island Interchange, is in Flood Zone 2, medium risk (land having between a 1 in 100 (1%) and 1 in 1,000 (0.1%) annual probability) of flooding from river or the sea.
- 13.5.30 The EA Flood Map for Planning identifies flood defences located along both banks of the River Alt and the Moor Hey Brook between the Switch Island Interchange and their confluence, however no information on the standard or type of these defences is available on-line.
- 13.5.31 The EA Flood Map for Planning does not include flooding from watercourses with catchment areas below 3km². As such, the classification of most of the study area in Flood Zone 1 is indicative of the small catchments sizes through the study area, in particular in the Rimrose Valley County Park. Flood risk from smaller catchments, including Rimrose Brook and its tributaries, will be assessed as part of the EIA and in the supporting site-specific FRA.

Pluvial

- 13.5.32 The entire study area that is located within Flood Zone 1 is also designated as within the Bootle CDA, containing over 95% of the study area. A CDA identifies an area within Flood Zone 1 with critical drainage problems and which has been notified to the local authority by the EA. The designation as a CDA means that surface water runoff must be managed to a high standard.
- 13.5.33 The EA Flood Risk from Surface Water map (Figure 13.2) indicates that most of the study area has a very low, less than 1 in 1,000 (0.1%), annual probability of surface water flooding. However, areas in proximity to surface waterbodies (particularly in the north east of the study area near the River Alt and Moor Hey Brook, and through the Rimrose Valley County Park) are designated with a low (land having between 1 in 100 (1%) and 1 in 1,000 (0.1%) annual probability of surface water flooding) to high risk (land having a greater than 1 in 30 (0.33%) annual probability) of surface water flooding, which corresponds to the likelihood for surface water flows to be directed towards most watercourses, as they are the lowest points in the terrain. In addition, the study area contains numerous scattered pockets of low to high risk of surface water flooding, which corresponds to areas of lower topography, where surface water pooling is likely, or represents surface water overland flow paths.

Groundwater

- 13.5.34 The study area is underlain by a Principal bedrock aquifer and Secondary A aquifer and therefore has the potential for groundwater emergence. The SMBC Strategic Flood Risk Assessment indicates that parts of the borough are at risk of groundwater flooding, which includes 'isolated patches associated with the Rimrose Brook'. Most of the study area is designated within a 'Major Aquifer High' groundwater vulnerability zone. During a previous Ground Investigation groundwater strikes were recorded at depths ranging from 0.50 m below ground

level (bgl) to 9.20 m bgl and in flatter, low lying parts of the study area groundwater emergence at ground level is therefore possible.

Artificial Sources

13.5.35 The EA Risk of Flooding from Reservoirs map indicates that most (over 95%) of the study area is not located within the maximum extent of reservoir flooding, should large reservoirs fail and release the water they hold. However, the north east corner of the study area, at the Switch Island Interchange and in proximity to the River Alt, is identified as being at risk. The consequences of reservoir breach can be very high, however continuing management of reservoirs under the Reservoirs Act 1975 serves to greatly reduce the likelihood of reservoir flooding.

13.5.36 The Scheme is located between 150m and 1200m west of the Leeds and Liverpool Canal. The proximity of the canal to the Scheme means that there is a potential flood risk from this source, which will be assessed in the FRA.

Flood Risk Assessment

13.5.37 A minor proportion of the study area is in Flood Zone 2 and the remainder of the study area, which occupies an area greater than one hectare, is in a CDA. As such, and following the guidance of the NN NPS and National Planning Policy Guidance and accompanying flood risk and coastal change planning practice guidance, a FRA is required to support the scheme. The FRA will assess flood risk from all sources to ensure no increase in flood risk from the Scheme within the Scheme boundary or to third party areas as a result of the Scheme.

Abstractions and Discharges

13.5.38 The Envirocheck Report produced for the Scheme identifies six abstractions within 1km of the Scheme, which are summarised in Table 13-2 (duplicates and revoked licences are not included). All licences are for industrial, agricultural or recreational uses and have been assigned a medium value, in line with DMRB Volume 11, Section 3, Part 10 HD45/09.

Table 13-2 Licensed Surface Water and Groundwater Abstractions

Operator	Licence Number	Source	Yearly Rate (m3)
British Waterways	2459030989	Surface Water	227
British Waterways	2569030047	Canal	Not supplied
Liverpool Tanning Co. Ltd	2569030026	Groundwater	136363
Total Fitness Health Clubs Ltd	Nw/069/0031/004	Groundwater	Not supplied
Total Fitness UK Ltd	2569031136	Groundwater	Not supplied
W. Counce	2569031063	Surface Water	40914

13.5.39 There are 21 licensed discharges within 1km of the Scheme. It is considered that these discharges would be maintained at current levels, therefore limiting potential changes (impact) from or on the Scheme. However, where the Scheme requires a watercourse diversion this could reduce streamflow available for the dilution of downstream discharges, and the proposed route of the Scheme could interrupt physical discharge infrastructure, including outfall pipes, headwalls and pumping stations. These impacts will require assessment in the EIA.

Designated Sites

13.5.40 The Scheme boundary contains the Brookvale LNR. This LNR consists of wetlands that have been created on reclaimed land arising from a previous landfill site. The potential for the leaching of pollutants from the landfill to groundwater will be reported in the Geology and Soils ES Chapter. This LNR is designated due to these wetlands and the associated reed beds and the presence of the sedge warbler and impacts to these ecological receptors will be reported in the Biodiversity ES Chapter.

13.5.41 There are no further statutory designated sites (SSSI, SAC, SPA, LNR or Ramsar) within the study area.

Other Baseline Information to be Obtained

13.5.42 No specific details on the surface water drainage regime are currently available for the Scheme and study area. Further survey, including topographical analysis and identification of local drainage/sewerage infrastructure via web-based sources and through consultation with stakeholders, is required to identify the current drainage regime in the study area, in particular for the Rimrose Brook, as well as to identify the available drainage connections. A site visit will also be undertaken to confirm locations of existing drainage and culverts.

13.5.43 Furthermore, the Scheme's outline drainage strategy consists of a series of attenuation ponds and tanks, pumping stations, culverts and minor watercourse diversions. A more specific drainage strategy, informed by the additional drainage regime surveys, will be required for the ES reporting. The drainage strategy will be substantially influenced by the vertical alignment of the Scheme, whereby a pumped drainage regime may be required should the Scheme be designed in cut.

13.6 Value of Environmental Resources and Receptors

13.6.1 The environmental value of a receptor is characterised by identifying and analysing its quality, scale, rarity and substitutability and in accordance with HD45/09. Table 13-3 summarises the values (sensitivities) of key water environment receptors within the study area, based on their flood risk/land drainage, water quality and water resources attributes.

Table 13-3 Importance (Value) of Water Environment Receptors

Receptor	Attribute	Value	Supporting Information
River Alt	Flood Risk	Medium	Regional-scale attribute surrounded by Flood Zones 2 and 3, which contains between 1 and 100 residential/industrial properties.

Receptor	Attribute	Value	Supporting Information
	Water Quality	Medium	Watercourse is targeting 'Good' overall status by 2027.
Moor Hey Brook	Flood Risk	Low	Local-scale attribute with limited probability of flooding of residential and industrial properties.
	Water Quality	Medium	Quality inferred from River Alt, but which is targeting 'Good' overall status by 2027.
Netherton Brook	Flood Risk	Low	Local-scale attribute with limited probability of flooding of residential and industrial properties.
	Water Quality	Medium	Quality inferred from River Alt, but which is targeting 'Good' overall status by 2027.
Rimrose Brook	Flood Risk	Low	Local-scale attribute with limited probability of flooding of residential and industrial properties.
	Water Quality	Medium	Quality inferred from River Alt, but which is targeting 'Good' overall status by 2027.
Minor Ponds and Tributaries	Flood Risk	Low	Local-scale attribute with limited probability of flooding of residential and industrial properties.
	Water Quality	Medium	Quality inferred from River Alt, but which is targeting 'Good' status by 2027.
Leeds and Liverpool Canal	Flood Risk	Medium	Regional-scale attribute with limited flood potential but floodplain containing between 1 and 100 residential and industrial properties.
Surface Water and Groundwater Abstractions	Water Resources	Medium	Local-scale attribute supporting non-potable industrial, agricultural and recreational uses.
Principal Aquifer	Groundwater Resource and Quality	High	Provides a regionally important groundwater resource to residential and commercial abstractions and supports river baseflow.
Secondary Aquifer	Groundwater Resource and Quality	Medium/High	Provides a locally important groundwater resource to residential and commercial abstractions and may support river baseflow.
Principal/Secondary Aquifer	Flood Risk	Medium/Low	Regional -scale attribute with potential for groundwater emergence.

13.7 Potential Effects including Monitoring and Mitigation Measures

13.7.1 The potential effects of the Scheme have been identified in accordance with HD45/09.

Construction

13.7.2 Construction works for the Scheme require the creation of:

- Retaining walls
- Overbridge structures
- Attenuation ponds
- Culverts
- Outfalls
- Watercourse diversions.

13.7.3 The construction works could also require a significant number of earthworks, including cuttings, embankments, piling and dewatering.

13.7.4 Potential effects during the construction phase are summarised in Table 13-4.

Operation

13.7.5 During operation, the potential impacts of the Scheme relate to the increased discharge of sediments and pollutants from road surfaces, due to the increase in traffic volumes as well as increased volumes of surface water runoff, due to increases in impermeable surfacing.

13.7.6 Potential effects during the operational phase are summarised in Table 13-4.

Table 13-4 Potential Effects to Water Environment Receptors

Receptor Attribute	Construction /Operation	Potential Effects
Flood Risk	C/O	Requirement for new watercourse crossings or alterations to existing crossings; which has the potential to impact on the flow conveyance and capacity of these waterbodies, resulting in increased flood risk local to the crossings.
	O	Increased surface water flood risk associated with creation of new impermeable areas generating higher rates and volumes of rainfall runoff.
	O	Drainage of new cuttings may increase stream flows and increase the risk of flooding.
	O	Diversion or alteration of existing drains and discharge points could alter existing catchment hydrology and drainage patterns.
	C/O	Construction in the floodplain (Flood Zone 2) causing a loss of floodplain storage leading to increased flood risk elsewhere.
Water Quality	C	Runoff during construction phase activities could cause deterioration in water quality of nearby surface water or groundwater receptors, as a result of sedimentation or pollution.

Receptor Attribute	Construction /Operation	Potential Effects
	O	Pollution of nearby surface water or groundwater receptors associated with the routine runoff from the highway following new or existing flow paths during the operational phase of the Development.
	O	Spillages associated with vehicular traffic on the new road alignment as well as increased volumes on the existing routes (identified for improvement) has the potential to cause detrimental effects on water quality attributes of surface water and groundwater receptors.
	C	Groundworks causing disturbance of historical landfill mobilising polluting leachate to groundwater and surface waters.
Water Resources	C/O	Loss of integrity to existing abstractions and discharges should the sources of supply/receiving waterbody suffer pollution or reductions in flow.
Hydrogeology	C	Interception of groundwater during construction and localised increase of groundwater flooding.
	C/O	Localised increase in groundwater levels due to the damming of natural groundwater flow paths.
	C/O	Derogation of water supplies due to lowering of the groundwater table by dewatering/groundwater control to enable construction (particularly if the Scheme is in cut).
	C/O	Consolidation of underlying soils potentially leading to changes in groundwater flow.
	C/O	Changes in groundwater levels due to new highway drainage regime.
	O	Potential reduction of recharge through an increased hardstanding area.
	C	Earthworks and piling may open pollution pathways to groundwater or alter groundwater flow pathways.

Potential Mitigation Measures

Pollution Prevention and Incident Response

- 13.7.7 To ensure the quality of the water environment does not deteriorate during construction implementation of best-practice construction phase pollution prevention methods, as outlined in industry standard guidance, would be adopted. Such measures would be documented in a Construction Environmental Management Plan (CEMP), prepared, managed and monitored by the main contractor. Additional measures are also likely to be required to prevent pollution

of surface and groundwater due to the legacy of land contamination in parts of the study area. These are described in Chapter 14: Geology and Soils.

Sustainable Water Use

- 13.7.8 To promote the sustainable use of water resources, measures would be implemented during the initial construction and demolition phase, where possible, to promote general water use efficiency and particularly reduce the use of potable water. Examples include rainwater harvesting to provide water supply for the construction welfare facilities and for use in dust suppression, the collection of greywater for use in wheel washing facilities and leakage prevention.

Flood Risk Reduction and Groundwater Management

- 13.7.9 To prevent any increase in flood risk from the construction and operation of the Scheme, several measures would be embedded into the design. These would include management of surface water runoff using Green Infrastructure and appropriate Sustainable Drainage Systems (SuDS) to attenuate rates of surface water discharge, provision of compensation for any loss of floodplain storage and sensitive design of new or modified culverts for watercourse crossings or diversions/realignments.
- 13.7.10 The design would also minimise possible deleterious groundwater level changes (lowering) and groundwater quality changes, based on the findings of a Hydrogeological Risk Assessment and informed by Ground Investigation data, as detailed in Chapter 14.

13.8 Proposed Level and Scope of Assessment

Design Manual for Roads and Bridges

- 13.8.1 DMRB and associated IANS outline the methodology for the assessment of potential effects arising from road schemes, as defined and referred to by the NN NPS. Specific to road drainage and the water environment is HD45/09. Following this guidance allows the assessment to comply with the requirements of the NN NPS as well as determining whether the impacts from the Scheme are considered significant on road drainage and the water environment. The details of the assessment methodology are provided in Section 13.8.
- 13.8.2 Following the HD45/09, the assessment undertaken to inform this Scoping Report has consisted of a simple, qualitative desk study using readily available published data and consultation with relevant bodies, including the EA and SMBC. More detailed, site-specific quantitative assessments would be undertaken, as necessary, during later stages and which includes the FRA and the WFD compliance assessment.
- 13.8.3 The methodology for the assessment will follow that provided in HD45/09. Direct and indirect effects on surface water and groundwater quality, flood risk and water resources will be considered during the construction and operation phases of the Scheme. The potential for cumulative effects will also be assessed.

13.9 Proposed Methodology Including Significance

Guidance

- 13.9.1 The assessment of road drainage and the water environment would be conducted in accordance with the guidance outlined in HD45/09, the WFD Guidance, and the National Planning Policy Framework (NPPF) and associated planning practice guidance. Relevant guidance documents are listed below:
- HD45/09 DMRB Volume 11, Section 3, Part 10, May 2007;
 - IAN 125/15 Environmental Assessment and Screening and Determination;
 - Directive 2000/60/EC of the European Parliament (the Water Framework Directive);
 - Water Environment (Water Framework Directive) (England and Wales) Regulations 2003;
 - Practical Method for Determining the Significance of Impacts on the Water Environment, Mustow et al., 2005;
 - National Planning Policy Framework;
 - National Planning Policy Framework: Planning Practice Guidance, Flood Risk and Coastal Change; and
 - PINS Advice Note 18: The Water Framework Directive (June, 2017) Version 1.
 - The HD45/09 and NN NPS require several different types of assessment to be undertaken, including:
 - Flood Risk Assessment;
 - Water Framework Directive Compliance Assessment; and
 - Highways Agency Water Risk Assessment Tool.

Flood Risk Assessment

- 13.9.2 An FRA is an assessment of the likely risk of flooding, from all flood mechanisms to a scheme. The aim of an FRA is to identify whether a site can be developed safely, and without increasing flood risk to the site or third parties. The FRA applies the Sequential and Exception tests to assess the flood risk to sites and provides guidance on necessary flood mitigation measures, where risks are identified, to ensure the site would be safe over the lifetime of the scheme.

Water Framework Directive Compliance Assessment

- 13.9.3 A WFD Compliance Assessment is an assessment of the potential for a development to affect waterbodies or lead to modifications in waterbodies that could result in the waterbodies failing to meet the environmental objectives of the WFD.

Highways Agency Water Risk Assessment Tool

- 13.9.4 The Highways Agency Water Risk Assessment Tool (HAWRAT) has been developed to assess the potential impact from polluted surface water runoff from roads on the local water environment and ecology.
- 13.9.5 HAWRAT uses an estimation of the likely change in traffic numbers from a

scheme to calculate the probable release of pollution onto a road surface and then transported into nearby waterbodies. The quantity of pollutant released can then be compared with toxicity thresholds to identify acceptable pollution levels, which would lead to no adverse impacts to the environment, as well as enable mitigation measures to be implemented where thresholds are likely to be exceeded.

Proposed Assessment Methodology

13.9.6 The road drainage and water environment assessment methodology is based on that detailed in the HD45/09. This methodology is supplemented with the guidance from the WFD and the paper 'Practical Methodology for Determining the Significance of Impacts on the Water Environment'. IAN 125/15 Environmental Assessment and Screening and Determination will also be referenced to inform the scope of the assessment.

13.9.7 The methodology comprises a number of stages:

- The importance (value) of the water receptors is identified
- The magnitude of impact is assessed, both without mitigation and with consideration of any embedded measures
- The significance of effect is then derived by comparing the importance of attributes with the magnitude of effect.

13.9.8 Where significant effects are identified, further mitigation measures would be proposed and the residual effects of the Scheme can be determined.

13.9.9 The HD45/09, Mustow and WFD methodologies follow the source-pathway-receptor method, where all components of the system need to be in existence for significant effects to occur.

Assessment Periods/Scenarios

Construction

13.9.10 Construction impacts will be assessed for the full duration of the construction phase, including during demolition and ground preparation work phases. The construction programme timeline is predicted to commence in March 2020 lasting for three years.

Operation

13.9.11 In accordance with HD45/09, the projected opening year (2023) will be used to undertake the predictions for the ES.

Future Baseline

13.9.12 The future baseline (i.e. the Do Minimum scenario) will be based on the projected opening year of the option (2023).

Significance Criteria

Importance of Water Environment Attribute

13.9.13 The first stage of the adopted assessment methodology, from HD45/09, requires the assignment of environmental importance to identified receptors. This

judgement is made based on quality, scale, rarity and substitutability. The categories of importance of each resource is assessed using the criteria in Table A4.3 of HD45/09 (Estimating the Importance of Water Environment Attributes), provided in Table 13-5 below.

Table 13-5 Estimating the Value of Water Environment Attributes

Value	Construction /Operation	Potential Effects	Typical Examples
Very High	Attribute has a high quality and rarity on a regional or national scale.	Surface Water	EC Designated Salmonid/Cyprinid Fishery WFD Class 'High' Site protected/designated under European Commission (EC) or United Kingdom (UK) habitat legislation (SAC, SPA, SSSI, Water Protection Zone (WPZ), Ramsar site, salmonid water) or species protected by EC legislation.
		Groundwater	Principal aquifer providing a regionally important resource or supporting site protected under EC and UK habitat legislation. Source Protection Zone (SPZ) 1.
		Flood Risk	Floodplain or defence protecting more than 100 residential properties from flooding.
High	Attribute has a high quality and rarity on local scale.	Surface Water	WFD Class 'Good' Major Cyprinid Fishery Species protected under EC or UK habitat legislation.
		Groundwater	Principal aquifer providing locally important resource or supporting river ecosystem SPZ2.
		Flood Risk	Floodplain or defence protecting between 1 and 100 residential properties or industrial premises from flooding.
Medium	Attribute has a medium quality and rarity on local scale.	Surface Water	WFD Class 'Moderate'.
		Groundwater	Aquifer providing water for agricultural or industrial use with limited connection to surface water SPZ3.
		Flood Risk	Floodplain or defence protecting 10 or fewer industrial premises from flooding.
Low	Attribute has	Surface	WFD Class 'Poor'.

Value	Construction /Operation	Potential Effects	Typical Examples
	a low quality and rarity on a local scale.	Water	
		Groundwater	Unproductive strata.
		Flood Risk:	Floodplain with limited constraints and a low probability of flooding of residential and industrial premises.

Magnitude of Impact

13.9.14 The magnitude of each impact (change) on the baseline conditions is assessed based on the expected scale/extent of the change, the nature and the duration of the impact. Impacts may be either beneficial (positive) or adverse (negative), which will be highlighted when assessing the magnitude of impacts using the criteria provided in Table A4.4 of HD45/09 (Estimating the Magnitude of an Impact on Attribute), provided in Table 13-6 below.

Table 13-6 Estimating the Magnitude of an Impact

Magnitude	Criteria	Typical Examples	
Major Adverse	Results in loss of attribute and/or quality and integrity of the attribute.	Surface Water	Failure of both soluble and sediment-bound pollutants in HAWRAT (Method A, Annex I) and compliance failure with EQS values (Method B) Calculated risk of pollution from a spillage >2% annually (Spillage Risk Assessment, Method D, Annex I) Loss or extensive change to a fishery Loss or extensive change to a designated Nature Conservation Site
		Groundwater	Loss of, or extensive change to, an aquifer Potential high risk of pollution to groundwater from routine runoff – risk score >250 (Groundwater Assessment, Method C, Annex I) Calculated risk of pollution from spillages >2% annually (Spillage Risk Assessment, Method D, Annex I) Loss of, or extensive change to, groundwater supported designated

Magnitude	Criteria	Typical Examples	
			<p>wetlands</p> <p>Flood Risk Increase in peak flood level (1% annual probability) >100 mm (Hydrological Assessment of Design Floods and Hydraulic Assessment, Methods E and F, Annex I)</p>
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute.	Surface Water	<p>Failure of both soluble and sediment-bound pollutants in HAWRAT (Method A, Annex I) but compliance with EQS values (Method B)</p> <p>Calculated risk of pollution from spillages >1% annually and <2% annually</p> <p>Partial loss in productivity of a fishery</p>
		Groundwater	<p>Partial loss or change to an aquifer</p> <p>Potential medium risk of pollution to groundwater from routine runoff – risk score 150-250</p> <p>Calculated risk of pollution from spillages >1% annually and <2% annually</p> <p>Partial loss of the integrity of groundwater supported designated wetlands</p>
		Flood Risk	<p>Increase in peak flood level (1% annual probability) >50 mm</p>
Minor Adverse	Results in some measurable change in attribute quality or vulnerability.	Surface Water	<p>Failure of either soluble or sediment-bound pollutants in HAWRAT</p> <p>Calculated risk of pollution from spillages >0.5% annually and <1% annually</p>
		Groundwater	<p>Potential low risk of pollution to groundwater from routine runoff – risk score <150</p> <p>Calculated risk of pollution from spillages >0.5% annually and <1% annually</p> <p>Minor effects on</p>

Magnitude	Criteria	Typical Examples	
			groundwater supported wetlands
		Flood Risk	Increase in peak flood level (1% annual probability) >10mm
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity	The proposed scheme is unlikely to affect the integrity of the water environment.	
		Surface Water	No risk identified by HAWRAT (Pass both soluble and sediment-bound pollutants) Risk of pollution from spillages <0.5%
		Groundwater	No measurable impact upon an aquifer and risk of pollution from spillages <0.5%
		Flood Risk	Negligible change in peak flood level (1% annual probability) <+/- 10 mm
Minor Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring.	Surface Water	HAWRAT assessment of either soluble or sediment-bound pollutants becomes Pass from an existing site where the baseline was a Fail condition Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is <1% annually)
		Groundwater	Calculated reduction in existing spillage risk by 50% or more to an aquifer (when existing spillage risk <1% annually)
		Flood Risk	Reduction in peak flood level (1% annual probability) >10 mm
Moderate Beneficial	Results in moderate improvement of attribute quality.	Surface Water	HAWRAT assessment of both soluble and sediment-bound pollutants becomes Pass from an existing site where the baseline was a Fail condition Calculated reduction in existing spillage by 50% or more (when existing spillage risk >1% annually)
		Groundwater	Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is >1% annually)

Magnitude	Criteria	Typical Examples	
		Flood Risk	Reduction in peak flood level (1% annual probability) >50 mm
Major Beneficial	Results in major improvement of attribute quality.	Surface Water	Removal of existing polluting discharge, or removing the likelihood of polluting discharges occurring to a watercourse
		Groundwater:	Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring Recharge of an aquifer
		Flood Risk:	Reduction in peak flood level (1% annual probability) >100 mm

Significance of Effect

13.9.15 The overall significance of effects on hydrology, flood risk, surface and groundwater receptors is then calculated by combining the value (sensitivity) of the receptor with the magnitude of the impact (change), as shown in Table A4.5 of HD45/09 (Estimating the Significance of Potential Effects), provided in Table 13-7 below.

Table 13-7 Estimating the Significance of Potential Effects

Importance of Attribute	Magnitude of Impact			
	Negligible	Minor	Moderate	Major
Very High	Neutral	Moderate / Large	Large / Very Large	Very Large
High	Neutral	Slight / Moderate	Moderate / Large	Large / Very Large
Medium	Neutral	Slight	Moderate	Slight / Moderate
Low	Neutral	Neutral	Slight	Slight / Moderate

13.9.16 Where more than one significance outcome is possible, professional judgement is used to determine which is most appropriate on a case-by-case basis and ensuring regard to the precautionary principle.

13.9.17 Significant effects may be either beneficial (positive) or adverse (negative) and this will be highlighted when assessing residual effects.

13.10 Assumptions and Limitations

13.10.1 The methodology reported above is based on best practice, policy, guidance and advice at the time of reporting.

13.10.2 Quantitative assessments reported in the ES would be based upon the accuracy and assumptions of data received by third parties. These assumptions and

limitations would be reported within the ES.

14 GEOLOGY AND SOILS

14.1 Introduction

- 14.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on geology and soils, and reporting potential significant effects.
- 14.1.2 The Geology and Soils chapter discusses geology, hydrogeology and contaminated land. Soils in relation to Agricultural Land Classification (ALC) and agricultural land use are discussed in Chapter 12: People and Communities.
- 14.1.3 There may be interrelationships related to the potential effects on geology and soils, and other disciplines comprising:
- Chapter 9: Biodiversity;
 - Chapter 12: People and Communities;
 - Chapter 13: Road Drainage and the Water Environment; and
 - Chapter 15: Materials.

14.2 Study Area

- 14.2.1 The study area, for geology and geotechnical considerations, will be limited to the proposed route and associated reconstruction and working areas as shown on Figures 1.3 and 1.4.
- 14.2.2 For contaminated land considerations, the study area will include an area up to 250m from the boundaries of the proposed route and associated works. This will enable assessment of the impact of the construction on the ground conditions, including potential for mobilisation of contaminants, migration of hazardous ground gases, and changes in the groundwater and surface water regime (to inform Chapter 13: Road Drainage and the Water Environment, which will cover a wider study area).
- 14.2.3 With regards to hydrogeology, the study area will be defined to reflect the surrounding hydrogeological features and the distance over which significant effects can reasonably be considered to have the potential to occur.
- 14.2.4 The proposed study areas for geology and contaminated land are presented on Figure 14.1.

14.3 NN NPS Requirements

- 14.3.1 The NN NPS contains limited details relating directly to geology and soils. Geological conservation is covered within the Biodiversity and Ecological Conservation chapter and relates to sites that are designated for their geology and / or their geomorphological importance.
- 14.3.2 Where schemes require EIA, the ES must set out any likely significant effects on soils and on internationally, nationally and locally designated sites of geological conservation importance. The scheme should demonstrate how it has taken advantage of opportunities to conserve and enhance geological conservation interests.

14.3.3 Development should avoid significant harm to geological conservation interests, including mitigation and consideration of reasonable alternatives. Where significant harm cannot be avoided or mitigated, appropriate compensation measures should be sought, as a last resort.

14.3.4 The NN NPS states that:

“Applicants should identify any effects, and seek to minimise impacts, on soil quality, taking into account any mitigation measures proposed. Where possible, developments should be on previously developed (brownfield) sites provided that this is not of high environmental value. Where developments are on previously developed land, applicants should ensure they have considered the risk posed by land contamination and how it is proposed to address this.”

14.3.5 Land quality is referred to in the Pollution Control and Other Environmental Protection Regimes section. This states that issues relating to discharges or emissions from a proposed project which affect air quality, water quality, land quality and the marine environment may be subject to separate regulations under the pollution control framework or other consenting and licensing regimes.

14.4 Consultation Undertaken and Proposed

14.4.1 No geology and soils specific consultations have been undertaken regarding the Scheme to date.

14.4.2 Table 14-1 summarises the consultations to be undertaken to inform the assessment.

Table 14-1 Details of Proposed Consultations

Consultations Proposed	Information to be Obtained
Local Authority Contaminated Land Officer / Environmental Health Department for the study area	Information they hold relating to potentially contaminative activities and pollution incidents on and near the study area, including records relating to the former landfilling operations and subsequent environmental monitoring.
Environment Agency	Information they hold relating to potentially contaminative activities and pollution incidents on and near the study area, including records relating to the former landfilling operations and subsequent environmental monitoring.

14.5 Baseline Information

Baseline Information Obtained/Surveys Undertaken

14.5.1 The baseline information outlined below will be used to determine the value (sensitivity) of sensitive receptors. The valuation of environmental receptors forms the basis of the assessment of the potential effects of the Scheme, which will be reported in the ES.

14.5.2 The baseline has been informed by previous studies to date and supplemented by readily available sources, including:

- MAGIC website (<http://www.magic.gov.uk/>);
- Envirocheck Reports produced by Landmark Information Group;
- The Environment Agency website (<http://maps.environment-agency.gov.uk/wiyby>);
- British Geological Survey (BGS) Geindex website (<http://www.bgs.ac.uk/geoindex/>) and Georecords website (<http://mapapps.bgs.ac.uk/GeoRecords/GeoRecords.html>);
- BGS Lexicon of Named Rock Units website (<http://www.bgs.ac.uk/lexicon/>);
- BGS 1:50,000 scale Solid geology map sheet 83 Formby, 1976;
- BGS 1:50,000 scale Drift geology map sheet 83 Formby, 1974;
- The Coal Authority Interactive Map Viewer (<http://mapapps2.bgs.ac.uk/coalauthority/home.html>); and
- Atkins Ltd, A5036 Port of Liverpool Access Study, Preliminary Ground Investigation Interpretive Report, March 2016.
- Atkins Ltd, A5036 Port of Liverpool Access Scheme, Preliminary Sources Study Report, December 2016.

14.5.3 Intrusive investigations were carried out in 1992, 1993, 1994, and 2015.

14.5.4 The following provides a summary of the findings of the PSSR and the EAR (Atkins Ltd, 2016 and Highways England, 2017), in relation to the environmental setting of the study area and potential sources of contamination. The site specific information has been taken from ground investigations undertaken between 21 September and 7 October 2015.

Site Setting

14.5.5 The study area is a linear feature which follows relatively level ground formed by former floodplain associated with River Alt and the now infilled Rimrose Valley. Mapping and topographical information available indicate the present day Rimrose Valley Country Park to be relatively flat. The existing ground levels along the entire preferred route range between approximately 5 m AOD and 19 m AOD, in line with elevations recorded in BGS historical borehole logs (4.83 m AOD to 18.38 m AOD).

14.5.6 The study area is flanked by residential properties with associated social facilities.

14.5.7 A landfill site, Whabbs Tip, is known to be present at the south western end of the Scheme, approximately 500m from Princess Way / Church Road Roundabout. The tip is approximately 1.5 km in length.

Geology

Natural Geology

14.5.8 Geological mapping indicates that the study area is underlain by four units of superficial deposits as listed below and illustrated in Figure 14.2:

- Shirdley Hill Sand – Moderately to well-sorted sand, wind-blown sediment with potential peat layer;
- Till - Over consolidated sandy and/or silty with gravel, cobbles and boulders;
- Alluvium – Clay, silt, sand and gravel;
- Peat; and
- Blown Sand – Sand, pale brown, fine-grained, uncemented.

14.5.9 Geological mapping indicates that the study area is underlain by three different units of solid geology as listed below and illustrated in Figure 14.3:

- Sherwood Sandstone Group of Triassic age comprising;
- Sellafeld Member – Fine to medium grained red-brown sandstone; and
- Wilmslow Sandstone Formation – Fine to medium grained red-brown sandstone; and
- Sidmouth Mudstone Formation - dominantly mudstone and siltstone, red-brown with common grey-green reduction patches and spots

14.5.10 Three major faults bisect the study area, and affect the superficial and solid geology, as indicated on the maps provided in Figures 14.2 and 14.3:

- The Ince Blundell fault has a north west-south east direction and is downthrown to the north east;
- The Crosby fault has a direction north west-south east and is downthrown to the SW. The southern part of the fault is separating in two, this central part is a graben; and
- The Litherland fault trends north north west-south south east and is downthrown to the north east. The part between Crosby and Litherland faults forms a graben.

14.5.11 Based on intrusive investigation, the natural geology has been described as follows:

- Alluvium (Figure 14.2 ref. 3): generally comprised very loose, brown or yellowish/orange brown, silty, fine to medium sand with occasional dark brown organic or peaty material. Cohesive alluvium was encountered within 2 exploratory hole locations and generally comprised soft dark grey to brown, sandy silt or organic clay.
- Shirdley Hill Sand (Figure 14.2 ref. 1): a deposit that may represent the Shirdley Hill Sand was recorded in 4 boreholes and generally comprised brown to grey, occasionally organic, fine to coarse sand.
- Peat (Figure 14.2 ref. 4): A 0.7m to 2.9m thick band of very soft, spongy, dark brown peat was encountered in two locations in the south-west of the site.
- Till (Figure 14.2 ref. 2): Granular glacial till was encountered in 5 exploratory hole locations, and generally comprised medium dense, greyish brown, gravelly, fine to coarse sand. Cohesive glacial till was also encountered in 5

exploratory holes and generally comprised firm to stiff, reddish brown, slightly sandy, slightly gravelly clay.

- Bedrock: Weathered sandstone (Figure 14.3 ref. i and ii) was encountered in 2 exploratory holes and is recorded as extremely weak greyish brown or reddish grey, fine to coarse grained sandstone. Weathered mudstone and/or intact mudstone was encountered in 3 exploratory holes (Figure 14.3 ref. iii). The mudstone was recorded to range from a stiff brown bluish grey gravelly clay to an extremely weak bluish or reddish-brown mudstone.

Made Ground

- 14.5.12 During the 2015 intrusive investigation, which was to provide information of the thickness and nature of the materials in Whabbs Tip, all except three exploratory holes encountered Made Ground. The Made Ground thickness varies between 0.4 m and 9.2 m. It is mainly granular and typically described as silty sand or sandy silt, usually gravelly with occasionally high cobble content. The gravel and cobbles are occasionally natural rock but generally comprise of fragments of brick, concrete, ash, clinker, ceramic, timber, glass, plastic, metal, pottery, masonry, paper, newspaper, rope, bone. This description is consistent with landfill materials. The greatest thicknesses of Made Ground were encountered in the area of Whabbs Tip (up to 9.0 m deep) with surrounding areas recording smaller thicknesses of Made Ground (up to 0.5-2.0m).
- 14.5.13 The ground investigation indicated that Whabbs Tip extends further to the south-west than indicated on the available historical and EA mapping, as illustrated in Figure 14.4.
- 14.5.14 No Regionally Important Geological Sites (RIGS) have been identified within the study area. This has been confirmed by a review of the JNCC Geological Conservation database.

Hydrogeology

- 14.5.15 The superficial deposits are designated by the EA as Secondary A Aquifer (relating to the Shirdley Hill Sand) and Secondary Undifferentiated Aquifer (relating to the alluvium).
- 14.5.16 The EA provides the following definitions:
- Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
 - Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
- 14.5.17 The Sherwood Sandstone Group bedrock is designated as a Principal Aquifer. They are described as layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water

storage. They may support water supply and/or river base flow on a strategic scale.

- 14.5.18 The Scheme is underlain by the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone (bedrock) Aquifer. The aquifer is designated with quantitative and chemical statuses of 'Poor', but targeting 'Good' by 2027.
- 14.5.19 The study area does not lie within any source protection zones (SPZs).
- 14.5.20 During the 2015 intrusive site investigation, generally, groundwater was struck in the majority of the boreholes at depths ranging from 0.50 m bgl to 9.20 m bgl. Standing groundwater levels were recorded at between 7.50 m and 10.50 m AOD by groundwater monitoring.
- 14.5.21 The groundwater sampling from six exploratory holes indicated concentrations of arsenic, boron, cadmium, copper, iron, nickel, anthracene, several PAHs, phenol, sulphate and ammoniacal, nitrogen exceeding the screening criteria used by in the PSSR (Atkins Ltd, 2016).

Hydrology

- 14.5.22 The hydrology of the area is discussed in Chapter 13: Road Drainage and the Water Environment.

Potential Sources of Contamination

- 14.5.23 Review of the historical maps and public register information indicates that there are numerous historical and current potential sources of contamination in the study area. These include (not an exhaustive list); a historic landfill (Whabbs tip 1956 to 1982), unspecified industrial and engineering works, former quarries, breweries, tanneries, garage, scrap metal yards, timber yard, builders yard, tar distillery, rubber works, metal plating factory.
- 14.5.24 Whabbs Tip is described as having been formed by infilling the natural valley and is approximately 1.5 kilometres in length. In 2008, a walkover survey was undertaken which identified the southern edge of the landfill as a steep slope rising five metres above ground level (EAR, Highways England, 2017). Figure 14.4 shows the extent of known landfilling determined. Previous studies have not defined what types of waste were deposited, other than descriptions of the ground conditions observed during the site investigations, as summarised above and described more fully in the PSSR (Atkins Ltd, 2016).
- 14.5.25 Other landfill sites have also been identified outside, though near to, the study area, as indicated on Figure 14.4.

Hazardous Ground Gases

- 14.5.26 Ground gas flows recorded in the 2015 investigation (Whabbs Tip) were low (1.4 l/hr or less) however elevated concentrations of both methane and carbon dioxide (> 30% in two or three locations on more than one occasion) were recorded. This is a significant source of hazardous ground gas so that there is a risk to people and property if this gas is displaced.

Other Baseline Information to be Obtained

- 14.5.27 Further information sources which will be used during the EIA, in addition to those

previously used as outlined in Section 14.5.2, will be as listed below:

- Information held by the Local Authority Contaminated Land Officer/Environmental Health Department, and by the EA not obtained in previous studies. This may include details of industrial activities on and near to the study area, pollution incidents, and records relating to the former landfilling operations and subsequent environmental monitoring.
- A ground investigation is planned across the Scheme to inform the design and to better characterise the potential risk associated with contaminated land, ground strength and stability. An initial design for that intrusive investigation is included in the PSSR (Atkins Ltd, 2016) and this will be refined based on any revision in the Scheme design and any further information obtained.

14.6 Value of Environmental Resources and Receptors

- 14.6.1 Table 14-2 summarises environmental resources and receptors with potential to be impacted by the Scheme and their perceived value, during the construction and operation stages.
- 14.6.2 The potential impact to ecologically sensitive receptors will be assessed in Chapter 9: Biodiversity, which will be informed by this chapter.
- 14.6.3 The potential impact to hydrology features in relation to impact from contaminated land is considered within this chapter and are therefore given a value in Table 14-2 below.
- 14.6.4 Construction and Maintenance Workers are not considered as receptors in the table below as they are governed by other Health and Safety legislation such as CDM Regulations.

Table 14-2 Summary of possible environmental resources and receptors

Environmental Resources and Receptors	Value
Geology <ul style="list-style-type: none"> • Superficial Deposits (Shirdley Hill Sand, Till, Alluvium, Peat and Blown Sand) • Solid Geology (Sherwood Sandstone Group, Sidmouth Mudstone Formation) 	<p>Low</p> <p>Low</p>
Human health <ul style="list-style-type: none"> • Local residents in adjoining properties • People using the public open space and nearby facilities • Road users after construction 	<p>High</p> <p>Low</p> <p>Low</p>
Hydrogeology (Groundwater) <ul style="list-style-type: none"> • Superficial deposits – designated Secondary A and Secondary undifferentiated Aquifer • Sherwood Sandstone Group – designated Principal Aquifer 	<p>Medium</p> <p>High</p>
Hydrology (Surface water)	

<ul style="list-style-type: none"> Rimrose Brook, Tributaries of the protected watercourses 	Medium
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14.7 Potential Effects including Mitigation Measures

Construction and operation phases

14.7.1 Table 14-3 summarises the potential impacts, associated possible receptors or resource, and possible mitigation measures.

Table 14-3 Summary of potential impacts, potential receptors and resources, and potential mitigation measures

Potential impact	Receptor or resource	Potential mitigation measures
Soil consolidation and partial or total excavation of a particular stratum or deposit	Groundwater Surface watercourses	Site investigation and assessment Adjust the horizontal or vertical route profile. Adopting ground improvement or excavation and replacement techniques.
Disturbance and excavation of potentially contaminated land and groundwater leading to migration of contaminants	Human health Groundwater Surface watercourses Property Landfill/waste management	Site investigation and risk assessment Chemical analysis of soil and water to enable waste characterisation prior to re-use on site or off-site disposal. Consideration of possible remediation techniques Minimise the depth of excavation into areas of landfill or contaminated land. Minimising the amount of exposed material and covering the working areas at the end of each working day, control and treatment of solid and liquid contamination.
Disturbance of the ground gas regime leading to potentially increased generation and flow	Human health Property	Site investigation and monitoring Suitable positioning of installed boreholes and subsequent frequent monitoring. Installation of a gas ventilation or barrier system, within the design of the Scheme

Potential impact	Receptor or resource	Potential mitigation measures
Creation of dust and airborne contaminants	Human health	Dust suppression techniques (spray bars, bowsers and nebulisers) Effective design of traffic control measures
Creation of new pollution pathways into underlying aquifers	Human health Groundwater Surface watercourses	Site investigation and risk assessment Consideration of possible remediation techniques Appropriate piling technique selection Restrict excavation into low permeability layers / restricting the depth of excavation Install lining systems if required
Leakages and spillages of fuel or other hazardous chemicals during the construction phase. Discharge of sediment into watercourses.	Human health Groundwater Surface watercourses	Safe storage of hazardous liquids or powders used for the construction phase Colour coding of surface and foul drains and use of drain covers Implement Construction Environmental Management Plan Provision and use of spill prevention kits.
Corrosion of concrete	Proposed structures below ground	Use soil and groundwater chemical analysis to inform concrete design

14.8 Proposed Level and Scope of Assessment

14.8.1 The EIA will use and build on the previous studies, and on the results of further consultations and investigations.

Construction

14.8.2 The EIA will consider the existing and future baseline conditions, and the potential impact of the proposed Scheme on the environmental receptors and resources identified in Section 14.6 during construction.

14.8.3 It will consider disturbance of contaminated land and groundwater and subsequent mobilisation of or increased exposure to contaminants, and will include a preliminary assessment of ground instability (but will not include a

geotechnical assessment).

- 14.8.4 No geologically protected sites have been identified during the baseline study and the geology across the Scheme is considered to be of low value (Table 14-2 above). Therefore, it is proposed to scope out this element and consideration of geology will not be included in the scope of the ES.

Operation

- 14.8.5 It is proposed to scope out all Geology and Soils receptors from the operational phase of the Scheme. The main impact is likely to be from contaminated land and potential effects on hydrogeology which will be dealt with during the construction phase.
- 14.8.6 Geology / ground conditions could be affected during a major accident on the road e.g. oil spillage but this will be assessed in a separate chapter of the ES. Other impacts from an accident would affect the surface water drainage which will be assessed in the Chapter 13.
- 14.8.7 The potential for cumulative effects will also be assessed.

14.9 Proposed Methodology Including Significance

Guidance

- 14.9.1 There is currently no defined methodology for assessing the value of geology receptors, so the assessment of significance will be undertaken using professional judgement.
- 14.9.2 However, in relation to contaminated land, a source, pathway receptor approach in accordance with Environment Agency CLR11 Model Practices (EA, 2004) would be adopted for assessing risks from contaminated soils / groundwater. Contaminant concentrations where available will be screened against appropriate screening values such as the Suitable 4 Use Levels (S4ULs (LQM / CIEH, 2015)). This will be tailored to be an appropriate level of assessment based on the end use (road). Assessment of significance of the risks will be undertaken using professional judgement with guidance based on CIRIA C552.
- 14.9.3 Below is a list of the guidance, legislation and policy which will be referred to in support of the assessment:
- The EU Water Framework Directive 2000; Council Directive 2000/60/EC;
 - The Water Resources Act 1991/2003;
 - Part 2A of the Environmental Protection Act (1990);
 - National Planning Policy Framework (NPPF) (March 2012);
 - The Town and Country Planning Act 1990 and subsequent amendments;
 - The Building Act 1984 and the Building Regulations 2010;
 - The Environmental Permitting (England and Wales) (Amendment) Regulations 2013;
 - DMRB Volume 11 Section 3 Part 11 'Geology and Soils';

- Environment Agency: Model Procedures for the Management of Land Contamination, Contaminated Land Report 11 (CLR 11) (2004);
- Environment Agency: Guiding Principles for Land Contamination (GPLC 1, 2 and 3) (2010);
- Construction Industry Research and Information Association (CIRIA) Guidance C532 'Control of Water Pollution from Construction Sites';
- British Standards 8485:2007 Code of practice for the characterization and remediation from ground gas in affected developments (BS8485:2007);
- CIRIA Guidance C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'; and
- CIRIA C552 Contaminated Land Risk Assessment A guide to good practice (2001).

Hydrogeology

- 14.9.4 In relation to hydrogeology, an assessment of effects will be undertaken that considers derogation (water level and water quality) potential to water interests and environmental receptors. A groundwater features survey will be undertaken using a suitable search radius, according to hydrogeological conditions, to identify all potential interests. An assessment will then be undertaken to determine the significance of development related impacts.

Assessment Periods/Scenarios

Construction

- 14.9.5 Construction impacts will be assessed for the full duration of the construction phase, including during demolition and ground preparation work phases.

Operation

- 14.9.6 As noted in Section 14.8, all Geology and Soils receptors are scoped out of the Operational phase assessment.

Future Baseline

- 14.9.7 Future baseline will be assessed by considering the existing site conditions at the time of the start of construction. If any significant changes in ground conditions has occurred since the ground investigation has taken place for example, potential contaminative uses on or near to the route, landslides / stability issues, then additional investigation would be undertaken to confirm the current conditions.

- 14.9.8 The baseline conditions with regards to geology and soils are not anticipated to alter significantly prior to commencement of the construction of the Project as the majority of the soil and groundwater contamination is historical e.g. Whabbs Tip.

Significance Criteria

- 14.9.9 For determination of significance criteria for the assessment of effects on the receptors/resource, guidance will be sought from CLR11, CIRIA C552 and professional judgement.

14.9.10 The value of the identified receptors / resources will be assessed against the criteria shown in Table 14-4 below. This has been based on the guidance provided in DMRB Volume 11 (Highways Agency, 2009).

Table 14-4 Environmental value (or sensitivity) and typical descriptors

Sensitivity / Value	Description of resource (receptor)
Very High	<p>Geology - Very rare and/or of very high national and regional geological/geomorphological importance with no potential for replacement</p> <p>Hydrogeology - Principal groundwater aquifers (Source Protection Zone 1) or contaminated land with highly mobile contaminants)</p> <p>Hydrology – EC Designated Salmonid/Cyprinid Fishery, WFD Class ‘High, designated sites such as SAC, SPA, SSSI, WPZ, Ramsar site, salmonid water</p> <p>Human Health⁵ – Current / Future users of residential properties with private gardens</p>
High	<p>Geology - Medium national and/or high regional geological/geomorphological importance with limited potential for replacement</p> <p>Hydrogeology - Principal groundwater aquifers (Source Protection Zone 2) or contaminated land with mobile contaminants)</p> <p>Hydrology –WFD Class ‘Good’, Major Cyprinid Fishery, Species protected under EC or UK habitat legislation.</p> <p>Human Health* – Current / Future users of allotments / public open space and nearby residents</p>
Medium	<p>Geology - Low regional and/or high local geological/geomorphological importance with some potential for replacement</p> <p>Hydrogeology - Secondary groundwater aquifers (Source Protection Zone 3) or contaminated land with contaminants of low mobility)</p> <p>Hydrology – WFD Class ‘Moderate’.</p> <p>Human Health* – Current / Future users of residential properties without private gardens</p>
Low	<p>Geology - Local geological/geomorphological importance with potential for replacement</p> <p>Hydrogeology - Secondary groundwater aquifers or contaminated land with immobile contaminants</p> <p>Hydrology – WFD Class ‘Poor’.</p> <p>Human Health* – Current / Future users of the completed highway and</p>

⁵ *Duration of exposure to contamination and number of pathways of exposure to contamination increases from commercial/industrial (minimum) to residential with private garden (maximum) land uses. Therefore, future users of industrial sites are considered to be of negligible importance as they would have minimal contact with underlying soils, whilst residential ends users are likely to be in contact with underlying soils on a more regular basis and are therefore of very high value.

	associated landscaping
Negligible	<p>Geology - Little local geological/geomorphological interest</p> <p>Hydrogeology - Non-aquifers and brownfield land with negligible contamination</p> <p>Hydrology – WFD Class ‘Poor’.</p> <p>Human Health* – Current / Future users of commercial / industrial properties</p>

14.9.11 The magnitude of impacts on receptors / resources will be described using the criteria outlined in Table 14-5 below.

Table 14-5 Criteria for Determining the Magnitude of Impacts

Magnitude of Impact	Definition
Major adverse	<p>Geology - The Scheme is very damaging to the geological environment/soils resource of the study area; may result in loss of or damage to areas designated as being of regional or national geodiversity value; and the effects cannot be mitigated.</p> <p>Human Health - Significant harm to a designated receptor (e.g. human health) is likely to arise from an identified hazard at the site without appropriate remedial action.</p> <p>Hydrogeology - Loss of, or extensive change to an aquifer used for potable supply, potential high risk of pollution of groundwater.</p> <p>Hydrology - Loss or extensive change to a fishery, Loss or extensive change to a designated Nature Conservation Site</p>
Moderate adverse	<p>Geology - The Scheme may result in the loss of or damage to areas designated as being of national and/or regional geodiversity value within the study area. Some mitigation may be possible but would not prevent damage to the geological environment, as some features of interest would be lost or partly destroyed.</p> <p>Human Health It is possible that without appropriate remedial action, significant harm to a designated receptor (e.g. human health) could arise to a designated receptor but it is relatively unlikely that any such harm would be severe and if any harm were to occur, it is likely that such harm would be relatively mild.</p> <p>Hydrogeology - Partial loss or change to an aquifer, potential medium risk of groundwater pollution. Partial loss of the integrity of groundwater supported designated wetlands.</p> <p>Hydrology - Partial loss in productivity of a fishery</p>
Minor adverse	<p>Geology - The Scheme would not affect areas with regional or national geodiversity value but may result in the loss of or damage to areas of local geodiversity value. The effects cannot be completely mitigated but opportunities exist for local enhancement of geodiversity value.</p> <p>Human Health - It is possible that harm could arise to a designated</p>

Magnitude of Impact	Definition
	<p>receptor (e.g. human health) from an identified hazard but it is likely that at worst this harm if realised would normally be mild.</p> <p>Hydrogeology - No significant change to an aquifer, potential low risk of pollution to groundwater Minor effects on groundwater supported wetlands</p> <p>Hydrology – Slight decrease in water quality</p>
Negligible adverse	<p>Geology - The Scheme would result in very minor loss of geodiversity value of local areas of geological interest/soils resource such that mitigation is not considered practical.</p> <p>Human Health There is a low possibility that harm could arise to a designated receptor. In the event of such harm being realised, it is likely to be mild or minor.</p> <p>Hydrogeology The Development is unlikely to affect the integrity of the water environment.</p> <p>Hydrology – Negligible decrease in water quality</p>
No change	No observable effect either adversely or beneficially.
Negligible beneficial	The Scheme would be of minor benefit to geodiversity value by potentially providing greater exposure and/or protection. The Scheme may resolve slight impact from existing land or water contamination.
Minor beneficial	The Scheme may result in the exposure of geological formations that may become of significant local interest. The Scheme may resolve minor impact from existing land or water contamination.
Moderate beneficial	There is benefit to the geodiversity value of the geological/soils resource of the area as a result of the Scheme. The Scheme may result in the exposure of geological formations that may become of significant regional interest. The scheme may resolve moderate impact arising from existing land or water contamination
Major beneficial	The Scheme is very beneficial to the geodiversity value of the geological/soils resource of the area. The Scheme may result in the exposure of geological formations that may become of significant regional and/or national interest. The Scheme may resolve major impact arising from existing land or water contamination.

14.9.12 The determination of significance of the impact is a factor of the value/sensitivity of the feature/resource (receptor) and the magnitude of the impact (change) as described above. Table 14-6 shows how the significance of effect is derived.

Table 14-6 General Approach for Determining Significance

Magnitude of Impact (Change)	Value/sensitivity of Receptor / Resource				
	Very high	High	Medium	Low	Negligible
Major	Very large	Large / very large	Moderate / large	Moderate	Slight
Moderate	Large / very large	Moderate / large	Moderate	Slight	Neutral
Minor	Moderate / large	Moderate	Slight	Neutral	Neutral
Negligible	Slight	Slight	Neutral	Neutral	Neutral
No change	Neutral	Neutral	Neutral	Neutral	Neutral

14.10 Assumptions and Limitations

- 14.10.1 Information provided by third parties, including publicly available information and databases are correct and complete at the time of publication.
- 14.10.2 Baseline conditions have been assumed to be accurate at the time of the surveys but, owing to the dynamic nature of the environment, conditions may change during the construction and operational phases beyond that envisaged at this stage for various reasons (e.g. modifications to plan, identification of previously unknown contamination issues etc.); and,
- 14.10.3 The approach adopted for the assessment is based on current guidance. Guidance relating to land contamination is, however, in a transitional state.

15 MATERIALS

15.1 Introduction

- 15.1.1 This chapter details the proposed scope of work for the assessment of the potential effects of the Scheme on materials during the construction phase.
- 15.1.2 Note that this Chapter would not make reference to impacts associated with the offsite manufacture of products or the off-site extraction of primary materials. These stages of the products' or material resources' life-cycles are outside the scope of this assessment due to the range of unknown variables associated with the extraction and manufacturing processes.
- 15.1.3 The Materials ES Chapter would also not make reference to the material resources and waste associated with the operation and maintenance of the Scheme as there will be a low level of material resources use and associated waste.
- 15.1.4 The term 'materials' was introduced within the DMRB Volume 11 in August 2009 and embraces use of the main material resources required to construct the Scheme and, the generation and management of construction-related wastes.
- 15.1.5 This chapter outlines the potential effects resulting from the use of material resources associated with the works and waste management in the construction, demolition and excavation (CD&E) phases of the Scheme.
- 15.1.6 There may be interrelationships related to the potential effects on material resources, and other disciplines. Therefore, please refer to the following chapters:
- Chapter 13: Road Drainage and the Water Environment
 - Chapter 14: Geology and Soils
 - Chapter 16: Climate

15.2 Study Area

- 15.2.1 A specific study area for the material resources assessment of the Scheme has not been identified, as a whole market approach would be used to procure material resources required for the Scheme. Efforts would be made to source material resources locally whenever possible.
- 15.2.2 Some material resources would be originated onsite, such as excavated soil (that is reused onsite). Other material resources used within construction would be sourced off-site and their environmental impact would also be taken into account.
- 15.2.3 In respect of the assessment in relation to waste, the study area would consider the Merseyside and Halton, Lancashire and Cheshire areas in assessing CD&E waste capacity. The study area would also comprise any waste facilities that would receive waste arising from the CD&E phase of the Scheme. Whilst the assessment would not include the promotion and operation of these facilities, because they are separately authorised, it would be necessary to consider whether the facilities would have the capacity and capability to manage the waste produced, as well as valid licences and consents.

15.3 NN NPS Requirements

- 15.3.1 The applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental outcome.
- 15.3.2 The Secretary of State should consider the extent to which the applicant has proposed an effective process that will be followed to ensure effective management of hazardous and non- hazardous waste arising from the construction and operation of the proposed development. The Secretary of State should be satisfied that the process sets out:
- Any such waste will be properly managed, both onsite and off-site;
 - The waste from the proposed facility can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area; and
 - Adequate steps have been taken to minimise the volume of waste arisings, and of the volume of waste arisings sent to disposal, except where an alternative is the most sustainable outcome overall.
- 15.3.3 The delivery of the mitigation measures set out in Section 15.7 of this Chapter will support adherence to the requirements of the NN NPS through the application of the waste hierarchy. The Scheme will apply the waste hierarchy by moving waste management practices as far up the hierarchy as practicable, and by minimising disposal and maximising reuse and recycling.

15.4 Consultation Undertaken and Proposed

- 15.4.1 No consultation with statutory stakeholders with regards to this Chapter has been undertaken to date, although existing waste capacity data has been reviewed regarding the key waste management facilities and landfill sites.
- 15.4.2 Table 15-1 details consultation proposed to be undertaken.

Table 15-1 Details of Consultation Proposed

Consultations Proposed	Information to be Obtained
Waste Officers - Metropolitan Boroughs of Knowsley, St. Helens, Wirral and Sefton	To obtain capacity data of active landfill sites and waste management facilities that could potentially take CD&E waste from the Scheme. To obtain data of other projects within the vicinity that could potentially take materials from the Scheme.
Waste Officer - City of Liverpool	
Waste Officer - Lancashire County Council	

Consultations Proposed	Information to be Obtained
Waste Officer - Cheshire East, Cheshire West and Chester Borough Councils	To consult on materials' targets, aims and commitments, including methods of transport.
Waste/Environment Officer - Environment Agency (EA) (North West Region)	<p>To obtain capacity data of active landfill sites, waste management facilities and quarries that could potentially take CD&E waste from the Scheme.</p> <p>To consult on materials' targets, aims and commitments, including methods of transport.</p>

15.5 Baseline Information

Materials

- 15.5.1 'Virgin aggregate' is the term used for aggregate produced from naturally occurring mineral deposits and used for the first time". The Mineral Products Association identifies the annual tonnage of aggregates (including crushed rock, sand and gravel, land won, marine and recycled aggregates) and concrete (including cementitious materials, ready-mixed concrete and concrete products).
- 15.5.2 'Secondary aggregates' as defined by AggRegain (a free Sustainable Aggregates information service provided by the Waste and Resources Action Programme (WRAP) Aggregates Programme) are derived from a very wide range of materials that may be used as aggregates. Many arisings of secondary materials have a strong regional character.
- 15.5.3 'Recycled aggregates', as defined by AggRegain, can be sourced from a variety of materials arising from construction and demolition (concrete, bricks, and tiles), highway maintenance, excavation and utility operations. There is currently no information available relating to the capacity of recycled aggregates. Therefore, it is not possible to quantify how much construction, demolition and excavation waste is re-used as aggregate.
- 15.5.4 The quantitative assessment would be based on available material resources data for the UK, as material resources data are not available for the study area.
- 15.5.5 At this stage, there is uncertainty as to the quantity of recycled aggregates (surplus material) that would be reused within the Scheme's elements and of secondary aggregates that would be required by the Scheme. If a significant amount of secondary aggregates is required, the Joint Merseyside and Halton Waste Local Plan (The Joint Authorities of Merseyside and Halton, 2013), the Joint Lancashire Minerals and Waste plan (Lancashire County Council, 2009) and the Cheshire Minerals and Waste Development Plan Document (Cheshire County Council, 1999) would be reviewed to ascertain if consistent baseline data for secondary aggregates could be obtained to base the quantitative assessment on available virgin aggregate data from a reduced study area.
- 15.5.6 Table 15-2 below provides a summary of most recent and projected CD&E waste arisings within the study area.

Table 15-2 Most recent and projected annual CD&E waste arisings

Areas	CD&E waste arisings (tonnes)			
	Most Recent	2020	2025	2030
Merseyside and Halton	2,400,000	2,228,000	2,336,000	2,385,000
Lancashire	3,200,000	3,641,898	3,789,774	3,983,091
Cheshire*	448,000	475,000	487,000	499,000
Total	6,048,000	6,344,898	6,612,774	6,867,091

*Based on combined arisings of Cheshire West and Chester and Cheshire East

Waste capacity

- 15.5.7 The capacity of waste infrastructure sites that could potentially receive CD&E waste arisings from the Scheme has been assessed using data gained from the EA Electronic Public Register (EPR) database (EA, 2017). Only information from permitted sites has been included in the assessment. Table 15-3 below details the annual waste infrastructure capacities from sites taking CD&E waste within the study area in 2015.

Table 15-3 Annual CD&E waste capacity within the study area

Areas	CD&E Capacity (tonnes)
Merseyside and Halton	1,884,265
Lancashire	5,801,949
Cheshire	2,162,701
Total	9,848,915

Source: Environment Agency (EA, 2017)

- 15.5.8 A non-exhaustive list of permitted landfill facilities that could potentially accept CD&E wastes generated during the construction phase of the Scheme can be seen in Table 15-4 below.
- 15.5.9 The ability for waste arisings to be deposited at these landfill facilities would be dependent on the conditions imposed on the facilities by the relevant licence or permit. There may be other facilities in the vicinity of the Scheme that may be used.

Table 15-4 Non-exhaustive list of landfill sites within the study area

No.	Facility Name	Facility Type	Annual Permitted Tonnage	License Number	Facility Postcode
18	Moorfield Industrial Estate	A01: Co-Disposal Landfill	500,000	EA/EPR/QP32 91CN/A001	BB12

No.	Facility Name	Facility Type	Annual Permitted Tonnage	License Number	Facility Postcode
23	Danes Moss Landfill Site	Site	360,000	EA/EPR/AP32 96SP/V001	SK11 0LB
11	Clayton Hall Sand Quarry L F S		149,999	EA/EPR/TP35 91CQ/V004	PR6 7DT
14	Withnell Quarry		400,000	EA/EPR/HP32 97CW/V002	PR6 8BT
3	Marl Road/wood Ward Road Inert Landfill	A05: Landfill taking Non-Biodegradable Wastes	100,000	EA/EPR/KP31 97CA/A001	L33 7UH
5	Round ' O ' Quarry		750,000	EA/EPR/BB36 07KN/V002	L40 6JJ
20	Rakehead Lane Landfill Site		260,400	EA/EPR/EP39 92CA/V010	OL13 0PB
21	Offerton Sand & Gravel Landfill Site		150,000	EA/EPR/JP339 2CF/V002	SK2 5EU
22	Sandy Lane Landfill Site		250,000	EA/EPR/KP30 92CX/A001	SK10
24	Holford Brinefield Landfill Site		220,000	EA/EPR/LP39 92CB/A001	CW9 7TD
13	Chapel Hill Quarry		240,000	EA/EPR/TP38 91CU/V009	PR3
4	Holland Colliery	A06: Landfill taking other wastes	100,000	EA/EPR/NP33 91CZ/A001	WN8 9QP
8	Stars Brow Landfill Site		200,000	EA/EPR/UP34 97CH/V005	WN6 0QD
6	Rough Park Quarry		100,000	EA/EPR/NP30 91CG/V002	WN8 8QE
7	North Quarry		250,000	EA/EPR/KP32 91CK/A001	WN6 9DB
10	Castle House Farm Sand Quarry		100,000	EA/EPR/CP39 91CN/A001	PR7 4DL

15.5.10 A non-exhaustive list of permitted waste management facilities that could potentially accept CD&E wastes can be seen in Table 15-5 below.

Table 15-5 Non-exhaustive list of waste management facilities in the study area

No	Facility Name	Facility Type	Annual Permitted Tonnage	License Number	Facility Postcode
9	The Materials Recycling Facility	A09: Special Waste Transfer Station	149,998	EA/EPR/E P3497CA/V006	BL6 5GR
15	Darwen Resource Recovery Centre		110,000	EA/EPR/B B3609KA/V004	BB3 0RP
2	Manisty Wharf	A15: Material Recycling Treatment Facility	74,999	EA/EPR/P P3793ZS/V	BB3 2AT
19	Norpol Recycling Ltd		149,999	EA/EPR/C P3893LB/V006	BB9 7YG
17	Great Harwood Reclamation Centre Ltd		225,000	EA/EPR/H P3597CQ/V003	BB6 7UR
12	Red Scar Processing Facility		182,099	EA/EPR/Q P3897CN/V007	PR2 5NQ
16	T Lethbridge Ltd	A20: Metal Recycling Site (mixed MRS's)	150,000	EA/EPR/N P3291CF/V002	BB1 3EU
1	S Norton & Co Ltd		500,000	EA/EPR/X P3292CQ/V002	L20 1DQ

Other Baseline Information to be Obtained

- 15.5.11 Relevant Local Authorities and the EA would be consulted to obtain future baseline data. The non-exhaustive list of potential receptor sites for waste arisings from the Scheme (landfills, waste management facilities and other projects), included within Table 15-4 and Table 15-5, would be further reviewed and a non-exhaustive final list of preferred receptor sites would be prepared. This list will also include preferred quarries.
- 15.5.12 The capacities of soil treatment facilities that could potentially receive and process contaminated soil waste arisings from the proposed Development would also be obtained.
- 15.5.13 Information regarding the quantities of material resources that would be required

will be developed as the design progresses. Information detailing the composition of waste streams that would be generated during the construction phase will also be developed.

15.6 Value of Environmental Resources and Receptors

15.6.1 Based on the baseline information detailed in Section 15.5, the following potential resources / receptors have been identified for the Scheme. These have been assigned a value in accordance with Table 15-7. The resource / receptors and value are detailed in Table 15-6 below.

Table 15-6 Value of environmental resources and receptors

Receptors / Resources	Value
Relevant policies and strategy targets influencing materials resources use and waste management aspirations of the Scheme	Low - Low scarcity of required material resource. High materials reuse, recycling and or recovery.
Material resources to be utilised by the Scheme	Low - Low scarcity of required material resource. Low or medium importance and rarity, local scale. The industry demonstrates high materials reuse, recycling and or recovery.
Waste management infrastructure to be utilised by the Scheme	Medium - There is adequate available waste management infrastructure capacity within the study area for the majority of waste arising from the Scheme.
Highways network	Low - High capacity of existing highways network to accommodate any increases in lorry movements resulting from the flow of material resources and wastes to and from the Scheme.

15.7 Potential Effects including Mitigation Measures

15.7.1 The potential effects of the Scheme have been identified and assessed in accordance with DMRB Volume 11, Section 2, Part 5 HA 205/08.

Construction Phase

15.7.2 The construction of noise bunds and embankments for the Scheme would likely require significant importation of fill materials.

15.7.3 In addition to this there would be a requirement to construct a number of new bridges for both roads and footpaths. These may require large quantities of concrete which is likely to make use of virgin materials for its constituent materials. The potential for specifying a proportion of recycled aggregate (coarse and fine material) can be investigated, but not until a detailed design has been developed. The structures would also require the use of steel for beams and reinforcement bars.

15.7.4 There would be a requirement for significant lengths of new pavement

construction, potentially with extensive foundation requirements. This could also involve piling for bridge and retaining wall construction, requiring further use of concrete, steel and/or aggregate.

15.7.5 Due to the presence of Whabbs Tip landfill site, it is likely that the majority of landfill materials generated from this area would not be appropriate for reuse. The materials are expected to consist of mixtures of ash, brick, clinker and cinders intermixed with biodegradable wastes that include domestic wastes. The materials may also consist of varying proportions of non-active, non-hazardous wastes, active non-hazardous wastes and hazardous wastes. All of these materials may require transport off-site to landfill sites.

15.7.6 Waste mass within the landfill is likely to be impacted by and/or a source of leachate, which may require extraction and treatment. The treatment plant would require a permit and may potentially require significant energy inputs, to treat leachate to a standard to allow discharge to foul sewer. If the utility provider refused a trade effluent discharge consent, then the material would have to be transported to a treatment plant.

15.7.7 Materials may consist of varying proportions of hazardous wastes which would require transport off-site to landfill sites. The nearest hazardous waste landfill site is located at White Moss in Skelmersdale. It is assumed that a proportion of this waste would require disposal at this facility. In addition to this, a number of road movements would be generated on the road network as a result of off-site transport of this material. However, these are not expected to have a significant impact.

Potential Mitigation Measures

15.7.8 Measures would be implemented to reduce the impacts of material resources use and waste arisings from the Scheme.

Material Resources

15.7.9 The key Scheme sustainability targets would be embedded within all relevant procurement documentation, along with the methodology for monitoring and reporting.

15.7.10 Contractors would be encouraged to apply good practice to source construction material resources from suppliers with responsible sourcing certification (as far as practicable). To this end, contractors would be encouraged to adopt the Building Research Establishment (BRE) Standard BES 6001: Responsible Sourcing of Construction Products.

15.7.11 The depletion of finite material resources could occur through extraction of primary aggregates (e.g. sands and gravels). Structures, drainage and signage products would therefore be procured with consideration of the environmental impacts associated with their manufacture, as well as other considerations such as structural design, carbon footprint, energy consumption, long-life performance, visual impacts, durability and cost.

15.7.12 The procurement process would ensure that material resources are ordered so that the timing of the delivery (e.g. 'just in time' deliveries), the quantity delivered and the storage are optimised to reduce opportunity for oversupply and damage

onsite.

- 15.7.13 Where possible and where specification allows construction material resources would include a measurable recycled content in their manufacture. In addition to this material would be ordered, where possible, in sizes to prevent wastage e.g. in form of off cuts and waste to be able to be returned to the original supplier.
- 15.7.14 Material resources delivered to the Scheme would be received and controlled by the contractor's Logistics Team or appointed person. Materials would be stored to minimise the potential of damage or wastage. Measures would include off-ground storage e.g. on pallets, remaining in original packaging, protection from rain or collision by plant or vehicles. The material resources storage area would be secured during out-of-hours periods to prevent unauthorised access.
- 15.7.15 Where possible, consideration would be given to the reuse of materials (e.g. uncontaminated soils) back into the Scheme and local sources would be used for aggregate supplies whenever possible.
- 15.7.16 Agreements would be sought with suppliers to reduce the amount of packaging used and to protect materials or to participate in a packaging take back scheme.

Waste

- 15.7.17 A detailed ground investigation would be required in order to determine the optimum design of the road to reduce as far as possible the need to excavate material from the landfill. Design of a road with a piled solution through the landfill would significantly reduce the volume of material to be excavated. Use of risk assessment and as large as possible data set of groundwater monitoring may allow the selection of a piling technique such as lateral displacement piles which would further reduce the volume of waste which would be generated.
- 15.7.18 Subject to confirmation by further detailed ground investigation and ground/cut and fill modelling of the application site area. It may be possible to reuse materials won from the area within any bunds required/designed for the final approved scheme, subject to appropriate assessment. This would significantly reduce the volume of imported material required.
- 15.7.19 As with other similar construction projects, where possible excavated materials would be sent for beneficial reuse to other sites. Unusable CD&E waste materials would be collected in receptacles for subsequent separation and disposal at an off-site facility.

Hazardous waste

- 15.7.20 Hazardous waste arisings (including any contaminated soil) would be identified, removed and kept separate from other CD&E waste materials, to avoid contamination of 'clean' materials and will be disposed of in accordance with the Hazardous Waste Regulations (HMSO, 2005).
- 15.7.21 The exact nature and extent of hazardous material present on the site is to be determined through a detailed ground investigation.
- 15.7.22 The ground investigation with an extended period of monitoring following the investigation would help to characterise the leachate and hydrogeological regime at the application site. This would enable the design and construction of the road

to be optimised by such methods as restricting the size of the area of the landfill being exposed at any one time. This would restrict the amount of surface infiltration and reduce the complexity of the collection system required to collect and treat leachate.

Application Site Practices

- 15.7.23 The Scheme would have a Waste Manager or Champion who would oversee the implementation of the waste control strategy and the handling of any waste material. The Scheme's Site Waste Management Plan (SWMP) would be a central monitoring and reference point for all waste related activities ongoing onsite.
- 15.7.24 The construction and demolition work would be carried out through close collaboration with the waste management contractors, in order to determine the best techniques for managing waste and ensure a high level of recovery of materials for recycling.
- 15.7.25 A specific area would be laid out and labelled to facilitate the separation of materials, where possible, for potential recycling, salvage, reuse and return. Recycling and waste bins are to be kept clean and clearly marked/colour coded in order to avoid contamination of materials. Skips for segregation of waste identified currently would be:
- Mixed inert (e.g. inert plastics, concrete and rubble)
 - Mixed non-hazardous (biodegradable waste, welfare waste, general waste)
 - Metal (e.g. copper and iron)
 - Wood (e.g. fencing/hoarding)
 - Food (canteen waste)
 - Paper and cardboard (office waste)
 - Waste Electrical and Electronic Equipment (WEEE) (e.g. cables, disused electrical appliances and equipment)
- 15.7.26 Successful recycling relies upon early planning, clear responsibility and space within a compound for segregation and storage. Shelter may be needed to prevent some materials such as cardboard and paper from deteriorating while being sorted or awaiting collection.
- 15.7.27 Discussions would be required between the HE and the Contractor to identify space requirements within the compound to accommodate skips and storage of reusable materials.
- 15.7.28 For all waste management options, consideration would need to be given for identifying whether waste exemptions or permits would be required to enable the storage and treatment of waste materials. Waste management options will be supported by the identification of appropriately permitted waste management and recycling facilities in close proximity to the Scheme.

Transport of material resources and waste

- 15.7.29 A Construction Logistics Plan would be implemented to minimise transport

movements. The plan would be reviewed by the Logistics Manager at regular intervals to ensure relevance to ongoing activities and adjacent developments.

- 15.7.30 Off-site consolidation and logistics centre(s) would be considered which would reduce the space required on the application site for storage of materials, creating a safer worksite and reducing the risk of damage to materials. The centre will be detailed within and managed through the Logistics Plan.

15.8 Proposed Level and Scope of Assessment

- 15.8.1 In October 2011, HE issued the IAN 153/11 - Guidance on the Environmental Assessment of Materials Resources (Highways England, 2011). It outlines an approach for the consideration of material resources use and waste as part of statutory and non-statutory EIA process for new construction, improvement and major maintenance.

- 15.8.2 A simple assessment will be undertaken covering waste impacts only, as opposed to a detailed assessment, in accordance with Volume 11, Section 2, Part 5 HA 205/08 (Highways England, 2008) and IAN 153/11 (Highways England, 2011) which states that:

'a simple assessment should assemble data and information that is readily available to address potential effects identified at the Scoping level, to reach an understanding of the likely environmental effects to inform the final design or to reach an understanding of the likely environmental effects that identifies the need for Detailed Assessment'.

- 15.8.3 The assessment would consider construction phase impacts, but operational impacts will not be considered.

- 15.8.4 It is therefore assumed that information regarding materials to be used during construction would be included within the Scheme Description of the ES. This text would include how waste materials will be managed through the design process and impacts would be assessed within topic specific chapters.

15.9 Proposed Methodology Including Significance

Guidance

- 15.9.1 The guidance that would be used to undertake the assessment would comprise the following publicly available policy and sources as well as consultation with the relevant bodies:

- Waste Management Plan for England 2011 (Defra, 2011);
- The Definition of Waste: Development Industry Code of Practice, Version 2, Contaminated Land: Applications in Real Environments (CL:AIRE, 2011);
- Waste Strategy for England 2007 (Defra, 2007);
- Waste and Resources Action Programme (WRAP) website and publications (WRAP, 2010);
- Local Plan for Sefton (Sefton Council, 2017);
- Merseyside and Halton Waste Local Plan (The Joint Authorities of

Merseyside and Halton, 2013);

- Joint Lancashire Minerals and Waste plan (Lancashire Country Council, 2009); and
- Cheshire Replacement Waste Local Plan (Cheshire County Council, 2007).

Proposed Assessment Methodology

15.9.2 Environmental value of resource is not covered by IAN 153/11 and there are no accepted criteria for determining the value of material resources and waste (including waste infrastructure). In the absence of such guidance, the materials assessment would be undertaken using the professional judgement of material resources and waste specialists. The assessment criteria that would be used for assessing environmental value and typical resources is included in Table 15-7 below.

Table 15-7 Determining the value of resource

Value of Resource	Criteria
Very High	<p>Very high scarcity of required material resource</p> <p>There is no available waste management infrastructure capacity within the study area for any waste arisings from the Scheme</p> <p>Very high importance and rarity, national scale. Very limited materials reuse, recycling and or recovery</p> <p>No capacity of existing highways network to accommodate any increases in lorry movements resulting from the flow of material resources and wastes to and from the Scheme</p>
High	<p>High scarcity of required material resource</p> <p>There is limited waste management infrastructure capacity within the study area in relation to the forecast waste arisings from the Scheme</p> <p>High importance and rarity, regional scale. Limited materials reuse, recycling and or recovery</p> <p>Low capacity of existing highways network to accommodate any increases in lorry movements resulting from the flow of material resources and wastes to and from the Scheme</p>
Medium	<p>Medium scarcity of required material resource.</p> <p>There is adequate waste management infrastructure capacity within the study area for the majority of waste arisings from the Scheme</p> <p>High or medium importance and rarity, regional scale. Moderate materials reuse, recycling and or recovery</p> <p>Medium capacity of existing highways network to accommodate any increases in lorry movements resulting from the flow of material resources and wastes to and from the Scheme</p>
Low	<p>Low scarcity of required material resource</p> <p>There is adequate available waste management infrastructure capacity</p>

Value of Resource	Criteria
	<p>within the study area for all waste arising from the Scheme</p> <p>Low or medium importance and rarity, local scale. High materials reuse, recycling and or recovery</p> <p>High capacity of existing highways network to accommodate any increases in lorry movements resulting from the flow of material resources and wastes to and from the Scheme</p>
Negligible	<p>Negligible scarcity of required material resource</p> <p>There is waste management infrastructure capacity within the study area for all waste arisings from the Scheme</p> <p>Negligible importance and rarity, local scale. Very high materials reuse, recycling and or recovery</p> <p>Very high capacity of existing highways network to accommodate any increases in lorry movements resulting from the flow of material resources and wastes to and from the Scheme</p>

Source: Professional judgement and DMRB Volume 11, Section 2, Part 5 HA 205/08 HA 205/08 'Assessment and Management of Environmental Effects'

15.9.3 The magnitude of each impact is assessed using the criteria provided in Table 15-8.

Table 15-8 Assessing magnitude of impact

Value of Resource	Criteria
Major	<p>Loss of natural resources and or quality and integrity of natural resources; severe damage to key characteristics, features or elements</p> <p>Waste arisings from the Scheme are predominantly disposed of to landfill or to incineration without energy recovery with little or no prior segregation</p> <p>Generation of large quantities of hazardous and inert waste which are managed for disposal using methods lower down the waste hierarchy (e.g. landfill or incineration with energy recovery)</p>
Moderate	<p>Loss of natural resources, but not adversely affecting the integrity; partial loss of or damage to key characteristics, features or elements</p> <p>Waste arisings from the Scheme are predominantly disposed of by incineration with energy recovery</p> <p>Generation of moderate quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery)</p>
Minor	<p>Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements</p> <p>Waste arisings from the Scheme are predominantly segregated and sent</p>

Value of Resource	Criteria
	<p>for composting, recycling or for further segregation and sorting at a materials recovery facility</p> <p>Generation of small quantities of hazardous and inert waste which is managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery)</p>
Negligible	<p>Very minor loss or detrimental alteration to one or more characteristics, features or elements</p> <p>Waste arisings from the Scheme are predominantly reused onsite or at an appropriately licensed or registered exempt site elsewhere</p> <p>Generation of negligible quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery)</p>
No-change	<p>No loss or alteration of characteristics, features or elements; no observable impact in either direction</p> <p>All waste arisings from the Scheme are reused onsite or at an appropriately licensed or registered exempt site elsewhere</p> <p>No generation of hazardous waste. All inert materials reused onsite</p>

Source: Professional judgement and DMRB Volume 11, Section 2, Part 5 HA 205/08 'Assessment and Management of Environmental Effects'

Assessment Periods/Scenarios

15.9.4 The assessment would consider an assessment period that covers a construction phase of 2020-2023.

Significance Criteria

15.9.5 The significance of each effect is assessed using the matrix provided in DMRB Volume 11, Section 2, Part 5 HA 205/08, Table 2.4 by cross referencing the value of the receptor with the magnitude of impact.

15.9.6 The magnitude of each impact is assessed using the criteria provide in Table 15-9.

Table 15-9 Assessing magnitude of impact

Magnitude of impact	Criteria
Major	<p>Loss of natural resources and or quality and integrity of natural resources; severe damage to key characteristics, features or elements</p> <p>Waste arisings from the Project are predominantly disposed of to landfill or to incineration without energy recovery with little or no prior segregation</p> <p>Generation of large quantities of hazardous and inert waste which are managed for disposal using methods lower down the waste hierarchy</p>

Magnitude of impact	Criteria
	(e.g. landfill or incineration with energy recovery)
Moderate	<p>Loss of natural resources, but not adversely affecting the integrity; partial loss of or damage to key characteristics, features or elements</p> <p>Waste arisings from the Project are predominantly disposed of by incineration with energy recovery</p> <p>Generation of moderate quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery)</p>
Minor	<p>Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements</p> <p>Waste arisings from the Project are predominantly segregated and sent for composting, recycling or for further segregation and sorting at a materials recovery facility</p> <p>Generation of small quantities of hazardous and inert waste which is managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery)</p>
Negligible	<p>Very minor loss or detrimental alteration to one or more characteristics, features or elements</p> <p>Waste arisings from the Project are predominantly reused on site or at an appropriately licensed or registered exempt site elsewhere</p> <p>Generation of negligible quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery)</p>
No Change	<p>No loss or alteration of characteristics, features or elements; no observable impact in either direction</p> <p>All waste arisings from the Project are reused on site or at an appropriately licensed or registered exempt site elsewhere</p> <p>No generation of hazardous waste. All inert materials reused onsite</p>

Source: Professional judgement and DMRB Volume 11, Section 2, Part 5 HA 205/08 HA 205/08 'Assessment and Management of Environmental Effects'

15.9.7 The definition of significance is defined as detailed in Table 15-10 below.

Table 15-10 Definition of Significance of Effect

Significance	Criteria
Very Large	<p>Significant change in environmental conditions. Impacts are likely to be of a very high magnitude and frequency and will impact on the existing strategy to deal with material resources and waste</p> <p>Impact likely to be on a permanent basis</p>

Significance	Criteria
Large	Considerable change in environmental conditions. Impacts are likely to be of a high magnitude and frequency and will have an effect on the existing strategy to deal with material resources and waste Impact likely to be on a permanent basis
Moderate	Noticeable change in environmental conditions. Impacts are likely to be of a high magnitude and frequency and will have an effect on the existing strategy to deal with material resources and waste Impact likely to be on a permanent basis
Slight	Barely perceptible change in environmental conditions. Impacts are likely to be of a low magnitude and frequency and will have an effect on the existing strategy to deal with material resources and waste Impact likely to be on a temporary basis
Neutral	No discernible change in environmental conditions. Impacts are likely to be of a negligible magnitude and frequency and will not have an effect on the existing strategy to deal with material resources and waste No impact

Source: Professional judgement and DMRB Volume 11, Section 2, Part 5 HA 205/08 HA 205/08 'Assessment and Management of Environmental Effects'

15.10 Assumptions and Limitations

15.10.1 Waste management facilities for specific waste streams have not been presented due to a lack of information. This would be presented as part of the ES and would be used to identify potential disposal options e.g. treatment facilities for leachate that may be present within the application site.

16 CLIMATE

16.1 Introduction

16.1.1 This chapter details the proposed scope of work for the assessment of the Scheme's potential effects on climate during both construction and operational phases. Climate change has been divided into the following two subsections:

- Climate change adaptation – Describes the vulnerability of the Scheme to climate change in the North West and how climate change would potentially manifest itself in the future; and
- Greenhouse Gas Emissions (GHG) – Describes how the Scheme would impact the climate in relation to greenhouse gas emissions.

16.1.2 There are linkages between the assessment of potential effects on climate change and other disciplines, notably:

- Chapter 7: Air Quality;
- Chapter 8: Cultural Heritage;
- Chapter 9: Biodiversity;
- Chapter 10: Landscape;
- Chapter 12: People and Communities;
- Chapter 13: Road Drainage and the Water Environment;
- Chapter 14: Geology and Soils; and
- Chapter 15: Materials.

16.2 Study Area

16.2.1 In relation to climate change adaptation, the study area would comprise the North West, with data specific to Merseyside also be presented.

16.2.2 In relation to climate change mitigation, the study area would comprise the Scheme boundary and the traffic model area that will be used to assess greenhouse gas emissions and will inform the appraisal of the traffic, air quality and noise effects of the Scheme.

16.3 NN NPS Requirements

16.3.1 The NN NPS requires that:

- the applicant should consider the effects of climate change when planning location, design, build and operation of transport infrastructure. The supporting environment statement should detail how the proposal would take into account the projected impacts of climate change.
- The applicant should consider the potential impacts of climate change using the latest UK Climate Projections available at the time and ensure any environmental statement identifies appropriate mitigation or adaptation measures. In cases where transport infrastructure contains safety-critical

elements and the design life of the asset is greater than 60 years, the applicant should use the UK Climate Projections 2009 (UKCP09) high emissions scenario (high impact, low likelihood) against the 2080 projections at the 50% probability level.

- The assessment should cover the estimated lifetime of the new infrastructure and in the case where a new set of UK Climate Projections are available after the preparation of an environment statement, the Examining Authority should consider whether additional information would be required from the applicant.
- The applicant should also assess if there are any critical features related to the design of new infrastructure which could be significantly affected by more extreme climate changes beyond the latest set of UK climate projections. Any potential critical features should be assessed using the latest credible scientific evidence and potential mitigation and adaptation measures should be considered.
- The applicant should base adaptation measures on the latest set of UK Climate Projections, the Government’s national Climate Change Risk Assessment and consultation with statutory consultation bodies. All adaptation measures must be assessed as part of any environmental impact assessment and included in the environment statement, which should set out how and where such measures are proposed to be secured.
- The Secretary of State should consider if adaptation measures themselves could potentially result in consequential impacts. The potential impacts should be considered in relation to the application as a whole and the impacts guidance set out in the NPSNN.
- The applicant should produce evidence of the carbon impact of the project and an assessment against the UK Government’s carbon budgets. Evidence of appropriate mitigation measures in both design and construction should be presented.
- The Secretary of State will consider the effectiveness of mitigation measures in relation to design and construction, to ensure that the carbon footprint is not unnecessarily high.

16.3.2 The delivery of adaptation and mitigation measures set out in Section 16.7 of this Chapter will support adherence to the requirements of the NPSNN.

16.4 Consultation Undertaken and Proposed

16.4.1 No consultations have been undertaken so far. Table 16-1 outlines the consultations that will be undertaken during the assessment.

Table 16-1 Details of proposed consultations

Consultations Proposed	Information to be Obtained
Environment Officer - Metropolitan Boroughs of Knowsley, St. Helens, Wirral and Sefton	To consult on climate change targets, aims, commitments, other projects, plans and policy

Environment Officer - City of Liverpool	that affect climate and baseline data To consult on any future developments, including transport infrastructure projects in close proximity to the Scheme
Environment Officer - Lancashire County Council	
Environment Officer - Cheshire East, Cheshire West and Chester Borough Councils	
Environment Officer - Environment Agency (EA) (North West Region)	

16.5 Baseline Information

Baseline Information Obtained/Surveys Undertaken

- 16.5.1 Across England as a whole, land temperature in the decade 2005 - 2014 was 1.0°C warmer than 1961-1990 (source). There has been a significant human influence on the observed warming in annual Central England Temperature since 1950. Statistical results from extreme value analysis suggest that the UK daily maximum and minimum temperature extremes have increased by just over 1°C since the 1950s, and that heavy seasonal and annual rainfall events have also increased (source).
- 16.5.2 There has been a small observed increase in annual mean rainfall in recent decades. Between 1961-1990 and 1981-2010 annual mean rainfall increased by 3.2%. However, this change is not statistically significant in the context of rainfall totals over the last century (source).
- 16.5.3 It is predicted that climate change will increase the frequency and severity of some types of extreme weather events in England. UK CP09 generally show that warmer, drier summers are more likely along with warmer, wetter winters. The projections for the North West in the 2020s under a high emissions scenario suggest a central estimate of:
- An increase in winter mean temperature of 1.2°C
 - An increase in summer mean temperature is 1.5°C
 - An increase in summer mean daily maximum temperature is 1.9°C
 - An increase in summer mean daily minimum temperature is 1.4°C
 - No change in annual mean precipitation
 - A 4% increase in winter mean precipitation
 - A 5% decrease in summer mean precipitation
- 16.5.4 By the 2050s, the high emission central estimate provides the following projection:
- An increase in winter mean temperature of 2.1°C
 - An increase in summer mean temperature is 3.0°C
 - An increase in summer mean daily maximum temperature is 3.8°C

- An increase in summer mean daily minimum temperature is 2.9°C
- No change in annual mean precipitation
- A 13% increase in winter mean precipitation
- A 18% decrease change in summer mean precipitation

16.5.5 Across UK, the total GHG emissions from transport in UK are presented in Table 16-2. These figures are by source, which means that they include direct emissions and do not include emissions resulting from the production of the fuels used.

Table 16-2 Total GHG from domestic transport in UK

Year	Tonnes of CO ₂ e
2010	120,100,000
2011	118,300,000
2012	117,700,000
2013	116,500,000
2014	117,800,000
2015	120,000,000

Other Baseline Information to be Obtained

- 16.5.6 A review of the future projections for Merseyside in the 2020s and 2050s under a high emissions scenario.
- 16.5.7 A review of recent relevant past extreme weather events in the study area and their direct and indirect impacts on the road infrastructure will be conducted using the UK CP09 weather generator data.
- 16.5.8 This review of recent events will allow the Scheme’s potential vulnerability to climate change and future extreme weather events to be better understood. A better understanding of the consequences of weather events would provide a starting point for raising awareness of the risks and initiating a more considered approach to dealing with weather and climate impacts.
- 16.5.9 Baseline conditions for GHG would also be established through a desktop research by calculating what carbon emissions would have been in the absence of the Scheme and the planned measures aiming to reduce GHG emissions.

16.6 Value of Environmental Resources and Receptors

16.6.1 As part of the approach to climate the vulnerability of the scheme to climate change will be considered and this will then inform the development of the Scheme. This may well require the incorporation of measures into the scheme to ensure its future resilience to climate change. That design will then be assessed by other topics to understand how that design will influence other receptors; the value of which will be presented in other chapters (e.g. Chapter 7: Air Quality, Chapter 8: Cultural Heritage, Chapter 9: Biodiversity, Chapter 10: Landscape, Chapter 12: People and Communities, Chapter 13: Road Drainage

and the Water Environment, Chapter 14: Geology and Soils and Chapter 15: Materials).

16.7 Potential Effects including Mitigation Measures

16.7.1 This section outlines the potential effects of the scheme during construction and operation from a climate change adaptation and greenhouse gas emissions perspective:

Climate Change Adaptation

Construction

16.7.2 During construction, drought, high rainfall intensities and high winds could give rise to an increased risk of dust or water pollution, damage the landscape planting design and rise the earthworks above predicted flood level.

Operation

16.7.3 Climate change is projected to increase peak rainfall intensity, and thus increase highway runoff rates and volumes. Flooding in watercourses are similarly expected to increase; therefore scour, bank erosion and exceedance of design rates for bridges and culverts will be more likely in the future.

16.7.4 An increase in climatic variability could lead to higher groundwater levels and more saturated soils, but also increased risk of extreme drought. Both mechanisms can affect ground stability in locations on vulnerable soils. Low to high emissions scenarios could lead to soil moisture fluctuations and therefore, increased risk of shrink-swell related failures.

16.7.5 Vegetation stress due to drought conditions could be a risk to the Scheme depending on the width of soft estate, steepened slopes and potential damage to root systems. Adding in the effect of increased wind velocities due to climate change, it is feasible that increasing loss/damage to trees could occur.

16.7.6 Table 16-3 presents the primary weather events currently affecting the study area and provides a high-level overview of the types of potential effects.

Table 16-3 Summary of primary weather events and types of potential effects

Primary Weather Event	Potential Effect
Heavy rain /flooding	Raised river levels, flooded drains, collapsed culverts Road closures Disruption to train services (e.g. trains cancelled or non-stopping at certain stations) Contaminated water
High winds	Damage structures Power cuts Fallen trees Road closure
Heat wave	Health impacts from breathing problems and sunstroke Impact to biodiversity (e.g. loss of fish) Grass and forest fires Structural damage
Lightning	Structural damage Power surge and tripping electricity breakers Fires Health impacts from direct strikes
Snow and Ice	Dangerous driving conditions Damage to roads Health impacts from slipping on ice and chest illnesses
Fog	Dangerous driving conditions

Greenhouse Gas Emissions

Construction

- 16.7.8 In order to construct the Scheme, a large amount of natural resources (i.e. materials and energy) will be required, which would contribute towards GHG emissions and therefore climate change.
- 16.7.9 The construction phase of the Scheme would also have the potential to increase GHG emissions due to:
- Emissions from construction plant onsite
 - Emissions from water consumption
 - Exhaust emissions from construction phase road traffic
- 16.7.10 It is estimated that additional vehicle movements and emissions, within the study area, associated with the construction of the Scheme would be a very small percentage of the total emissions within the study area, thus will have a negligible

effect on regional climate change.

Operation

- 16.7.11 As a result of the operation of the Scheme GHG emissions would mainly result from vehicular movements with other emissions, e.g. due to maintenance likely to be minimal.

Potential Mitigation Measures – Climate Change Adaptation and GHG Emissions

Construction and Operation

- 16.7.12 The Scheme would adhere to the EA's guidance on allowances for rainfall and flood probability due to climate change, within the context of flood risk assessments. This would require that more extreme predictions of climate models are considered and be relevant to construction and operation.
- 16.7.13 The Contractor would ensure appropriate measures within the CEMP are implemented and, as appropriate, additional measures to ensure the resilience of the proposed mitigation of impacts during extreme weather events. For example, avoidance of storing construction materials in floodplains and dampening of soils and stockpiles.
- 16.7.14 Water use during construction would be minimised and the reuse would be encouraged. The water abstraction required for construction would be coordinated with the needs of local community
- 16.7.15 As the Scheme would be open to traffic in 2023, the potential for existing weather conditions to materially change such that the basis of the EIA becomes insecure is remote. The principal aspect for which climate change is most important is that of flood risk particularly as it affects road safety. The current 20% uplift in attenuation capacity is supported by a test providing for a 40% uplift within the Scheme region in line with the EA guidance. Where uplift is considered necessary then the Scheme would be designed to cope with the increase in rainfall.
- 16.7.16 As the Scheme's soft estate would be a stressful location for trees, species would be selected that can withstand such conditions. Adaptive measures would also include the selection of drought tolerant species. As a consequence, it is considered that they would be able to accommodate climate change.
- 16.7.17 The presence of noxious weeds, if any, would be controlled by an appropriate management regime during both construction and operation.
- 16.7.18 Appropriate water drainage, considering capacity, would be incorporated within the design of the Scheme.
- 16.7.19 Whilst climate change has the potential to bring about changes in the groundwater regime (for example groundwater depths and gradients), there is insufficiently detailed evidence to predict with certainty the impact that climate change will have on the assessment and remediation of contaminated land. Therefore, it is not considered feasible to predict climate change mitigation measures at this stage. However, the detailed assessment of contamination and the detailed design of remediation would consider potential changes in the

groundwater regimes, and other potential impacts, to ensure that remediation designs are resilient.

- 16.7.20 Allowances for increased river flows due to climate change would be incorporated in design of elements, such as culvert design.
- 16.7.21 The Scheme’s design would ensure that flow paths are not obstructed by including conveyance in structures such as culverts in embankments.
- 16.7.22 Good practice in soil handling guidelines would be implemented. The creation of suitable well drained landforms in reinstated areas would be an option; together with the installation of field drains, as necessary.

16.8 Proposed Level and Scope of Assessment

- 16.8.1 The Scheme’s related impacts on the receptors would be measured within the study area and during the construction and operational phases of the Scheme. In addition, the impacts will be numerically quantified or employ a qualitative judgement when data is not available.

Climate change adaptation

- 16.8.2 The vulnerability of the scheme to climate change and incorporation of appropriate adaptation measures into the scheme design will be part of the iterative design process. A risk assessment will be undertaken in conjunction with the design team and the details of this risk assessment will be reflected in the scheme description that will be subsequently assessed in other environmental topic chapters.

Greenhouse Gasses Emissions

- 16.8.3 Following the Environmental Impact Assessment Guide to: Assessing GHG and Evaluating their Significance (IEMA, 2017), the assessment undertaken to inform this Scoping Report has consisted of qualitative desk study using readily available published data. More detailed, site-specific quantitative assessments would be undertaken as part of the EIA.
- 16.8.4 A full scope of a GHG assessment is summarised in Table 16-4 as would be consistent with the principles set out in PAS 2080:2016.

Table 16-4 Scope of GHG emissions assessment broken down by Life Cycle (LC) stages

LC Stage	Description
Construction	
Transport	Represents transport related GHG emissions associated with the delivery of construction material, such as concrete and steel, and construction equipment to construction sites along the Scheme from the point of production (or point of storage in the case of plant and machinery).
Onsite operations	Represents GHG emissions from construction activities including:

LC Stage	Description
	Temporary works, ground works, and landscaping Materials storage and any energy Transport of materials and equipment onsite Installation of materials and products Emissions associated with site water demand Carbon sequestration from tree planting Waste management activities (transport, processing, final disposal) associated with waste arising from the Scheme GHG implications associated with land use change
Maintenance, repair, replacement and refurbishment	Represents the GHG emissions resulting from activities of works and new materials for the maintenance, repair, replacement and refurbishment of the Scheme during the operation.
Operation	
Energy	Represents the GHG emissions resulting from the energy used by the Scheme's infrastructure, minus any electricity generated through onsite low carbon energy sources not exported to the grid.
Water	Represents the GHG emissions resulting from the provision of water required by the Scheme to enable it to operate and deliver its service. For example, this includes water used in the maintenance and cleaning.
Other operational processes	Represents other process GHG emissions arising from the Scheme to enable it to operate and deliver its service including management of operational waste
Users utilisation	Represents the GHG emissions associated with the operation of the Scheme.
Post-operation	
End of life	Represents the GHG emissions resulting from activities of deconstructing, demolishing and decommissioning the Scheme. Essentially these are onsite GHG emissions from plant equipment. It also represents the activities associated with transport, waste management and final disposal of materials associated with the Scheme.

16.8.5 As detailed above, the GHG emissions assessment would be based on a LC approach. Best practice criteria, based on professional knowledge and the predicted low GHG emissions, for the exclusion of inputs and outputs (cut-off rules) of the scope has been applied. The scope of the Scheme's GHG emissions assessment is outlined in Table 16-5 below.

Table 16-5 Scope of Scheme’s GHG Assessment

LC Stage	Included	Excluded
Construction	Transport of construction materials from the factory gate to the construction site Construction processes	Product manufacturing Preliminary desk-based studies Transport of construction plant equipment to and from site
Operation	Carbon sequestration from tree planting Operation of the Scheme Maintenance, repair, replacement and refurbishment	Operational water use Other operational processes.
Post-operation	N/A	End of life deconstruction, demolishing and decommissioning, transport and waste processing and disposal

16.9 Proposed Methodology Including Significance

Guidance

- 16.9.1 The overarching policy in relation to climate change is the Climate Change Act 2008. The Act sets up a framework for the UK to achieve long-term goals of decreasing GHG emissions by 34% compared to the 1990 baseline by 2020 and by 80% by 2050 and to ensure steps are taken towards adapting to the impact of climate change. The Act introduces a system of carbon budgeting which constrains the total amount of emissions in a specific time period, and establishes a procedure for assessing the risks of the impact of climate change for the UK.
- 16.9.2 In addition to the above Act, reference would be made to the following national, regional and local guidance and legislation relating to climate change:
- Highways England (2016) Climate Adaptation Risk Assessment Progress Update
 - IEMA (2017) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance
 - The Green Construction Board (2016) PAS 2080:2016 Carbon Management in Infrastructure
 - The Department for Transport (DfT) (2016) WebTAG (the Transport Analysis Guidance – Data Book)
 - DEFRA (2017) The UK Climate Change Risk Assessment
 - The Department of Energy and Climate Change (2011) The Carbon Plan: Delivering our Low Carbon Future

Proposed Assessment Methodology – Climate Change Adaptation

- 16.9.3 Workshops will be held with the designers and the other environmental topic specialists to complete a risk assessment to understand the vulnerability of the Scheme to climate change.
- 16.9.4 The risk assessment will be used to inform the evolution of the Scheme design during all project phases.
- 16.9.5 This design will then be assessed in the Environmental Statement and each topic chapter will consider the potential effects of the measures that have been incorporated into the scheme from an adaptation perspective.
- 16.9.6 Table 16-6 presents some examples of the adaptation measures that may need to be incorporated into the Scheme design.

Table 16-6 Example table to demonstrate summary of effects and mitigation measures by ES topic

Aspect	Effect (construction (C) and operation (O))	Adaptation / Mitigation Measures	Relevant ES Topic
Increased wind / gusting of X mph	Wind damage to planting (O)	Consideration of wind damage in landscape planting design	Landscape (planting mix) Biodiversity (e.g. due to requirement for different species mix)
Increased wind / gusting of X mph	Damage to structures plus health and safety risk (C, O)	Designing structures for extreme wind events	Larger structures with increased material usage, landtake / ecological effect and visual impact
Increased wind / gusting of X mph	Dust raising (C)	CEMP requirements to include mitigation	Air Quality Biodiversity
Increased precipitation of X mm in winter	Increased flooding (C, O)	Raising of earthworks above predicted flood level	Air Quality Biodiversity People and Communities (e.g. landtake)
Increased temperature of X degs in summer	Damage to / failure of planting (O, M)	Choice of planting. Maintenance regime	Air Quality Biodiversity

Proposed Assessment Methodology – GHG Emissions

- 16.9.7 Both construction and operational phases of the Scheme would be considered for the GHG assessment. This would be based on the full operation of the Scheme in 2023 and the anticipated construction period of three years

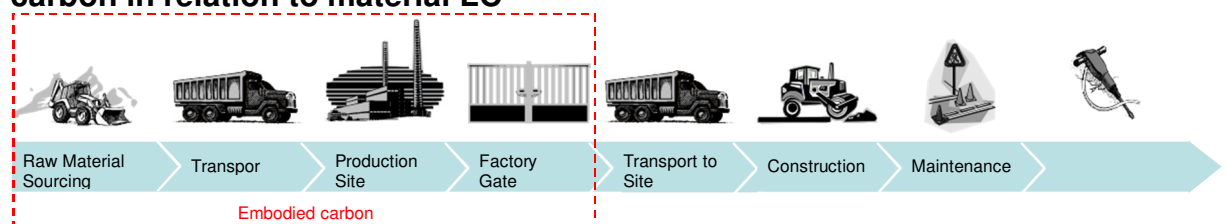
commencing in March 2020.

- 16.9.8 The GHG emissions assessment would take a LC approach consistent with the principles set out in PAS 2080:2016. The GHG emissions associated with the construction and operation of the Scheme would be reported in the form of the 'carbon footprint' - reported in tonnes of carbon dioxide equivalent (tCO₂e).
- 16.9.9 Direct and indirect emissions would be considered in line with GHG reporting and the total carbon footprint that would be reported in CO₂ equivalents (CO₂e). This would allow for the emissions of the six key GHG: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆); to be expressed in terms of their equivalent global warming potential in mass of CO₂e.
- 16.9.10 The assessment would report the carbon footprint from the construction phase and for the operational design life of the Scheme. Transport related GHG emissions will be calculated using WebTAG. In addition, the assessment would be carried out for the following time periods: 2020 – start of construction;
- 2023 – proposed Scheme's opening; and
 - 2063 - 40 years of operation after opening.

Construction

- 16.9.11 While international standards and guidance documents exist for compiling GHG Inventories, there are currently no accepted criteria for quantifying the GHG emissions of construction activities. In the absence of such guidance, the assessment would be undertaken using professional judgement and utilising the HE Carbon Tool, Project's Bill of Quantities and Bath University's Inventory of Carbon and Energy (ICE) Database.
- 16.9.12 The HE Carbon Tool model would be used to calculate the carbon footprint associated with construction of the Scheme as it is based on the widely-used GHG Protocol. The HE Carbon Tool contains carbon factors related to the types of materials commonly used in highway construction.
- 16.9.13 The HE Carbon Tool measures the GHG impacts of construction activities in terms of carbon dioxide equivalent emissions (CO₂e). It does this by calculating the embodied CO₂e of materials and the associated emissions of their transport. Insert 16-1 below represents how the embodied CO₂e of materials would be calculated.

Insert 16-1 Diagrammatic representation of the measure of embodied carbon in relation to material LC



- 16.9.14 In addition to the calculation of embodied emissions of materials, the emissions of construction activities would also be considered. This would include emissions

associated with waste arisings, water use, transportation of waste arisings, construction site energy for the duration of the construction period, workers commute and land use change.

- 16.9.15 The construction related emissions would be based on the construction and logistics information for the Scheme. This would include information relating to specific design elements (e.g. bridges) across the entire Scheme in terms of:
- Volume (m3) of material resources
 - Type of material resources (e.g. concrete)
 - Transport distances (km) of material resources
 - Volume (m3) of waste generated (both construction and demolition)
 - GHG emissions coefficients
 - Overall carbon emissions of each design element
 - Functional units (e.g. tonnes of carbon dioxide CO₂e per metre and year of design element) if available
- 16.9.16 The excavation and movement of excavated materials along the Scheme would be modelled separately. This assessment would provide volumes of materials reused onsite along with distances travelled and modes of transport.

Operation

- 16.9.17 Transport related GHG emissions will be calculated using WebTAG.
- 16.9.18 Carbon sequestration from tree planting would also be calculated in CO₂e.
- 16.9.19 The drainage strategy is currently at the outline stage, and considers the inclusion of pumping stations. This strategy will require finalisation in the EIA and if pumping is required, GHG emissions from this activity would be calculated.

Significance Criteria

Climate Change Adaptation and GHG Emissions

- 16.9.20 As noted above, appropriate adaptation measures will be incorporated into the scheme design during both construction and operation to reduce the vulnerability of the Scheme to climate change. These measures would be incorporated into the Scheme design and then assessed as required in other relevant environmental topic chapters. The risk assessment undertaken to understand the Schemes' vulnerability to climate change will be reported in the climate chapter. Therefore, there are no specific significance criteria for the assessment of climate change adaptation effects.
- 16.9.21 With regards to GHG emissions there are no recognised significance criteria and the information presented will demonstrate the levels of emissions predicted during construction and operation.

16.10 Assumptions and Limitations

- 16.10.1 The climate assessment is inherently uncertain in relation to climate change projections and the variation of information availability in relation to different

climate hazards.

- 16.10.2 The climate change mitigation assessment will be based on a number of assumptions. For example, construction site carbon emissions relating to fuel and energy use would consider carbon emissions associated with machinery and plant used.
- 16.10.3 A series of alternative future scenarios will be assessed in order to illustrate the sensitivity of the Scheme's carbon footprint to key assumptions; this assessment will be set out in the ES.

17 CUMULATIVE EFFECTS

17.1 Introduction

17.1.1 This chapter sets out the scope of the Cumulative Effects Assessment (CEA) that would be completed as part of the EIA. The CEA would be undertaken following the guidance in PINS Advice Note 17: Cumulative Effects Assessment (December, 2015). The CEA would identify where two or more sources of effects interact to give rise to impacts on environmental resources or receptors.

17.1.2 Two types of cumulative effects would be considered:

- Intra-Scheme Effects – The combined action of a number of different environmental topic specific effects upon a single resource/receptor; and
- Inter-Scheme Effects – The combined action of a number of different projects, in combination with the project being assessed, on a single resource/receptor.

17.2 Method

Intra-Scheme Cumulative Effects

17.2.1 Intra-Scheme effects would be presented for receptors which could be affected by more than one ES topic. Where a receptor has been identified as only experiencing one effect or where only one topic has identified effects on that receptor there is no potential for intra- scheme effects to occur.

17.2.2 Intra-Scheme cumulative effects would therefore only be identified where more than one ES chapter has identified a residual effect on an individual or group of receptors.

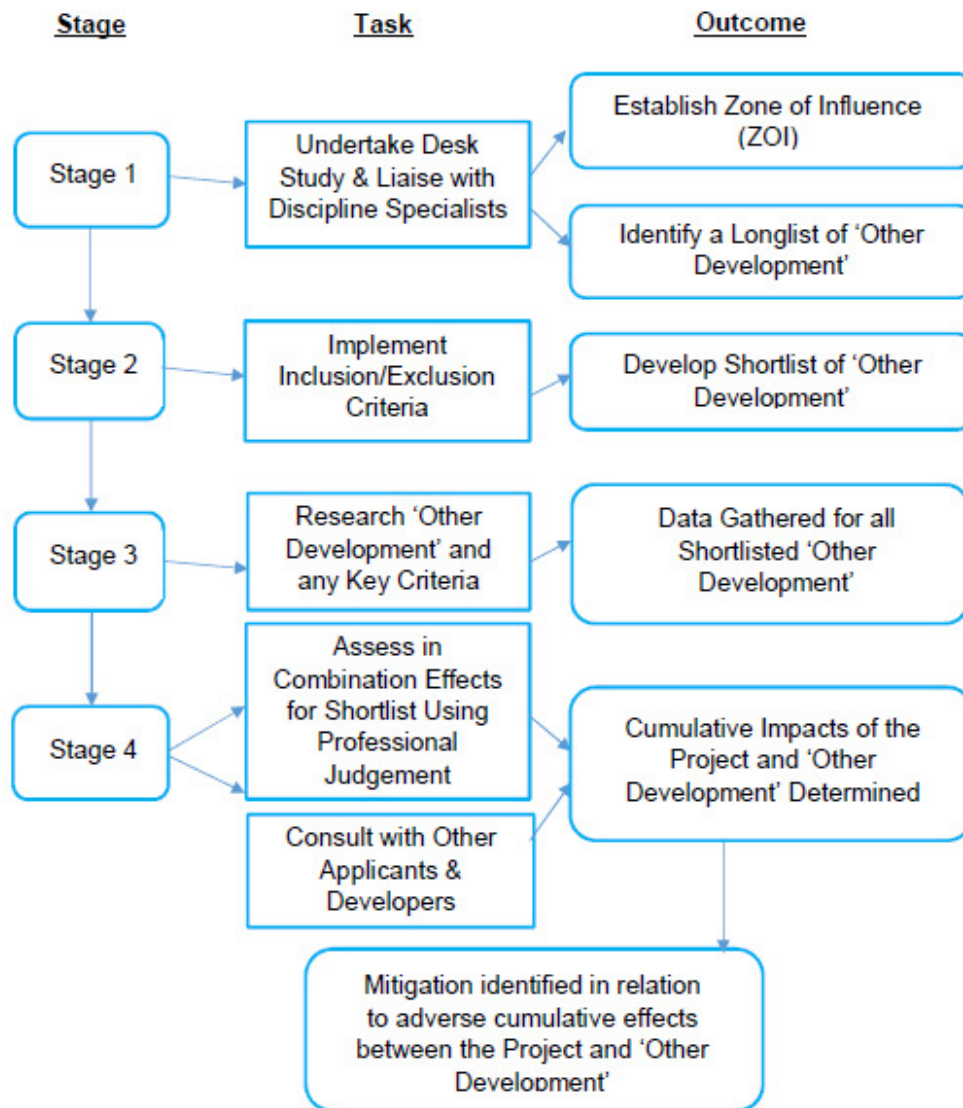
17.2.3 The results would be presented within the ES in a CEA chapter within a matrix.

Inter-Scheme Cumulative Effects

17.2.4 Inter-scheme effects arising from the Scheme in combination with ‘other development’ schemes during the construction and operational phases would be assessed.

17.2.5 The EIA Regulations require an assessment of potentially significant cumulative effects of a scheme along with other developments. There are no legislative or policy requirements which set out how a CEA should be undertaken. However, PINS have issued an Advice Note which sets out the staged approach that applicants are encouraged to adopt in CEA for NSIPs. The Advice Note suggests a process, involving four ‘Stages’. These four ‘Stages’ are outlined below in Insert 17-1 and explained in detail further below.

Insert 17-1 Flow diagram showing the critical processes involved in the CEA



17.2.6 Stage 1 of the process involves establishing an appropriate 'Zone of Influence' (Zoi) to help identify 'other development' relevant to the CEA. Through liaison with technical specialists for each individual ES topic, Zois have been established using professional judgement. The resultant Zoi determined for each topic is presented in Table 17-1 below.

17.2.7 A 1km Zoi addresses localised cumulative effects from topic areas such as Cultural Heritage, Materials and People and Communities, meanwhile a 2km Zoi addresses the potential for cumulative effects associated with Landscape and

Nature Conservation and a 3km Zol for Geology and Soils which have greater Zol's due to the reach of development impacts on specific receptors.

Table 17-1 The Established Zol's For Environmental Topics

Environmental Topic	Zone of Influence
Air Quality	Dependent on the traffic study area
Cultural Heritage	1km
Landscape	2km
Nature Conservation	2km
Geology and Soils	3km
Materials	1km
Noise and Vibration	Dependent on the traffic study area
People and Communities	1km
Road Drainage and the Water Environment	1km
Climate	Dependent on the traffic study area

17.2.8 Following the establishment of the Zols for each topic, a desk study was undertaken to search for 'other development'. This used the furthest Zol as the maximum extent of the study area in which the 'other development' was searched for to create a 'long list'. The desk study was undertaken to obtain all available information about the 'other development' which is planned. In the absence of a developed traffic model it is recognised that there would be other schemes that need to be considered as part of the assessment as the model extent would be more than 5km. This would form part of the assessment presented in the ES and is also likely to include schemes within the DfT's Road Investment Strategy 2015/16 – 2019/20.

17.2.9 A tiered approach was applied to consider the level of certainty of 'other development' being carried out that falls within the Zol.

17.2.10 The tiers assigned were as follows

- Tier 1(a): Under construction (although if it is expected to be completed at the time of the Scheme commencement, the 'other development' would form part of the baseline as requested within the PINS advice note);
- Tier 1(b): permitted application(s), whether under the PA2008 or other regimes, but not yet implemented;
- Tier 1 (c): submitted application(s) whether under the PA2008 or other regimes but not yet determined;
- Tier 2: schemes on the Planning Inspectorate's Programme of Projects

where a Scoping Report has been submitted;

- Tier 3: scheme on the Planning Inspectorate's Programme of Projects where a Scoping Report has not been submitted;
- Tier 3: identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals would be limited; and
- Tier 3: identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

17.2.11 The resulting list is presented in Appendix E. These 'other developments' are also mapped on Figure 17.1 within Appendix E. This list and map reflects the temporal scope and scale and nature of the 'other development', in line with Stage 2 of the Advice Note.

17.2.12 Following agreement from PINS and statutory consultees, more detailed information would be gathered for the ES on the 'other developments' for use within the individual technical topic Sections cumulative impact assessments before proceeding to Stage 3. Once information is gathered on each of the 'other developments', each technical ES topic area would compile a short-list of 'other development' for their individual CEA, with clear justification for inclusion or exclusion.

17.2.13 Following this stage, the CEA would be undertaken (Stage 4) in accordance with the Advice Note. Throughout the process of CEA, the 'other development' identified would be reviewed periodically to ensure that the most up to date information is used at key points during the evolution of the ES. This includes reviewing the status of 'other development' and any new applications which may be registered within the Zol.

18 PROPOSED STRUCTURE OF THE ES

18.1.1 The ES would comprise three volumes:

- Volume 1A – Main Environmental Statement Text;
- Volume 1B – Environmental Statement Figures; and
- Volume 2 – Environmental Statement Appendices.

18.1.2 A Non-Technical Summary would also be produced.

18.1.3 The ES would reflect the new requirements of the EIA Directive 2014/52/EU transposed into UK Regulations in May 2017.

18.1.4 Volume 1A of the ES is currently anticipated to be structured as below – subject to further discussion with the Statutory Environmental Bodies (SEBs):

- Introduction;
- Project Description;
- Design Iterations and Alternatives;
- Consultation;
- EIA Methodology;
- Air Quality (the structure of the air quality chapter would be replicated for other assessment chapters).
- Introduction;
- Regulatory Framework/NN NPS requirements;
- Methodology;
- Existing and future baseline;
- Receptors potentially affected;
- Mitigation and enhancement measures (note that only mitigation measures that can be secured appropriately would be used in the assessment);
- Monitoring;
- Residual Effects;
- Cultural Heritage;
- Biodiversity;
- Landscape;
- Noise and Vibration;
- People and Communities;
- Road Drainage and the Water Environment – this would be supported by a Flood Risk Assessment;
- Geology and Soils;

- Materials;
- Climate; and
- Cumulative Effects.

18.1.5 A number of plans would be produced that would support the preparation of the ES and the results presented therein and would also be a mechanism for securing the required mitigation. These are likely to include:

- A Construction Environmental Management Plan including a Pollution Prevention Plan; and
- The Environmental Masterplan.

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20 ABBREVIATIONS

Abbreviation	Definition
AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling System
ALSF	Aggregates Levy Sustainability Fund
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ARN	Affected Road Network
AURN	Automatic Urban and Rural Network
BCR	Benefit Cost Ratio
BGS	British Geological Survey
BNL	Basic Noise Level
BPM	Best Practicable Means
BS	British Standard
BTO	British Trust for Ornithology
CDA	Critical Drainage Area
CD&E	Construction, Demolition and Waste
CEMP	Construction Environmental Management Plan
Ch	Chainage
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CRRN	Compliance Risk Road Network
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
CWS	County Wildlife Site
C&D	Construction and Demolition
DBA	Desk-Based Assessment
DCO	Development Consent Order

Abbreviation	Definition
Defra	Department for Environment Food & Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EAR	Environmental Assessment Report
EclA	Ecological Impact Assessment
eDNA	Environmental DNA
EFT	Emission Factor Toolkit
EIA	Environment Impact Assessment
END	Environmental Noise Directive
EPR	Electronic Public Register
EPR	Environmental Permitting Regulations
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GIS	Geographic Information System (Mapping Tool)
ha	Hectare (Unit of Measurement)
HA	Highways Agency
HDV	Heavy Duty Vehicle
HE	Historic England
HER	Historic Environmental Record
HGV	Heavy Goods Vehicle
hr	Hour (Unit of Time)
HRA	Habitat Regulations Assessment
HSI	Habitat Suitability Index
IAN	Interim Advice Note
IAQM	Institute of Air Quality Management
JNCC	Joint Nature Conservation Committee
km	Kilometre (Unit of Measurement)
kph	Kilometres per hour

Abbreviation	Definition
Kv	Kilovolt
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LCA	Landscape Character Assessment
LCC	Liverpool City Council
LDP	Long Distance Path
LDV	Light Duty Vehicle
LFRMS	Local Flood Risk Management Strategy
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LV	Limit Values
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographic Information for The Countryside
MEAS	Merseyside Environmental Advisory Service
MMP	Materials Management Plan
MoU	Measure of Uncertainty
mph	Miles per hour
N/A	Not Applicable
NCA	National Character Areas
NCR	National Cycle Route
NE	Natural England
NERC	National Environment Research Council
NEWP	Natural Environment White Paper
NHLE	National Heritage List for England
NIA	Noise Important Area
NIR	Noise Insulation Regulations
NMUs	Non-Motorised Users
NO ₂	Nitrogen Dioxide
NOEL	No Observed Effect Level

Abbreviation	Definition
NO _x	Oxides of Nitrogen
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NN NPS	National Policy Statement for National Networks
NSIP(s)	Nationally Significant Infrastructure Project(s)
NTEM	National Trip End Model
NVC	National Vegetation Classification
OMH	Open Mosaic Habitat
ONS	Office for National Statistics
PCM	Pollution Climate Mapping
PINS	Planning Inspectorate
PM	Particulate Matter
PPC	Pollution Prevention and Control
PPG	Planning Policy Guidance
PRoW	Public Rights of Way
RBMP	River Basin Management Plan
RIGS	Regionally Important Geological and Geomorphological Sites
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAQAP	Scheme Air Quality Action Plan
SEB	Statutory Environmental Bodies
SFRA	Strategic Flood Risk Assessment
SI	Statutory Instrument
SM	Scheduled Monument
SMBC	Sefton Metropolitan Borough Council
SOAEL	Significant Observed Adverse Effect Level
SoS	Secretary of State
SPA	Special Protection Area
SPZs	Source Protection Zones
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems

Abbreviation	Definition
SWMP	Site Water Management Plan
TBC	To Be Confirmed
TEU	Twenty-Foot Equivalent Unit
TPO	Tree Preservation Order
TRA	Traffic Reliability Area
TTM	Temporary Traffic Management
UK	United Kingdom
VP	Vantage Point
WAC	Waste Acceptance Criteria
WEEE	Waste Electrical and Electronic Equipment
WFD	Water Framework Directive
WHS	World Heritage Site
WPZ	Water Protection Zone
WRAP	Waste and Resources Action Programme
WSI	Written Scheme of Investigation
WT	Woodland Trust
Zol	Zone of Influence
ZVI	Zone of Visual Influence

APPENDIX A

Suggested Scoping Report Contents in PINS Advice Note 7

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Table A-1 Suggested Scoping Report Contents in PINS Advice Note 7

Suggested Scoping Report Contents (Based on Advice Note 7)	Relevant Chapter in the EIA Scoping Report
<p>A plan showing: The proposed draft DCO site boundary (identified by a red line) including any associated development; Any permanent land take required for the proposed development; Any temporary land take required for construction, including construction compounds; Any existing infrastructure which would be retained or upgraded for use as part of the proposed development and any existing infrastructure which would be removed; and Features including planning constraints and designated areas on and around the site such as national parks or historic landscapes.</p>	Appendix B
<p>A description of the proposed development including both the NSIP and any of the associated development.</p>	Chapter 2
<p>In dealing with the description of the development and its possible effects on the environment, applicants should: Set out the information using the headings in Schedule 3 to the EIA Regulations, being: Characteristics of the development; Location of the development; Characteristics of the potential impacts; and Ensure that all aspects of the environment likely to be significantly affected by the development are addressed.</p>	Chapter 2, 3 and 7 to 16
<p>An outline of the main alternatives considered and the reasons for selecting a preferred option.</p>	Chapter 3
<p>Results of desktop and baseline studies where available.</p>	Chapter 7 to 17
<p>Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal.</p>	Appendix B
<p>Guidance and best practice to be relied upon, and whether this has been agreed with the relevant bodies (for example the statutory nature conservation bodies or local authorities) together with copies of correspondence to support these agreements.</p>	Chapter 7 to 17
<p>Methods used or proposed to be used to predict impacts and the significance criteria framework used.</p>	Chapter 7 to 17

Suggested Scoping Report Contents (Based on Advice Note 7)	Relevant Chapter in the EIA Scoping Report
Any mitigation proposed and predicted residual impacts.	Chapter 7 to 17
Where impacts from consequential or cumulative development have been identified, how applicants intend to assess these impacts in the ES.	Chapter 17 and Appendix D
An indication of any European designated nature conservation sites that are likely to be significantly affected by the proposed development and the nature of the likely significant impacts on these sites.	Chapter 9
Key topics covered as part of applicants' scoping exercise.	Chapter 7 to 17
An outline of the structure of the proposed ES	Chapter 18
The elements of the proposed development likely to have a significant environmental effect should be identified. Where uncertainty remains, the applicant should provide as much detail as possible or assume the worst case (e.g. maximum dimensions of a building or feature).	Chapter 7 to 17
The applicant may also wish to provide a completed transboundary screening matrix dealing with the effect of the proposed development on other European Economic Area (EEA) States with the Scoping Report.	Appendix C

21.1

APPENDIX B

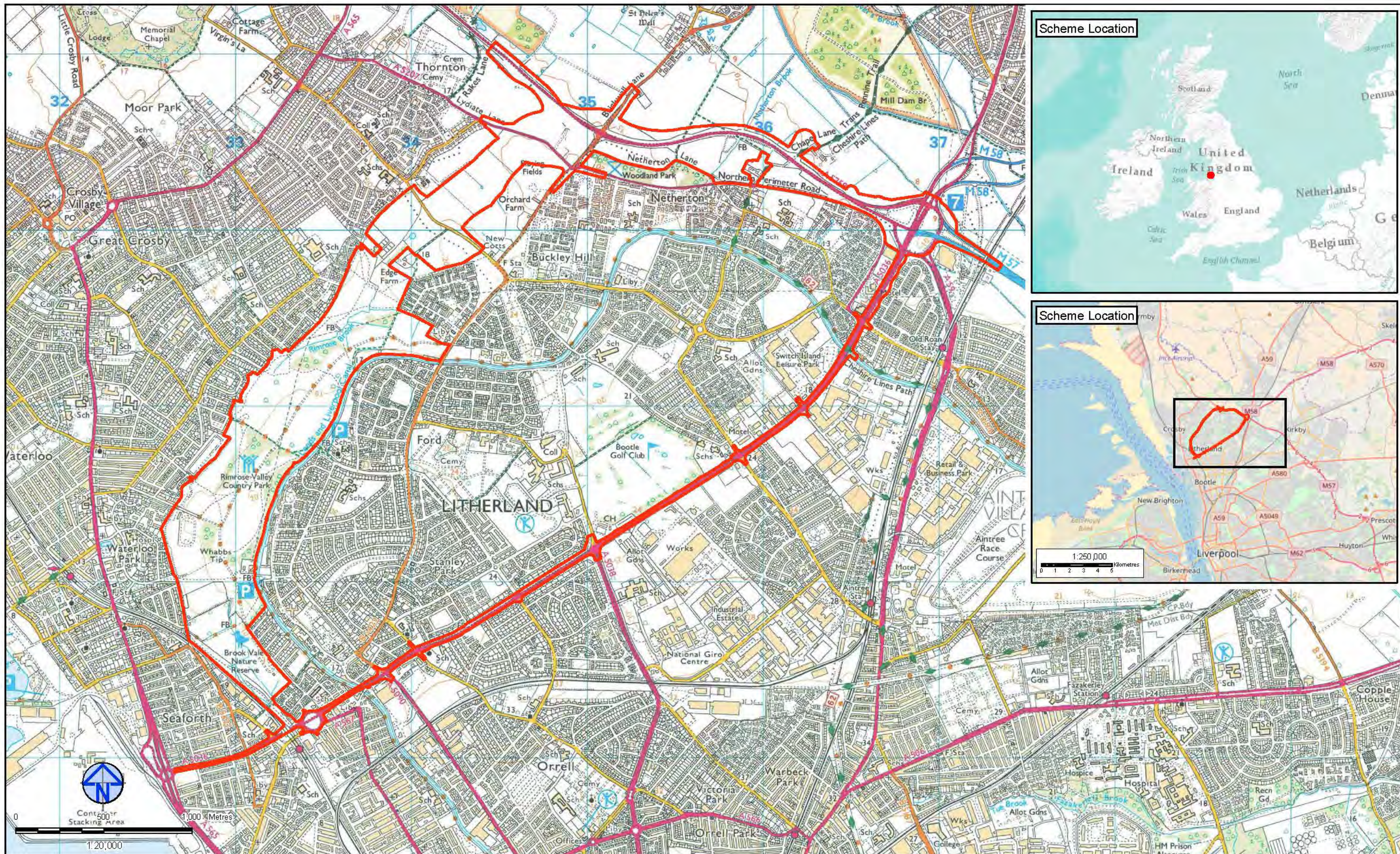
Figures

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12.1	Land Use
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14.3	Solid Geology
14.4	Historic Landfill Sites
15.1	Landfill Sites and Waste Management Facilities
17.1	Cumulative Development

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P1	13SEP17	Initial Issue	AH	BT	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary

Registered office: Arcadis House, 24 York Way, London, N1 1AA
 Coordinating office: 5th Floor 401 Faraday Street, Birchwood Park, Warrington, Warrington, Cheshire, WA3 5SQ, UK. Tel: +44 (0) 1925 703333
 www.arcadis.com

Suitability Description:
PRELIMINARY/CONFIDENTIAL



Designed	B.Twiss	Date	13SEP17	By	BT
Drawn	A.Hankinson	Date	13SEP17	By	BT
Checked	B.Twiss	Date	13SEP17	By	BT
Approved	A.Morrissey	Date	13SEP17	By	BT
Scale:	As Shown	Datum:	AOD		
Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT:
A5036 Port of Liverpool Access Scheme

TITLE:
Figure 1.1: Geographic Location of the Scheme

Drawing Number:	1.1	Project No.:	UA009770	Issue:	P1
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NOTES:
 Proposed Scheme Boundary
 Scheme Layout

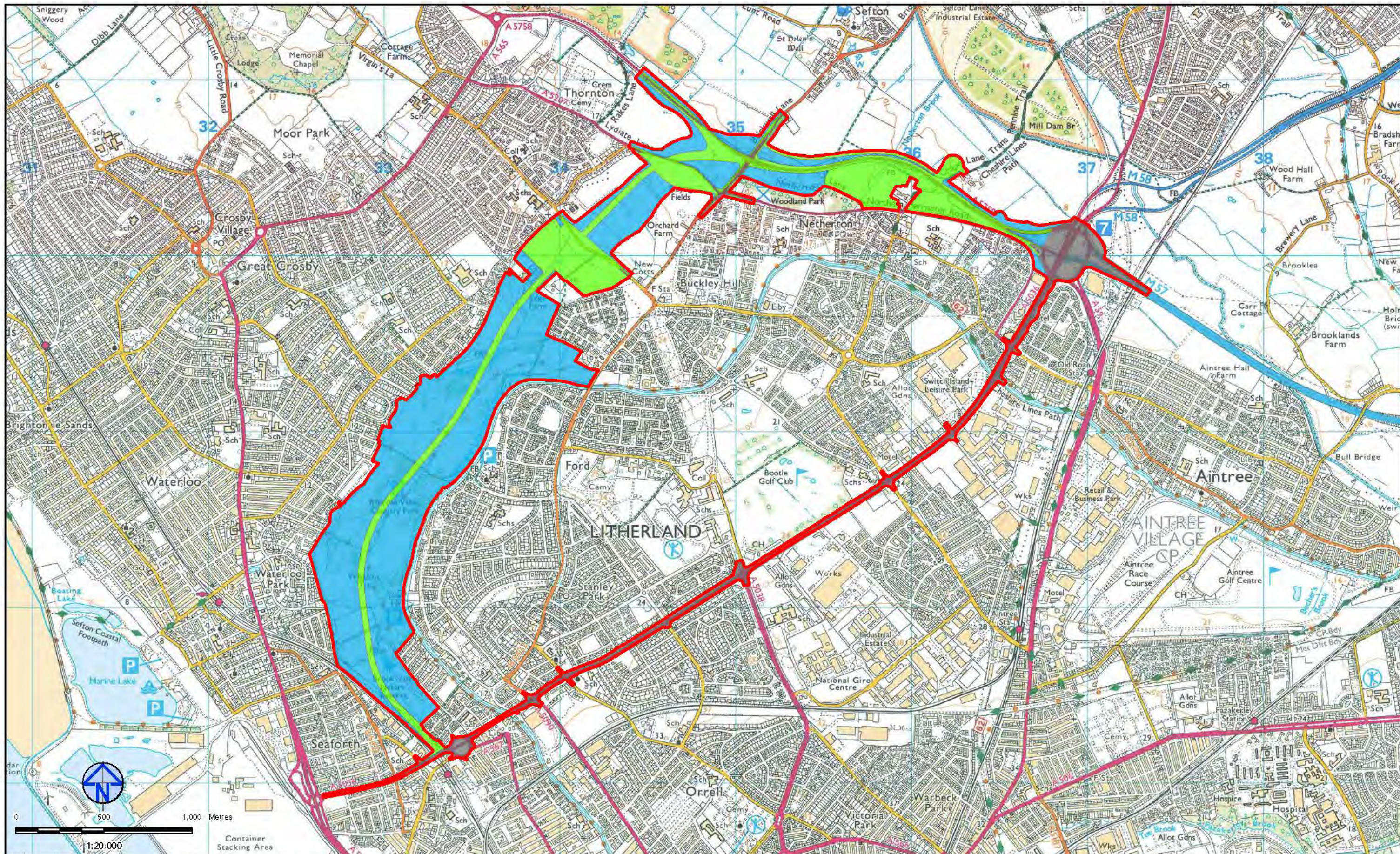


Suitability Description:			
PRELIMINARY/CONFIDENTIAL			
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Checked	B.Twiss	Date	13SEP17
Approved	A.Morrissey	Date	13SEP17
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Original Size:	A3	Grid:	OS
Suitability Code:	SX	Project Number:	UA009770

PROJECT:	A5036 Port of Liverpool Access Scheme		
TITLE:	Figure 1.2: Scheme Overview		
Drawing Number:	1.2	Project No.:	UA009770
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- NOTES:**
- Proposed Scheme Boundary
 - Existing Road
 - Permanent Land Take
 - Temporary Land Take

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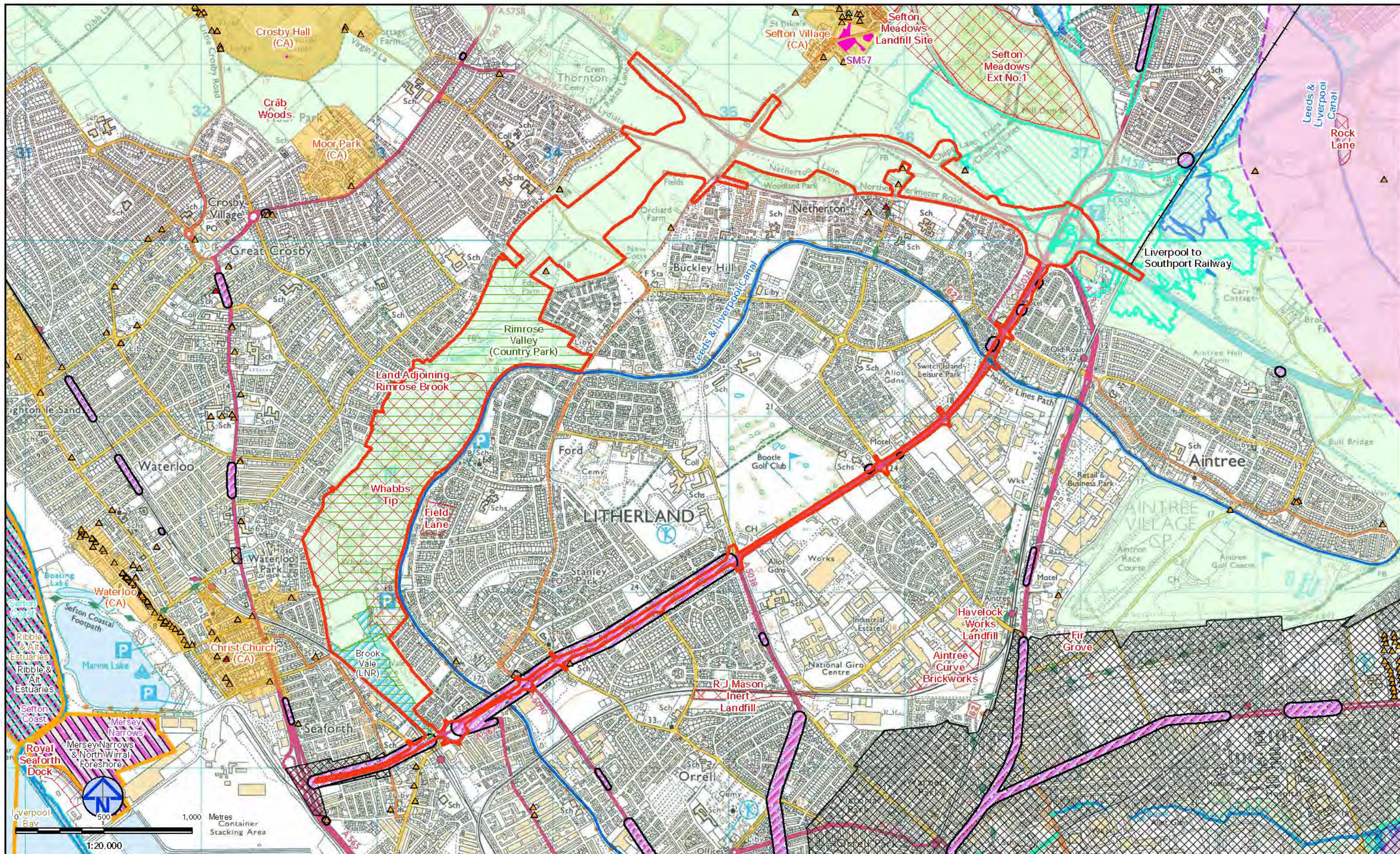
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Drawn	A.Hankinson	Date	13SEP17	Signed	
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Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT:
A5036 Port of Liverpool Access Scheme

TITLE:
Figure 1.4: Working Areas

Drawing Number:	1.4	Project No.:	UA009770	Issue:	P1
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NOTES:

Railway	Local Nature Reserve	Site of Special Scientific Interest
Listed Building	Noise Important Area	Flood Zone 3
Grade I	Scheduled Monument	Flood Zone 2
Grade II*	Air Quality Management Area	Leeds & Liverpool Canal
Grade II	Special Protection Area	Greenbelt
Proposed Scheme Boundary	Special Area of Conservation	Conservation Area
Country Park	Ramsar	
Historic Landfill	Source Protection Zone	

highways england

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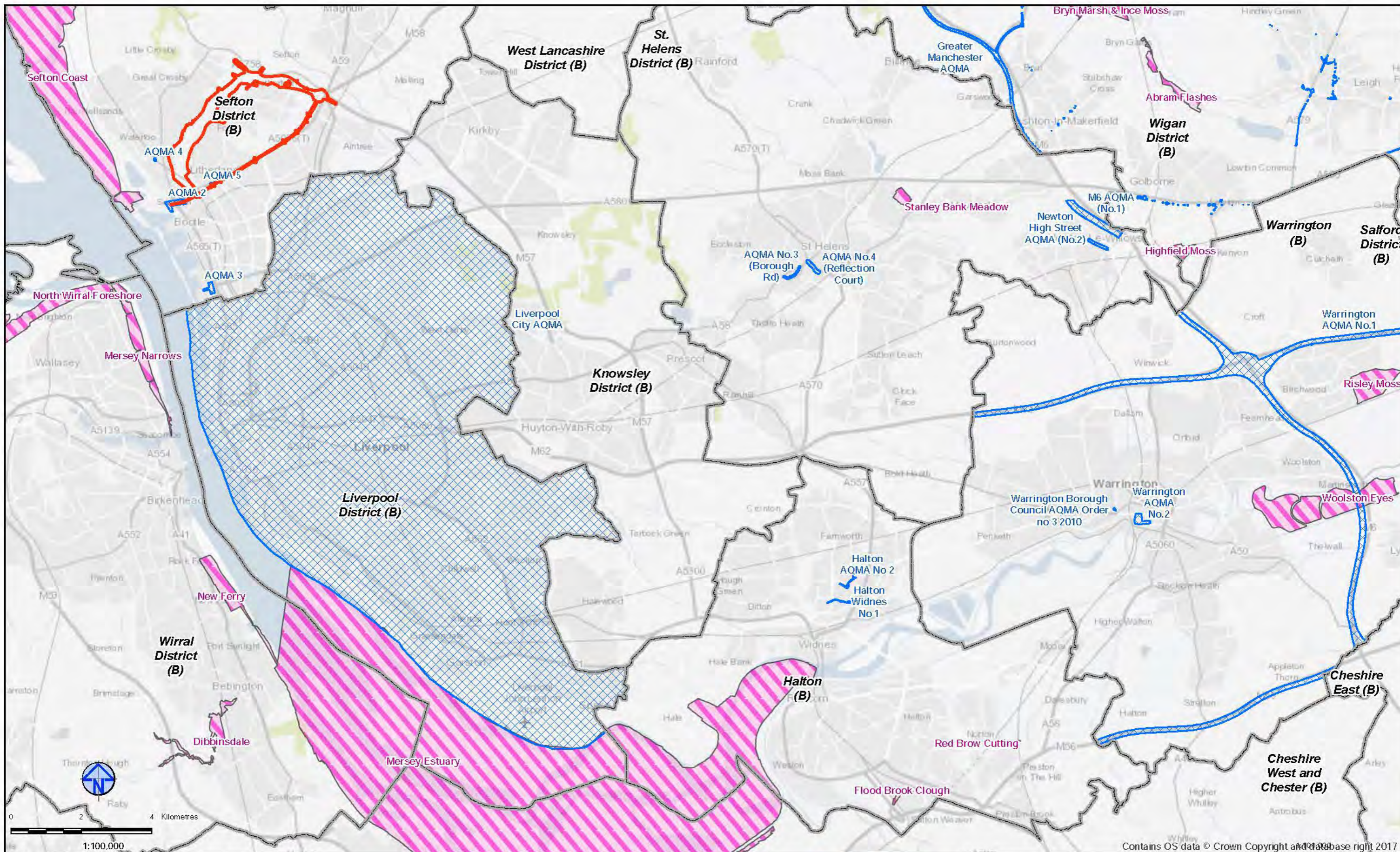
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Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 1.5: Scheme Constraints Plan

Drawing Number:	1.5	Project No.:	UA009770	Issue:	P1
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P1	13SEP17	Initial Issue	AH	TW	AM
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NOTES:

- Scheme Boundary
- District Boundary
- Air Quality Management Area (AQMA)
- Site of Special Scientific Interest

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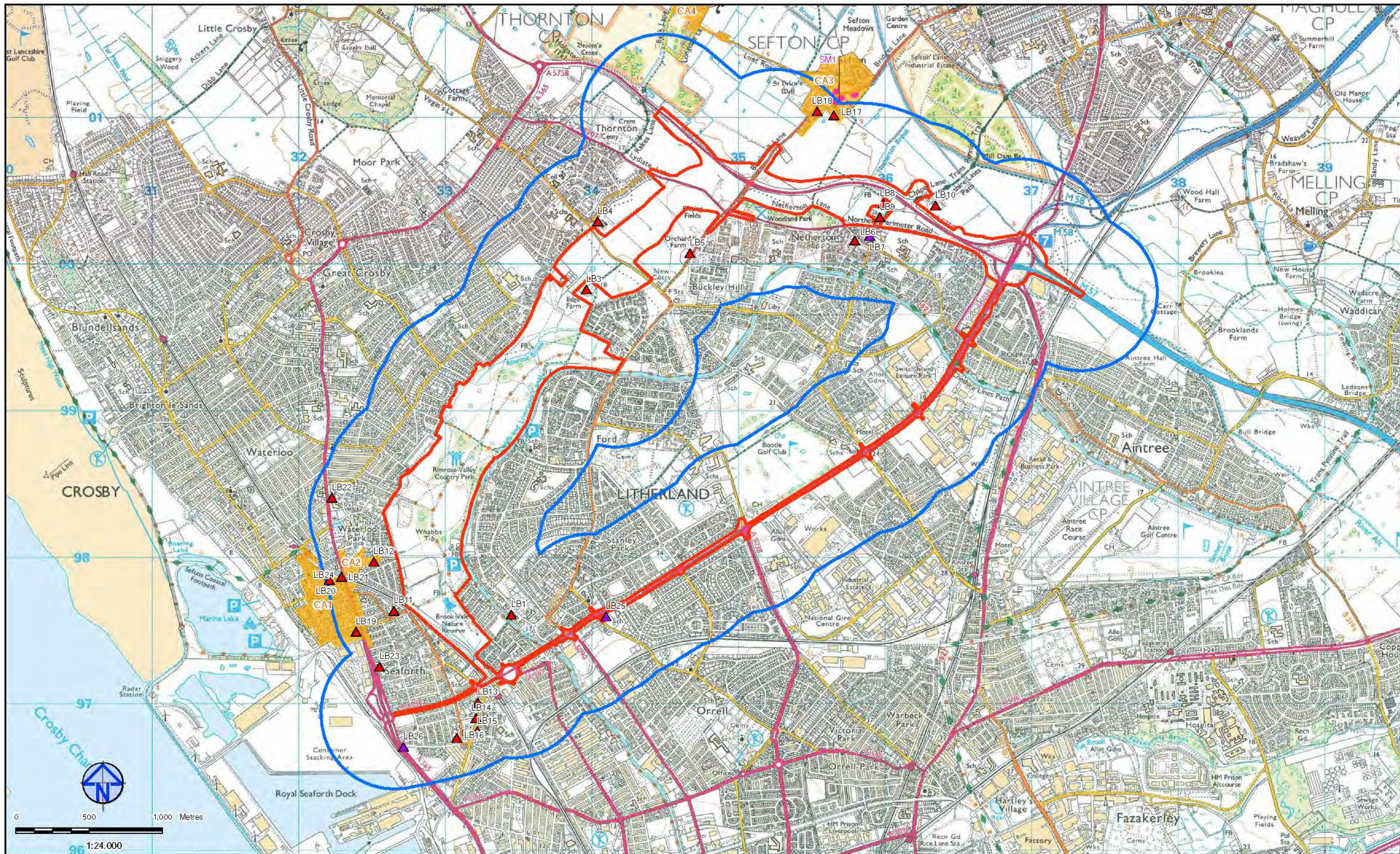
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Suitability Code:	Sx	Project Number:	UA009880	

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 7.1 Air Quality Constraints

Drawing Number: 7.1 Project No: UA009770 Issue: P1



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NOTES:

- Proposed Scheme Boundary
- Study Area Boundary - 500m
- Conservation Areas

Listed Buildings

- Grade II
- Grade II*

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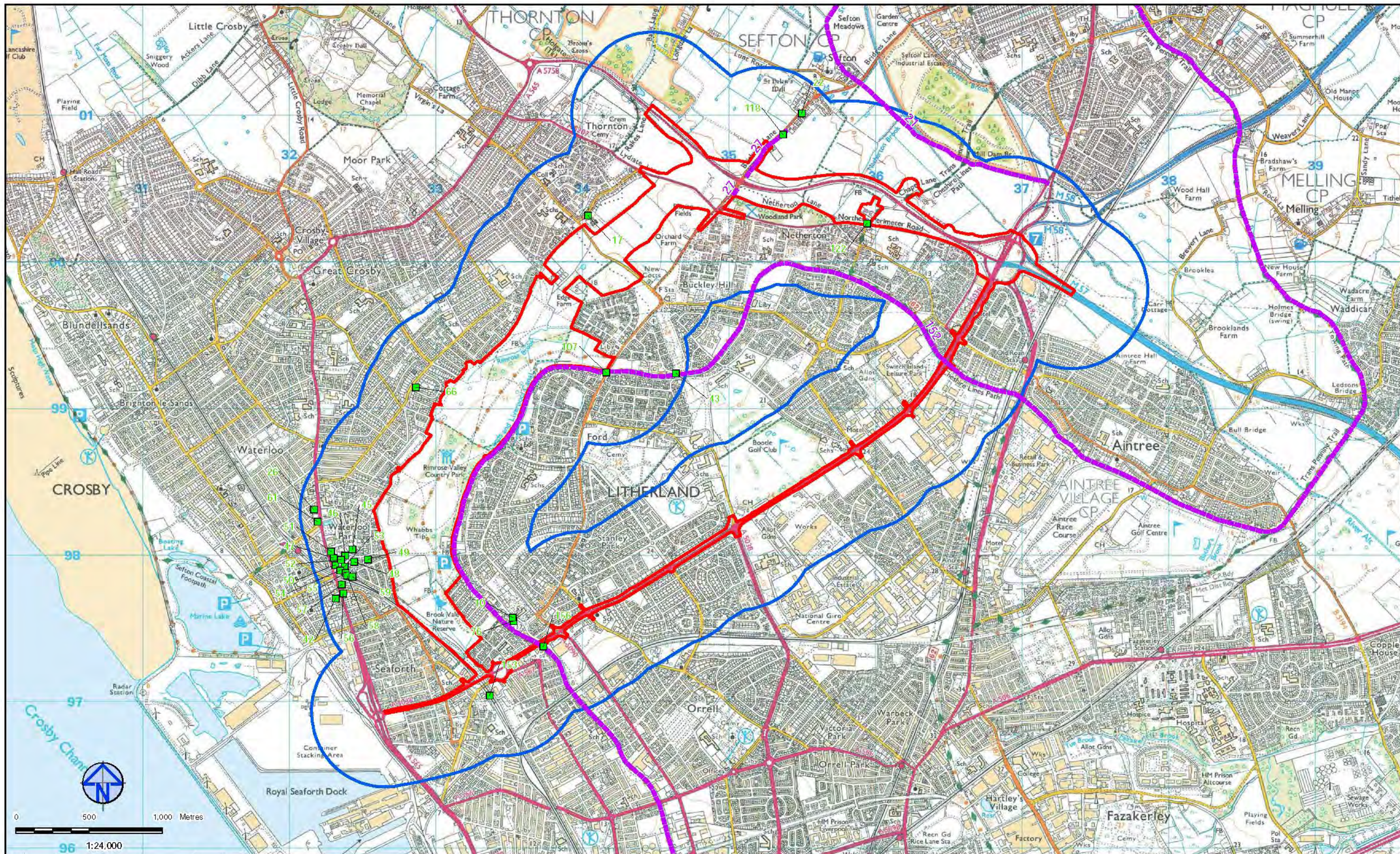
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Suitability Code:	Sx	Project Number:	UA009770	

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 8.1: Designated Heritage Assets

Drawing Number:	8.2	Project No.:	UA009770	Issue:	P1
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- NOTES:**
- Proposed Scheme Boundary
 - Study Area 500m
 - HER Buildings
 - Monument Line

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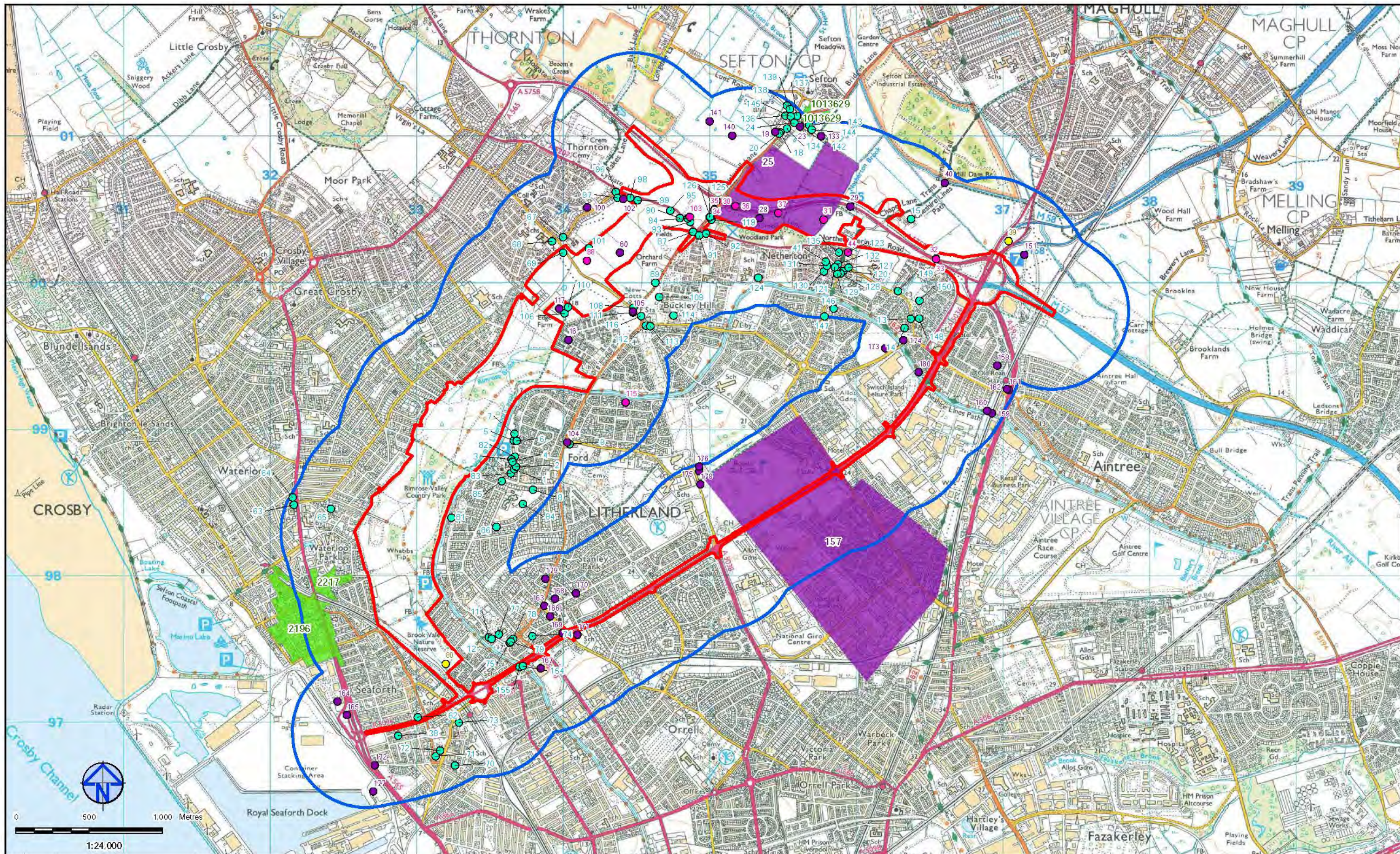
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Suitability Code:	SX	Project Number:	UA009770

PROJECT:	A5036 Port of Liverpool Access Scheme		
TITLE:	Figure 8.2: Non-designated Built Heritage		
Drawing Number:	8.3	Project No.:	UA009770
Issue:			P1



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P1	13SEP17	Initial Issue	AH	BT	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Study Area 500m
- Heritage at Risk
- Monument Polygons
- HER Findspots
- HER Former BH Sites
- HER Monuments
- HER Other

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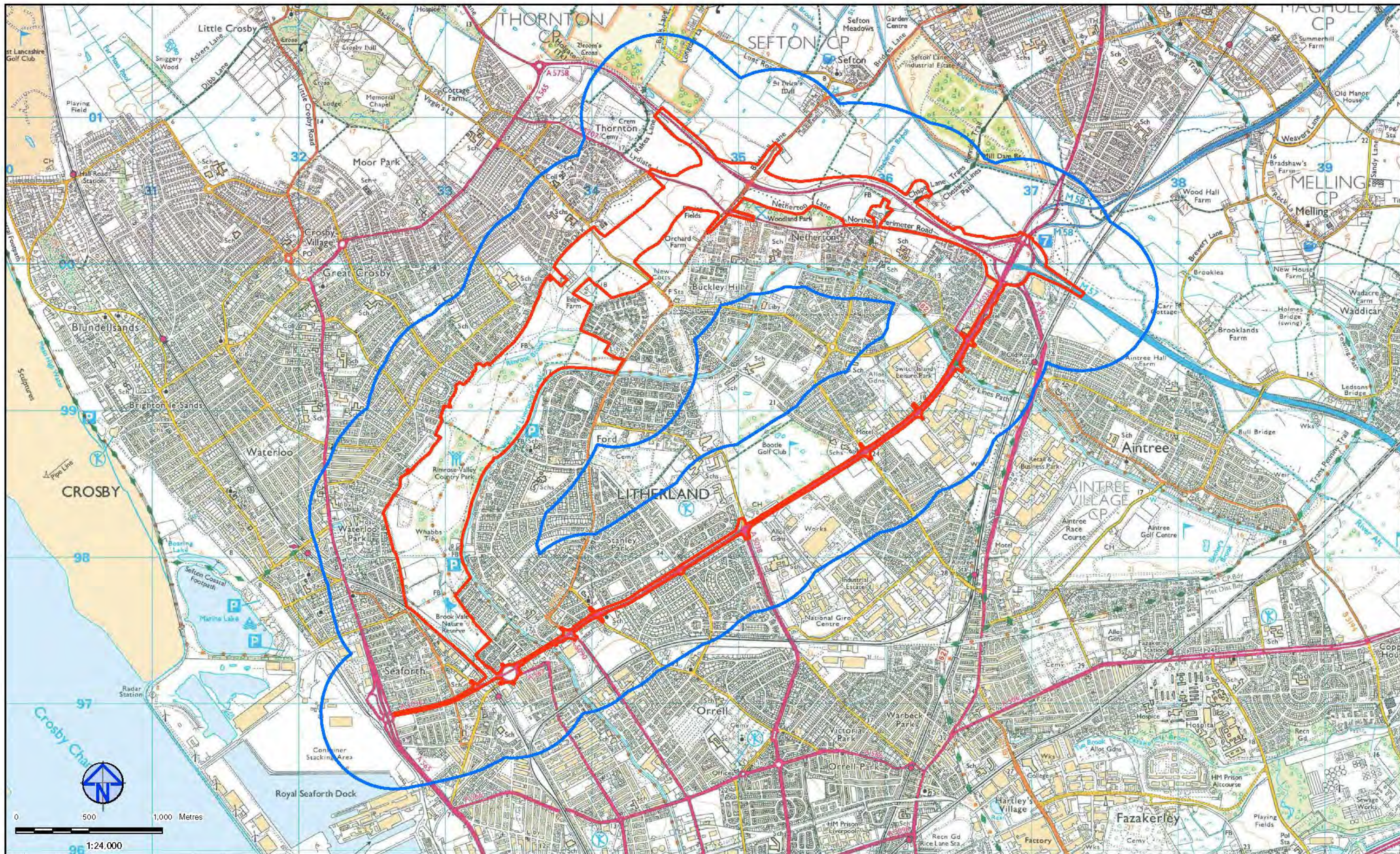
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Suitability Code:	Sx	Project Number:	UA009770	

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 8.3 Non-designated Archaeological Assets

Drawing Number:	8.4	Project No.:	UA009770	Issue:	P1
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NOTES:

- Proposed Scheme Boundary
- Field Survey Area - 500m

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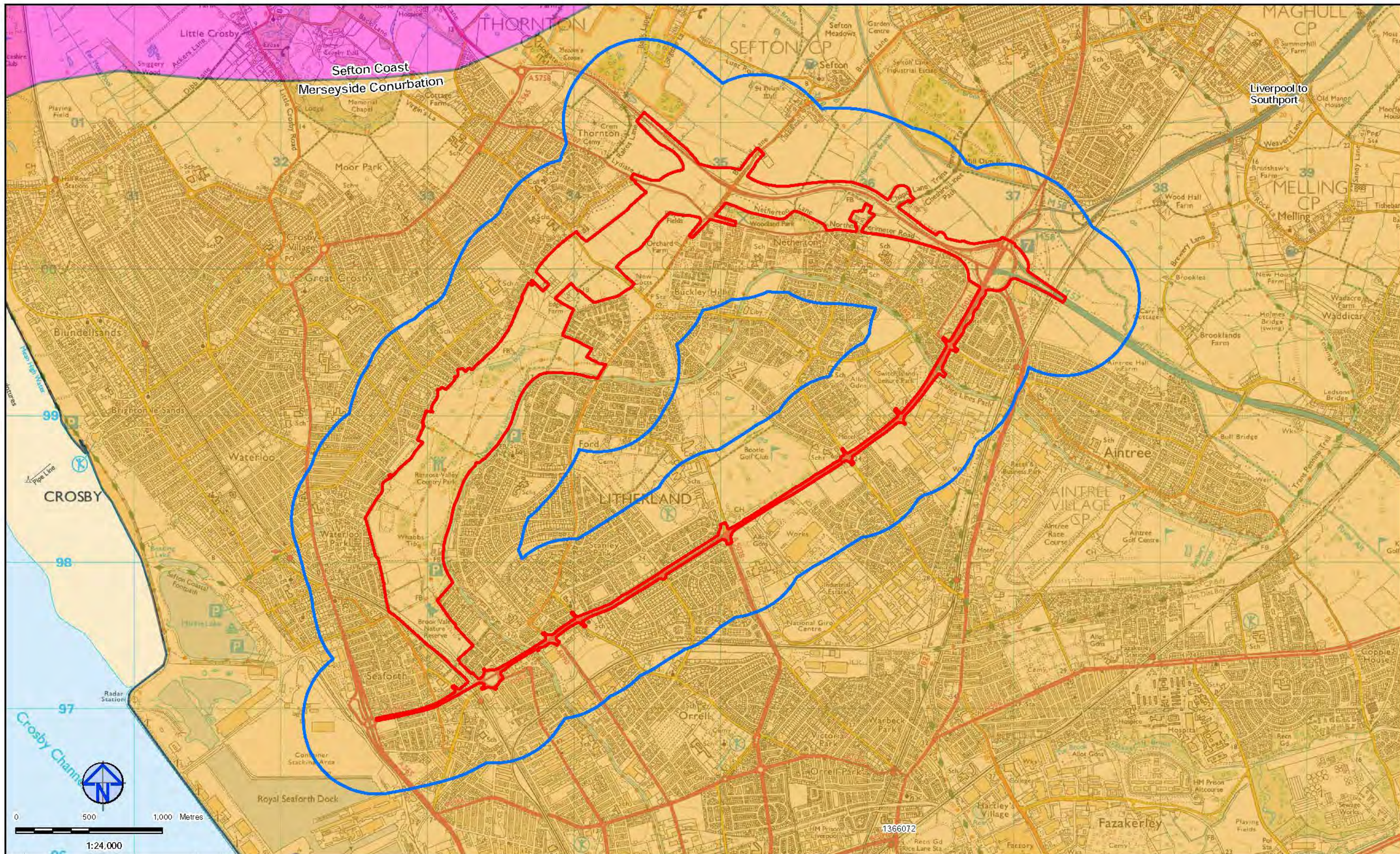
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Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 9.1: Ecology Field Survey Area

Drawing Number: 9.1 Project No: UA009770 Issue: P1



P1	13SEP17	Initial Issue	AH	BP	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Study Area - 500m
- National Character Area
- Merseyside Conurbation
- Sefton Coast

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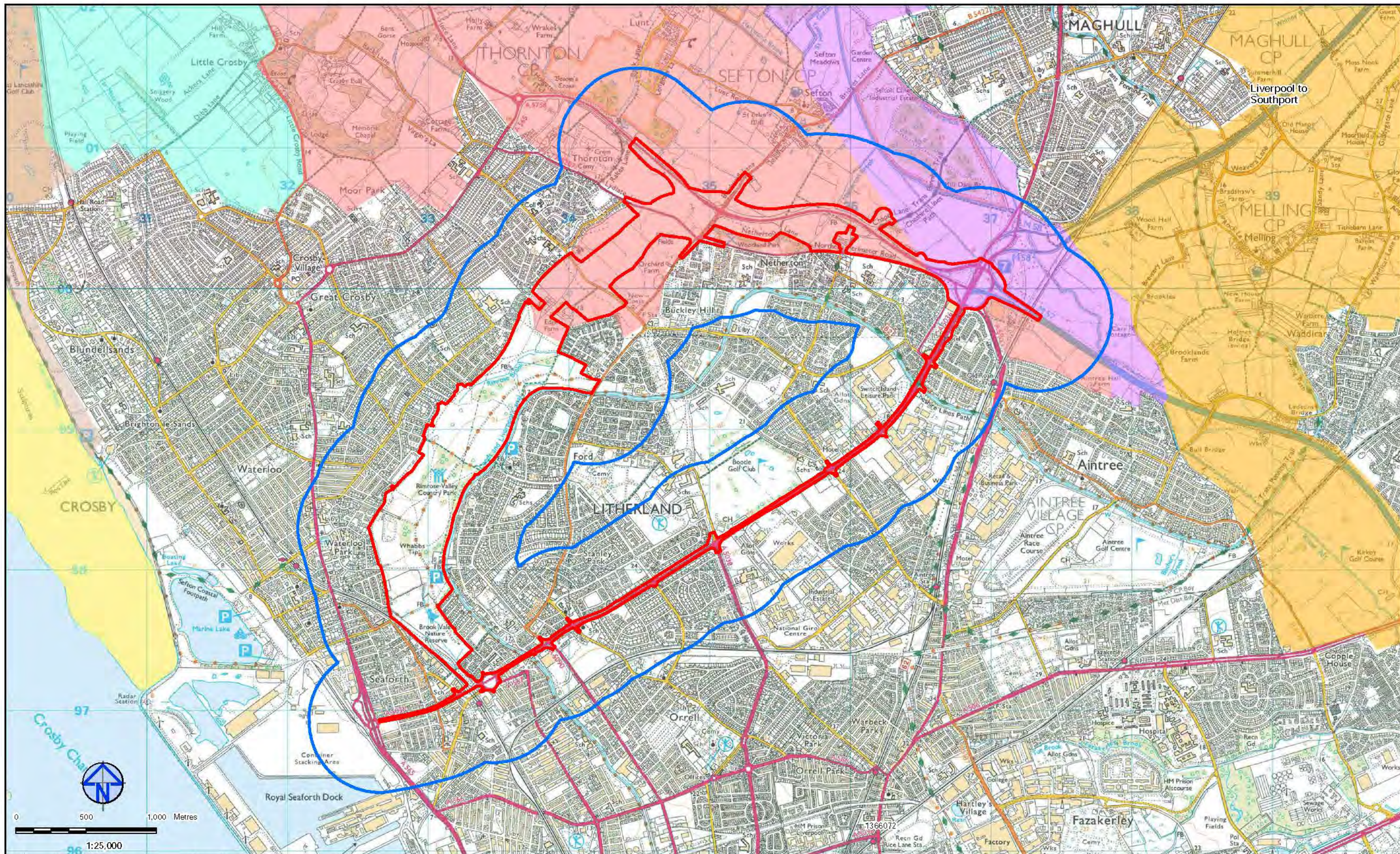
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Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT:
A5036 Port of Liverpool Access Scheme

TITLE:
Figure 10.1: National Character Areas

Drawing Number: **10.1** | Project No: **UA009770** | Issue: **P1**



P1	13SEP17	Initial Issue	AH	BP	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Study Area - 500m
- Local Landscape Character Areas
- Carr Farmlands
- Coastal Dunes
- Dune Backlands
- Estate Farmlands
- Sandy Foreshore
- Settled Farmlands

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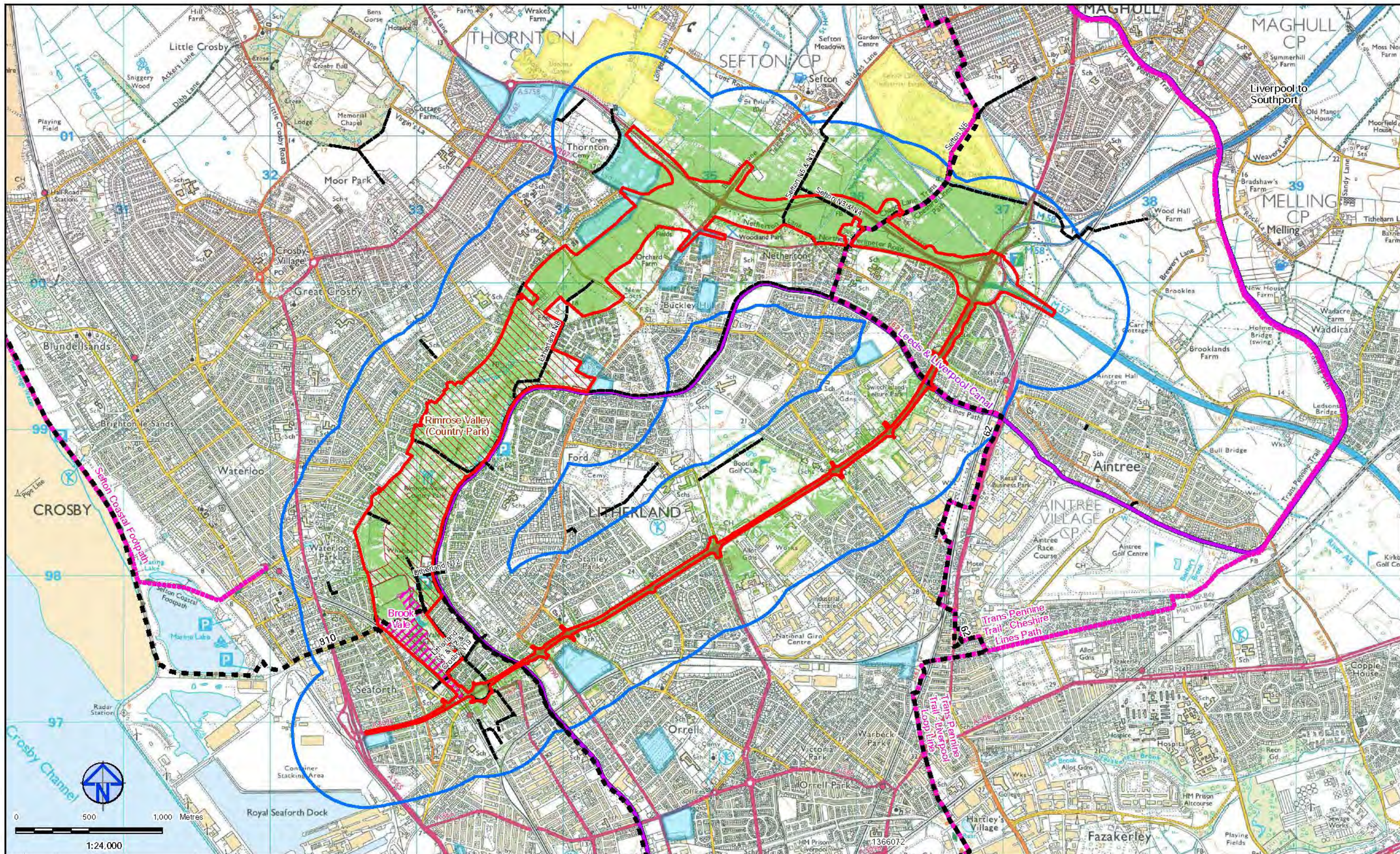
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Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 10.2: Local Landscape Character Areas

Drawing Number:	10.2	Project No.:	UA009770	Issue:	P1
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P1	13SEP17	Initial Issue	AH	BP	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Study Area - 500m
- National Cycle Route
- National Trails
- Public Rights of Way
- Leeds Liverpool Canal
- Open Access Land
- Country Park
- Local Nature Reserve
- Housing Allocation

Zone of Theoretical Visibility (ZTV)

- Not Visible
- Visible

This ZTV was created using ESRI ArcGIS Viewshed software.

The ZTV provides an appropriate starting point for undertaking the visual impact assessment and assessment of viewpoints. The elevation data used for this analysis was 2m LIDAR data.

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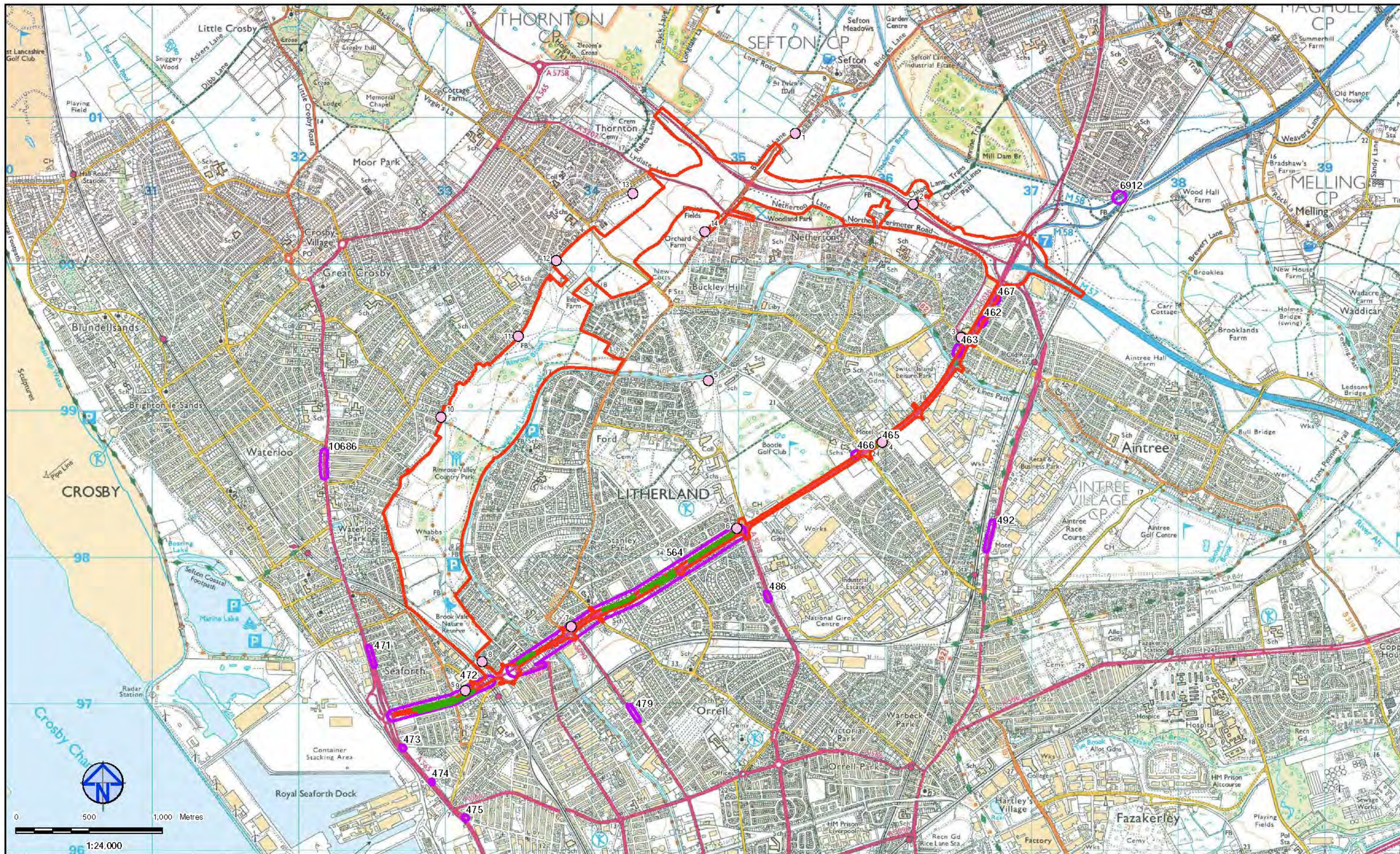
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Suitability Code:	Sx	Project Number:	UA009770	

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 10.3: Key Visual Receptors

Drawing Number: 10.3 Project No: UA009770 Issue: P1



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P1	13SEP17	Initial Issue	AH	KD	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Noise Monitoring Location
- Existing Noise Barriers
- Noise Important Area

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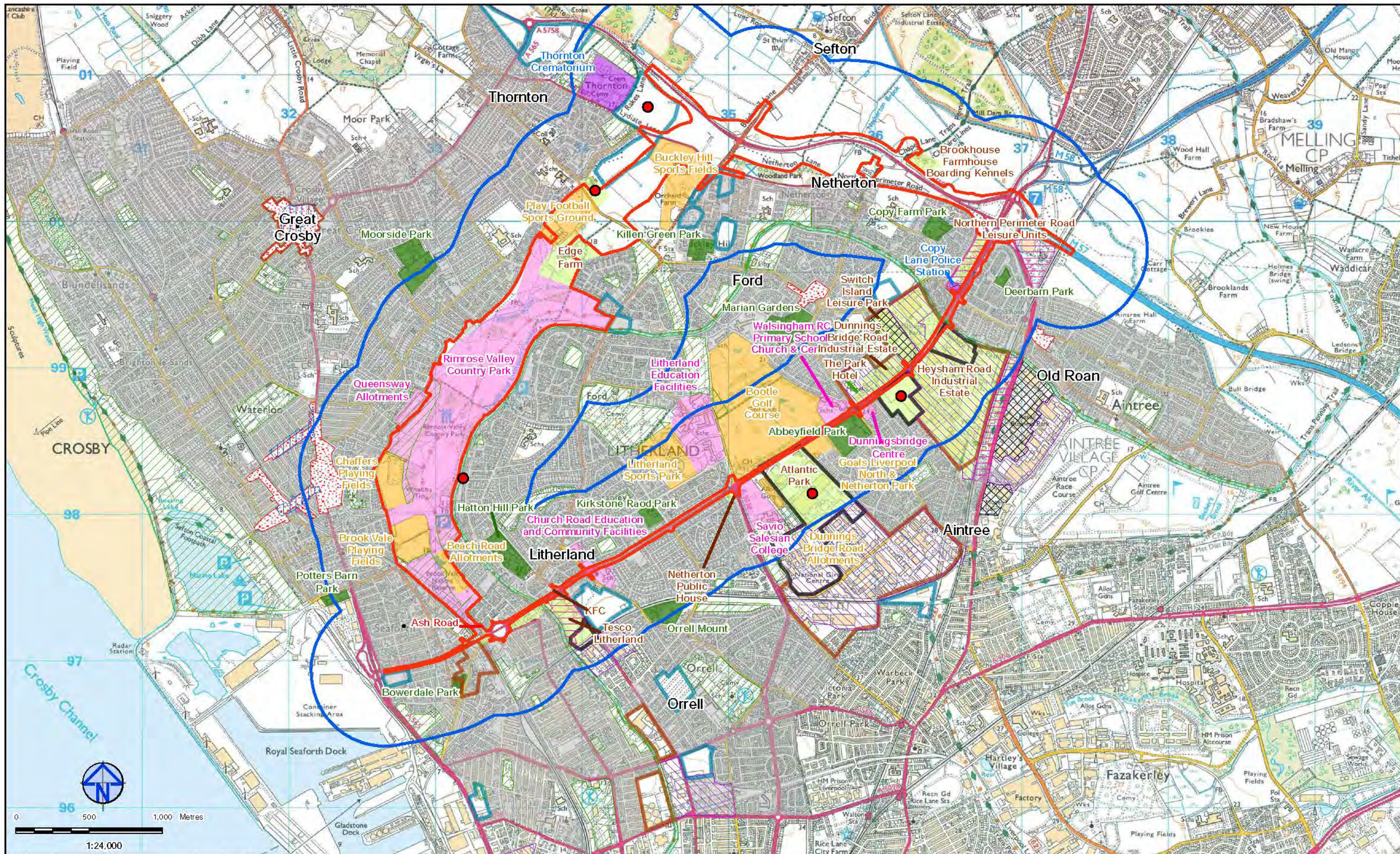
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Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 11.1: Noise Monitoring Locations and Noise Important Areas Locations

Drawing Number:	Project No.:	Issue
11.1	UA009770	P1



P1	13SEP17	Initial Issue	AH	EW	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Study Area - 500m

Site Allocations

- Regeneration Opportunity Area
- Housing Allocation
- Employment & Mixed Use Allocation

Main Receptor

- Commercial
- Education Facilities
- Health and Emergency Services
- Residential
- Sport and Leisure Facilities
- Open Space

- Mixed Use Areas
- Employment Areas
- Primary Shopping Area
- Town Districts and Local Town Centres
- Retail Parks
- Planning Applications
- Parks

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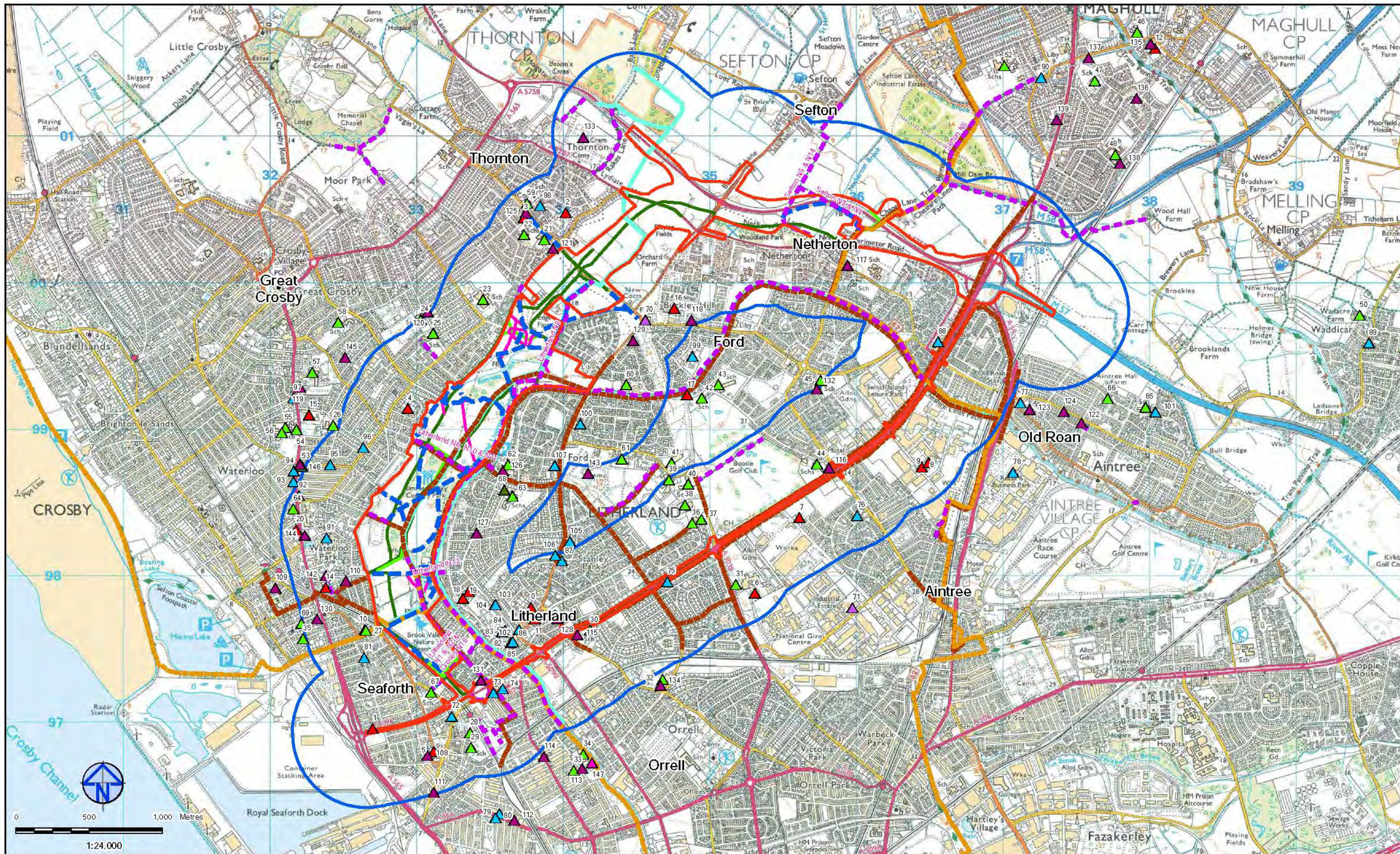
PROJECT:

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TITLE:

Figure 12.1: Land Use

Drawing Number:	12.1	Project No.:	UA009770	Issue:	P1
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P1	13SEP17	Initial Issue	AH	EW	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

Proposed Scheme Boundary	Strategic Footpaths	Education
Study Area - 500m	Informal Footpaths	Education/ Community Facilities
Public Rights of Way	Proposed Footpath and Cycleway Ramps	Emergency Services
Local Footpath	Proposed Footpath and Cycleways	Health
National Cycle Routes	Community Assets	Religious
Local Cycle Route	Community Facilities	Religious/ Community Facilities

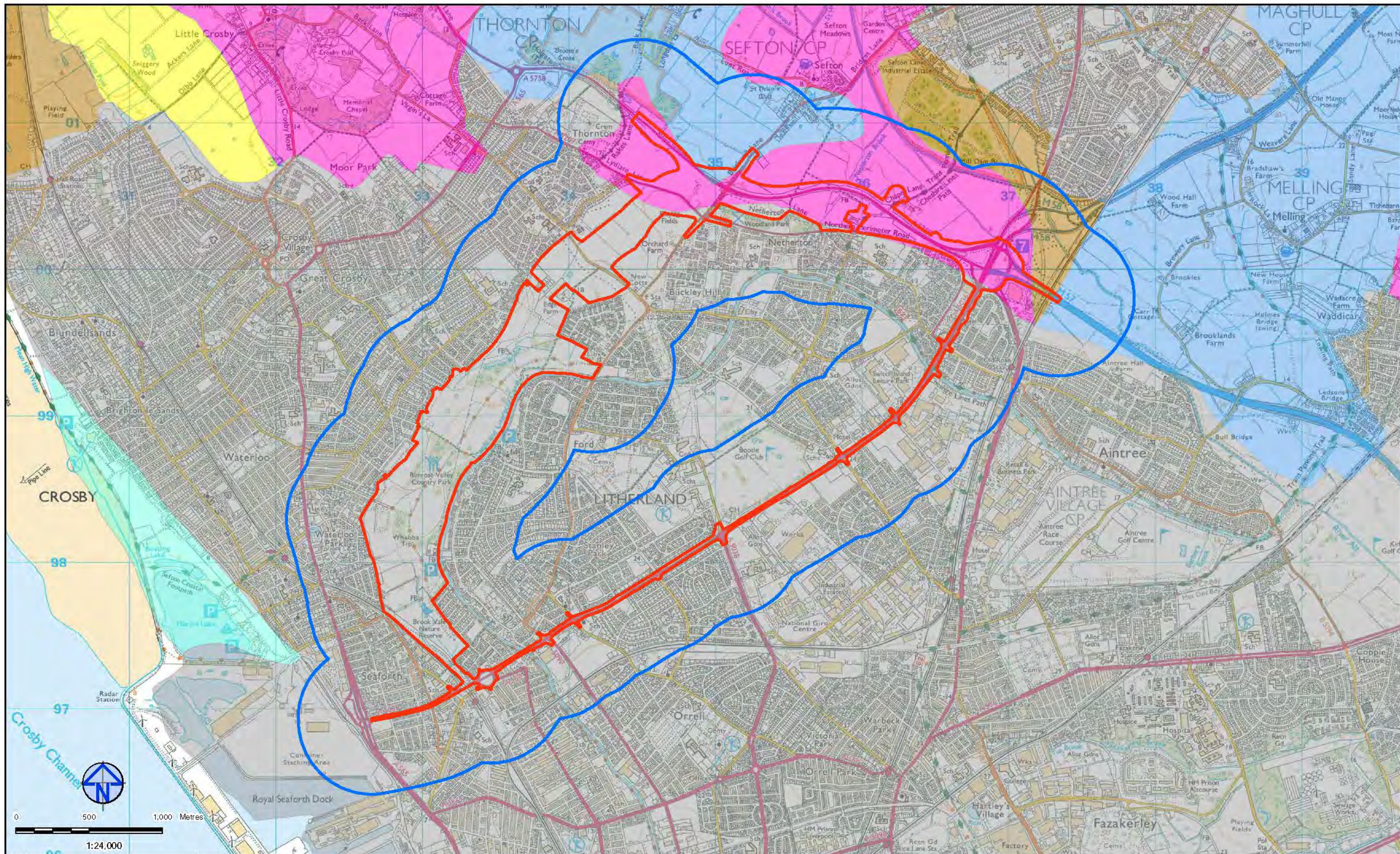
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Suitability Code:	Sx	Project Number:	UA009770	

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 12.2: Rights of Way and Community Assets Sheet 1 of 2

Drawing Number:	12.2	Project No.:	UA009770	Issue:	P1
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P1	13SEP17	Initial Issue	AH	EW	AM
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NOTES:

Proposed Scheme Boundary	Grade 3
Study Area - 500m	Grade 4
Exclusion	Grade 5
Grade 1	Non Agricultural
Grade 2	Urban

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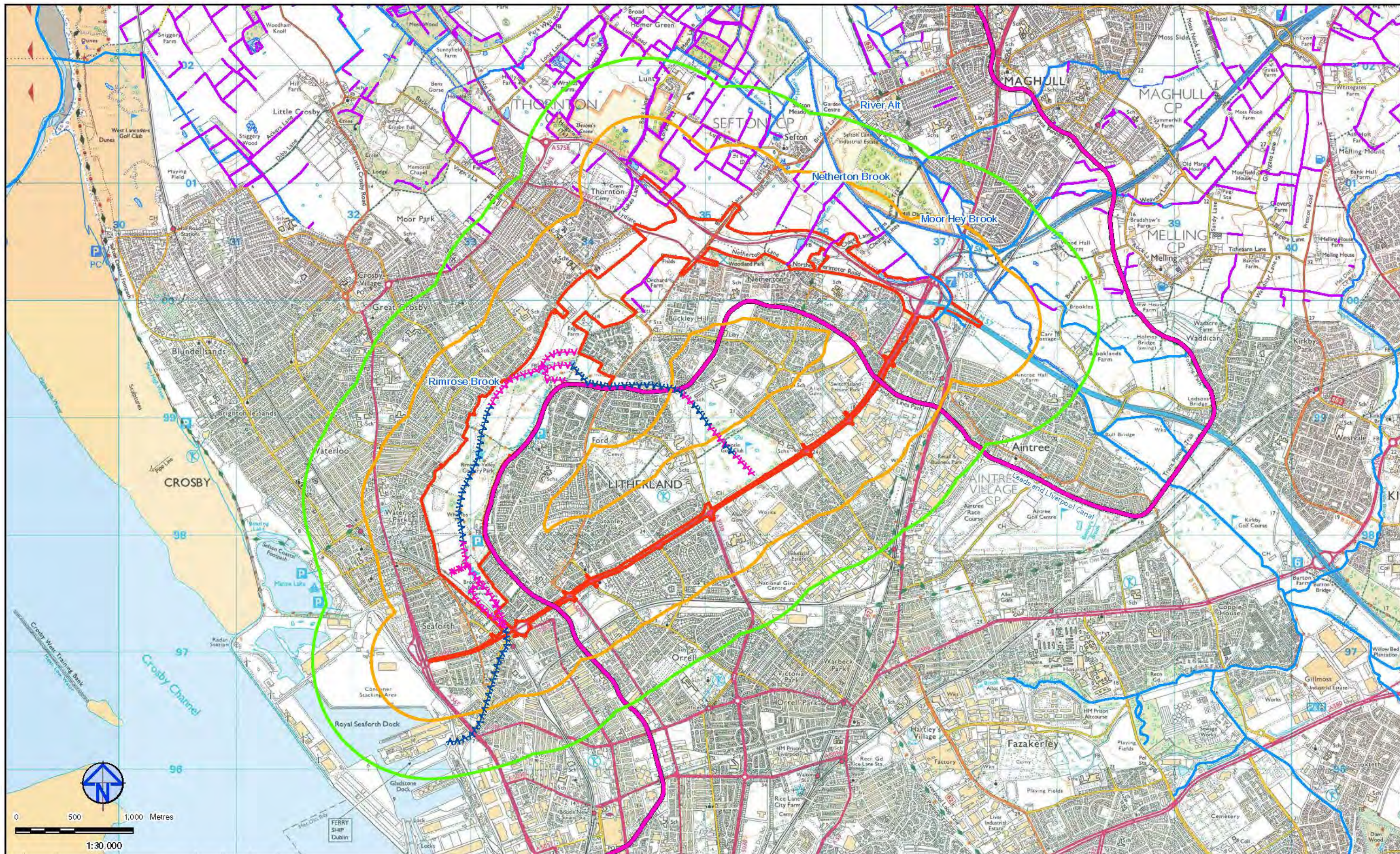
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Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 12.3: Agricultural Land Classification

Drawing Number:	12.3	Project No.:	UA009770	Issue:	P1
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NOTES:

- Proposed Scheme Boundary
- Groundwater Study Area - 1000m
- Surface Water Study Area - 500m
- - - - Rimrose Brook
- - - - Approximate Route of Rimrose Brook Culvert
- Leeds and Liverpool Canal
- Main River
- Ordinary Watercourse
- Ponds

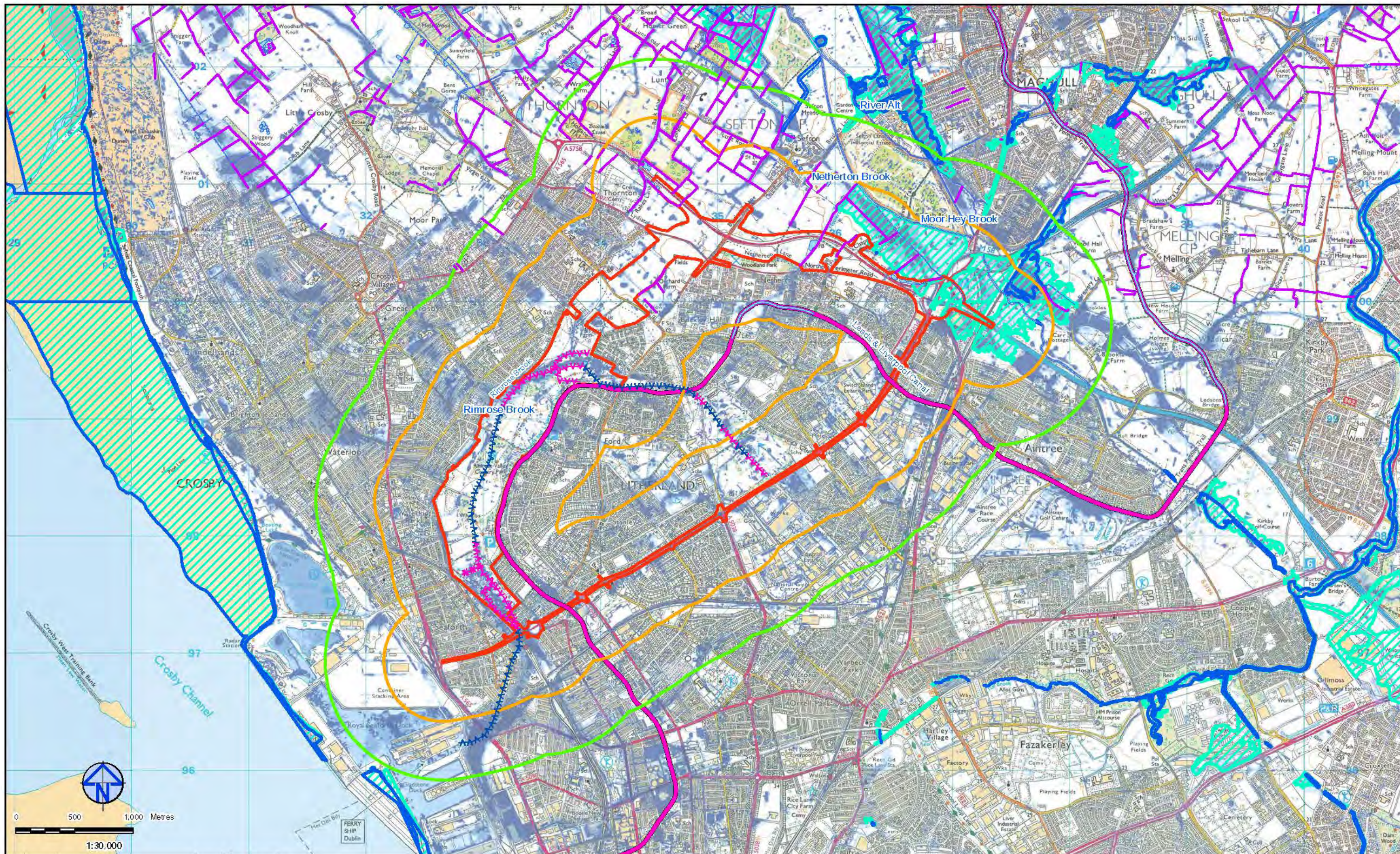
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Suitability Code:	Sx	Project Number:	UA009770	

PROJECT:
A5036 Port of Liverpool Access Scheme

TITLE:
Figure 13.1 Surface Water

Drawing Number:	13.1	Project No.:	UA009770	Issue:	P1
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P1	13SEP17	Initial Issue	AH	BT	AM
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NOTES:

- Proposed Scheme Boundary
- Groundwater Study Area - 1000m
- Surface Water Study Area - 500m
- Rimrose Brook
- Approximate Route of Rimrose Brook Culvert
- Ordinary Watercourse
- Leeds/Liverpool Canal
- Flood Zone 3
- Flood Zone 2
- Ponds

Risk of Flooding from Surface Water

- 0.1% Annual Chance
- 1% Annual Chance
- 3.3% Annual Chance

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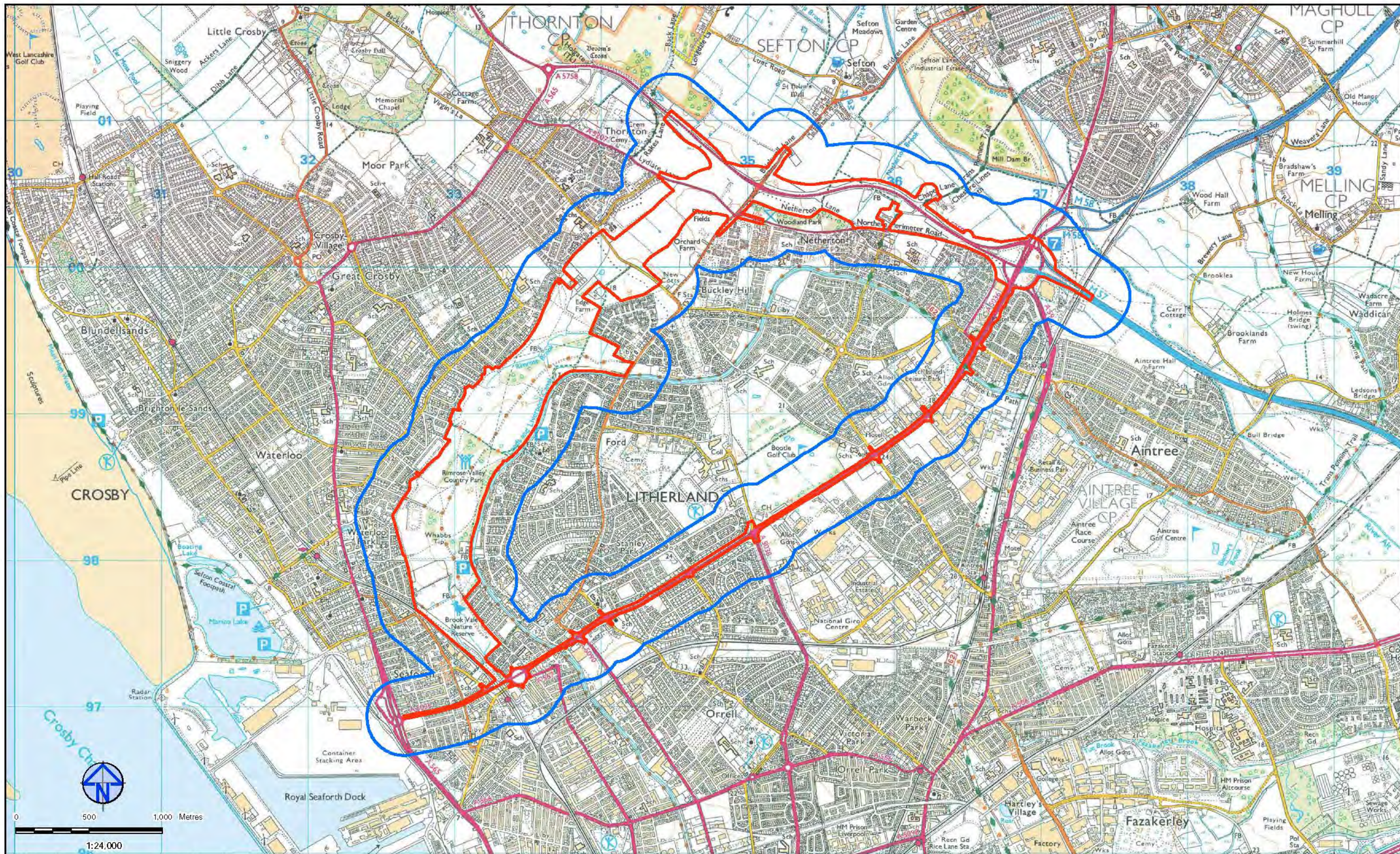
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Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 13.2 EA Flood Zones and Surface Water Flood Risk

Drawing Number: 13.2 | Project No: UA009770 | Issue: P1



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P1	13SEP17	Initial Issue	AH	CW	AM
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NOTES:

- Proposed Scheme Boundary (Geology Study Area)
- Study Area - 250m (Contaminated Land Study Area)

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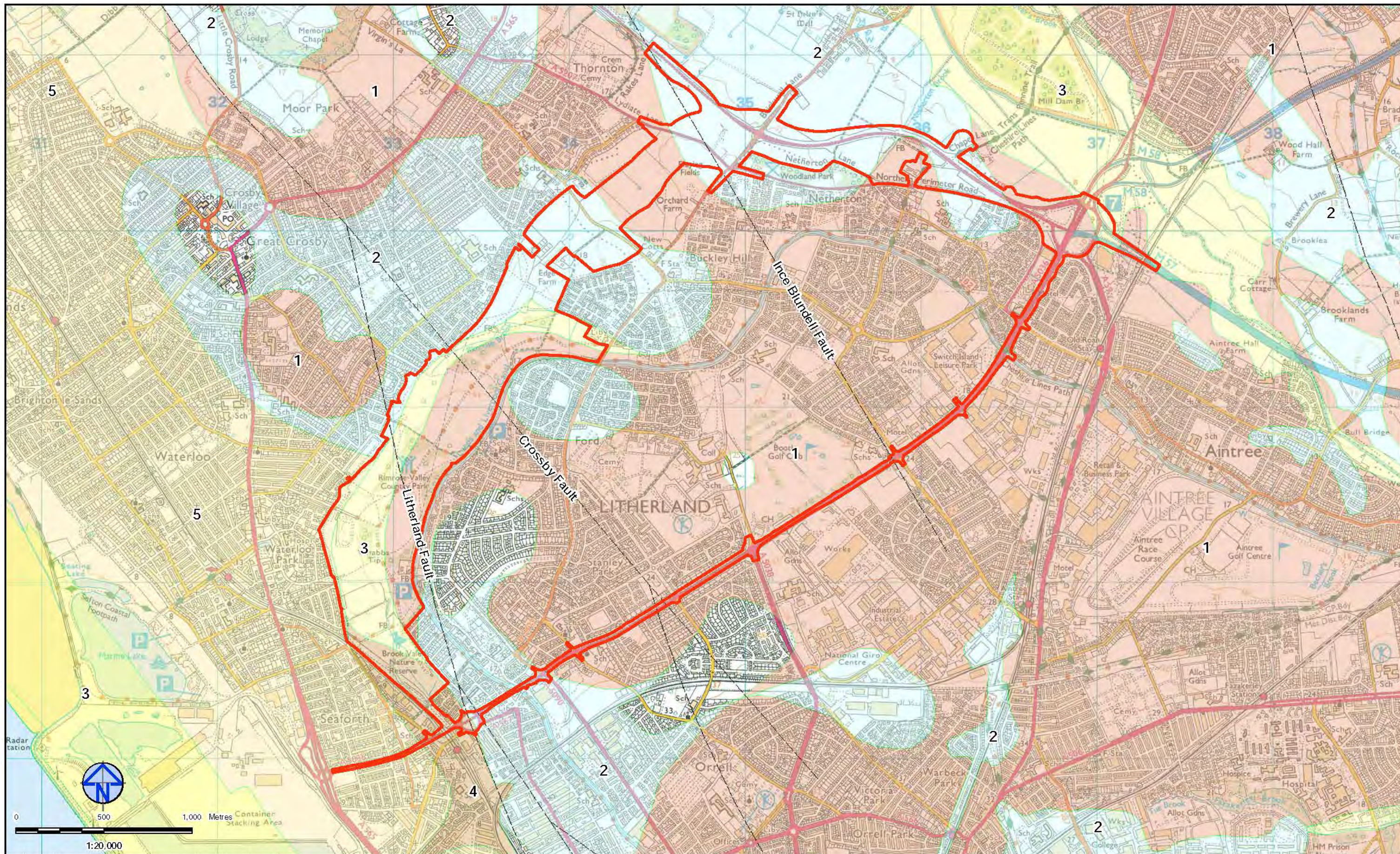
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Suitability Code:	SX	Project Number:	UA009770		

PROJECT:
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TITLE:
Figure 14.1: Geology and Contaminated Land Study Area

Drawing Number:	14.1	Project No.:	UA009770	Issue:	P1
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NOTES:

Proposed Scheme Boundary

Superficial Deposits

1 Shirdley Hill Sand - Moderately to well-sorted sand, wind-blown sediment.	4 Peat.
2 Till - Over consolidated sandy and/or silty with gravel, cobbles and boulders.	5 Blown Sand - Sand, pale brown, fine-grained, uncemented.
3 Alluvium - Clay, silt, sand and gravel.	

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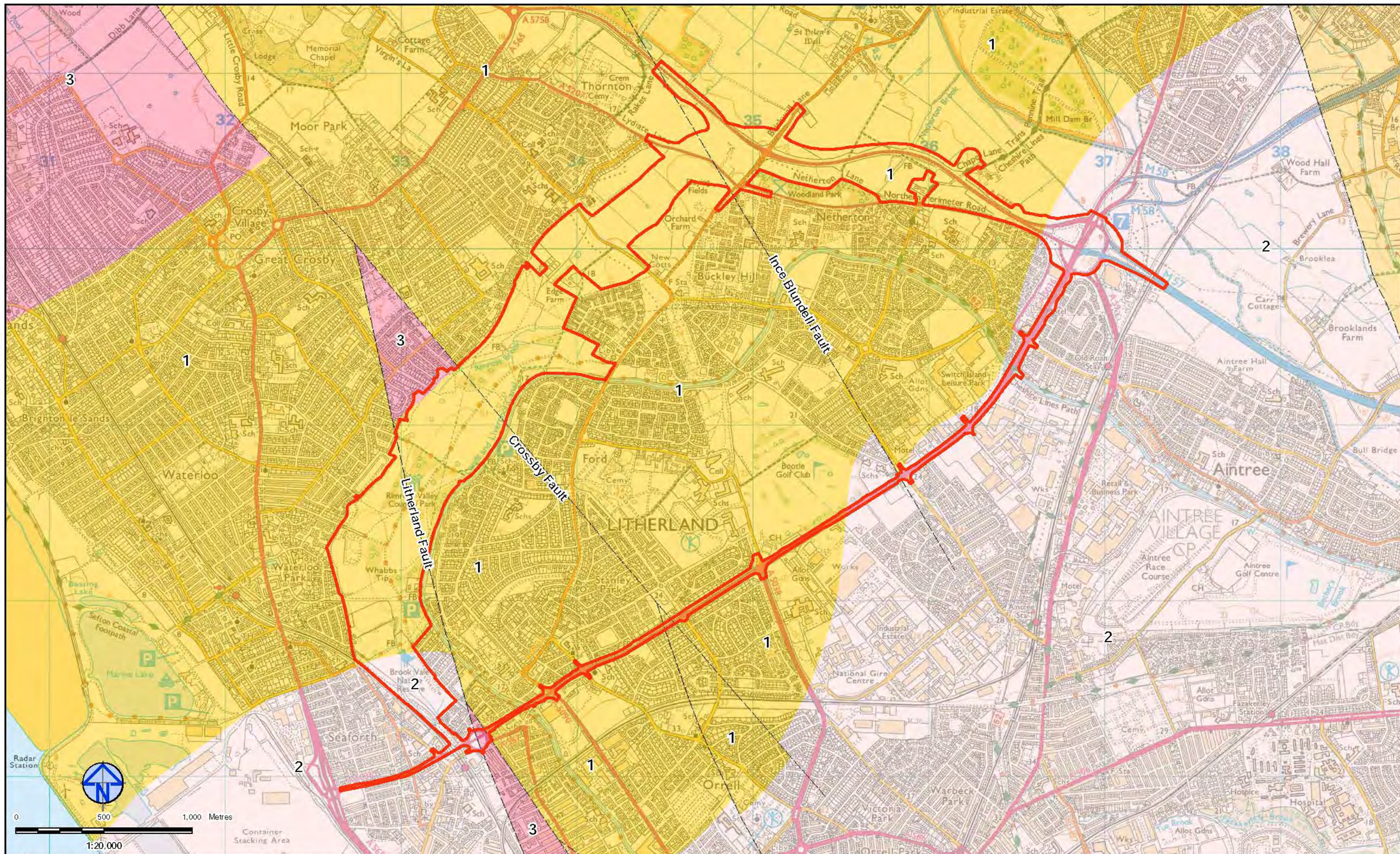
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Approved	A.Morrissey	Date	13SEP17	Signed	
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Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 14.2: Superficial Deposits

Drawing Number:	14.2	Project No.:	UA009770	Issue:	P1
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P1	13SEP17	Initial Issue	AH	CW	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

Proposed Scheme Boundary

Solid Geology - Bedrock

1 Sellafeld Member - Fine to medium grained red-brown sandstone.

2 Wilmslow Sandstone Formation - Fine to medium grained red-brown sandstone.

3 Sidmouth Mudstone Formation - Dominantly mudstone and siltstone, red-brown with common grey-green reduction patches and spots.

Data provided by www.bgs.ac.uk

Print Date: 30.10.17 14:11:27

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Drawn	A.Hankinson	Date	13SEP17	Signed	
Checked	C.Wheatley	Date	13SEP17	Signed	
Approved	A.Morrissey	Date	13SEP17	Signed	
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Suitability Code:	Sx	Project Number:	UA009770		

PROJECT: A5036 Port of Liverpool Access Scheme

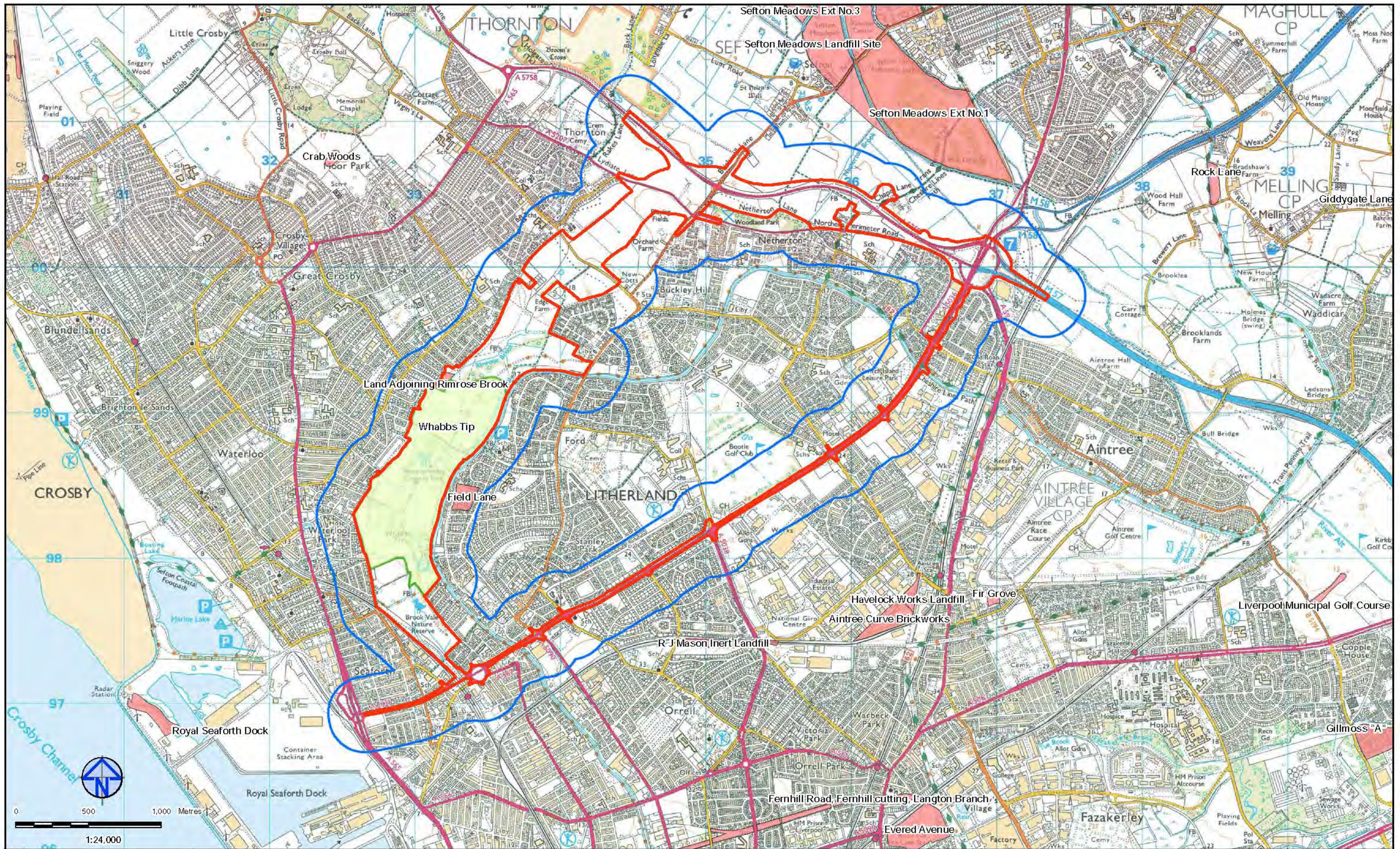
TITLE: Figure 14.3: Solid Geology

Drawing Number: 14.3

Project No: UA009770

Issue: P1

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P1	13SEP17	Initial Issue	AH	CW	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Proposed Scheme Boundary
- Study Area - 250m
- Historic Landfill Site
- Historic Landfill Site - Whabbs Tip

Insert Source: Atkins PSSR 2016
HE549387-ATK-HGT-ZZ-RP-GE-0001
PSSR P04 HAGDMS Number 29122

Historic Landfill Data Source: www.data.gov.uk/dataset/historic-landfill1

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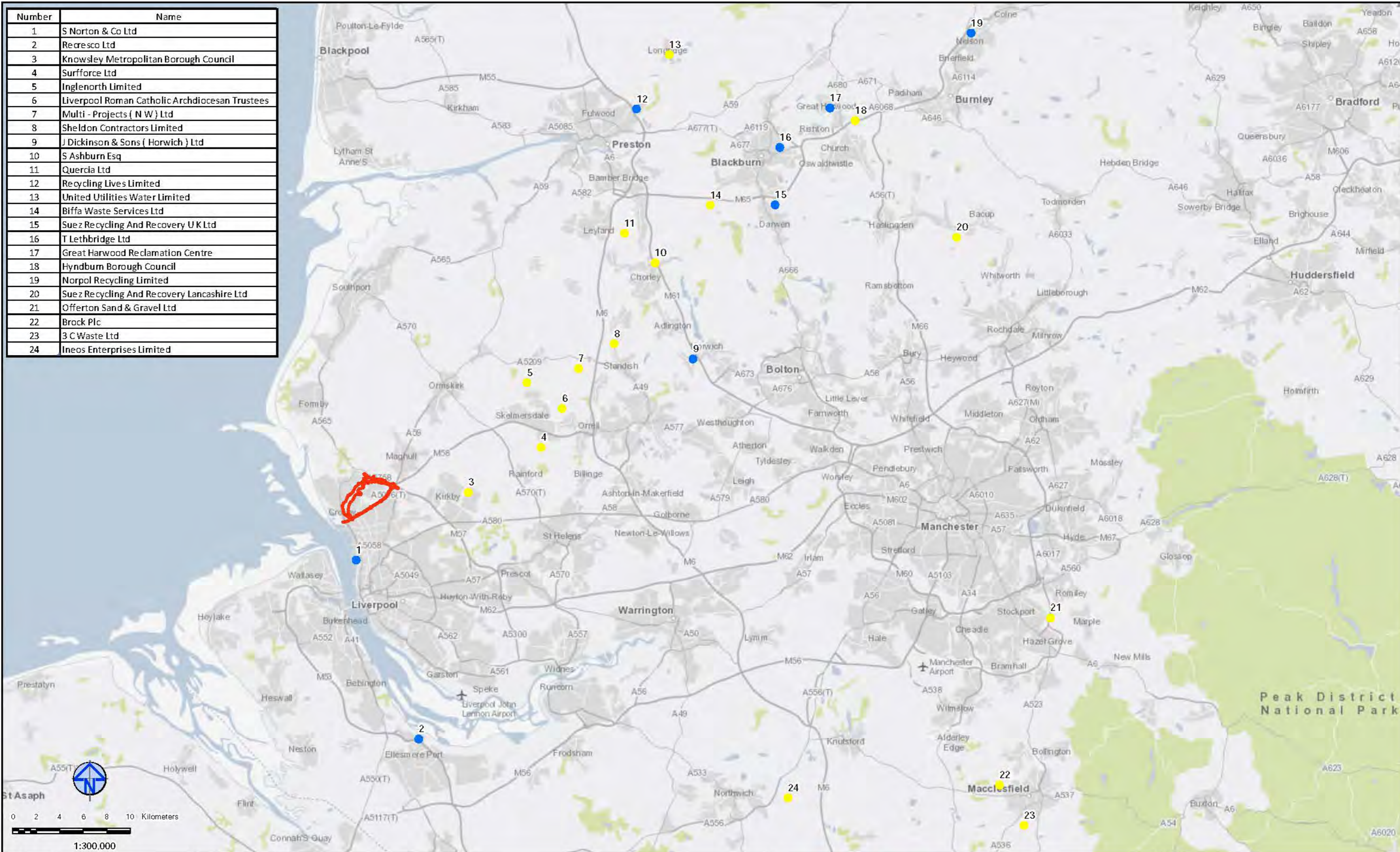
Designed	C. Wheatley	Date	13SEP17	Signed
Drawn	A. Hankinson	Date	13SEP17	Signed
Checked	C. Wheatley	Date	13SEP17	Signed
Approved	A. Morrissey	Date	13SEP17	Signed
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Suitability Code:	Sx	Project Number:	UA009770	

PROJECT: A5036 Port of Liverpool Access Scheme

TITLE: Figure 14.4: Historic Landfill Sites

Drawing Number:	14.4	Project No.:	UA009770	Issue:	P1
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Number	Name
1	S Norton & Co Ltd
2	Reresco Ltd
3	Knowsley Metropolitan Borough Council
4	Surforce Ltd
5	Inglenorth Limited
6	Liverpool Roman Catholic Archdiocesan Trustees
7	Multi - Projects (N W) Ltd
8	Sheldon Contractors Limited
9	J Dickinson & Sons (Horwich) Ltd
10	S Ashburn Esq
11	Quercia Ltd
12	Recycling Lives Limited
13	United Utilities Water Limited
14	Biffa Waste Services Ltd
15	Suez Recycling And Recovery U K Ltd
16	T Lethbridge Ltd
17	Great Harwood Reclamation Centre
18	Hyndburn Borough Council
19	Norpol Recycling Limited
20	Suez Recycling And Recovery Lancashire Ltd
21	Offerton Sand & Gravel Ltd
22	Brock Plc
23	3 C Waste Ltd
24	Ineos Enterprises Limited



- NOTES:**
- Proposed Scheme Boundary
 - Landfill Site
 - Waste Management Facility

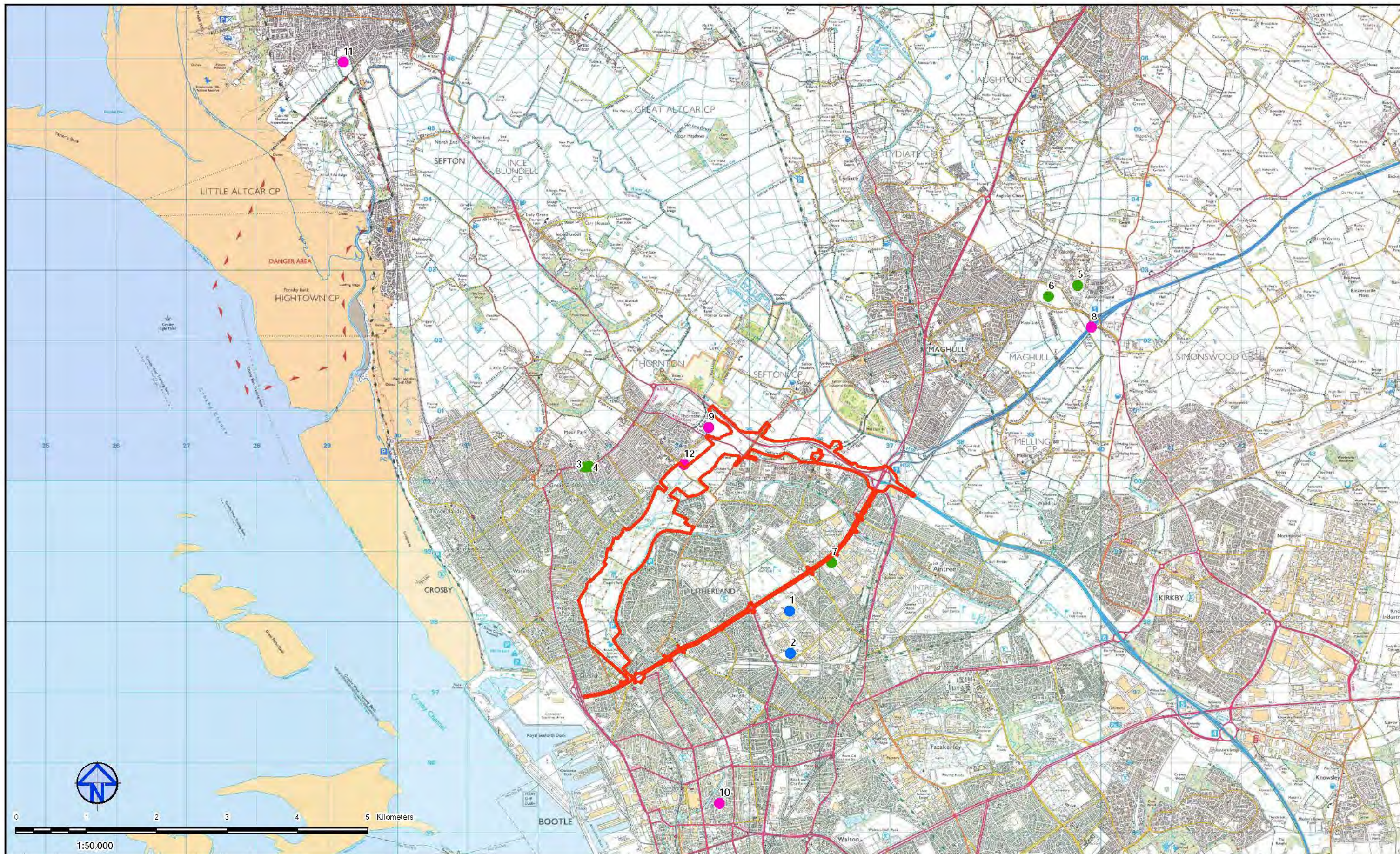
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Drawn	A. Hankinson	Date 13SEP17	Signed
Checked	J. Clarke	Date 13SEP17	Signed
Approved	A. Morris sy	Date 13SEP17	Signed
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Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009770

PROJECT:	
A5036 Port of Liverpool Access Scheme	
TITLE:	
Figure 15.1: Landfill Sites and Waste Management Facilities	
Drawing Number:	Project No.
15.1	UA009770
Issue	P1



P1	13SEP17	Initial Issue	AH	JC	AM
REV	Date	Description	Drawn	Check	Approv

NOTES:

- Scheme Boundary
- Cumulative Developments - Tier
- 1(a)
- 1(b)
- 1(c)

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Checked	B. Twiss	Date	13SEP17	Signed	
Approved	A. Morrissey	Date	13SEP17	Signed	
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Original Size:	A3	Grid:	OS		
Suitability Code:	Sx	Project Number:	UA009770		

PROJECT:
A5036 Port of Liverpool Access Scheme

TITLE:
Figure 17.1: Cumulative Development

Drawing Number: **17.1** | Project No.: **UA009770** | Issue: **P1**

APPENDIX C

Transboundary Screening

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- 23.1.1 PINS Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping states that within the Scoping Report the applicant may wish to provide a completed transboundary screening matrix (as presented in PINS Advice Note 12: Regulation 24 of the EIA Regulations) dealing with the effect of the Project on other European Economic Area (EEA) States.
- 23.1.2 This matrix would facilitate the consideration by the Secretary of State under Regulation 24 of the EIA Regulations of whether the Scheme is likely to have significant effects on the environment in these states. Table C-1 identifies where in this Scoping Report the relevant information is presented to inform the transboundary screening exercise.

Table C-1 Information to Inform a Decision regarding Likely Significant Effects on Another EEA State

Transboundary Screening Criteria	Commentary and Location of Relevant Information in the Scoping Report
Characteristics of the development	Information about the characteristics of the Scheme are described in Chapter 2: Description of the Scheme.
Geographical area	The Scheme would not require any physical works in any area under the jurisdiction of any other EEA State and based on the current understanding there would be no significant environmental effects on any other EEA State.
Location of development	The Scheme lies within the administrative boundary of Sefton Metropolitan Borough Council (SMBC), near the city of Liverpool. Details of the location of the Scheme are provided in Chapter 1: Introduction and shown on Figure 1.1 at Appendix A. The nearest EEA state is Ireland which is approximately 125 miles (200km) away.
Cumulative impacts	There are a number of other schemes being developed near the Project and these are identified in Chapter 17: Cumulative Effects and shown on Figure 17.1 at Appendix A. Potential cumulative impacts will be assessed within the ES.
Carrier	The pathways by which impacts could be spread are via air, land and water. Potential impact pathways are identified where relevant in Sections 7 to 17 of this Scoping Report.
Environmental importance	All environmental resources that are identified as potentially experiencing significant environmental effects all lie within the UK. Details of relevant environmental

Transboundary Screening Criteria	Commentary and Location of Relevant Information in the Scoping Report
	receptors and their importance are provided in Sections 7 to 17 of this Scoping Report.
Extent	Based on the information collated to date as part of the scoping exercise, no significant effects are identified that could impact on another EEA Member State. This position would be clarified as the environmental topic assessments proceed and confirmed in the ES.
Magnitude	
Probability	
Duration	
Frequency	
Reversibility	

APPENDIX D

Cultural Heritage Gazetteers

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Table D-1 Scheduled Monuments Gazetteer (Figure 8.1)

Project ID	List Entry Ref	Name	Date Scheduled	NGR
SM1	1013629	Sefton Old Hall moated site and fishponds, Sefton.	09/08/1962 00:00	SD 35698 01127

Table D-2 Conservation Areas Gazetteer (Figure 8.1)

Project ID	Name
CA4	Lunt Conservation Area
CA3	Sefton Conservation Area
CA2	Waterloo Park Conservation Area
CA1	Christ Church Conservation Area

Table D-3 Listed Buildings Gazetteer (Figure 8.1)

Project ID	List Entry Ref	Name	Grade	Easting	Northing
LB19	1257626	POTTERS BARN	II	332393	397493.4
LB20	1257631	37, GREAT GEORGES ROAD	II	332211	397847.4
LB21	1257636	THREE LAMP STANDARDS SURROUNDING WAR MEMORIAL	II	332292.8	397866.8
LB22	1257640	WATERLOO UNITED FREE CHURCH AND ATTACHED CHURCH HALL	II	332229	398407.4
LB23	1257647	RIVERSLIE	II	332554	397254.4
LB24	1257659	WAR MEMORIAL	II	332293.7	397866.7
LB1	1283407	MOSS BANK	II	333452	397608.4
LB10	1283188	BROOK FARMHOUSE	II	336345	400401.4
LB11	1257651	ADULT EDUCATION CENTRE	II	332652	397636.4
LB12	1257355	CHURCH OF ST MARY THE VIRGIN	II	332516	397971.4
LB13	1257325	SEAFORTH ARMS HOTEL	II	333225	397010.4

Project ID	List Entry Ref	Name	Grade	Easting	Northing
LB14	1257365	JOHN CROSS MEMORIAL DRINKING FOUNTAIN	II	333213	396903.4
LB15	1257327	THE FITNESS CONNECTION HEALTH CLUB	II	333220	396814.4
LB16	1257655	CHURCH OF OUR LADY STAR OF THE SEA	II	333080	396767.4
LB17	1199814	FORMER OLD HALL FARMHOUSE AND BARN	II	335653	401017.4
LB18	1075851	FORMER GRANGE FARMHOUSE AND OUTBUILDING	II	335539	401044.4
LB3	1343290	EDGE FARMHOUSE	II	333964	399827.4
LB4	1343281	TAN HOUSE FARMHOUSE	II	334041	400293.4
LB5	1199864	ORCHARD FARMHOUSE	II	334672	400075.4
LB6	1075850	NETHERTON HOUSE	II	335796	400163.4
LB7	1075849	CHURCH OF ST BENET AND CHAPEL HOUSE	II*	335897.4	400193
LB8	1075848	MANOR HOUSE LODGE	II	335991	400413.4
LB9	1283216	MANOR HOUSE	II	335966	400322.4
LB25	1199359	CHURCH OF ST PHILIP	II	334098	397597.4
LB26	1257656	INTERNATIONAL HOTEL	II	332717	396707.4

Table D-4 HER Monuments Gazeteer (Figures 8.2 and 8.3).

Project ID	HER Ref	Name	Period
1	MME11735	Site of a barn, Ford Lane, Ford	Post-Medieval to Modern
2	MME11736	Site of Ivy Cottage, Ford Lane, Ford	Post-Medieval to Modern
3	MME11737	Site of Ford Cottage, Ford Lane, Ford	Post-Medieval to Modern
4	MME11739	Site of a barn at Ford Cottage, Ford Lane, Ford	Post-Medieval to Modern
5	MME11740	Site of Ford House shippon, Ford Lane,	Post-Medieval to

Project ID	HER Ref	Name	Period
		Ford	Modern
6	MME11741	Site of Ford House barn, Ford Lane, Ford	Post-Medieval to Modern
7	MME11742	Site of Ford House, Ford Lane, Ford	Post-Medieval to Modern
8	MME11743	Site of The Gardens, Kirkstone Road West, Ford	Post-Medieval to Modern
9	MME11745	Site of Cross House Farm, Sterrix Lane, Ford	Post-Medieval to Modern
10	MME12073	Coach house to The Elms, No. 1 Field Lane, Litherland	Post-Medieval to Modern
11	MME12075	Site of an 18th century house, Field Lane, Litherland	Post-Medieval to Modern
12	MME12076	Site of an 18th century barn, Field Lane, Litherland	Post-Medieval to Modern
13	MME14343	Site of a barn, Copy Lane, Netherton	Post-Medieval to Modern
14	MME14351	Site of a house, Barberry Crescent, Netherton	Post-Medieval to Modern
15	MME14357	Site of a barn, Brook House Farm, Chapel Lane, Netherton	Post-Medieval to Modern
16	MME14663	Location of a brick kiln, Sefton	Post-Medieval
17	MME14664	Barn at Tanhouse Farm, Runnell's Lane, Sefton	Post-Medieval to Modern
18	MME14668	Site of Sefton Rectory gate lodge, Brickwall Lane, Sefton	Post-Medieval to Modern
19	MME14671	Site of a fish pond, Brickwall Lane, Sefton	Post-Medieval to Modern
20	MME14676	Site of gate piers and wall to the south of Sefton Rectory, Brickwall Lane, Sefton	Post-Medieval to Modern
21	MME14686	Route of Sefton mill stream, Sefton	Medieval to Modern
22	MME14687	Nos. 1 and 2 Coach House Court, Sefton	Post-Medieval to Modern
23	MME14688	Undated ditches, Brickwall Green, Sefton	Unknown
24	MME15066	Site of the chapel attached to Sefton Old	Post-Medieval

Project ID	HER Ref	Name	Period
		Hall Moated Site, Bridges Lane, Sefton	
25	MME15253	Location of Sefton Park, Sefton	Post-Medieval
26	MME15349	Plaza Cinema, Crosby Road North, Waterloo, Great Crosby	Modern
27	MME15412	Brick wall, Brickwall Lane, Sefton	Post-Medieval to Modern
28	MME15414	Cropmarks of ridge and furrow, Thornton	Medieval to Modern
29	MME15415	Cropmarks of ridge and furrow, Thornton	Medieval to Modern
30	MME15906	Medieval pottery, Brickwall Lane, Sefton	Medieval
31	MME15907	Possibly Roman pottery, Netherton Lane, Sefton	Roman
32	MME15908	Possibly Roman pottery, Northern Perimeter Road, Netherton	Roman to Medieval
33	MME15909	Flint blade, Northern Perimeter Road, Netherton	Prehistoric
34	MME15944	Struck flakes, Brickwall Lane, Sefton	Prehistoric
35	MME15945	Possible Roman pottery, Brickwall Lane, Sefton	Roman
36	MME15946	Possible Roman pottery, Brickwall Lane, Sefton	Roman
37	MME15949	Struck flakes, Brickwall Lane, Sefton	Prehistoric
38	MME15958	Site of Seaforth House, Cecil Road, Litherland	Post-Medieval to Modern
39	MME16110	Location of Arland, Netherton	Medieval to Post-Medieval
40	MME16112	Possible location Netherton watermill, Netherton	Medieval to Post-Medieval
41	MME16120	Site of Netherton House outbuildings, Netherton Green, Netherton	Post-Medieval to Modern
42	MME16127	Christ Church, Alexandria Road, Waterloo, Litherland	Modern
43	MME16215	Half milepost, Leeds and Liverpool Canal, Ford	Modern

Project ID	HER Ref	Name	Period
44	MME16292	Medieval pottery, Chapel Lane, Netherton	Medieval to Post-Medieval
45	MME16307	Stone House, Park Road, Great Crosby	Post-Medieval to Modern
46	MME16308	Braunston Lea, No. 5 Bramhall Road, Great Crosby	Post-Medieval to Modern
47	MME16309	Ellesmere House, No. 4 Crosby Road North, Great Crosby	Post-Medieval to Modern
48	MME16311	Nos. 1-8 Park Terrace, Great Crosby	Post-Medieval to Modern
49	MME16312	St Mary's Church Hall, Park Road, Great Crosby	Modern
50	MME16319	Seafield House, No. 2 Crosby Road North, Great Crosby	Post-Medieval to Modern
51	MME16320	Poppy Place, No. 6 Crosby Road North, Great Crosby	Post-Medieval to Modern
52	MME16321	Nos. 1 and 3 Bramhall Road, Great Crosby	Post-Medieval to Modern
53	MME16322	Angra Bank, No. 4 Bramhall Road, Great Crosby	Post-Medieval to Modern
54	MME16323	Rosebank and Olivebank, No. 2 Bramhall Road, Great Crosby	Post-Medieval to Modern
55	MME16324	Nos. 1-2 Greenbank, Great Crosby	Post-Medieval to Modern
56	MME16336	Welsh Presbyterian Church, Crosby Road South, Litherland	Post-Medieval to Modern
57	MME16343	Nos. 1-3 Crosby Road South, Litherland	Post-Medieval to Modern
58	MME16356	Nos. 3-4 Greenbank, Great Crosby	Post-Medieval to Modern
59	MME16357	Nos. 5-6 Greenbank, Great Crosby	Post-Medieval to Modern
60	MME16516	Possible site of a medieval windmill, Edge Lane, Sefton	Medieval to Post-Medieval
61	MME2290	The Liver Hotel Public House, South Road, Waterloo, Great Crosby	Post-Medieval to Modern

Project ID	HER Ref	Name	Period
62	MME2300	Site of Seaforth Farm, near Thomson Road, Litherland	Post-Medieval to Modern
63	MME2303	Site of Crosby Academy, Crosby Road North, Great Crosby	Post-Medieval to Modern
64	MME2304	Site of Marsh Cottage, Crosby Road North, Great Crosby	Post-Medieval to Modern
65	MME2305	Site of Seafield House, near Glenwyllin Road, Great Crosby	Post-Medieval to Modern
66	MME2308	Nos. 38 and 40 Brownmoor Lane and The Barn, Brownmoor Park, Great Crosby	Post-Medieval to Modern
67	MME2329	Site of Windles Green Farm, Runnel's Lane, Sefton	Post-Medieval to Modern
68	MME2340	Site of a house, Edge Lane, Sefton	Post-Medieval to Modern
69	MME2341	Site of a house, Edge Lane, Sefton	Post-Medieval to Modern
70	MME2702	Site of Seaforth Parsonage, off Seaforth Road, Litherland	Post-Medieval to Modern
71	MME2703	Site of St Thomas Church, Church Road, Litherland	Post-Medieval to Modern
72	MME2704	Site of Elm Lodge, Seaforth Road, Litherland	Post-Medieval to Modern
73	MME2706	Site of Seaforth School, Seaforth Road, Litherland	Post-Medieval to Modern
74	MME2720	Possible site of a medieval Tithe Barn, Marina Avenue, Litherland	Medieval to Post-Medieval
75	MME2722	Site of a smithy, Sefton Road, Litherland	Post-Medieval to Modern
76	MME2724	The Constitutional Club, No. 1 Field Lane, Litherland	Post-Medieval to Modern
77	MME2725	Site of Litherland House, Field Lane, Litherland	Post-Medieval to Modern
78	MME2727	Site of an 18th century house, Sefton Road, Litherland	Post-Medieval to Modern
79	MME2728	Site of Mill Randle Inn, Sefton Road, Litherland	Post-Medieval to Modern

Project ID	HER Ref	Name	Period
80	MME2733	Pollen Samples from Rimrose Valley Boreholes, near Beach Road, Litherland	Unknown
81	MME2734	Site of Litherland Tannery, Field Lane, Litherland	Post-Medieval to Modern
82	MME2737	Site of Ford Lodge, Ford Lane, Ford	Post-Medieval to Modern
83	MME2738	Site of Rose Cottage, Ford Lane, Ford	Post-Medieval to Modern
84	MME2739	Site of Hatton House, later Hatton Hill, Hatton Hill Primary School, Ford	Post-Medieval to Modern
85	MME2741	Site of Hatton Cottage, Hatton Hill Road, Ford	Post-Medieval to Modern
86	MME2747	Site of two buildings, Watling Avenue, Ford	Post-Medieval
87	MME2755	Site of Maypole Farm, Lydiate Lane, Sefton	Post-Medieval to Modern
88	MME2757	Medieval and post medieval pottery, south of Tanhouse Farm, Sefton	Medieval to Modern
89	MME2758	Site of The Cottage, Buckley Hill lane, Sefton	Post-Medieval to Modern
90	MME2759	Site of a house, Lydiate Lane, Sefton	Post-Medieval to Modern
91	MME2760	Site of a house, Buckley Hill Lane, Sefton	Post-Medieval to Modern
92	MME2761	Site of a house, Pinfold Close, Sefton	Post-Medieval to Modern
93	MME2762	Site of Suttons, Lydiate Lane, Sefton	Post-Medieval to Modern
94	MME2763	Site of The Poplars, Lydiate Lane, Sefton	Post-Medieval to Modern
95	MME2764	Site of The Hollies, Lydiate Lane, Sefton	Post-Medieval to Modern
96	MME2765	Site of Catons, Lydiate Lane, Sefton	Post-Medieval to Modern
97	MME2766	Site of two houses, Runnell's Lane, Sefton	Post-Medieval to Modern
98	MME2767	Site of a house, Lydiate Lane, Sefton	Post-Medieval to

Project ID	HER Ref	Name	Period
			Modern
99	MME2768	Site of a house, Lydiate Lane, Sefton	Post-Medieval to Modern
100	MME2769	Location of a brick kiln, Runnell's Lane, Sefton	Post-Medieval
101	MME2770	Site of a windmill, Edge Lane, Sefton	Medieval to Post-Medieval
102	MME2771	Location of a smithy, Runnell's Lane, Sefton	Post-Medieval
103	MME2772	Stone quern, The Poplars, Lydiate Lane, Sefton	Unknown
104	MME3215	Site of Sterrix Lane Cross, Ford	Medieval to Modern
105	MME3221	Location of Buckley Hill cross, Edge Lane Lane, Sefton	Medieval to Modern
106	MME3222	Site of a cruck framed barn, Edge Farm, Sefton	Medieval to Modern
107	MME3224	Gorse Lane Bridge, Gorse Lane, Ford	Post-Medieval to Modern
108	MME3230	Site of Sefton School, Buckley Hill Lane, Sefton	Post-Medieval to Modern
109	MME3231	Site of Fir Grove Farm, Almond's Turn, Sefton	Post-Medieval to Modern
110	MME3233	Site of a barn, Edge Farm, Sefton	Post-Medieval to Modern
111	MME3234	Site of a house, Edge Lane, Sefton	Post-Medieval to Modern
112	MME3235	Site of a house, Fleetwood's Lane, Sefton	Post-Medieval to Modern
113	MME3236	Site of a house and smithy, Fleetwood's Lane, Sefton	Post-Medieval to Modern
114	MME3237	Site of Holmes Farm, Fleetwood's Lane, Sefton	Post-Medieval to Modern
115	MME3239	Roman coin, No. 54 Northumberland Way, Ford	Roman
116	MME3240	Site of a house, Edge Lane, Sefton	Post-Medieval to

Project ID	HER Ref	Name	Period
			Modern
117	MME3241	The Edge moated site, Edge Farm, Sefton	Medieval to Modern
118	MME3244	Cross base, Brickwall Lane, Sefton	Medieval to Modern
119	MME3245	Site of Pinfold Cottage and smithy, Brickwall Lane, Sefton	Post-Medieval to Modern
120	MME3247	Site of Netherton Hall, Aldrins Lane, Netherton	Post-Medieval to Modern
121	MME3248	Site of Horse Stone, Netherton Green, Netherton	Post-Medieval to Modern
122	MME3250	No. 1 Northern Perimeter Road, Netherton	Post-Medieval to Modern
123	MME3251	Site of Bleak House, Chapel Lane, Netherton	Post-Medieval to Modern
124	MME3255	Site of Harrop's Barn Cottage, Waterside, Sefton	Post-Medieval to Modern
125	MME3256	Site of Sefton pinfold, Brickwall Lane, Sefton	Post-Medieval to Modern
126	MME3258	Site of Sefton Town Cross, Brickwall Lane, Sefton	Medieval to Post-Medieval
127	MME3259	Site of a house, Copy Lane, Netherton	Post-Medieval to Modern
128	MME3260	Site of a barn, Aldrins Lane, Netherton	Post-Medieval to Modern
129	MME3261	Site of a house, Netherton Green, Netherton	Post-Medieval to Modern
130	MME3262	Site of a house, Netherton Green, Netherton	Post-Medieval to Modern
131	MME3263	Site of Laburnum House, Netherton Green, Netherton	Post-Medieval to Modern
132	MME3266	Site of a house, Netherton Green, Netherton	Post-Medieval to Modern
133	MME3267	Possible location of a brick kiln, Sefton	Post-Medieval
134	MME3268	Site of a house and malt kiln, Brickwall Lane, Sefton	Post-Medieval

Project ID	HER Ref	Name	Period
135	MME3270	Site of St. Bennet's Roman Catholic School, Chapel Lane, Netherton	Post-Medieval to Modern
136	MME3281	Site of Sefton Rectory, Brickwall Lane, Sefton	Medieval to Modern
137	MME3292	Lady Gate, Brickwall Lane, Sefton	Post-Medieval to Modern
138	MME3303	Site of Sefton Rectory barn, Glebe End, Sefton	Post-Medieval to Modern
139	MME3304	Site of Sefton Rectory coach house, Glebe End, Sefton	Post-Medieval to Modern
140	MME3310	Location of a brick kiln, Brickwall Lane, Sefton	Post-Medieval
141	MME3312	Possible location of a windmill, Sefton	Post-Medieval
142	MME3315	Location of the Old Hall Cross, Sefton	Medieval to Modern
143	MME3317	Site of Outbuilding, Southeast of Sefton Hall Moated Site, Bridges Lane, Sefton	Post-Medieval
144	MME3318	Site of Tithe Barn, Southeast of Sefton Hall Moated Site, Bridges Lane, Sefton	Post-Medieval
145	MME3325	Sefton Rectory moated site, Brickwall Lane, Sefton	Medieval to Modern
146	MME3632	Site of Bridge Farm, Louis Pasteur Avenue, Netherton	Post-Medieval to Modern
147	MME3636	Site of a house, St. Oswald's Lane, Netherton	Post-Medieval to Modern
148	MME4010	Site of Copy Farm, Copy Lane, Netherton	Post-Medieval to Modern
149	MME4011	Site of Moor Bridge House, Copy Lane, Netherton	Post-Medieval to Modern
150	MME4012	Site of The Cottage, Smethick Walk, Netherton	Post-Medieval to Modern
151	MME4015	Location of a kiln, Netherton	Post-Medieval
152	MME9762	Leeds and Liverpool Canal	Post-Medieval to Modern
153	MME9807	Seaforth and Litherland Railway Station, Seaforth Road, Litherland	Post-Medieval to Modern

Project ID	HER Ref	Name	Period
154	MME9808	Site of a bridge over the Leeds and Liverpool Canal, Bridge Road, Litherland	Post-Medieval to Modern
155	MME9809	Site of a smithy, Bridge Road, Litherland	Post-Medieval to Modern
156	MME9810	Footbridge over the Leeds and Liverpool Canal, Bridge Road, Litherland	Post-Medieval to Modern
157	MME14340	Site of Stand Park, Netherton and Sefton, Deer Park	Medieval to Modern
158	MME11617	Site of a farm, Marl Road, Aintree	Post-Medieval to Modern
159	MME9836	Canal Bridge No. 7c, Rail bridge No. 14, Leeds and Liverpool Canal, Aintree	Post-Medieval to Modern
160	MME9835	Bridge abutments, Canal Bridge 7b, Leeds and Liverpool Canal, Aintree and Netherton	Post-Medieval to Modern
161	MME11625	Site of Old Roan Inn, Ormskirk Road, Aintree	Post-Medieval to Modern
162	MME11626	Old Roan Inn, Ormskirk Road, Aintree	Modern
163	MME12017	The Priory Public House, No. 64 Sefton Road, Litherland	Post-Medieval to Modern
164	MME2301	Site of a Second World War Heavy Anti Aircraft Battery, MY67 Seaforth, Crosby Road, Litherland	Modern
165	MME12064	Site of a Second World War Heavy Anti Aircraft Battery camp, MY67 Seaforth, Crosby Road, Litherland	Modern
166	MME2718	Site of Litherland Pinfold, School Lane, Litherland	Post-Medieval to Modern
167	MME2719	Site of Kemp's Farm, Litherland	Post-Medieval to Modern
168	MME12067	Site of Litherland Tithe Barn, Moss Lane, Litherland	Post-Medieval
169	MME2723	Possible site of a post medieval kiln, School Lane, Litherland	Post-Medieval
170	MME3206	Site of King's House, Moss Lane, Litherland	Post-Medieval to Modern
171	MME13219	Church of St Philip, Church Road, Litherland	Post-Medieval to Modern

Project ID	HER Ref	Name	Period
172	MME13293	The International Hotel, Church Road, Litherland	Post-Medieval to Modern
173	MME14345	Possible enclosure, Browns Lane, Netherton	Unknown
174	MME14349	Site of a house, Brown's Lane, Netherton	Post-Medieval
175	MME3219	Site of Park Cottage, Boundary Road, Sefton	Post-Medieval to Modern
176	MME14862	Site of a Second World War Heavy Anti Aircraft Battery camp, Bottle Golf Course, Sefton	Modern
177	MME2286	Site of Seaforth Hall, Crosby Road South, Litherland	Post-Medieval to Modern
178	MME3217	Site of Engine House, Boundary Road, Sefton	Post-Medieval
179	MME15403	No. 71 Sefton Road, Litherland	Post-Medieval to Modern
180	MME16217	Milepost, Leeds and Liverpool Canal, Netherton	Post-Medieval to Modern

APPENDIX E

Cumulative Schemes

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Environmental Impact Assessment Scoping Report

Fig 17.1 Ref	Type of Development	Development Details	Development Status	Timescales	Approx. Distance from the Scheme
Tier 1 (a)					
1	Commercial	DC/2015/00573 New planning permission to extend time limit for implementation to replace planning permission S/2006/1165 granted 17 May 2007 for an outline application for the development of an Employment Park and Trade Park (Use Classes B1, B2, B8 and Sui Generis) with associated areas, servicing and parking and change of use of existing Rolls Royce plant building from B2 to B2/B8 Former Rolls Royce Factory, Atlantic Industrial Complex, Dunnings Bridge Road, Netherton, Bootle, L30 4UZ	Under Construction	Opening 2017 / 2018	3.4km south east
2	Residential	DC/2016/00009 Erection of a new B1/B2/B8 facility with associated external works and layout of car parking with access from Farrier's Way Senate Business Park, Bridle Road, Netherton	Under Construction	Near certain/under construction	10.8km south
Tier 1 (b)					
3	Highway	DC/2016/00202 Construction of a vehicular access to a classified road (A565) at the front of the dwelling house 156 Moor Lane, Crosby, L23 2UQ	Approved	Opening 2018	2.8km west
4	Highway	DC/2015/02064 Construction of a vehicular access to a classified road (A565)	Approved	Opening 2018	2.8km west

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Fig 17.1 Ref	Type of Development	Development Details	Development Status	Timescales	Approx. Distance from the Scheme
5	Secure Residential Institution	144 Moor Lane, Crosby, L23 2UQ DC/2016/01954 Full planning application for the development of a medium secure mental health inpatient facility with associated access arrangements, car parking and landscaping works Land Bounded by Villas Road, Parkbourn, Maghull Liverpool, L31 1HW	Approved	Opening 2018	7.9km north east
6	Residential	DC/2015/01527 Reserved Matters application for 369 dwellings including the associated infrastructure, landscaping and recreational open space (Pursuant to outline planning application DC/2014/00980 granted 8 Jan 2015) Former Ashworth Hospital Site (South), School Lane, Maghull	Approved with conditions	Unknown	7.9km north east
7	Commercial	DC/2016/02454 Erection of 6 industrial units, (Use Class B1(c), B2 and B8), petrol filling station with associated retail unit (Use Class A1), and a drive-thru' coffee shop (Use Class A3) together with external works to servicing, parking, landscaping & associated infrastructure Former Peerless Site Dunning's Bridge Road Netherton	Approved with conditions	Unknown	3.2 km east
Tier 1(c)					
8	Highways	DC/2017/00953 Creation of two new west facing slip roads to Junction 1 of	Pending	Opening 2019	8.5km east

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Fig Ref	Type of Development	Development Details	Development Status	Timescales	Approx. Distance from the Scheme
9	Residential	<p>the M58 Junction of Maghull Lane/School Lane and M58 Motorway Melling</p> <p>DC/2017/00434 Outline planning application for up to 268 no. dwelling houses with some matters reserved in respect of: (Appearance, Landscaping, Layout and Scale) with Access applied for at this stage</p> <p>Land North Of Lydiate Lane Thornton</p>	Pending	Unknown	1.5km west
10	Residential	<p>DC/2017/00739 The selective/partial demolition of employment buildings and the conversion of remaining buildings (with associated construction /refurbishment works, such as replacement windows and doors, new roofs, etc.) and a two-storey rooftop extension (above Alsol House) to create a total of 155 mixed residential units (146 apartments and 9 town houses), landscaped amenity space, 118 car parking spaces (7 of which for dedicated disabled use), 124 cycle parking spaces and refuse stores, to be accessed from/to Litherland Road and (exit only) onto Well Lane</p> <p>Davies Products (Liverpool) Ltd Laburnum Place Bootle L20 3NE</p>	Pending	Unknown	5.6km south
11	Residential	<p>DC/2017/00606 Construction of 99 dwellings comprising a mix of houses and apartments together with the construction of access</p>	Pending	Unknown	10.5 km north west

Fig 17.1 Ref	Type of Development	Development Details	Development Status	Timescales	Approx. Distance from the Scheme
		road and the laying out of open space (to include the installation of an attenuation pond) (Amended plans and description) Land To The South Of Andrews Lane, Formby, L37 2YH			
12	Residential	DC/2017/00434 Outline planning application for up to 268 no. dwelling houses with some matters reserved in respect of: (Appearance, Landscaping, Layout and Scale) with Access applied for at this stage	Pending	Unknown	0.1 km north west
13	Residential	DC/2017/01178 Layout of a residential development with access from Edge Lane comprising the erection of 36 dwellings and provision of landscaping after demolition of the Garden Centre cafe and polytunnels, Windles Green Runnells Lane Crosby L23 1TR	Pending	Unknown	0.1 km north west

