The Leeds Railway Station (Southern Entrance) Order
Environmental Statement

Volume I: Main Statement
Report 296480RPT021

May 2012
Metro & Network Rail
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Metro & Network Rail
# Issue and revision record

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Abbreviations

AQMA
BGS
BMP
BREEAM
CCTV
CFD
CIRIA
CR-E
DDA
DEFRA
DETR
DfT
EA
ECML
EIA
EMP
ES
FRA
GRIP
ha
HER
IEEM
JSA
LCC
LCM
LDF
LNA
LPA
LSOA
LSSE
LWS
m

Air Quality Management Area
British Geological Society
Best Practicable Means
Building Research Establishment Environmental Assessment Method
Closed Circuit Television
Computational Fluid Dynamics
Construction Industry Research and Information Association
Network Rail Contract Requirements - Environment
Disability Discrimination Act
Department for Environment, Food and Rural Affairs
Department for Environment, Transport and the Regions
Department for Transport
Environment Agency
East Coast Main Line
Environmental Impact Assessment
Environmental Management Plan
Environmental Statement
Flood Risk Assessment
Governance for Railway Investment Projects
Hectares
Historic Environment Records
Institute of Ecological & Environmental Management
Job Seekers Allowance
Leeds City Council
Lower Coal Measures
Local Development Framework
Local Nature Area
Local Planning Authority
Lower Super Output Areas
Leeds Station Southern Entrance
Local Wildlife Sites
metres
1. Introduction

1.1 Introduction

Mott MacDonald has been appointed by the West Yorkshire Passenger Transport Executive (Metro) as the Planning and Environmental Technical Advisor to provide a range of services relating to the delivery of a Transport and Works Act Order (TWAO) application for the proposed Leeds Station Southern Entrance (LSSE) scheme. This document is the main statement which summarises the results of the Environmental Impact Assessment (EIA) process which is required to accompany the application for the TWAO. In addition to this main statement (Volume I) there is a non-technical summary, supporting technical appendices (Volume II), figures (Volume III) and other relevant supporting documents (Volume IV). Collectively the non-technical summary and these four volumes comprise the Environmental Statement (ES) for LSSE.

1.2 Overview of LSSE

Leeds City Station is one of Network Rail’s seventeen managed stations, serving the city centre of Leeds in West Yorkshire, UK with local, regional and inter-city rail services. At present, it hosts 85,000 to 100,000 passengers per day, mainly commuters, shoppers, business travellers, and leisure visitors. As well as serving the dense network of local railway stations around the hub of Leeds, the station is also located on the busy east-west Transpennine rail route and on the Doncaster branch of the East Coast Main Line (ECML), linking Scotland to London Kings Cross.

The LSSE scheme will contribute to the on-going regeneration and development of Leeds, particularly to the south of Leeds railway station, which has created demand for a new station entrance linking directly with the new developments located to the south of the station. It is estimated that approximately 20,000 passengers a day will use the proposed new station entrance. The LSSE scheme will include a concourse deck comprising three levels located over the River Aire within a visually iconic enclosed building, as shown on Figure 1.1. Open link span bridges will provide direct access from the lower concourse to the east and west banks of the River Aire. The lower concourse also extends back through the span of the station viaduct to link with a further footbridge running parallel to Dark Neville Street. From the upper concourse, access to the station footbridge is provided by steps, escalators and lifts. At the existing station western footbridge level, the widened bridge provides an upper concourse with customer information screens, ticket vending machines, automated ticket barriers and ticket purchasing facilities.
In October 2009, a planning application for the LSSE scheme was submitted to Leeds City Council (LCC) and a grant of planning permission was made in May 2010. In June 2011, the Department for Transport (“DfT”) confirmed that in order to authorise the construction and maintenance of the scheme, an application could be submitted for an order under the Transport and Works Act 1992 (“the 1992 Act”). Accordingly, an application has been prepared to be submitted to the Secretary of State for an order under sections 1 and 3 of the 1992 Act.

An order is required under sections 1 and 3 of the 1992 Act to authorise:

a) the construction and maintenance of a new station entrance at Leeds Railway Station;

b) the carrying out of works in the Aire and Calder Navigation adjacent to the southern boundary of Leeds Railway Station and associated with a) above;

c) the carrying out of other works and the exercise of powers required in connection with or ancillary to the matters set out in items a) and b) above; and

d) the acquisition of land and rights over land required in connection with items a), b) and c) above.
The application is being promoted jointly by Metro and Network Rail Infrastructure Limited. In addition, a request for a direction as to deemed planning permission will also be submitted to the Secretary of State under section 90(2A) of the Town and Country Planning Act 1990. An application for conservation area consent is also being submitted in respect of works proposed to be undertaken at Water Lane, Leeds as part of the overall scheme. It is intended that an application for an order will be submitted to the Secretary of State in Spring 2012.

The completion of an EIA, and subsequent production of an Environmental Statement (ES), is a legal requirement for a TWAO application and its purpose is to present the findings of the EIA process which is undertaken to assess the potential likely significant environmental effects which may arise from a scheme’s construction or operation. The ES for the scheme must meet the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (herein referred to as the EIA regulations) and the Transport and Works Applications and Objections Procedure (England and Wales) Rules 2006.

1.3 Project Objectives

The objectives of the LSSE scheme (derived as part of the major scheme business case application) are as follows:

- to improve access to Leeds by sustainable means;
- maximise growth of the Leeds economy by enhancing its competitive position and facilitating future employment and population growth;
- support and facilitate the sustainable growth of Leeds, in particular to the South, recognising the importance of its city centre to the future economy of the Leeds City Region;
- to minimise journey times accessing Leeds Station to/from the south;
- to meet existing and future passenger flow requirements to the south of Leeds Station; and
- to ensure the current passenger flows within the station are maintained or improved.

1.4 Transport and Works Act Order Application

Metro and Network Rail are applying to the Secretary of State for an Order under the Transport and Works Act 1992 that will authorise the development and operation of the LSSE scheme. It is anticipated that the application will be submitted in Spring 2012 after which the Secretary of State will decide on the form of public scrutiny. If a Public Inquiry is required it is likely to occur around 6 months after the TWAO application is submitted and a decision as to whether the Order is made is likely to occur in mid 2013.

1.4.1 Need for an Environmental Impact Assessment under TWA

The Transport and Works Act 1992 requires that applications for TWAO authorising a Schedule I or Schedule II project under the EIA regulations are accompanied by an ES which reports the findings of an EIA. This is the process whereby ‘environmental information is collected, publicised and taken into account in reaching a decision on a relevant planning application’ (Department for Environment, Transport and the Regions (DETR), 1999). In accordance with the EIA regulations and the Transport and Works Act 1992, this ES has been prepared to document the EIA of the proposed LSSE scheme.
1.5 Environmental Impact Assessment

1.5.1 Overview of process

EIA is a process whereby ‘environmental information is collected, publicised and taken into account in reaching a decision on a relevant planning application’ (DETR, 1999).

The EIA process is essentially a systematic procedure, using the best practicable techniques and best available sources of information, to determine the potential environmental effects of a proposed development (both beneficial and adverse) and their significance, and to provide an opportunity for public scrutiny of the proposed development. This enables the importance of predicted effects to be assessed and taken into account by the appropriate body before a decision to grant or not grant planning permission or an Order is taken.

1.5.2 Legislative basis for Environmental Impact Assessment

The requirements for EIA are defined by EC Directive 85/337/EEC, as amended and subsequently the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 in the UK. The required content of an ES, which presents the findings of the EIA process, is set out in Schedule 1 of the EIA regulations.

No formal EIA screening process has been undertaken. However, this is not considered necessary as the completion of an EIA, and subsequent production of an ES, is a requirement for this TWAO application.

1.5.3 EIA Scoping

An EIA Scoping Report (see Appendix A) was prepared for the scheme by Mott MacDonald on behalf of Metro and submitted to DfT in October 2011. The Scoping Report described how the EIA would be undertaken and identified the technical environmental disciplines that have since been considered as part of this ES. Defining the environmental scope is one of the most critical parts of the EIA process as it sets out the method for the detailed environmental assessment and allows opinions to be provided on the scope prior to commencing the assessment.

Subsequently, a Scoping Opinion was received from DfT in November 2011 (see Appendix B). Further details relating to the Scoping Opinion and how comments from consultees have been addressed within this ES are provided in Section 5.2 and within Appendix C.

1.5.4 Environmental Statement

According to the EIA regulations, an ES must describe the likely significant effects of the proposed development on the environment and, in accordance with Department for Environment Transport and the Regions (DETR) guidance, this has been undertaken in the ES on a ‘realistic basis and without unnecessary elaboration’ (DETR, 1999). As a result, the content of this ES has focused on the potential significant residual environmental effects, which may occur following the implementation of incorporated mitigation measures of the scheme.
1.6 Planning Framework

An outline of the relevant planning policy is presented within Chapter 6 of this Main Statement. It establishes an overview of the planning policy framework within which the project has been assessed, including the specific policies relevant to this development at local, regional and national level.

The Planning Statement, to be submitted as a separate document as part of the TWAO application, provides a detailed assessment of the project in the context of the relevant planning policies and sets out the case for the project.

1.7 Structure of the Environmental Statement

The structure of the ES is presented in Table 1.1

Table 1.1: Structure of the Environmental Statement

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<thead>
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<th>Environmental Statement Volume</th>
<th>Description</th>
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<tr>
<td>ES Non-Technical Summary</td>
<td>This provides a summary of the proposed development and the main findings of the ES in non-technical language.</td>
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<tr>
<td>Volume I - ES Main Statement</td>
<td>The main statement of the ES presents an overview of the project, including the following: * proposed project description; * need for the project; * consideration of alternatives; * consultation; * compliance with planning policy; and * a summary of the findings from the technical assessments.</td>
</tr>
<tr>
<td>Volume II - ES Technical Appendices</td>
<td>The detailed technical assessments will be presented as a series of Technical Appendices within Volume II of the ES.</td>
</tr>
<tr>
<td>Volume III – ES Figures</td>
<td>This volume will present all A3 figures associated with the ES.</td>
</tr>
<tr>
<td>Volume IV – Supporting Documents</td>
<td>This volume will present the supporting documents associated with the ES.</td>
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This main statement introduces the proposed scheme, together with a description, and the methodology that has been adopted in undertaking the EIA. A description of the likely magnitude and significance of the predicted environmental effects after incorporated mitigation has been implemented (both adverse and beneficial) is documented. This Main Statement also provides details of the incorporated mitigation measures intended to prevent, reduce or offset any adverse environmental effects. Recommendations for potential future environmental enhancement measures, referred to as ‘supplementary mitigation’, are included although should not be considered as commitments at this stage.

1.7.1 Structure of the Main Statement

The structure of the main statement is presented in Table 1.2 below. A description of each section has also been provided.
Table 1.2: Structure of the main statement

<table>
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| 1       | Introduction  
This chapter comprises an introduction to the proposed development, an account of the EIA requirements and the legislative basis of the ES, the scope of the assessment, an overview to the overall structure of the ES, and information about where the ES can be found and where comments from the general public may be addressed. This chapter also includes an account of the strategic and project level needs for the proposed scheme. |
| 2       | Site Setting  
This chapter describes the site location and surrounding area in terms of existing physical characteristics and land uses. |
| 3       | Project Description  
The chapter presents a detailed description of the proposed scheme, including details of the construction process and traffic management and information on other proposed developments proposed within the vicinity of the proposed scheme. An overview of the proposed operational processes is also provided. |
| 4       | Project Alternatives  
This chapter presents information on alternatives and the reasons for which this proposed scheme has been identified. |
| 5       | Consultation  
This chapter provides details of the approach that has been taken to obtain stakeholder involvement. This comprises consultation with both statutory and non-statutory consultees and through undertaking public exhibitions. |
| 6       | Planning Policy  
This chapter provides an outline of the relevant planning policies and establishes an overview of the planning policy framework within which the project has been assessed, including the specific policies relevant to this development at local, regional and national level. |
| 7       | EIA Approach and Methodology  
This chapter provides an account of how key issues have been identified and addressed within the ES and the approach that has been taken for the EIA process. |
| 8       | Assessment of Effects  
This chapter presents the assessment of effects on the environmental topics identified for inclusion in the ES. This chapter is supported by the technical appendices for each environmental receptor. |
| 9       | Conclusions  
This chapter draws the ES to a close and presents a summary of the significant residual environmental effects for each of the environmental topics covered by the ES. |

The main statement is supported by technical appendices for each environmental topic considered, as follows:

- air quality;
- ecology;
- geology and soils;
- historic environment;
- noise and vibration;
- socio-economics;
- townscape and visual amenity;
- traffic and access; and
- water resources.

An assessment of climatic factors, which must be considered under EC Directive 85/337/EEC, has been undertaken in part or in combination with the separate supporting documents namely the Energy Demand Assessment, Sustainability Appraisal and Climate Change Management Assessment. A Wind Assessment
has also been undertaken, a summary of this assessment is presented in Section 8.11. All these documents have been included in Volume IV of this ES and will form part of the TWAO application. Cross reference to these documents has been made throughout the ES, where relevant.

It is not the intention of this main statement to provide a detailed analysis of the environmental effects of the proposed scheme. Rather, it presents a summary of the baseline and the works affecting it, prescribed mitigation measures and the resultant significant residual environmental effects. The detailed assessments are presented within the specialist technical appendices in Volume II and provide supporting information to Volume I. Figures relating to the scheme and referenced within Volumes I and II are presented in Volume III.

The ES is summarised in a Non-Technical Summary (NTS), which is written in non-technical language and is available as a separate document.

1.7.2 Supporting Documents

The ES is accompanied by a number of other supporting documents, including a Flood Risk Assessment (FRA), Heritage Statement, Transport Statement, Energy Demand Assessment, Sustainability Appraisal, Climate Change Management Assessment, a Schedule of Site Specific Construction Mitigation Measures, Lighting Assessment and a Wind Assessment. Copies of these documents, along with other key project documentation, have been included in Volume IV of this ES.

In addition, a Planning Statement, Design and Access Statement and Conservation Area Consent for the Water Lane site have been prepared as stand alone documents forming part of the TWAO application. Where relevant, information from these supporting documents and the stand alone documents have been incorporated into the ES and referenced appropriately. The EIA process has similarly informed these studies as appropriate.

1.8 Availability of Documentation

The full ES and supporting TWAO application documents will be made available for public inspection at the following locations:

- Metro – Wellington House, 40-50 Wellington Street, Leeds, LS1 2DE (Mon-Fri 09:00-16:00)
- Leeds City Council Development Enquiry Centre – Leonardo Building, 2 Rossington Street, Leeds, LS2 8HD (Mon, Tue, Thurs 08:30-17:00; Wed 10:00-17:00; Fri 08:30-16:30)
- Leeds Central Library – Calverley Street, Leeds, LS1 3AB (Mon-Wed 09:00-20:00; Thurs-Fri 09:00-17:00; Sat 10:00-17:00; Sun 13:00-17:00)
- Eversheds (on behalf of Network Rail) - Bridgewater Place, Water Lane, Leeds LS11 5DR (Mon-Fri 09:00-16:00)

A copy of the application, and of all plans and other documents submitted with it, may be inspected free of charge at the addresses above between the hours stated above. Copies of that information may be obtained from Metro (a charge may be payable to cover production costs) or alternatively the information is available to download from the Metro website at: www.wymetro.com/lsse.

Any objections to, or other representations about, the proposals in the TWAO application should be sent to the Secretary of State for Transport either via e-mail to transportandworksact@dft.gsi.gov.uk or in writing to the following address:
An objection or other representation must

i. be received by the Secretary of State on or before the expiry date for objections (42 days after submission of the application);
ii. be made in writing (whether sent by post or e-mail);
iii. state the grounds of the objection or other representation;
iv. indicate who is making the objection or other representation; and
v. give an address to which correspondence relating to the objection or other representation may be sent. (If you are sending your objection or other representation by e-mail, please provide a postal address.)

The Secretary of State may make complete copies of the objections and other representations public, including any personal information contained in them, and will copy them to the applicant for the order.
2. Site Setting

2.1 Scheme Overview

The proposed LSSE scheme is to be located in an urban area, with the surrounding land used mostly for residential apartments, businesses, offices and roads. The green circle on Figure 1 in Volume III of this ES shows the location of the site within the wider city of Leeds, herein referred to as the main site. The proposed project is situated to the south of the existing Leeds railway station and will span the River Aire.

Due to the constrained nature of the site surroundings in terms of space, it is anticipated that a separate working area will be needed during the construction phase of the scheme. It is proposed that materials will be transported by barge to the site along the River Aire. However, this will require a barge loading/unloading area for the duration of the construction phase. An area on Water Lane adjacent to the River Aire (to the east of the main site) would be used for this loading/unloading area, herein referred to as the Water Lane site. The location of the Water Lane site is indicated by the red circle on Figure 1 in Volume III of this ES, and therefore forms part of the TWAO application.

2.2 Summary of Site Area

The total site area, which will be included within the TWAO application limits, is 20948.16m$^2$ (2.09 hectares). This includes the loading/unloading area on Water Lane, which is 4517.56 m$^2$ (0.45 hectares). The red line boundaries, for the purposes of the TWAO application, are presented in Figures 2 and 3 of Volume III of this ES for the main site and the Water Lane site respectively.

The proposed site of the new entrance is bounded by the railway viaduct, an accessible area underneath the railway viaduct known locally as the Dark Arches including Dark Neville Street to the north, Granary Wharf and Watermans Place apartments to the west and Blue Apartments and Little Neville Street to the east. The location of these key sites and links surrounding the site are shown on Figure 2.1 below.
A site walkover was carried out by an environmental specialist from Mott MacDonald in September 2011. The River Aire is a predominant feature of the site, which flows in an approximately north-south direction beneath the site via the railway viaduct. The Leeds and Liverpool Canal joins the River Aire via a listed lock structure to the south of the proposed site (as shown on Figure 2.1 above).

The Blue Apartments and Watermans Place apartments on Granary Wharf are recent developments located on the east and west banks of the River Aire respectively (as shown on Figure 2.1 above and Photo 2.1 below). The Blue Apartments comprise a 16 storey high residential block with ground floor retail use that has recently been fitted out as a golf shop, including a private deck which cantilevers over the eastern river wall. There is no public footpath on the eastern bank in the immediate vicinity of the proposed station entrance.
Photo 2.1: View towards the proposed site with the Blue Apartments and Watermans Place apartments on Granary Wharf on both sides of the River Aire.

Source: Mott MacDonald, 2011

On the west bank a residential and commercial block, Watermans Place is a mixed use scheme standing up to 15 storeys high. Along the western bank there is a floodwall of 1.6m in height alongside the ground floor retail unit but between the ISIS footbridge and the viaduct it is mainly a service access to plant rooms and refuse stores.

2.3 **Description of Existing Site Conditions**

2.3.1 **Site Access and the Surrounding Access Network**

The main site is not readily accessible from the major road network (as shown on Figure 1 in Volume III of this ES); limited road access to the east of the site is provided by Little Neville Street and Dark Neville Street, which also provides a link through the Dark Arches in the railway viaduct as shown in Photo 2.2 below.

Little Neville Street is an adopted highway (under the control of LCC as the local highway authority) and connects to Neville Street at the eastern end and Dark Neville Street at the northern end. Little Neville Street provides pedestrian access to the ISIS footbridge over the River Aire, the UKI Partnerships office building and to the Blue Apartments building, which includes the Golf Bar business unit (as shown in Figure 2.1 above). In addition, Little Neville Street provides vehicular access to the underground car park for the UKI Partnerships building, the Blue Apartments building and deliveries to the Hilton Hotel. Dark Neville Street is a private road situated within the railway station undercroft (Dark Arches) and is owned by Network Rail (as shown on Figure 2.1 above). At present Dark Neville Street is primarily used by vehicles to access the private car parking in the Dark Arches located on either side of Dark Neville Street.
On the western side of the main site, pedestrian access is available via Granary Wharf, which can be accessed by road from Canal Wharf and Wharf Approach or on foot by the existing ISIS footbridge over the river, situated approximately 30 metres (m) downstream of the site of the proposed new entrance (as shown on Figure 2.1 above).

### 2.3.2 Railway Station Access

Leeds railway station is located to the south-west of Leeds city centre as shown on Figure 1 in Volume III of this ES. The main station entrance is situated on New Station Street for pedestrians, cyclists, buses and taxis. Additional entrances are located on Wellington Street for pedestrians only and off Princes Square adjacent to the station car parking and drop off areas. Passengers wanting to access or exit the station from the south of the railway currently have no alternative to the existing indirect route via the main entrance on the north side of the station, the ‘Rotunda’ steps and through the Neville Street underpass beneath the station.
2.3.3 Site Historic Environment

The proposed LSSE site is located partly within the Canal Wharf Conservation Area. In addition, the proposed barge loading/unloading site for this scheme, at Water Lane is located within the Leeds City Centre Conservation Area. Both of these conservation areas have been designated by LCC and are shown on Figure 2.2 in relation to the LSSE main site and the Water Lane site.

In addition, the following heritage assets were identified within the site area as being potentially visually affected during the construction or operation phase of LSSE:

- River lock and retaining walls to the River Aire, Grade II* Listed Building;
- Canal Wharf, Grade II* Listed Building;
- Victoria Bridge, Grade II Listed building; and
- Dark Arches over the River Aire, locally designated heritage asset

Further information regarding the heritage status of the area is presented in the Historic Environment Technical Appendix in Volume II, whilst a summary is provided in Section 8.5 of this Main Statement.

Figure 2.2: Canal Wharf and Leeds City Centre Conservation Areas in relation to the scheme

Source: Mott MacDonald

2.3.4 Site Geology

The British Geological Survey (BGS) Solid and Drift 1:50,000 scale maps, sheet no. 70 (17), and the Geotechnical and Geoenvironmental Desk Study and Preliminary Interpretative Report produced by Faber
Maunsell in 2009 for the Governance for Railway Investment Projects (GRIP) stage 4 design indicates that the site is underlain by alluvium and the Pennine Lower Coal Measures (LCM) formation. For reference this document has been included as an annex to the Geology & Soils Technical Appendix in Volume II of this ES.

Due to the industrial and urban location of the site, a layer of made ground is expected to be present and information from historical borehole logs suggests the made ground is approximately 2m to 4m in thickness and principally comprises granular (sand and gravel) soils with a proportion of brick, concrete, slate, mortar, ash and clinker. Further information regarding the geology and soils of the area is presented in the Geology & Soils Technical Appendix in Volume II, whilst a summary is provided in Section 8.4 of this Main Statement.

2.3.5 Site Flood Risk

The primary source of flood risk to, and resulting from, the proposed LSSE scheme, is considered to be fluvial flooding from the River Aire. The scheme design has been carried out in accordance with the requirements and recommendations of the Leeds Strategic Flood Risk Assessment (SFRA), Technical Guidance to the National Planning Policy Framework, LCC and the Environment Agency (EA). The EA flood map and the Leeds SFRA flood map (shown in Supporting Document 4: Flood Risk Assessment in ES Volume IV) indicate that the site area is at risk of fluvial flooding from the River Aire. Further information relating to flood risk is provided in the Flood Risk Assessment prepared for the scheme (presented in Volume IV).
3. Project Description

3.1 Introduction

The Co-Promoters have submitted a TWAO application to obtain the necessary powers to construct and operate a new entrance at Leeds railway station. Once complete, the new station entrance will provide a direct link to the new and emerging development areas in Leeds, particularly to the south of the railway station. The red line boundary for the proposed works is shown on Figure 2 in Volume III of this ES and illustrates the site in further detail.

3.2 Need for the Project

Leeds railway station is situated on an extensive brick railway viaduct which straddles the River Aire at the station’s location, but also generally transects the entire city centre in the vicinity. The viaduct impedes traffic and pedestrian circulation into the city centre. The only significant road link in the vicinity of the station being Neville Street, which, despite recent renovation, is dominated by traffic and provides a poor quality pedestrian route.

The existing main station entrances are located to the north of the viaduct, primarily feeding City Square and the city centre beyond. Passengers wanting to access or exit the station from the south of the railway currently have no alternative to the existing indirect route through the Neville Street underpass beneath the station and up to the main station entrance on New Station Street via the ‘Rotunda’ steps.

With many new developments and regenerated areas completed (and others planned) to the south of the railway, especially Holbeck Urban Village and Granary Wharf, there is a need to develop a new entrance which encompasses the approaches from the southern area of the city directly into the station.

3.3 Project Benefits

A Major Scheme Business Case (MSBC) was submitted to the DfT in November 2009 and successfully gained Programme Entry status for LSSE. The scheme was re-endorsed as a regional priority on the 23rd October 2009 by the Yorkshire and Humber Joint Regional Board. Further evidence was presented in an updated business case in mid 2010 as part of the government’s Comprehensive Spending Review process, and revised funding was confirmed in February 2011 allowing the scheme to progress.

Key benefits of the LSSE scheme include the following:

- a new, pedestrian entrance to the station, which incorporates lifts, escalators and stairs to provide passengers access to the current western footbridge within the station from ground level either side of the River Aire. The proposals also include Closed Circuit Television (CCTV), help points, ticket purchasing facilities and passenger information screens;
- the scheme will provide a direct pedestrian link to and from the southern section of Leeds City Centre as shown in Figure 3.1. Recent work undertaken as part of the ‘Transport for Leeds’ programme of studies has estimated that jobs in the City Centre as a whole will increase from around 102,000 in 2009 to 108,000 (+8%) in 2018 and 118,000 (+16%) in 2030. Most new jobs are likely to be located in the expanding southern part of the city centre;
- it is estimated between 22% to 24% of passengers (approximately 20,000 passengers per day) using Leeds station would use the proposed southern entrance; and
on average, it is estimated that each of these passengers would benefit from an estimated time saving of 133 seconds for each trip to or from the station.

Figure 3.1: Scheme location in relation to Leeds city centre and other developments in South Leeds

3.4 Description of the Proposed Project

3.4.1 Project Design

3.4.1.1 Overview

The proposed scheme comprises bridge decks over the River Aire, supporting lifts, escalators and stairs to provide a connection into the existing western railway station footbridge, which will be extended and widened to the south and west over platforms 15, 16 & 17 to meet the new entrance. As shown by the indicative visualisation image in Figure 3.2, the whole of the new entrance will be enclosed. Selected design drawings from the GRIP 4 stage are given in Figures 4 to 10 in Volume III of this ES. In addition, public realm improvements are proposed to Little Neville Street and Dark Neville Street to facilitate the safe access and egress for users of LSSE and these are shown in Figure 11 in Volume III of this ES. The following sections provide further details of these proposed works, based on the design at the GRIP 4 stage.
3.4.1.2 River Deck and Entrance Building

The river deck is the central section of the new entrance and forms the lower concourse at ground level for the entrance building. The entrance building will house four escalators, two lifts and a 1.5m wide staircase up to the widened section of the existing station footbridge as shown in Figure 3.3.

The river deck will be constructed from steel beams in-filled with reinforced concrete to form a composite deck. The entrance building and river deck will be supported by two new piers located in the channel of the River Aire. The piers will be aligned with the piers of the existing viaduct to minimise restriction on river flows. The piers will be founded on piles which will be end-bearing on rock.
3.4.1.3 River Spans

These two external river spans will provide direct stepped access to the river deck from the east and west banks of the River Aire. Where the river spans meet the river deck, these will be supported on two new river piers. On the east and west river banks, piled bank-seats will provide end support to the spans.

3.4.1.4 Arch Deck

This deck will connect back into the existing railway viaduct from the river deck and external entrance building. The deck is at a higher level than the existing footbridge at Dark Neville Street. This footbridge will be replaced and ramps and steps will be provided to allow access from the arch deck to Dark Neville Street. Access to Granary Wharf to the west and Neville Street to the east will be provided via ramps or steps onto Dark Neville Street.

3.4.1.5 Existing Railway Station Western Footbridge Extension

The existing main (western) footbridge in Leeds railway station will be widened and extended over platform 15 to the southern face of the existing railway viaduct. A new support column will be located on platform 15 adjacent to the lift motor rooms and the existing roof support column will be strengthened. The southern end of the extension will be supported by columns which extend down to and are supported by two new river piers.
This structure will also support the continuation of the curved entrance roof, to tie in with the existing station roof as shown in Figure 3.4. This structure allows the form of the existing footbridge to continue on into the new entrance. The upper level of the escalators will be supported by the footbridge extension, which will also incorporate ticket purchasing facilities and automated ticket barriers.

Figure 3.4: Indicative visualisation image showing the extension of the existing western footbridge with the new station entrance structure

3.4.1.6 Access and Public Realm Improvements to Little Neville Street and Dark Neville Street

As discussed in Section 2.2.1, access to the eastern side of the main site is provided by Little Neville Street and Dark Neville Street. Once complete, it is estimated that 20,000 passengers per day will use the new station entrance, of which approximately 65% of these passengers will egress the new entrance to the east via Dark Neville Street and Little Neville Street. Given that LSSE is designed as a pedestrian facility, no vehicular drop-off area will be provided as part of the TWAO application, instead station users will be directed to the existing station drop-off facility located near Princes Square to the north of the station.

To ensure that Little Neville Street and Dark Neville Street are not used as an informal drop-off facility once LSSE is operational, the TWAO application will include appropriate control measures, which will include access and public realm improvements to Little Neville Street and Dark Neville Street, these are described in more detail below.

As shown on Figure 11 in Volume III of this ES, access from Neville Street to Dark Neville Street will be subject to some form of access control. The proposals for this are currently being developed in conjunction with Network Rail (the owners of Dark Neville Street). It is proposed that white lining and surface treatments demarking pedestrian areas and a route in Dark Neville Street will extend from the ramps/steps at the end of arch deck of LSSE, along the south side of Dark Neville Street to the eastern edge of the Little
Neville Street arch. Furthermore, the proposals are likely to include vehicle access control at the northern end of Little Neville Street to prevent vehicular access from Dark Neville Street routing through to Little Neville Street and vice versa.

There will be a prohibition of driving over the complete length of Little Neville Street with specified exemptions for service vehicles, vehicles accessing the UKI Partnerships car park and the proposed additional car parking spaces at the Hilton Hotel, which was granted full planning permission in August 2011. As shown in Figure 11 in Volume III of this ES, it is intended that Little Neville Street will become a shared surface pedestrian zone, with trees and street furniture facilitating safe access and egress for LSSE. The road surface on Little Neville Street is currently formed from basalt setts, as shown in Photo 3.1 below, and they are considered to add historic character to this area. It is intended that these basalt setts will be removed and re-used in the public realm improvements, forming a trim to the Hilton Hotel building.

Photo 3.1: The basalt setts currently forming the road surface on Little Neville Street (looking north along Little Neville Street with the Blue Apartments building on the left and back of the Hilton Hotel on the right)
3.4.2 Construction works

3.4.2.1 Overview

The following section presents a summary of the Constructability Review provided by Carillion (April, 2012) to Network Rail. For reference this report has been included in Volume IV and key figures from this report have been included in Figures 12 to 14 in Volume III of this ES. The report aimed to assess the different construction methodologies given the severe access constraints at the site which mainly relate to:

- working over the River Aire;
- working in close proximity to large residential properties (including Blue Apartments and Watermans Place apartments); and
- working in a manner which minimises disruption to users of Leeds railway station.

3.4.2.2 Site Layout

As shown in Figure 13 in Volume III of this ES, the main site offices, welfare facilities and a compound area will be located to the west of the main site, adjacent to the railway and at the end of Wharf Approach. This site office area is surrounded by a high wall (as shown in Figure 3.5) which will provide sufficient screening to mitigate any temporary visual effect on surrounding Conservation Areas. As shown in Figure 13 in Volume III of this ES, a staircase will be provided against the wall for site pedestrian access. Parking for site staff and subcontractors will be subject to local agreement and a Traffic Management Plan (in line with the requirements of Network Rail Contract Requirements – Environment) will be produced, and approved by LCC, to ensure that the scheme does not result in any uncontrolled parking from construction staff private vehicles.

Figure 3.5: Location of the main site offices, welfare facilities and compound at the end of Wharf Approach

A satellite setup will also be established at the end of Little Neville Street, between the Blue Apartments building and the railway viaduct as shown in Figure 3.6. These facilities are likely to include site offices for the site engineers and foreman, toilet, washing facilities and first aid equipment.
As described above, the main site offices will be located approximately 200m to the west of the main site and access between the main site (LSSE), the main site offices (Approach Wharf) and the satellite setup (Little Neville Street) is through a busy pedestrian area at Granary Wharf and Dark Neville Street. At this stage, it is not envisaged that a designated segregated walkway will be required through this area but all site personnel will be briefed by the appointed construction contractor to ensure that staff conduct themselves in an appropriate and courteous manner when interacting with the public.

As shown on Figure 13 in Volume III of this ES, the main site, the main site offices and the satellite setup will all be surrounded by solid hoarding to prevent unauthorised access, screen construction compounds and control dust and litter. Where it is safe to do so, Heras type hoarding will be used following feedback from the consultation exercises. The exact alignment and layout of the hoarding will have to be agreed locally with the Golf Bar to provide the most aesthetically pleasing but safe solution. Incorporation of vision panels into the hoarding will also be considered.

### 3.4.2.3 Water Lane Barge Loading/ Unloading Site

As outlined in Section 2.2.1 above, the main site is not readily accessible from the major road network, therefore it is proposed that plant and materials will be transported to the main site via the River Aire. To facilitate this construction delivery method, a barge loading/unloading area on Water Lane (near Bridge End) is required as part of the TWAO application. As part of the Constructability Review, Carillion examined a number of sites in the vicinity of the proposed scheme, however the Water Lane site was considered to be the most suitable due to its proximity to the main site and the River Aire, the amount of land available for establishing a construction compound and its transport links. Further details relating to the appraisal of the site options is given in the appendix of the Constructability Review report in Volume IV of this ES.
An indicative layout of how this site will be worked, for the duration of the construction period, is shown in Figure 12 in Volume III of this ES. As part of the enabling works, the existing car parking provided at the site will be relocated elsewhere; ASDA employees will continue to use the remainder of their available car parking and the Old Red Lion Pub patrons will be directed to car parking available at Meadow Lane. The arch structure and retaining wall (shown in Figures 3.7 and 3.8) will be dismantled and the site levelled. This arch structure will be reinstated during the final stage of the construction works and once all other works at the Water Lane site have ceased. In addition, the dismantling and reinstatement of this structure will be subject to a written method statement, which will be approved in advance with the conservation officer at LCC. As part of the TWAO application, a Conservation Area Consent for dismantling and reinstating this structure has been prepared.

Dismantling the arch structure and retaining wall will ensure that the required crane can be positioned in the most advantageous position next to the River Aire and it will allow the delivery wagons to manoeuvre around the site in a safe manner.

Figure 3.7: Arch structure and retaining wall located at the Water Lane site
Figure 3.8: Looking east towards the Water Lane site

The public footpath which is currently located through this site will be temporarily diverted as part of the TWAO but access will continue to be maintained for the duration of the construction phase.

3.4.2.4 Highways Access

Access to the main site, the main site offices and the satellite setup will either be via narrow, minor roads or along the River Aire. A number of highway construction routes have been specified in the Constructability Review, which link the construction sites and compounds described in Section 3.4.2.2 and 3.4.2.3 above with the motorway network. These proposed delivery routes are shown in Figure 14 in Volume III of this ES and are considered in more detail in Section 5.2 of the Transport Statement (Mott MacDonald, 2012) which has been included in Volume IV of this ES.

Deliveries to the main site are expected to be made via Neville Street and Little Neville Street, which is considered to be a very congested artery into Leeds City Centre, and is located at least 80m from the main site. The Constructability Review estimates that a peak level of twenty small delivery wagons could arrive.
per day to deliver and collect plant and small materials in addition to delivering concrete via Neville Street and Little Neville Street.

Deliveries to the main site offices and compounds, located to the west of the main site, are expected to be made via Wharf Approach, and the cobbled area between the railway viaduct and Watermans Place. The Constructability Review estimates that on average three or four small delivery wagons a day may use this route including the delivery and dismantling of the site cabins and a maximum of five wagons may visit this site in a day.

Large deliveries via the highway network will be made to the Water Lane site where plant and materials will be transferred onto barges in the river to be transported upstream to the main site. The Constructability Review estimates that whilst large deliveries will not be required to this site every day, there may be up to five or six scheduled wagon deliveries per day, which will be carefully managed to limit the amount of material storage required and/or double handling.

3.4.2.5 Crane Options

Due to the adjacent high rise buildings and the site’s close proximity to Leeds railway station, the Constructability Review presents two options for crane type and location, which in summary comprise:

- a self erecting crane located on the west bank of the River Aire, between the Watermans Place apartment building and the railway viaduct; and
- a tower crane located on the east bank of the River Aire, between the Blue Apartments building and the railway viaduct.

Access for delivering the self-erecting crane will be required through Wharf Approach and the Wharf Approach Canal Bridge. Once in situ on the west bank of the River Aire, the self erecting crane will be approximately 26.3m high and will be dismantled every evening thereby reducing the visual impact on the surrounding area. If this crane option is preferred, the size and assembly of the structural components will need to be carefully considered at the detailed design stage, due to the weight lifting restrictions with this crane option. If this crane option is preferred, it is anticipated that more deliveries to the Water Lane site will be required, however fewer deliveries to Little Neville Street will be needed.

To facilitate the safe delivery and assembly of the tower crane temporary closure of Little Neville Street, for approximately one week, is likely to be required. Once assembled, this tower crane will remain in position for the duration of the construction works and will be 54m in height. If this crane option is preferred, it is anticipated that more deliveries to Little Neville Street will be required resulting in fewer deliveries to the Water Lane site.

Both the self erecting crane and the tower crane will be considered as part the TWAO application, and each technical discipline has assessed the worse case scenario in their technical appendices.

3.4.2.6 Construction Phasing

The construction phase is currently anticipated to commence in early summer 2013 and will take approximately 62 weeks to complete. Construction activity will be restricted to normal working hours which will be Monday to Friday from 07:30 hours until 19:00 hours, and 08:00 hours until 18:00 hours on a Saturday. Construction will not normally take place overnight, on Sundays, Bank Holidays, Christmas Day or Good Friday; unless it is necessary to do so for reasons of safety to personnel or in order to satisfy the operational requirements of Leeds City Station. The Constructability Review indicates that a number of
night time possessions will be required when works will be undertaken over the platforms and to the existing western station footbridge.
4. Scheme Alternatives

4.1 Introduction

It is a requirement under the EIA Regulations to report on the main alternatives considered, taking into account environmental effects, during the scheme design process. Information provided below examines the alternatives that have been considered during the project design, both through examination of alternative sites, design layout and access through design iteration.

Information regarding alternatives for the proposed development is also presented in the Planning Statement which accompanies this ES as part of the TWAO application.

4.2 Approach to Considering Alternatives

This chapter addresses the requirements above and presents the approach taken to assessing and reporting alternatives. The alternatives were considered in the light of the project objectives.

As a Co-Promoter of the scheme, the design progression of LSSE has followed Network Rail's process called “Governance for Railway Investment Projects” (GRIP) (previously known as Guide to Rail Investment Projects). GRIP is a company standard that describes how Network Rail manages and controls projects that enhance or renew the national rail network. There are eight GRIP stages as outlined below:

1. Output definition;
2. Pre-feasibility;
3. Option selection;
4. Single option development;
5. Detailed design;
6. Construction test & commission;
7. Scheme hand back; and
8. Project close out.

LSSE has progressed through GRIP stages 1, 2 and 3 during 2006 and 2007. A GRIP 4 design and report was completed by Faber Maunsell AECOM in April 2009, and this formed the basis of the planning application for the scheme which was submitted to LCC and for which approval was granted in May 2010. In addition, Mott MacDonald has produced a Location and Design Rationale report (which has been included as a supporting document in Volume IV of this ES) which provides the evidence, rationale and context for how the preferred scheme location and design were reached, and more detailed information to the appraisal of the options can be found in this report.

The following section provides a summary of the alternatives and scheme options presented at each GRIP stage, including site location options, layout options and further scheme options resulting from the design iteration process.

4.3 Alternatives to the Proposed Scheme

4.3.1 Site Location Alternatives

The following section is as summary of the Scheme Location and Design Rationale report produced by Mott MacDonald (2012), and for reference has been included in Volume IV of this ES. This report provides
a consolidated options selection summary which is intended to provide the evidence, rationale and context for how the preferred scheme location and design have been reached.

4.3.1.1 GRIP 1 options

The GRIP 1 Feasibility Report (Corus, September 2006) presented eight options as shown in Figures 4.1 to 4.8, and a further location option was discussed at the GRIP 1 workshop which was referred to at the time as ‘Option 9’. No drawing was prepared for ‘Option 9’ because it was agreed that this option would be developed further at GRIP 2. The option was considered as a variant of Options 1 and 3, serving both banks of the River Aire and therefore resolving the issues surrounding severance. The options at GRIP 1 investigated possible locations for the scheme including:-

- Granary Wharf;
- River Aire;
- Little Neville Street; and
- Sovereign Place.

Figure 4.1: GRIP 1 – Option 1

Figure 4.2: GRIP 1 – Option 2

Figure 4.3: GRIP 1 – Option 3

Figure 4.4: GRIP 1 – Option 4
The options presented in Figures 4.1 to 4.8, present a number of advantages and disadvantages in terms of accessibility, safety and feasibility and further detail regarding why options were discounted at GRIP 1 are provided in the Scheme Location and Design Rationale report in Volume IV of this ES. At GRIP 1, Options 1 and 4 (shown in Figures 4.1 and 4.4 above) were considered to be the options that best met the scheme objectives, with Option 1 becoming the ‘Option 9’ variant developed at GRIP 2.

4.3.1.2 GRIP 2 options

Following the completion of the GRIP Stage 1, Network Rail further explored three sub-options of Option 1 (as shown in Figure 4.1) and three sub-options of Option 4 (as shown in Figure 4.4).

Schematic views of options 1A to 1C at the River Aire and Granary Wharf location are shown in Figures 4.9 to 4.11 below.
Source: GRIP 2 Report (Corus, April 2007)

Schematic views of options 4A to 4C at the Sovereign Place location are shown in Figures 4.12 to 4.14 below.
It was considered that all sub-options would improve accessibility to the station. However, Options 4A to 4C did not directly serve Holbeck Urban Village and Granary Wharf and they did not provide direct access to all the station platforms. Additionally, Option 4A to 4C would severely limit accessibility around the station during the construction phase and as such, adversely affect traveller and journey ambience. Furthermore, Options 4A to 4C were considered unlikely to improve pedestrian journey times compared to Options 1A to 1C as most train stopping points are at the west end of the station; therefore, some pedestrians travelling from the south may continue to use the existing station access. Options 1A and 1B were progressed to GRIP stage 3 because they best met the scheme objectives.

### 4.3.2 Entrance Layout Alternatives

#### 4.3.2.1 GRIP 3 Options

The work at GRIP stage 3 focussed on the River Aire site as the preferred location for the entrance and presented different layouts for the entrance as shown in Figures 4.15 to 4.18.
At GRIP 3 Option 1Aiii was considered as the preferred option because the configuration of the escalators (i.e. parallel to the railway viaduct) reduced the mass and volume of the entrance structure, and therefore reduced the adverse impacts on the adjacent developments.

4.3.2.2 Design Development GRIP 3 to GRIP 4

As outlined above, the final GRIP 3 option, developed by AECOM, comprised a set of escalators parallel to the railway viaduct leading down from the existing western footbridge down to a deck over the River Aire, with associated lifts and stairs. The ticket office and ticket barriers were located at the lower level.

This option provided direct connection with both sides of the River Aire, with the main routes being via a direct connection with the proposed ISIS footbridge just to the south of the proposed entrance and via a walkway on the eastern bank of the river, in front of the Blue Apartment building.

Following the completion of GRIP3 and before the beginning of GRIP4, there were a number of external factors which changed the form of the station entrance, namely:-

- the construction type of the ISIS footbridge prevented the escalators joining into the western bank on the River Aire and therefore the escalators had to double back on themselves into the Dark Arches;
- during consultation with the Environment Agency at the beginning of the project, a flood risk level of 1 in 100 year was established. However, this requirement changed as a result of the ongoing consultation with the Environment Agency so that the LSSE building soffit level would provide a 510mm freeboard above the predicted 1 in 200 year plus climate change fluvial flood level, for the future scenario incorporating the proposed Leeds Flood Alleviation Scheme. This meant that the structure was raised up from the height of the river banks and required a series of ramps to provide step free access. Lift shafts and escalator pits would infringe on the freeboard but be designed so as to reduce the likelihood of trapping debris.

These surrounding developments resulted in concerns that the ends of the escalators and the stairs were very close to the adjacent buildings and an alternative design was proposed by AECOM. The alternative design re-orientated the escalators to a position at right angles to the viaduct, which produced a more compact overall design. Initial illustrations of this proposal showed the entrance contained within a ‘box’ shaped building.
As the design was progressed and following consultation with stakeholders, it was considered that there were a number of reasons to reconsider the proposed ‘box’ like shape:

- it was known that the area around the proposed entrance was valued by the planners in terms of aesthetics and therefore a more aesthetically appealing design would be preferred by the local planning authority;
- due to the proximity of the adjacent buildings, a curved roof design would allow more light into the adjacent apartments;
- a curved design would minimise the visual impact of the building, thus minimising the impact on the adjacent residents; and
- a curved roof is sympathetic to the curved nature of the existing station roof.

4.3.3 Traffic and access options on Little Neville Street

As part of the TWAO process, Mott MacDonald on behalf of Metro, developed and appraised a number of different access options for Little Neville Street to facilitate a safe access and egress for users of LSSE. In summary, these options included:

- bollards (or other form of physical access control) at the north end of Little Neville Street;
- bollards (or other form of physical access control) at the north end of Little Neville Street and traffic regulation orders;
- bollards (or other form of physical access control) at the north end and south end of Little Neville Street and traffic regulation orders;
- a one way loop linking Dark Neville Street with Little Neville Street which would only allow for servicing and essential access; and
- full closure of Little Neville Street to vehicular traffic

A full description and appraisal of these options is provided in the Traffic, Access and Urban Realm report (Mott MacDonald, 2012), which has been included in Volume IV of this ES.

4.3.4 Step Free Access Design Review

Since planning permission was granted in May 2010, Metro has been working with SBS Architects and Hyder Consulting to review the design to investigate possibilities for provision of step-free access. It was considered that the main footprint of the scheme is unlikely to change significantly and any anticipated changes will be predominantly inside the proposed building. As such, it is considered unlikely that any amendments to the design post-GRIP 4 will significantly affect the environmental scope presented within the ES.

4.3.5 Construction Alternatives

The Constructability Review provided by Carillion (April, 2012) included a consideration of suitable access points on to River Aire. This review of sites included:

- Water Lane;
- Granary Wharf Canal Basin;
- Bridge End Wharf car park; and
- the car park adjacent to Neville Street and Bridgewater Place.

The Granary Wharf Canal Basin site would have resulted in significant landtake in a recently developed area resulting in a loss of public open space and Bridge End Wharf car park presented severe access...
The car park adjacent to Neville Street and Bridgewater Place provided a number of positive benefits such as good links to the highways network, the proximity of this site to the canal locks may result in congestion at this frequently used stretch of the River Aire. The Water Lane site was chosen due to its current land use, access to the River Aire and good transport links.
5. Consultation

5.1 Introduction

It is recognised that EIA best practice requires broad stakeholder consultation to be undertaken to aid in the assessment of potential environmental and socio-economic effects, whether adverse or beneficial. Consultation allows consultees to share information about a proposed project. Findings from the consultation process are used to iteratively inform the EIA process to allow any specific concerns to be addressed.

Key findings from the consultation process for the proposed LSSE scheme are presented in the following section.

5.2 EIA Consultation

An EIA Scoping Report (Appendix A) was prepared for the LSSE scheme and formally submitted to DfT as the determining authority in October 2011. The objective of the scoping exercise was to identify which aspects of the scheme are likely to give rise to significant environmental effects, and to determine the scope of work required for the preparation of the ES. The determining authority has a duty under Rule 8 of the Transport and Works Act 1992 and Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006 to consult widely before adopting a Scoping Opinion. DfT circulated the scoping report to the consultation bodies to seek their views on the scope and methodology for the EIA. In accordance with rule 8 of the above Rules, DfT consulted British Waterways, English Heritage, the Environment Agency, Leeds City Council and Natural England.

A formal Scoping Opinion provided by DfT was received in November 2011 (see Appendix B). The Scoping Opinion set out the opinion of DfT and its consultees on the basis of the information provided in the EIA Scoping Report (Mott MacDonald, 2011). The Scoping Opinion indicated that overall, the DfT was satisfied that the topics identified in the EIA Scoping Report encompassed those matters identified in Schedule 4 of the Town and Country Planning (EIA) Regulations 2011 which were relevant to the scheme.

A summary of the comments received from DfT and other consultees are presented in Appendix C. The response from the environmental specialists to the comments is also documented in Appendix C and an indication of where changes have been incorporated in the ES, where appropriate.

In addition to the formal scoping consultation process, ongoing liaison has been undertaken with relevant bodies during the preparation of the ES to address particular aspects during the scheme design and development. A consultation log has been used to record consultation meetings and correspondence and is included in Appendix D of this Main Statement.

Several meetings and follow-up discussions have also taken place with Officers from LCC regarding the proposed project. For example, information regarding the listed buildings and conservation areas surrounding the proposed scheme has been discussed with Conservation Officers at LCC. Meetings have also taken place with the EA to agree the proposed scope of the FRA to be submitted as a supporting document with this planning application. A summary of these conversations is included within the consultation log in Appendix D.
5.3 Public and Statutory Consultation

5.3.1 Overview

Metro has undertaken consultation for the LSSE scheme to ensure that all those stakeholders who have a view on the proposals have had an opportunity to express their views. Consultation for the proposed scheme has previously been undertaken by Metro for the planning application in summer 2009 (summarised in Section 5.3.2 below) and additional consultation for the purposes of the TWAO has been undertaken by Metro and Network Rail in late 2011 (summarised in Section 5.3.4 below). During the consultation process, stakeholder groups were contacted at an early stage and every effort has been made to continue to build and maintain dialogue throughout the development of the scheme.

The principal objectives of consultation with stakeholders were as follows:

- to make information readily available and shared with those who might be affected by or interested in proposals;
- to give stakeholders the opportunity to comment;
- to give members of the general public the opportunity to comment;
- to gather feedback from comments received for consideration in final design proposals where improvements may be incorporated; and
- to create an environment for continuous engagement.

5.3.2 Planning Application Consultation

As outlined in Section 1.2, a planning application for the LSSE project was submitted in October 2009 and a series of consultation exercises were held to inform the design of the scheme prior to the submission to LCC. The initial consultation exercises sought to ensure that the widest possible audience was consulted and encouraged to provide feedback on the proposals for a new southern station entrance. An extensive programme of consultation was undertaken, to inform local residents, businesses and user groups about the scheme, and to advertise the consultation events being undertaken.

Consultations included, but were not limited to, the following activities:

- letters delivered to all residents in the affected Blue Apartments, inviting them to a presentation and consultation event held on the 5th August 2009 prior to the wider public consultation process. The residents were provided with a website address and a telephone number for further information;
- a letter and leaflet distribution to all known residents, business and others with a potential interest in the proposal within a 250 m radius to the south of the station;
- a dedicated webpage was developed on Metro’s web site, viewed by approximately 400 people at the time, providing an opportunity for both web feedback and a dedicated email address for comments;
- information posters were displayed for the full consultation period at Leeds City Station;
- a presentation of the proposals took place on the 13th August 2009 for members of LCC Plans Planning group;
- a follow-up press release was sent to residents to remind people of the final days of the consultation period and exhibition and their opportunity to comment;
- further presentations to other key stakeholders and investment groups including the Holbeck Urban Village Partnership Board, Holbeck Urban Village Developer Forum, Leeds Involvement Project DRG Group and ISIS (developers for Granary Wharf).
- a public consultation event was held from the 14th August to 25th August 2009, with opening hours spread from 8 am until mid evening on two days. Representatives of the Metro and Network Rail team
were on hand to answer any questions and a public display included a specially designed board and a ‘walk-through’ video presentation. The information posters, put on display during the consultation period, remained in place through out September and October 2009 in Leeds City Station; and

- during the consultation period, over 7,000 information leaflets were distributed and nearly 250 people responded to the consultation process through various available mediums. The consultation response period remained open until 7th September 2009, although all responses received before 21st September 2009 were also captured in the final analysis.

5.3.2.1 Planning Application Consultation Feedback

Feedback on the above consultation activities indicated that 96% of the respondents (206) supported the LSSE proposals, and 4% (9) respondents not being supportive of the proposals. Some 147 (68%) of the respondents were positive and had no specific concerns with a further 59 respondents (28%) supportive, but with concerns that they wished to be considered by the team. The remaining 9 (4%) were against the proposals.

The positive comments received indicated four key themes:

- 43 comments received highlighted a positive economic impact on the commercial and residential district of the south of the station;
- 37 commented on the architectural merits of the proposals;
- 36 commented on the journey time savings and improved accessibility; and
- 34 commented on the benefits of reduced congestion around the existing concourse and entrances;

The main concerns highlighted during this consultation process focused on the project design, with the following themes:

- 12 commented that they disliked the architectural design;
- 6 commented on the colour of the roof tiles;
- 12 commented that they felt the scheme was over-engineered for what was needed; and
- there were some respondents who raised issues and concerns related to wider matters at Leeds City Station and the surrounding area, covering such matters as the existing station concourse and infrastructure, the existing ticketing barrier and existing footpaths from the station.

5.3.3 TWAO Consultation

Metro has produced a Statement of Consultation in accordance with Rule 10(2)(d) of the Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006. The Transport and Works Act 1992 requires the applicant (in this case, Metro and Network Rail) to submit with the draft Order a report summarising all the consultations undertaken, including confirmation that Metro has consulted with all the relevant bodies named in Schedule 5 and 6 to the Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006, or if not why not.

During the consultation process there has been on-going dialogue with key stakeholders, in particular Network Rail, LCC and local ward members. Public consultation exercises have taken place inof public cluding exhibitions, flyers and targeted information mailshots and establishing a website. A summary of public and key stakeholder consultation is provided below:
5.3.3.1 Public Consultation

As part of the TWAO consultation three public exhibitions were held during December 2011. These included:
- Monday 5th December 2011 (am) at Leeds Rail Station
- Tuesday 6th December 2011 (pm) at Leeds Rail Station
- Wednesday 14th December 2011 (pm) at The Doubletree (formerly Mint) Hotel, Leeds

The conclusion of these consultation events indicated, from the 375 people that responded the consultation process, that 89% of the respondents (331) supported the LSSE proposals and 11% (41) of the respondents were not supportive of the proposals. The main reasons for supporting the proposals included:
- Journey time savings and improved accessibility;
- Reducing congestion around the existing concourses and entrances; and
- Positive impact on businesses and residents in South Leeds.

The reasons for respondents not supporting the scheme were on the grounds that:
- It was a waste of money;
- The funding should be used to improve existing infrastructure and / or provide additional rolling stock; and
- The architectural design.

In addition to the public consultation Metro and Network Rail have consulted extensively with key stakeholders and property owners during the preparation of the TWAO. This has included, but not been limited to.

5.3.3.2 Consultation with the Local Authority

Throughout the development of the LSSE scheme regular liaison has taken place with Leeds City Council Members. This has included provision of written updates for Ward Members. There has been continued dialogue with the local MP throughout the development of the project.

5.3.3.3 Consultation with property owners and residents

Substantial consultation has taken place with locally affected property owners and occupiers affected by the scheme. Metro and Network Rail have attended and presented at a number of residents association meetings for the Blue, Watermans Place and Candle House Apartments. Meetings have included:
- Watermans Place Residents - 13th October 2011
- Watermans Place Residents - 13th December 2011
- Blue Apartments Residents - 5th January 2012
- Blue, Watermans and Candle House - 8 February 2012

Following these meetings a continuing dialogue continues with local residents and both Metro and Network Rail are keen to work with local residents to deliver the scheme. Further face-to-face meetings have been offered to discuss the impact of the scheme local residents following the submission of the TWAO.

5.3.3.4 Consultation with local business

In September/October 2011, a letter was sent to all local businesses within the initial Order Limits, informing them about the scheme and the intention to submit a Transport and Works Act Order.
Throughout the development of the TWA Order application, face to face and telephone consultations have taken place with principal landowners and businesses likely to be affected by the scheme. The meetings were tailored to meet the requirements/impacts of LSSE on the affected party. Typically meetings would cover the scheme in general, proposed highway alterations, constructability and the TWAO process. Face to face meetings have included:

- ISIS Waterside Regeneration;
- Golf Bar;
- Hilton Hotel;
- Doubletree Hotel;
- ASDA;
- UKi Partnerships; and
- Other commercial property owners.

Following the submission of the TWAO Metro will continue to consult with the public and key stakeholders.
6. **Planning Policy**

6.1 **Introduction**

6.1.1 **Overview**

This section of the main statement establishes an overview of the planning policy framework within which the proposed development will be assessed. The chapter demonstrates that consideration has been given to planning policy guidance at the national, regional and local levels in the evolution and final design of the proposed development.

This chapter focuses only on those policies that are relevant to the EIA and detailed discussions of compliance with relevant planning policies will be provided within the Planning Statement that will accompany the request for deemed planning consent. Specific planning policies are also referred to and analysed within the subsequent technical appendices of the ES where appropriate.

The planning policy framework has been reviewed and considered at the following levels:

- National: as set out in draft National Planning Policy Framework (NPPF);
- Regional: as set out in the Yorkshire & Humber Plan; and
- Local: the ‘saved’ policies of the Leeds City Council Unitary Development Plan (UDP), associated planning guidance and the emerging Local Development Framework (LDF).

The review also considers the sustainability policy framework at the national, regional and local levels. Supplementary Planning Guidance and Supplementary Planning Documents produced at the local level have also been reviewed.

6.2 **National Policy Context**

6.2.1 **National Planning Policy Framework**

On 27 March 2012, the Government published the National Planning Policy Framework ("NPPF") with immediate and wide-ranging effect. It replaces practically all planning policy statements (PPS) and planning policy guides (PPG). Of relevance to the LSSE proposals PPS10 regarding waste remains, pending a separate framework document covering waste and a technical guidance note has been published to accompany the NPPF on flood risk and minerals.

The framework is designed to promote the Government’s Localism Agenda with an emphasis on policies which reflect local priorities. A key change to previous guidance is a presumption in favour of sustainable development which balances economic, social and environmental factors. This therefore provides a more pro-active approach than before where the default answer to development is ‘yes’, except where this would compromise key sustainable development principles.

Of relevance to the LSSE proposals, the framework seeks to build a strong and competitive economy and ensure the vitality of town centres. This includes addressing potential barriers to investment - such as a poor environment and lack of infrastructure.
The strategy states that transport policies have an important role to play in facilitating sustainable
development while also contributing to wider sustainable and health objectives. In particular plans should
ensure that developments that generate significant movement should be located where the need to travel is
minimised.

The framework aims to protect and enhance the environment through high quality design and conservation
of the historic environment (elaborated on further in the Design and Access Statement) and by conserving
and enhancing biodiversity. It states that planning has a key role to play in providing resilience to the
impacts of climate change such as flooding (with requirements for a Flood Risk Assessment in areas which
are vulnerable to flooding) and delivery of low carbon energy. Further policies encourage reuse of land that
has been previously developed.

To prevent unacceptable risks from pollution and land instability, it states that decisions should ensure that
the proposed site is suitable for its new use. Development should also mitigate and reduce to a minimum,
adverse impacts on health and quality of life arising from noise and ensure compliance with EU values for
pollutants taking into account the presence of Air Quality Management Areas (AQMA).

6.3 Regional Policy Context

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the proposed development will be assessed. The chapter demonstrates that consideration has been given
to planning policy guidance at the national, regional and local levels in the evolution and final design of the
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6.5 Regional Policy Context

The Yorkshire and Humber Plan is the current Regional Spatial Strategy (RSS) for the Yorkshire and Humber Region which encompasses the city of Leeds. The Plan was issued in May 2008.

The government has indicated that it will abolish regional policy documents outside Greater London using powers enabled by the Localism Act 2011. However, the current position is that the policies in the Y&H RSS remain part of the development plan, for the present. This was confirmed by the Government in Command Paper 8103, dated 23 June 2011, which states “decisions on planning applications and appeals must be made in accordance with the ‘development plan’ unless material considerations indicate otherwise. The Government’s intention to abolish Regional Strategies is a material consideration – the weight to be given to it however, will be a matter for the decision maker”.

The current RSS includes a broad development strategy for the region, setting out regional priorities in terms of location and scale of development. These include the following:

- Economic Development;
- Transport & Communications;
- The Environment;
- Tourism & Leisure; and
- Urban Regeneration.
Policies relevant to the proposed development have been considered and are set out below:

- Policy YH1: Overall approach and key spatial priorities;
- Policy YH2: Climate change and resource use;
- Policy LCR1: Leeds City Region sub area policy;
- Policy LCR2: Regionally significant investment priorities for Leeds City Region;
- Policy ENV1: Development and Flood Risk;
- Policy ENV8: Biodiversity;
- Policy ENV9: Historic Environment;
- Policy E2: Town centre and major facilities;
- Policy T1: Personal travel reduction and modal shift;
- Policy T3: Public Transport;
- Policy T5: Transport and tourism; and
- Policy T9: Transport investment and management priorities.

6.6 Local Policy Context

6.6.1 Introduction

The Leeds City Council Unitary Development Plan (UDP) was adopted in 2001 and reviewed in 2006. The Review updated the 2001 plan and forms an 'alteration' to the 2001 plan rather than a 'replacement'. The UDP forms the current Development Plan for the City Council.

A number of policies in the Local Plan were ‘saved’ under the Planning and Compulsory Purchase Act. These will ensure that there is continuity in planning policy until the Core Strategy for the Council supersedes the planning policy contained in the Local Plan. As such, the UDP provides a framework for all new developments and is used as a basis for making decisions regarding land use and planning applications.

Policies relevant to the proposed development are outlined below:

- SG1 Land Use Coordination of Aspirations;
- SG2 Maintain City Distinctiveness
- SG4 Pursuit of Sustainable Development;
- SA1 Environment;
- SA2 Transport;
- SA4 Local Economy;
- SA6 Leisure & Tourism;
- SA7 Urban Regeneration;
- SA8 Access for All;
- SA9 Aspirations for the City Centre;
- SP3 Development Location Strategy;
- SP4 Transport Priorities;
- SP8 City Centre Policy;
- GP5 Requirements of Development Proposals;
- GP11 Sustainable Design Principles;
- GP12 Sustainability Assessment;
- N10 Public Rights of Way and Development;
6.7  Local Development Framework

The UDP will gradually be replaced by the Local Development Framework (LDF) for Leeds City Council or by any new development plan policies proposed in the Localism Act 2012. The Core Strategy is the principal document within the LDF; it sets out the vision for the future of Leeds and provides broad policies to shape development over the next two decades.

Consultation on the ‘Preferred Approach’ stage for the Core Strategy took place between October and December 2009. Consultation responses to the ‘Preferred Approach’ will be considered and used to work up the final version of the Core Strategy. It is anticipated that the Core Strategy will be adopted towards the end of 2012.

The ‘Preferred Approach’ for the Core Strategy is based around a number of themes, as follows:

- **Leeds (A Distinctive Place):** The Core Strategy supports sustainable and high quality design that protects and enhances those elements which contribute to the distinct identity of the City;
- **Shaping the Future:** The Core Strategy seeks to deliver a sustainable, diverse and competitive economy in Leeds;
Managing Environmental Resources: Development should protect and enhance biodiversity as part of any development and should seek to promote sustainable development. In particular, flood risk issues should be addressed as part of any proposed development; and

A Well-Connected City: The Core Strategy is supportive of the delivery of an integrated transport strategy, which includes a range of transport infrastructure improvements.

6.8 Additional Planning Policy Documents

6.8.2 Overview

In addition to the UDP, there are a number of Supplementary Planning Guidance (SPG) and Supplementary Planning Documents (SPD) as well as Strategies adopted by the City Council, which are relevant to the proposed development. These documents provide a more detailed explanation of how strategic policies of the UDP might be practically implemented. The content of these documents should be given weight in considering development proposals.

Those documents relevant to the proposed development are summarised below:

6.8.3 Leeds Waterfront Strategy

The Leeds Waterfront Strategy was adopted in 2002 and was the subject of a partial review in 2006. The Strategy encompasses approximately 6.5km of the river and canal corridor running through central Leeds, formed by the Aire & Calder Navigation and the Leeds and Liverpool Canal. The proposed development falls within the study area.

The Waterfront Strategy identifies opportunities for regeneration and enhancement in the study area and seeks to promote good design within the study area which respects the character of the Conservation Area. It aims to improve pedestrian and cycle access to/from the waterway corridor and to identify opportunities for environmental improvements to the waterway.

The Strategy identifies the view into Dark Arches as an important feature within the river corridor. As such, this view should be retained and enhanced. In addition Granary Wharf (on the southern side of Dark Arches) is identified as a key focal point/space.

6.8.4 Biodiversity & Waterfront Development

The Biodiversity and Waterfront Development SPD provides a framework to inform, guide and assess new development on sites adjacent to rivers, canals and becks in Leeds to ensure that biodiversity issues are duly considered and addressed. The SPD was adopted in September 2006 and forms part of the LDF suite of documents.

The document promotes the following objectives:

- to provide guidance on the ecological design of developments within waterway corridors;
- to provide guidance on the conservation of protected and important species;
- to identify opportunities for habitat enhancement, creation and restoration; and
to encourage appropriate long term habitat management.

The document contains a number of policies which are pertinent to the proposed development. These policies are outlined below:

- **Policy N8**: Within the urban river corridors development proposals should ensure that:
  - any existing corridor function of the land is retained, enhanced or replaced; and
  - where there is potential to create a link between existing green spaces provision is made for one or more corridor function.

- **Policy N9**: All development proposals should respect and where possible enhance the intrinsic value of land in fulfilling a corridor function in terms of access, recreation, nature conservation and visual amenity;

- **Policy N49**: Development will not normally be permitted which threatens significant net depletion or impoverishment of the district’s wildlife or habitat resources. Design of new development should minimise its potential adverse impact;

- **Policy N50**: Development which would seriously harm SEGI or LNA designations (either directly or indirectly and through any means) will not be permitted;

- **Policy N51**: The design of new development should (wherever possible) enhance existing wildlife habitats and provide new areas for wildlife as opportunities arise. Where new development is proposed adjacent to any area of existing nature conservation interest, a buffer zone will be required; and

- **Policy LT6B**: The City Council will (where appropriate) seek to secure footpath access and public rights of way along both banks of the River Aire and the Leeds canal system, having regard to public safety and nature conservation interests.

### 6.8.5 Building for Tomorrow Today: Sustainable Design and Construction

This SPD was adopted in August 2011 and forms part of the LDF suite of documents. The document provides guidance for design and construction projects within Leeds and seeks to achieve rigorous levels of sustainability.

Leeds City Council encourages developments of 1,000 or more square metres to meet the ‘Excellent’ standard set by BREEAM¹ by 2013.

The SPD seeks to support developers in realising projects that:

- Reduce greenhouse gas emissions;
- Successfully adapt to climate change;
- Have a minimal impact on overall environmental quality; and
- Provide inclusive development to all users.

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¹ Building Research Establishment Environmental Assessment Method (BREEAM). A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building’s specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes. (www.breeam.org)
The document gives guidance to developers on the following topics, based on the categories and environmental issues covered by BREEAM. Those themes that are pertinent to the proposed development are outlined below:

- **Site Appraisal:** Any proposed development should consider the wider context of a site and identify the constraints and opportunities for sustainable development. A site appraisal should examine both the site and its surroundings and include an assessment of accessibility particularly public transport, walking and cycling;

- **Design Considerations:** The character of the space around buildings should define a development's quality, creating an attractive setting, relating to the wider townscape or landscape and, where possible, creating habitats;

- **Energy & CO2 Emissions:** Any proposed development should examine low-carbon technologies and include measures which seek to reduce their carbon footprint. In particular, development should promote the use of public transport and walking/cycling and week to reduce reliance on the private car;

- **Materials:** Any proposed development should consider the source of the materials and the energy used in both their manufacture and transportation;

- **Surface water run-off:** The impact on the water environment should include impacts on water quality, protecting the flood capacity of watercourses and protecting such features. The site layout should seek to minimise impacts on the water environment by reducing the quantity and improving the quality of surface water run-off; and

- **Ecology:** Any proposed development should consider the enhancement and integration of biodiversity measures into development schemes, where feasible.

The SPD identifies 10 Urban Design Principles which seek to promote sustainable and cohesive communities. Of these, Principle 9 (Delivering Sustainable Environmental Solutions) is particularly pertinent to this SPD. These principles are set out below:

1. Investing Effectively – Recognise that good design is good business;
2. Creating Excellent New Places: Take a visionary approach;
3. Working Together: Get the team right;
4. Improving Existing Identity: Analyse and enhance the character;
5. Involving the Community: Make places for (and by) people;
6. Connecting Places: Create visual and physical links;
7. Regenerating throughout Leeds: Close the gap and move forward;
8. Managing the Investment: Look after the place;
9. Delivering Sustainable Environmental Solutions: Provide for future generations; and

### 6.8.6 Leeds City Centre Urban Design Strategy

The Leeds City Centre Urban Design Strategy was adopted in September 2000. The document seeks to provide a working tool which can be used to encourage good distinctive design proposals appropriate to Leeds City Centre..

### 6.8.7 Holbeck Urban Village Planning Framework 2006

The Holbeck Urban Village (HUV) Revised Planning Framework was adopted in February 2006. It sets out the planning and design framework for the regeneration of this historically important area. This includes creating new opportunities for employment, living and leisure including a new creative quarter based on
new media and digital technologies. It also seeks to improve connectivity between the city centre and communities of Beeston Hill and Holbeck.

6.8.8 **My Journey West Yorkshire, West Yorkshire Local Transport Plan (2011 – 2026)**

This Plan sets out a vision for transport in West Yorkshire over the next 15 years, ‘to ensure [the] transport system connects people and places in ways that support the economy, the environment and quality of life’. The most relevant of these three objectives is the aim to improve connectivity to support economic activity and growth in West Yorkshire and the Leeds City Region. Specifically, the ‘Enhancements’ programme, a major priority for the next three years, refers directly to plans for a new entrance to Leeds City Station as one of the main projects that will spur on the objectives of this plan.

6.8.9 **Leeds City Region Local Enterprise Partnership Plan – ‘Realising the Potential 2011**

This report sets out various strategic priorities to be addressed in order to fulfil the LEP aim for Leeds to become ‘A world-leading dynamic and sustainable low carbon economy that balances economic growth with a high quality of life for everyone.’ The first priority is the most relevant to this project, and focuses on creating the environment for growth which includes establishing the physical infrastructure to connect business and workforce to opportunities and to each other.

6.8.10 **Leeds City Region DaSTS Connectivity Study, Phase 1: 2010**

The goal of this report is to support economic competitiveness and growth. It suggests that one way of doing this is to reduce productive time lost through delays in transport, improve access and connectivity to labour markets in key business centres.

6.9 **Summary**

A planning statement forms part of the TWAO application, which demonstrates compliance of the EIA and the proposed LSSE scheme with the policies outlined above. In addition, the technical appendices presented in Volume II also demonstrate how the proposed LSSE scheme complies with any specific policies relating to that technical discipline.
7. EIA Approach and Methodology

7.1 Introduction

This chapter outlines the approach which has been taken during preparation of this ES. Further details regarding the specific methodologies used for each technical discipline are provided within the Technical Appendices presented in Volume II of this ES.

7.2 EIA Scope

7.2.1 Temporal Scope

The ES addresses environmental effects arising from the construction, temporary and permanent land take and operation of LSSE as follows:

- construction effects that may arise directly from construction activities (e.g. piling) and from the temporary use of land (e.g. construction site compounds, the Water Lane barge loading/unloading site, etc), or from associated changes in traffic movements (e.g. diversions); and
- operational effects that may arise from the new infrastructure associated with LSSE.

The temporal scope may vary for specific disciplines but will generally extend from commencement of construction works until 15 years after commencement of operations.

7.2.2 Spatial Scope

The spatial scope is the geographical area that will be covered by the EIA. The definition of the spatial scope has taken account of:

- the footprint of the proposed works;
- the nature of the existing baseline environment;
- the manner in which effects are likely to be propagated (e.g. effects on watercourses may extend some distance downstream);
- the area affected (positively and negatively) by transport movements; and
- the geographical boundaries of the political and administrative authorities which provide the planning and policy context for the project.

These basic principles define the spatial scope, but a more specific description will be provided within each technical methodology given in Chapter 8 below and the corresponding technical appendix.

7.3 Baseline environmental conditions

Environmental effects are described in terms of the extent of change to the baseline environment. This is the environment that existed at the time of assessment or has been predicted to be the case at key points in the proposed scheme’s development. The baseline environment has been identified using existing data, surveys, studies and modelling. Resources and receptors were identified for each environmental topic and the baseline environment was determined.
A substantial amount of baseline environmental work has already been undertaken for the scheme as part of the GRIP 4 study (Faber Maunsell AECOM), completed in April 2009. This study formed the basis of the planning application for the scheme which was submitted to LCC and approval granted in May 2010. The EIA process for the TWAO submission will be primarily based on the existing environmental baseline information from the GRIP 4 study, as presented in the appendices of the GRIP 4 report and the supporting documents for the planning application. It is understood that the environmental baseline data contained in these documents is considered to be relevant and sufficiently up-to-date, and that the statutory environmental consultees will be familiar with the environmental conditions and issues on the site following the award of planning permission in May 2010. Where it is deemed necessary, additional site visits may have been undertaken; an outline of the scope for the environmental works by discipline is provided in the EIA Scoping Report in Appendix A.

7.4 Assessment of Effects

7.4.1 Introduction

An ES must report the likely significant environmental effects (whether beneficial or adverse) that will result from undertaking the project. There is no statutory definition of what constitutes a significant effect. However, the primary purpose of identifying the significant effects of a project is to inform the decision maker so that a balanced decision in respect of the development can be reached. On this basis, and in accordance with established EIA practice, a significant effect is considered to be: “an impact that, in isolation or in combination with others, should, in the opinion of the EIA team, be taken into account in the decision-making process.”

The significance of an effect is assessed by looking at the change against existing and/or predicted baseline conditions as a result of the project. The way that the significance of an effect is determined varies for each topic, but in broad terms it is the product of the degree of change (or the magnitude of the effect) and the sensitivity or value of the receptor or resource that is affected. The individual methodologies used for the assessment of significance of effects for each of the technical areas are shown in Chapter 8.

The following type of effects will be considered:

- **direct effects** - effects that arise from activities that form an integral part of the project (e.g. land take and new infrastructure);
- **indirect effects** - effects that arise from activities not explicitly forming part of the project (e.g. noise changes due to an increase or decrease in road traffic flows on existing roads resulting from construction vehicles accessing the site);
- **secondary effects** - effects that arise as a consequence of a direct or indirect effect of constructing or operating the project (e.g. reduced amenity of a community facility as a result of noise generated on site);
- **permanent effects** - effects that result from an irreversible change to the baseline environment or which persist for the foreseeable future;
- **temporary effects** - effects that persist for a limited period only. Where possible, these will be classified as short term (less than 1 year), medium term (1 to 3 years) and long term (more than 3 years);
- **beneficial effects** - effects that have a positive influence on receptors and resources;
- **adverse effects** - effects that have an negative influence on receptors and resources;
**combined effects** – effects on one receptor due to a combination of different impacts from the same project; and

**cumulative effects** - cumulative effects can be defined as the impacts on the environment which result from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (IEMA 2004). Cumulative effects may arise from the interaction of the LSSE project in conjunction with other existing or proposed development projects (DTLR, 2000) on the resources and / or receptors which benefit from a development consent order or planning permission. The DCLG consultation paper “Environmental Impact Assessment: A guide to good practice and procedures” describes other developments as those that are ‘already begun or constructed or those that have not been commenced but have a valid planning permission’ (DCLG, 2006). These criteria will be used for the purposes of the EIA.

The above types of effects were assessed for both construction and operational phases of the proposed development.

### 7.4.2 Mitigation Measures

#### 7.4.2.1 Incorporated Mitigation

An ES should also include a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment. The identification of such measures is an iterative process which has been undertaken in parallel with the design to aid the incorporation of measures into the design during project development. This early adoption of appropriate mitigation will help reduce significant environmental effects to a practicable minimum.

Where significant effects are identified as part of the EIA, mitigation measures will be proposed to avoid or reduce these effects. Where measures are integral to the design and the project promoters (in this case, Metro and Network Rail) have committed to their implementation, mitigation will be termed “incorporated mitigation”. Where significant effects still remain after application of incorporated mitigation, they are termed significant residual effects and such effects will be reported within the ES.

In addition to the mitigation identified as part of this ES, the selected Construction Contractor will be obliged to follow best practice construction techniques. The key Network Rail environmental guidance is provided by the *Contract Requirements – Environment* document (for reference this is included in Volume IV as a supporting document to this ES), which provides guidance on measures to reduce the environmental effects during the construction period, as well as taking into account measures identified within the ES. This includes the production of an Environmental Management Plan, Waste Management plan, Traffic Management plan and a Nuisance Management Plan. A schedule of site specific construction mitigation measures has also been prepared (for reference this is included in Volume IV as a supporting document to this ES) and is designed to act as an annex to Network Rail’s *Contract Requirements – Environment* document and inform interested parties of the standards of construction practice acceptable to the Co-Promoters, and acts as a general guidance document for the Contractor.

These documents will present mitigation measures adopted to address environmental aspects affecting the interests of residents, businesses, all road users and the general public in the vicinity of the works. Network
Rail will monitor adherence of the Construction Contractor to these plans and relevant guidance throughout the whole construction period.

7.4.2.2 Supplementary Mitigation

Any further mitigation measures suggested which are not incorporated into the design of the project for which permission is being sought, are termed “supplementary mitigation”. Supplementary mitigation can also take the form of enhancement measures which aim to improve existing baseline environmental conditions. These further supplementary mitigation measures may be discussed in the ES as activities which could be potentially undertaken but does not commit the developer to undertaking them. They will not form part of the assessment process (therefore do not reduce the level of an effect in terms of the assessment), and should not be considered as part of the application.

A summary of the environmental mitigation identified for the scheme as a result of the findings of the EIA process is provided in Appendix E.
8. Assessment of Effects

8.1 Introduction

The following chapter summarises the findings of the technical assessments undertaken for the purposes of this ES. Full details of the assessments are provided in the individual technical appendices, presented within Volume II of this ES.

8.2 Air Quality

8.2.1 Introduction

This section summarises the air quality assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within air quality Technical Appendix in Volume II of this Environmental Statement.

8.2.2 Baseline Conditions

Information on air quality in the UK is available from a variety of sources including Local Authorities, national network monitoring sites and other published sources. The primary sources examined in this assessment include the Leeds City Council’s (LCC) Review and Assessment documents, Leeds Station South Entrance – Air Quality & Dust Report (Faber Maunsell/AECOM, April 2009) and the Department for Environment, Food and Rural Affairs (Defra).

LCC most recent Progress Report was produced in October 2010. LCC has currently declared six AQMAs, all of which come under one AQMA Order (AQMA No. 1, declared 1st July 2010). All of these have been declared due to exceedences of the nitrogen dioxide (NO₂) annual mean objective and all six of them are in residential areas. The AQMAs declared by LCC are between 800m and 6.5km from the LSSE project. On this basis, no consideration of the proposed scheme’s potential impact on the declared AQMAs is required.

Table 8.1 presents the continuous monitoring data at four locations that are representative of the LSSE site.

<table>
<thead>
<tr>
<th>Site Name</th>
<th>NO₂ Annual Mean Concentration (µg/m³)</th>
<th>PM₁₀ Annual Mean Concentration (µg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2007</td>
</tr>
<tr>
<td>Leeds Centre</td>
<td>39</td>
<td>37</td>
</tr>
<tr>
<td>Corn Exchange</td>
<td>72</td>
<td>71</td>
</tr>
<tr>
<td>West Street</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>Jack Lane, Hunslet</td>
<td>42</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: LCC AQ Progress Report 2010
Data Capture: Please see Air Quality Technical Appendix

The diffusion tube monitoring data presented in Table 8.2 are not measured at sites within an AQMA and have been selected as they are representative of the site and all lie within a 2km radius of the site. A number of these sites are co located with automatic analysers for QA/QC purposes.
Table 8.2: NO2 Diffusion Tube Monitoring Results

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Site Type</th>
<th>Distance From Site (km)</th>
<th>X</th>
<th>Y</th>
<th>Data Capture for Monitoring Period (%)</th>
<th>Annual Mean Concentration (µg/m3)</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>121 Dewsbury Road</td>
<td>Residential façade</td>
<td>1.3</td>
<td>430183</td>
<td>431890</td>
<td>92</td>
<td>36</td>
<td>32</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>12 Marlborough Grange</td>
<td>Residential façade</td>
<td>0.82</td>
<td>429280</td>
<td>433745</td>
<td>83</td>
<td>32</td>
<td>29</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>West Street Car Park</td>
<td>Co-loc'd urb. cen.</td>
<td>0.96</td>
<td>429011</td>
<td>433617</td>
<td>100</td>
<td>43</td>
<td>43</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Leeds AURN (L)</td>
<td>Co-loc'd urb. cen.</td>
<td>1.16</td>
<td>429969</td>
<td>434259</td>
<td>100</td>
<td>38</td>
<td>34</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Leeds AURN (R)</td>
<td>Co-loc'd urb. cen.</td>
<td>1.16</td>
<td>429969</td>
<td>434259</td>
<td>100</td>
<td>41</td>
<td>36</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Leeds AURN (M)</td>
<td>Co-loc'd urb. cen.</td>
<td>1.16</td>
<td>429969</td>
<td>434259</td>
<td>92</td>
<td>39</td>
<td>35</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>43 Grange Close, Hunslet</td>
<td>Residential façade</td>
<td>1.59</td>
<td>430878</td>
<td>431930</td>
<td>92</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>110 Jack Lane, Hurs t</td>
<td>Residential façade</td>
<td>1.52</td>
<td>430720</td>
<td>431898</td>
<td>100</td>
<td>37</td>
<td>38</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Corn Exchange</td>
<td>Co-loc'd urb. cen. kerbside</td>
<td>0.58</td>
<td>430358</td>
<td>433422</td>
<td>92</td>
<td>-</td>
<td>59</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>52 Bruce Lawn, Armley</td>
<td>Residential façade</td>
<td>1.38</td>
<td>428469</td>
<td>433037</td>
<td>92</td>
<td>-</td>
<td>31</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>7 Bruce Gardens, Armley</td>
<td>Residential façade</td>
<td>1.46</td>
<td>428392</td>
<td>432958</td>
<td>100</td>
<td>-</td>
<td>28</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>27 Holdforth Close, Armley</td>
<td>Suburban b/g</td>
<td>1.62</td>
<td>428220</td>
<td>433075</td>
<td>100</td>
<td>-</td>
<td>24</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Jack Lane GH</td>
<td>Residential façade</td>
<td>1.52</td>
<td>430731</td>
<td>431911</td>
<td>83</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>11 Tilbury Road</td>
<td>Residential façade</td>
<td>1.84</td>
<td>428736</td>
<td>431676</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>College of Technology Floor 1</td>
<td>Residential façade</td>
<td>0.98</td>
<td>429987</td>
<td>434122</td>
<td>90</td>
<td>-</td>
<td>-</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

Source: Leeds City Council Air Quality Progress Report 2010, bias adjusted

(1) Results from these tubes have been ‘annualised’ in accordance with the methodology described in TG(09).

8.2.3 Mitigation & Predicted Effects

Metro and Network Rail will ensure that its construction contractor will abide by Network Rail’s Contract Requirements - Environment (CR-E) [Ref 19] and Register of Consents & Commitments which includes requirement to implement Best Practicable Means (BPM) for the control of dust and other emissions to the atmosphere. These requirements will form part of the construction contractor’s Environmental Management Plan (EMP) which will be adopted and implemented by the construction contractor. In addition to adopting Network Rail’s CR-E, the site specific mitigation measures listed below will be adopted and will also form part of the construction contractor’s EMP.
The ‘Greater London Authority and London Councils Best Practice Guidance - The Control of Dust and Emissions from Construction and Demolition’ 2006 (Ref 20) (hereafter referred to as the ‘London Guidance’) provides a comprehensive overview of BPM mitigation measures to control dust and combustion related emissions from construction sites. Although the proposed LSSE scheme is located outside of London, the BPM mitigation measures will be adopted for the LSSE scheme.

As previously stated, the construction phase of LSSE is predicted to have a medium dust emission potential, however, in line with Metro and Network Rail’s commitment to reducing environmental effects, mitigation measures applicable to high risk sites will be employed.

The BPM mitigation measures, from the London Guidance, that are considered appropriate and will be imposed on site by the construction contractor during the construction phase are listed below.

**Site Planning**
- Erect effective barriers around dusty activities or the site boundary;
- No bonfires;
- Plan site layout – machinery and dust causing activities should be located away from receptors (where possible);
- Ensure site construction routes are hard standing;
- Use nearby waterways for transportation to/from site, where feasible;
- Establish a method for visual dust monitoring across site and ensure key site personnel are fully trained in this respect.
- A trained and responsible manager on site during working times will supervise and oversee site inspections to monitor compliance with dust control procedures set out above and record the results of the inspections, including nil returns, in a site log book.

**Construction Traffic**
- All vehicles to switch off engines – no idling vehicles;
- Effective vehicle cleaning and specific wheel-washing on leaving site and damping down of haul routes if required;
- Routinely clean the public highway using wet sweeping methods;
- All loads entering and leaving site to be covered;
- No site runoff of water or mud;
- On-road vehicles to comply to set emission standards;
- All non road mobile machinery (NRMM) to use ultra low sulphur tax-exempt diesel (ULSD) where available and be fitted with appropriate exhaust after-treatment from the approved list;
- On-road vehicles to comply with the requirements of a possible future Low Emission Zone (LEZ) as a minimum;
- Minimise movement of construction traffic around site;
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site; and
- Ensure all vehicles carrying loose or potentially dusty material to or from the site are fully sheeted.

**Site Activities**
- Strip and wrap any areas of the site to be demolished to reduce the amount of dust which may be liberated;
- Cutting equipment to use water as suppressant or suitable local extract ventilation;
- Use enclosed chutes and covered skips;
- Wrap structures to be demolished;
Minimise dust generating activities;
Use water as dust suppressant where applicable;
Keep stockpiles on site for the shortest possible time; and
Avoid double handling of material wherever reasonably practicable.

Operational phase

Following the adoption of the Transport Statement (and the mitigation measures specified within it) there is no requirement for further mitigation measures to be proposed here. There are currently no significance criteria to assess traffic quantitatively. However, the scheme is expected to reduce traffic flow which would provide some beneficial impact on local air quality. The Transport Statement includes the installation of access control measures at the entrances to Little Neville Street and Dark Neville Street to prevent congested traffic and high vehicle emissions in an enclosed space.

There will be no activity at the Water Lane site during the operational phase.

8.2.4 Significant Residual Effects

It is considered that the mitigation measures outlined above will be implemented effectively. Therefore, no significant residual air quality effects are predicted to occur as a result of the construction and operation of the LSSE Scheme.

8.2.5 Enhancement Opportunities

As there is potential for reduced traffic on Dark Neville Street and Little Neville Street the LSSE scheme is predicted to have a beneficial impact and so no further enhancement opportunities have been suggested.

8.3 Ecology

8.3.1 Introduction

This section summarises the Ecological Impact Assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within the Ecology Technical Appendix in Volume II of this ES. The assessment follows the IEEM (2006) methodology for assigning conservation value or importance to ecological features and using professional judgment to determine, whether or not effects are significant, based on the importance of features and nature, magnitude, permanence and severity of effects.

8.3.2 Baseline Conditions

As outlined in Section 3.4.1, the proposed LSSE scheme design includes a river deck and spans over the River Aire, supporting lifts, escalators, and stairs which connect to the existing, and widened railway station western footbridge.

The scheme is in a highly built-up area that has very little natural vegetation present, but nonetheless there is potential that the scheme and associated construction works could have an effect on species that use bridges and rivers as habitat, namely breeding birds, bats and otters. Bats and otters are known to use the River Aire and breeding birds including kingfisher have been anecdotally recorded. In response to the EIA
Scoping Report for the scheme (Mott MacDonald, 2011), the EA recommended that the impacts to fisheries should be considered as part of the EIA.

During the GRIP stage 4 design for LSSE, an ecological assessment was carried out by Faber Maunsell AECOM in October 2009. This assessment included:

- extended phase 1 habitat survey;
- bat habitat assessment;
- breeding birds habitat assessment;
- an otter survey; and
- an impact assessment and mitigation.

The bat surveys were subsequently updated in 2011 by Access Ecology on behalf of Metro and comprised:

- inspection of bridge structures for signs of bats;
- activity surveys for bats; and
- Anabats surveys for bats (static recordings).

In response to comment raised as part of the Scoping Opinion, Mott MacDonald ecologists carried out an otter survey in December 2011 and analysed fisheries data provided by the EA.

8.3.2.1 Designated Sites

There are no statutory designated sites within 2km of the proposed development site; however there are three non-statutory designated Local Wildlife Sites (LWSs) within the search area. These are:

- Leeds and Liverpool Canal Site of Ecological and Geological Importance (SEGI), located where the canal joins the River Aire, about 100m south of Leeds Station;
- Aireside Embankment Local Nature Area (LNA), located west of the railway station on the southern bank of the River Aire; and
- St Matthew’s LNA, described as being 1.75km east of the LSSE site in Holbeck. This site is not considered further in this assessment due to its distance and isolation from the proposed development site.

The Leeds and Liverpool Canal SEGI is of regional importance for nature conservation and the two LNAs are of local importance.

8.3.2.2 Habitats

The habitats surrounding the proposed development site are predominantly highly urbanised and dominated by buildings and hard standing. The immediate footprint of LSSE is characterised by the highly modified River Aire. This habitat comprise stone and metal piled river banks, with no submerged, marginal or emergent vegetation, this character is maintained throughout the majority of this stretch of the river. Occasional strips of ruderal vegetation exist on disturbed ground on some parts of the river banks.

The River Aire offers connectivity with more optimal habitats up and downstream from the site and is a UK Biodiversity Action Plan (UKBAP) habitat. The section of river within 500m of the site is considered to be of less than local importance, however it has the potential to support protected species including bats and otters.
All habitats above at LSSE are of less than local importance for nature conservation.

8.3.2.3  Protected Species

- **Bats** - Surveys carried out in 2009 by Faber Maunsell Aecom and in 2011 Access Ecology indicated that the features within the area of LSSE are of low to moderate suitability for roosting bats and no bats were recorded emerging from this area. Small numbers of common pipistrelle *Pipistrellus pipistrellus* bats were recorded foraging over the River Aire. Bats at LSSE are of local importance for nature conservation.

- **Breeding Birds** – Surveys undertaken for the GRIP4 works indicated that nesting opportunities for birds within the area of LSSE or within the zone of influence of works are limited to occasional immature vegetation, predominantly upstream from the works area. Only a few incidental observations of common bird species were made during surveys. Birds at LSSE are of less than local importance for nature conservation.

- **Fisheries** - Surveys undertaken by the EA found small numbers of salmonids in a mainly cyprinid fish assemblage indicating a water environment of good quality. The assemblage includes brown trout, a UKBAP priority species and bullhead, a common and widespread species listed on Annex II of the EC Habitats Directive. Fish at LSSE are of local importance for nature conservation.

- **Otters** - Records indicate the presence of otters on the River Aire, downstream of the site, including one record approximately 50m from the site. Habitat enhancement for otters, including an artificial holt, has been carried out as part of the adjacent Granary Wharf development. Surveys carried out in 2011 by ecologists from Mott MacDonald revealed no signs of any otters but confirmed that the previously identified sites from surveys carried out in 2008 and 2009 by Faber Maunsell Aecom still have potential for use by otters. Otters within the area of LSSE are of district importance for nature conservation.

8.3.3  Mitigation & Predicted Effects

8.3.3.1  Construction phase

A full assessment detailing the ecological effects during construction of the proposed development can be found in the Ecology Technical Appendix. The results have been summarised in Table 8.3 below.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Importance</th>
<th>Predicted effects</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Designated Sites</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leeds and Liverpool Canal SEGI.</td>
<td>Regional</td>
<td>No construction effects</td>
<td>Work in accordance with Environment Agency’s Pollution Prevention Guidance Note 5: Works on near, or liable to affect watercourses (EA PPG05). Store materials in bunded site compound</td>
</tr>
<tr>
<td>Aireside Embankment LNA</td>
<td>Local</td>
<td>No construction effects</td>
<td>Avoid damage to any habitats created as part of adjacent Granary Wharf development</td>
</tr>
<tr>
<td><strong>Habitats</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buildings and hard standing</td>
<td>Less than local</td>
<td>Temporary land take</td>
<td>Work in accordance with .EA PPG05. Store materials in bunded site compound. Environmental Management Plan in line with the Network Rail Contract Requirements – Environment will be produced by contractor.</td>
</tr>
<tr>
<td>Ruderal</td>
<td>Less than local</td>
<td>Temporary clearance. Minor dust deposits.</td>
<td></td>
</tr>
<tr>
<td>River and Canal</td>
<td>Less than</td>
<td>Temporary drainage of</td>
<td>Tie in works to avoid compromising enhancements for</td>
</tr>
</tbody>
</table>
8.3.3.2 Operational phase

A full assessment detailing the ecological effects on the proposed development during operation can be found in the Ecology Technical Appendix. The results have been summarised in Table 8.4 below.

Table 8.4: Assessment of operational effects on ecological receptors in the study area

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Importance</th>
<th>Predicted effects</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designated Sites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leeds and Liverpool Canal SEGI</td>
<td>Regional</td>
<td>No operational effects</td>
<td>Not required</td>
</tr>
<tr>
<td>Aireside Embankment LNA</td>
<td>Local</td>
<td>No operational effects</td>
<td>Not required</td>
</tr>
<tr>
<td>Habitats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buildings and hard standing</td>
<td>Less than local</td>
<td>No operational effects</td>
<td>Not required</td>
</tr>
<tr>
<td>Ruderal</td>
<td>Less than local</td>
<td>Loss due to land take</td>
<td>Landscaping where feasible using native species of local provenance.</td>
</tr>
<tr>
<td>River and Canal</td>
<td>Less than local</td>
<td>No operational effects</td>
<td>Not required</td>
</tr>
<tr>
<td>Protected Species</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeding Birds</td>
<td>Less than local</td>
<td>Loss of nest sites.</td>
<td>Landscaping where feasible using native species of local provenance.</td>
</tr>
</tbody>
</table>
### 8.3.4 Significant Residual Effects

None of the construction or operational effects discussed in Section 8.3.3 are considered to be significant at any geographical scale. A full assessment detailing the temporary and residual ecological effects of the proposed scheme can be found in the Ecology Technical Appendix in Volume II of this ES. The results have been summarised in Table 8.5 below.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Construction Level of effect</th>
<th>Operation Level of effect</th>
<th>Adverse Effect / Beneficial Effect</th>
<th>Significance following implementation of incorporated mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds and Liverpool Canal SEGI</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Not significant</td>
</tr>
<tr>
<td>Aireside Embankment LNA</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Not significant</td>
</tr>
<tr>
<td>Buildings and hard standing</td>
<td>Negligible</td>
<td>None</td>
<td>N/A</td>
<td>Not significant</td>
</tr>
<tr>
<td>Ruderal</td>
<td>Negligible</td>
<td>Negligible</td>
<td>N/A</td>
<td>Not significant</td>
</tr>
<tr>
<td>River and Canal</td>
<td>Negligible</td>
<td>None</td>
<td>N/A</td>
<td>Not significant</td>
</tr>
<tr>
<td>Breeding Birds</td>
<td>Slight</td>
<td>Negligible</td>
<td>Adverse</td>
<td>Not significant</td>
</tr>
<tr>
<td>Bats</td>
<td>Slight</td>
<td>Slight</td>
<td>Adverse</td>
<td>Not significant</td>
</tr>
<tr>
<td>Fisheries</td>
<td>Negligible</td>
<td>None</td>
<td>N/A</td>
<td>Not significant</td>
</tr>
<tr>
<td>Otters</td>
<td>Slight</td>
<td>Slight</td>
<td>Adverse</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

### 8.3.5 Enhancement Opportunities

Aside from recommended tie-in with otter habitat improvements at the Granary Wharf development, additional enhancements are recommended as supplementary mitigation:

- fish pass within the station undercroft to the north of LSSE
- otter ledges on the LSSE entrance structure; and
- complementary planting for otter habitats.

Additional planting for otter habitats could follow the same recommendations as provided for the Granary Wharf development, further details in relation to this can be found in Appendix C of the LSSE Ecological Assessment GRIP 4 Report (Faber Maunsell Aecom, April 2009).
8.4 Geology and Soils

8.4.1 Introduction

This section summarises the Geology and Soils assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within the Geology and Soils Technical Appendix in Volume II of this ES.

8.4.2 Baseline Conditions

The British Geological Survey (BGS) Geological map (Sheet 70, Leeds 1:50,000) indicates that the superficial geology comprises alluvial deposits associated with the River Aire. Due to the industrial use of the area, it is expected that there will be a layer of made ground above the alluvial soils on the river banks. The underlying solid geology comprises interbedded grey mudstone, siltstone and pale grey sandstone of the Pennine Lower Coal Measures (LCM) Formation at the LSSE site, and ‘Thick Stone’, also of the Lower Coal Measures, comprising fine-grained sandstone at the Water Lane site.

There are no known faults at the surface that could make the proposed site unstable. The Coal Authority report states that the site is not in an area at risk to be affected by ground movements from coal mining.

Information provided on the EA website indicates that the alluvium is classified as a Secondary A Superficial Aquifer whilst the underlying Pennine Lower Coal Measures Formation are classified as a Secondary A Bedrock Aquifer. The site does not fall within a designated source protection zone.

Both the east and west banks of the River Aire have a long history of industrial use including docks, boat building, coal wharves, saw mills and car parks. Infrastructure from the boat building yard on the west bank may still remain and may pose obstruction to foundations. On the east bank, a travelling crane was positioned directly under the proposed structure support.

A review of the historical maps for the Water Lane site illustrate a lesser contaminative history, with activities apparently restricted to warehousing. However, a cover of made ground could be expected with cycles of redevelopment which may be of relatively poor quality.

The assessment has identified the key areas which may pose or have posed a risk to land contamination at the site. These represent historical land uses rather than the ongoing contamination sources as the area has now been redeveloped for non-contaminating uses. The plans for the new entrance include foundations within and across the River Aire as well as minor excavation works at the barge loading/unloading site at Water Lane. The presence of contaminated soil and groundwater at both sites should be assumed until proven otherwise by further intrusive ground investigations or during soils disposal activities.

As an initial step in the assessment of impacts and effect on geology and soils, an assessment of the principal contaminant sources, pathways and receptors have been identified that would be expected to be associated with the proposed scheme. This initial assessment, together with the principal contaminant types that may be anticipated are detailed in the Geology and Soils Technical Appendix in Volume II of this ES.
8.4.3 Mitigation & Predicted Effects

8.4.3.1 Construction phase

The construction phase effects of the proposed scheme on geology and soils are predominantly related to ground contamination, as discussed below. The following activities during the construction works have the potential to affect geology and soils:

- Piling will be undertaken through the river bed and on the river banks to provide pillars for piers and platforms from which the construction activities will be undertaken;
- Site levelling/soil excavation works at both the main site and the Water Lane site; and
- General use and storage on site of raw materials (for example fuels and aggregates) during the construction works, which could cause potential contamination of underlying soils.

In order to mitigate these risks the following incorporated mitigation measures will be implemented:

- Ground investigation, risk assessment and remedial options appraisal (as appropriate);
- Piling risk assessment and design;
- Materials management plan for soils excavation; and
- Environmental Management Plan (EMP) incorporating the following measures set out in the Network Rail Contract Requirements – Environment stating that the Contractor will:
  - Identify potential areas of contaminated land affected by the works
  - Minimise disturbance of contaminated land and avoid the introduction of pollution pathways
  - Remediate/Remove where necessary. Landfill shall only be used if other remediation options (e.g. on-site treatment, off-site treatment) are not reasonably practicable.

Further details on these incorporated mitigation measures are given in the Geology and Soils Technical Appendix in Volume II of this ES.

Following the implementation of these incorporated mitigation measures, the predicted effects on geology and soils from land contamination are as follows:

- Geology and Soils
  - Soils – the scheme will result in the generation of waste soils as a product of the excavation works (such as piling works and crane foundation bases and dredging activities). The majority of waste soils are likely to be classified as inert, although the generation of a small proportion of hazardous materials is also conservatively assumed at this stage. Given the nature of the project there is no significant opportunity for soil re-use within the temporary works or completed scheme. Waste soils and sediment will therefore be sent for off-site disposal. The sensitivity of the natural soils is considered to be low and the magnitude of impact of soil removal and disposal is moderate, resulting in a slight adverse effect.

- Land quality
  - Soils – the removal of potentially contaminated soils that are identified as posing an unacceptable risk to the wider environment. The sensitivity of the natural soil materials is considered to be low and the magnitude is also low, resulting in a negligible positive effect;
  - Groundwater – piers are required to support the new station entrance. To construct the piers, piling will be undertaken into the aquifer, which could create new pollution pathways. Groundwater is also sensitive to direct spillages from liquid contaminants stored on site. The sensitivity of the groundwater is considered to be moderate, with the magnitude of impact being low following the measures outlined previously, resulting in a slight adverse effect;
Surface water /aquatic environment – piling will be undertaken through the river bed which may disturb contaminated sediments and create turbidity issues within the watercourse. The River Aire is a moderately sensitive receptor and the magnitude following mitigation is low giving rise to a slight adverse effect;

Construction workers - there is a short term risk of dust generation from soils during earthworks and an associated risk that dust borne soil contaminants may be released. The increased proximity of workers to soil contaminants will cause a short term increase in probability of exposure and associated risk. The sensitivity of construction workers is considered to be moderate as there are limited below ground works, and the magnitude is low due to implementation of appropriate health and safety measures and provision of suitable PPE, resulting in a slight adverse effect;

Site end users – site end users would only be at risk through the potential migration of land gas from the underlying coal measures via piles or services. The LSSE structure is significantly elevated, hence unlikely to be at risk from such a pathway. However, a land gas risk assessment will be undertaken as part of the ground investigation works to determine whether this risk exists and what mitigation should be applied. End users in the station are moderate sensitivity and the magnitude of impact following mitigation will be low, resulting in a slight adverse effect; and

Built environment – concrete structures may be at risk from aggressive substances present within soils in the ground (commonly high sulphate levels) which can be present both naturally and by man made action. Aggressive soils can attack concrete materials reducing their structural integrity. This can be mitigated using concrete mixes resistant to such attack from aggressive soils. Concrete structures are considered to be low sensitivity and the magnitude of impact with mitigation will be low giving a negligible adverse effect.

It is considered that the risks identified with regards to geology and soils can be readily mitigated through design and appropriate mitigation.

A summary of the incorporated mitigation measures and residual effects are presented in Table 8.6 below.

8.4.3.2 Operational phase

With the inclusion of appropriate mitigation measures, it is considered unlikely that there will be significant impacts from soils or contaminated land during the operational phase of the scheme and therefore this has been scoped out of the assessment.

8.4.4 Significant Residual Effects

This assessment indicates that there are no significant residual effects relating to geology and soils as a result of the proposed construction works or operational effects.

8.4.5 Enhancement Opportunities

The assessment does not identify the need for further supplementary mitigation or the opportunity for enhancement measures associated with geology and soils during the construction phase.
### Table 8.6: Summary of incorporated mitigation and prediction of effects

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Receptor</th>
<th>Summary of impact &amp; resulting effect</th>
<th>Incorporated Mitigation</th>
<th>Residual effect (i.e. following mitigation)</th>
<th>Significance following mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Geology and Geomorphology</td>
<td>Soils</td>
<td>Excavated material characterised as inert of Hazardous Waste and require off site disposal</td>
<td>Reuse of materials should be encouraged to reduce distance travelled and reduce quarrying of new materials.</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>Soils</td>
<td></td>
<td>Removal or treatment of potentially contaminated soils which would otherwise remain in-situ and pose a risk to other receptors.</td>
<td>Site investigation and risk assessment to decide whether soils may remain or require remedial action.</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>Creation of additional pollution pathway into the underlying aquifer during piling works.</td>
<td>Contractor to follow EMP and best practice when selecting piling options. Works to be carried out in accordance with Network Rail and EA requirements. Ground investigation to inform ground model at the site.</td>
<td>Slight</td>
<td>Adverse</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>Potential contamination from storage and use of hazardous materials during construction.</td>
<td>Storage of raw materials should be regularly monitored and fuel storage bunded. No vehicle maintenance to be carried out on site.</td>
<td>Slight</td>
<td>Adverse</td>
</tr>
<tr>
<td></td>
<td>Surface Water</td>
<td>Potential contamination from storage and use of hazardous materials during construction.</td>
<td>Storage of raw materials should be regularly monitored and fuel storage bunded and kept a minimum distance from watercourse. No vehicle maintenance to be carried out on site.</td>
<td>Slight</td>
<td>Adverse</td>
</tr>
<tr>
<td></td>
<td>Surface Water</td>
<td>Disturbance of river bed sediments which may have been impacted by contamination from off site sources.</td>
<td>Site investigation to be undertaken to inform ground conditions and sediment quality and in turn mitigation that may be required.</td>
<td>Slight</td>
<td>Adverse</td>
</tr>
<tr>
<td>Project Phase</td>
<td>Receptor</td>
<td>Summary of impact &amp; resulting effect</td>
<td>Incorporated Mitigation</td>
<td>Residual effect (i.e. following mitigation)</td>
<td>Significance following mitigation</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-------------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Construction workers</td>
<td>Short term human health risk from dust and ground gas accumulating in excavations during construction works.</td>
<td>Good working practices to be put in place, PPE provided where necessary. Results of the ground investigation can inform potential risk posed to construction workers from contaminated soils.</td>
<td>Slight</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
<tr>
<td>Built environment</td>
<td>Degradation of concrete due to sulphate attack.</td>
<td>Site investigation to be undertaken to inform ground conditions and concrete mix design</td>
<td>Negligible</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
<tr>
<td>Operation</td>
<td>None expected, therefore scoped out of this assessment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8.5 Historic Environment

8.5.1 Introduction

This section summarises the historic environment assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within the Historic Environment Technical Appendix in Volume II of this Environmental Statement.

8.5.2 Baseline Conditions

8.5.2.1 Topographical and Geological Background

LSSE will be located above the River Aire extending out from the existing railway station and brick built viaduct. As part of the works, two new piers will be constructed to support the new entrance structure. The Geological Survey Map of Great Britain (sheet 104, scale 1:50,000) identifies a superficial alluvial deposit over a bedrock of Pennine Lower Coal Measures Formation into which the piers will extend. Proposed access ramps, steps and public realm improvements on Little Neville Street are located on modern made ground. The location of the Water Lane site is also upon an area of made ground.

8.5.2.2 Site Setting

The Townscape and Visual Amenity Technical Appendix, in Volume II of this ES, identified the visual envelope of receptors (also shown on Figure 16 in Volume III of this ES) affected by the construction works. An assessment of this area has identified that the following conservation areas and heritage assets will be affected:

- Canal Wharf Conservation Area;
- Leeds City Centre Conservation Area;
- Holbeck Conservation Area;
- River lock and retaining walls to the River Aire, Grade II* Listed Building;
- Canal Wharf, Grade II* Listed Building;
- Victoria Bridge, Grade II Listed building; and
- Dark Arches over the River Aire, Heritage Asset.

8.5.2.3 Archaeological and Historic Background

Records from the West Yorkshire Archaeology Advisory Service Historic Environment Records (HER) and the National Monuments Record (NMR) were consulted for details of heritage assets within 500m surrounding the main site, including Little Neville Street, and a 250m area around the Water Lane site. A review of published material and cartographic data has also been assessed. It was identified that the proposed scheme borders the Canal Wharf Conservation Area and is within close proximity to the Holbeck Conservation Area. The Water Lane site is within the Leeds City Centre Conservation Area. A comprehensive list of these heritage assets can be found within the Historic Environment Technical Appendix in Volume II of this ES. A summary of the sites and monuments which will be potentially effected by the proposed scheme are summarised in Table 8.7 below.
Table 8.7: Key heritage assets potentially effected by the proposed schemes

<table>
<thead>
<tr>
<th>Heritage Assets</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Lock and retaining walls to river Aire</td>
<td>Grade II* Listed Building</td>
</tr>
<tr>
<td>River Lock and retaining walls to River Aire</td>
<td>A four-storey, stone-built warehouse. Built in 1776 to the design of Robert Owen. There is a later two-storey addition to the west which dates from 1866-90</td>
</tr>
<tr>
<td>Canal Wharf</td>
<td>Grade II* Listed Building</td>
</tr>
<tr>
<td>Victoria Bridge</td>
<td>Grade II Listed building</td>
</tr>
<tr>
<td>Single span road bridge built of stone, dated 1837-9</td>
<td></td>
</tr>
<tr>
<td>Dark Arches over the River Aire, Heritage Asset</td>
<td>Part of the viaducts constructed 1865 to 1869 to support the New Station and rail lines.</td>
</tr>
<tr>
<td>Water Lane barge loading site, Heritage Asset</td>
<td>The partial remains of a structure including an entrance archway.</td>
</tr>
<tr>
<td>Basalt Setts on Little Neville Street</td>
<td>The current road surface comprises black basalt setts laid in a diagonal pattern of unknown date.</td>
</tr>
</tbody>
</table>

## 8.5.3 Mitigation & Predicted Effects

### 8.5.3.1 Construction phase

**Incorporated Mitigation**

The existing archway structure and low level wall will need to be dismantled and the ground levelled to facilitate a safe working area at the Water Lane site. This structure will need to be reinstated during the final stage of the construction works and once all works at the Water Lane site have ceased. In addition, the dismantling and reinstatement of this structure will be subject to a written method statement, which will need to be approved in advance with the conservation officer at LCC. As part of the TWAO application, a Conservation Area Consent for dismantling and reinstating this structure has been prepared. Consultation with the West Yorkshire Archaeological Service advised that no archaeological mitigation such as a watching brief will be required for the dismantling of the structure or ground levelling works.

The construction compounds and work areas will be screened by solid hoarding reducing the visual impact of the works. Conservation Area Consent will not be required for the construction impact on the Canal Wharf Conservation Area at the main site. The construction compounds, crane site and the Water Lane site will be reinstated once construction works have ceased.

The operation of the tower crane option would create the most significant visual impact on the surrounding Conservation Areas during the construction phase. The option of a self erecting crane on the west bank of the River Aire would be preferable because it can be dismantled at night reducing the visual impact on the surrounding Conservation Areas.

The proposed scheme will involve the removal of the basalt setts, which currently form part of the road surface on Little Neville Street. These basalt setts are considered to add historic character to this area. Upon completion of the main construction works for the new entrance, Little Neville Street will be subject to public realm improvements resulting in a shared space pedestrian zone and facilitating a safe and attractive access and egress for users of LSSE. To mitigate the removal of these basalt setts, they will be retained and incorporated into the design of the public realm improvements where appropriate.
Predicted Effects

A full assessment detailing the effects of the proposed scheme can be found in the Historic Environment Technical Appendix in Volume II of this ES. The predicted direct and indirect effects resulting from the construction phase of the proposed scheme are summarised in Tables 8.8 and 8.9 below.

Table 8.8: Assessment of direct construction effects on the historic environment

<table>
<thead>
<tr>
<th>Heritage Asset</th>
<th>Description</th>
<th>Importance</th>
<th>Magnitude</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Lock and retaining walls to River Aire</td>
<td>Grade II* Listed Building</td>
<td>High</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Canal Wharf</td>
<td>Grade II* Listed Building</td>
<td>High</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Victoria Bridge</td>
<td>Grade II Listed Building</td>
<td>Medium</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Dark Arches over the River Aire</td>
<td>Heritage Asset</td>
<td>Low</td>
<td>Low Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Water Lane barge loading site</td>
<td>Heritage Asset</td>
<td>Low</td>
<td>Negligible</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Little Neville Street (Basalt Setts)</td>
<td>Heritage Asset</td>
<td>Low</td>
<td>Moderate Adverse</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Table 8.9: Assessment of indirect construction effects on the historic environment

<table>
<thead>
<tr>
<th>Heritage Asset</th>
<th>Description</th>
<th>Importance</th>
<th>Magnitude</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal Wharf</td>
<td>Conservation Area</td>
<td>Medium</td>
<td>Low beneficial</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Leeds City Centre</td>
<td>Conservation Area</td>
<td>Medium</td>
<td>Imperceptible/None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Holbeck</td>
<td>Conservation Area</td>
<td>Medium</td>
<td>Imperceptible/None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>River Lock and retaining walls to River Aire</td>
<td>Grade II Listed Building</td>
<td>Medium</td>
<td>Imperceptible/None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Canal Wharf</td>
<td>Grade II Listed Building</td>
<td>Medium</td>
<td>Imperceptible/None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Victoria Bridge</td>
<td>Grade II Listed Building</td>
<td>Medium</td>
<td>Imperceptible/None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Dark Arches over the River Aire</td>
<td>Heritage Asset</td>
<td>Low</td>
<td>Imperceptible/None</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

8.5.3.2 Operational phase

Incorporated Mitigation

There will be a direct impact caused by the removal of the basalt setts road surface on Little Neville Street. The public realm improvements designs will retain an element of the historic character by incorporating the basalt setts as a trim surrounding the Hilton Hotel whilst renewing the street surface. The public realm improvement plans aim to enhance the appearance of Little Neville Street incorporating modern ideas whilst maintaining an element of the historic character resulting in improved lighting, journey ambience, urban realm and personal safety.
Once completed, LSSE will have no further physical impact on the historic environment, therefore no further incorporated mitigation measures are anticipated to be required for the historic environment during the operational phase.

**Predicted Effects**

A full assessment detailing the effects of the proposed scheme can be found in the Historic Environment Technical Appendix. The results have been summarised in the Tables 8.10 and 8.11 below.

### Table 8.10: Assessment of direct operational effects to the historic environment

<table>
<thead>
<tr>
<th>Heritage Asset</th>
<th>Description</th>
<th>Importance</th>
<th>Magnitude</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Lock and retaining walls to River Aire</td>
<td>Grade II* Listed Building</td>
<td>High</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Canal Wharf</td>
<td>Grade II* Listed Building</td>
<td>High</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Victoria Bridge</td>
<td>Grade II Listed Building</td>
<td>Medium</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Dark Arches over the River Aire,</td>
<td>Heritage Asset</td>
<td>Low</td>
<td>Nil</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Little Neville Street</td>
<td>Basalt sett road surface</td>
<td>Low</td>
<td>Low Adverse</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

### Table 8.11: Assessment indirect operational effects to the historic environment

<table>
<thead>
<tr>
<th>Heritage Asset</th>
<th>Description</th>
<th>Importance</th>
<th>Magnitude</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal Wharf</td>
<td>Conservation Area</td>
<td>Medium</td>
<td>Low beneficial</td>
<td>Significant</td>
</tr>
<tr>
<td>River Lock and retaining walls to River Aire</td>
<td>Grade II* Listed Building</td>
<td>Medium</td>
<td>Imperceptible/ None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Canal Wharf</td>
<td>Grade II* Listed Building</td>
<td>Medium</td>
<td>Imperceptible/ None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Victoria Bridge</td>
<td>Grade II Listed Building</td>
<td>Medium</td>
<td>Imperceptible/ None</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Dark Arches over the River Aire,</td>
<td>Heritage Asset</td>
<td>Low</td>
<td>Low adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Little Neville Street</td>
<td>Basalt sett road surface</td>
<td>Low</td>
<td>Low adverse</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

### 8.5.4 Significant Residual Effects

The assessment summaries presented in Tables 8.8 to 8.11 has identified two significant residual effects.

#### 8.5.4.1 Construction phase

A moderate adverse significant residual effect on the Little Neville Street basalt setts has been identified as a result of direct construction effects associated with the proposed scheme. Whilst the basalt setts will be removed and reinstated as part of the public realm improvements on Little Neville Street, these basalt setts will not be reinstated in their existing location, resulting in the adverse significant residual effect.

#### 8.5.4.2 Operational phase

A beneficial significant residual effect on the Canal Wharf Conservation Area has been identified as a result of indirect operational effects associated with the proposed scheme. It is considered that the high quality, striking design of the proposed new entrance has been assessed as an improvement resulting in a beneficial effect on the overall setting of the Canal Wharf Conservation Area including the Dark Arches.
8.5.5 Enhancement Opportunities

The construction of the new entrance on the Dark Arches will permanently alter the structure and setting of the non-listed 19th century viaduct. It is therefore recommended that in line with best practise, a record of the structure in its current state is made and undertaken as enhancement measure. This would involve the production of a report, prior to construction that would record the structure with methods such as sketching, photography, levelling and electronic distance measurement. This report would then be stored in the local records office in order to preserve the structures original form by record.

8.6 Noise and Vibration

8.6.1 Introduction

This section summarises the noise and vibration assessment undertaken as part of the EIA for the LSSE project. Full details of the assessment undertaken are presented within the Noise and Vibration Technical Appendix in Volume II of this ES.

8.6.2 Baseline Conditions

The closest receptors to the main LSSE site in terms of potential noise and vibration impacts are identified as:

- residential buildings known as Blue apartments and Watermans Place apartments which are immediately adjacent to the site;
- Hilton Hotel and Doubletree Hotel;
- Commercial premises including Golf Café Bar, Wasabi Tepanyaki, Out of the Woods, Fazena, Vineataly and The Hop; and
- UKI Partnerships office building on Little Neville Street.

A site on Water Lane will also be utilised during the construction phase for the transfer of equipment of materials to the LSSE site via the navigable waterway. The main receptors in this area are residences and commercial premises on Water Lane and at The Quays on the adjacent side of the river.

A baseline noise survey was conducted in October 2011 in order to observe conditions and obtain noise levels representative of the noise climate in the area of the receptors identified above. This comprised a combination of:

- attended short-term measurements in various locations around the study area; and
- unattended measurements conducted on the balcony of a Watermans Place apartment and a Blue apartment close that both overlook the entrance site. The surveys were undertaken using equipment that logged noise levels continuously over a period of several days including a weekend at each location.

The baseline noise climate in the area of the proposed entrance was steady noise from road traffic in the area and rushing water in the River Aire, and more intermittent noise from rail traffic (moving idling and horns) and the public address system of Leeds station. The noise climate in the area around the Water Lane site was dominated by road traffic mainly associated with Neville Street and Meadow Lane.
Table 8.12 summarises the measured baseline noise levels obtained during the survey. Full details are given in the Noise and Vibration Technical Appendix.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Daytime</th>
<th>Evening</th>
<th>Weekend</th>
<th>Night-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watermans Place apartments (façade)</td>
<td>62</td>
<td>63° – 67*</td>
<td>61 - 62</td>
<td>59 - 61</td>
</tr>
<tr>
<td>Blue apartments (façade)</td>
<td>60 - 64</td>
<td>59 - 62</td>
<td>59</td>
<td>56 - 62</td>
</tr>
<tr>
<td>Little Neville Street (façade)</td>
<td>65</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Water Lane (free field)</td>
<td>55</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

8.6.3 Mitigation & Predicted Effects

8.6.3.1 Construction phase

The mitigation of noise and vibration will be formally managed under an EMP. Contractors will be required to prepare a Noise and Vibration Management Plan and seek consent from LCC for construction works under Section 61 of the Control of Pollution (CoPA) 1974. These consents will specify the method of working, the hours of work and noise controls to be applied in accordance with Best Practicable Means as defined in Section 72 of the CoPA.

The Contractor will also devise a Community Engagement Plan and appoint a liaison manager in order to inform third parties of the construction programme and relay concerns so these can be considered in the management and implementation of the works.

Guidance on best practice for the control of noise and vibration during construction is given in:

- BS 5228 Code of Practice for noise and vibration control on construction and open sites 2009;
- Construction Industry Research and Information Association (CIRIA) guidance; and
- Network Rail guidance and advice notes.

Appropriate measures for the mitigation of noise and vibration during the construction phase are discussed in outline within the Noise and Vibration Technical Appendix.

Noise from Construction Activities

The assessment of noise from construction activities considers daytime works at the entrance site as being associated with a rotary bored piling, concreting operations and the use of a diesel generator to power a crane. Noise from night-time works is expected to be mainly associated with craning activities.

Noise generating activities at the Water Lane site are expected to be due to craning activities with a mobile telescopic crane and due to the movement of large delivery vehicles. Works at Water Lane are expected to be daytime only.

Noise arising from the above activities affecting nearby receptors is assessed in accordance with the ABC Method described in Annex F of BS 5228-1:2009. This is based on the comparison of the baseline noise levels with ambient noise levels during construction subject to thresholds for construction noise levels alone that are derived from baseline noise levels. Significant effects are indicated where the construction noise
The Leeds Railway Station (Southern Entrance) Order  
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exceeds the threshold value and the ambient noise level during construction is 5 dB or more above the baseline noise level.

The threshold for noise levels from daytime construction works was determined to be 65 LAeq dB for all receptors. For all receptors close to the entrance site the threshold was determined to be 65 LAeq dB for evenings and 55 LAeq dB for night-times.

Summaries of the day and night-time construction noise impacts affecting residential receptors are presented in Table 8.13 and Table 8.14 affects on commercial receptors are considered in Table 8.15 and Table 8.16 Details of the construction noise calculations are provided in the Noise and Vibration Technical Appendix. It is assumed that deliveries at the Water Lane site will be made during the daytime only.

Table 8.13: Summary of daytime construction noise effects at key residential receptors

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Blue</th>
<th>Watermans Place</th>
<th>Hilton Hotel</th>
<th>Water Lane</th>
<th>The Quays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall daytime construction noise level L_{Aeq} dB free field</td>
<td>67</td>
<td>65</td>
<td>59</td>
<td>68</td>
<td>58</td>
</tr>
<tr>
<td>Daytime threshold value dB(A)</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Exceedence dB</td>
<td>+2</td>
<td>0</td>
<td>-6</td>
<td>+3</td>
<td>-8</td>
</tr>
<tr>
<td>Duration</td>
<td>Variable over a period of 62 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnitude of impact</td>
<td>Minor adverse</td>
<td>Minor adverse</td>
<td>None</td>
<td>Minor adverse</td>
<td>None</td>
</tr>
<tr>
<td>Significance of effect</td>
<td>Slight or moderate adverse</td>
<td>Slight or moderate adverse</td>
<td>Neutral</td>
<td>Slight or moderate adverse</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

Table 8.14: Summary of night-time construction noise effects at key residential receptors

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Blue</th>
<th>Watermans Place</th>
<th>Hilton Hotel</th>
<th>Water Lane</th>
<th>The Quays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall night time construction noise level L_{Aeq} dB free field</td>
<td>58</td>
<td>45</td>
<td>41</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Night-time threshold value dB(A)</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Exceedence dB</td>
<td>+3</td>
<td>-10</td>
<td>-14</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Duration</td>
<td>6no. 18-hour periods typically Saturday night to Sunday morning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnitude of impact</td>
<td>Negligible adverse</td>
<td>None</td>
<td>None</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Significance of effect</td>
<td>Slight Adverse</td>
<td>Neutral</td>
<td>Neutral</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Table 8.15: Summary of daytime construction noise effects at key commercial receptors

<table>
<thead>
<tr>
<th>Receptor</th>
<th>UKI Partnerships</th>
<th>Golf Café Bar</th>
<th>The Hop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall daytime construction noise level L_{Aeq} dB free field</td>
<td>50</td>
<td>65</td>
<td>53</td>
</tr>
<tr>
<td>Day-time threshold value dB(A)</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Exceedence dB</td>
<td>-15</td>
<td>0</td>
<td>-12</td>
</tr>
<tr>
<td>Duration</td>
<td>Variable for 62 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnitude of impact</td>
<td>None</td>
<td>Minor adverse</td>
<td>None</td>
</tr>
<tr>
<td>Significance of effect</td>
<td>Neutral</td>
<td>Slight or moderate</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Table 8.16: Summary of evening construction noise effects at key commercial receptors

<table>
<thead>
<tr>
<th></th>
<th>UKi Partnerships</th>
<th>Golf Café Bar</th>
<th>The Hop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall evening noise level $L_{Aeq}$ dB free field</td>
<td>n/a</td>
<td>44</td>
<td>35</td>
</tr>
<tr>
<td>Evening threshold value dB(A)</td>
<td>n/a</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Exceedance dB</td>
<td>n/a</td>
<td>-19</td>
<td>-30</td>
</tr>
<tr>
<td>Duration</td>
<td>6no. 18-hour periods typically Saturday night to Sunday morning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnitude of impact</td>
<td>n/a</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Significance of Effect</td>
<td>n/a</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

In assessing the significance of construction noise effects it is concluded that:

- Construction noise affecting Blue residential receptors is expected to have a slight or moderate adverse effect during the daytime, and a slight adverse effect during night works;
- Daytime construction works affecting Watermans Place residential receptors is also expected to have a slight or moderate adverse effect during the daytime but neutral effects during night works;
- Noise from construction affecting the Hilton Hotel residential receptor is expected to have neutral effects during both day and night time works;
- At Water Lane, construction works are expected to be limited to daytimes but there is potential for slight or moderate adverse effects. This due to the operation of a mobile crane in close proximity to the residential receptors;
- At Water Lane; construction works are also limited to daytimes only and the effects are assessed as neutral;
- Daytime construction works are expected to have neutral effects on the commercial receptors UKi Partnerships and The Hop but at Golf Café Bar this has been assessed as slight or moderate adverse; and
- Evening construction works (during possessions) are expected to have neutral effects on the commercial receptors Golf Café Bar and The Hop.

It should be noted in terms of daytime works affecting receptors close to the entrance site, the noise emissions from the piling equipment is the main cause for adverse effects. Works using a piling rig are expected to be a relatively short stage, during the daytime and early on in the construction phase.

Vibration from Construction Activities

Generally, vibration from construction activities will be temporary and intermittent in nature. Based on the advice given within BS 5228–1:2009, a Peak Particle Velocity (PPV) of 1.0 mm/s or more, lasting for a minimum of one hour during the normal hours of working, would be considered to have a major adverse impact and would be deemed to produce a significant adverse effect in terms of annoyance to the occupiers of affected buildings.
Table 8.17 presents criteria used here for the assessment of construction vibration affecting people in residential environments based on the advice given in BS 5228–2:2009.

Table 8.17: Criteria for the assessment of the significance of transient vibration effects on occupiers of residential receptors in terms of annoyance

<table>
<thead>
<tr>
<th>Continuous peak particle velocity (1 hour minimum) [mm/s]</th>
<th>Magnitude of impact</th>
<th>Significance of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>Neutral</td>
</tr>
<tr>
<td>&gt;0 and &lt;0.14</td>
<td>Negligible adverse</td>
<td>Slight adverse</td>
</tr>
<tr>
<td>≥0.14 and &lt;0.3</td>
<td>Minor adverse</td>
<td>Slight or moderate adverse</td>
</tr>
<tr>
<td>≥0.3 and &lt;1.0</td>
<td>Moderate adverse</td>
<td>Moderate or large adverse</td>
</tr>
<tr>
<td>≥1.0</td>
<td>Major adverse</td>
<td>Large or very large adverse</td>
</tr>
</tbody>
</table>

BS 5228 – 2:2009 also provides the following guidance on the levels of vibration that would be necessary to cause structural damage to different types of buildings. PPVs of 7.5 mm/s at low frequency may cause cosmetic damage in un-reinforced or light framed structures e.g. for residential/light commercial use. On this basis, a PPV of 7.5 mm/s or more, would be considered to have a major adverse impact and would be deemed to produce a significant adverse effect in terms of damage to buildings.

The main source of vibration during the works is expected to be piling. Annex D of BS 5228 – 2:2009 presents measured vibration levels, described as PPV, arising from a range of piling methods that have been obtained from case studies. Best fit lines have been taken through the case study data for piling methods similar to those described in the Constructability Review in order to provide an indication of the potential vibration impacts affecting receptors close to the entrance site.

The best fit lines have been used to estimate potential vibration impacts for each piling method at the receptors adjacent to the entrance site. The results are summarised in Table 8.18.

Table 8.18: Vibration levels from various piling methods

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Distance in metres</th>
<th>Driven bearing piles</th>
<th>Peak particle velocity mm/s</th>
<th>Driven cast in place drop hammer</th>
<th>Casing vibrators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Impact bored</td>
<td>Rotary bored</td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td>16</td>
<td>2.6</td>
<td>1.4</td>
<td>0.2</td>
<td>2.8</td>
</tr>
<tr>
<td>Granary Wharf</td>
<td>20</td>
<td>2.2</td>
<td>1.2</td>
<td>0.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Hilton Hotel</td>
<td>60</td>
<td>0.9</td>
<td>0.6</td>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Golf Cafe Bar</td>
<td>20</td>
<td>2.2</td>
<td>1.2</td>
<td>0.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Hops</td>
<td>45</td>
<td>1.2</td>
<td>0.7</td>
<td>0.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Uki Partnership</td>
<td>57</td>
<td>1.0</td>
<td>0.6</td>
<td>0.1</td>
<td>1.1</td>
</tr>
</tbody>
</table>

At a PPV of 0.3 mm/s, vibration will be perceptible and, if present for longer than one hour, this is assumed to result in a significant adverse effect in terms of annoyance. The results show that all methods except rotary bored piling could be perceptible during piling activity and a significant adverse effect would occur if present for more than one hour.
The results show that at all receptors the expected levels of vibration arising from all methods are significantly below the 7.5 mm/s threshold for the onset of cosmetic damage.

Table 8.19 presents the assessment of potential vibration impacts from rotary bored piling at the entrance site. In practice, the effects will be less significant as the impacts are expected to occur during the daytime with prior notice given and the equipment that will be used is expected to be designed to more recent, stringent specifications that minimise vibration effects.

Table 8.19: Assessment of potential vibration impacts from rotary bored piling in terms of annoyance and cosmetic damage to buildings

<table>
<thead>
<tr>
<th></th>
<th>Blue Apartments</th>
<th>Watermans Place</th>
<th>Hilton Hotel</th>
<th>Golf Café Bar</th>
<th>The Hop</th>
<th>UKi Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated distance from piling in metres</td>
<td>16</td>
<td>20</td>
<td>60</td>
<td>20</td>
<td>45</td>
<td>57</td>
</tr>
<tr>
<td>PPV mm/s from the line of best fit</td>
<td>0.2</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Magnitude of impact in terms of annoyance (less than one hour continuous)</td>
<td>Minor adverse</td>
<td>Minor adverse</td>
<td>Minor adverse</td>
<td>Minor adverse</td>
<td>Minor adverse</td>
<td>Minor adverse</td>
</tr>
<tr>
<td>Magnitude of impact in terms of cosmetic damage to buildings</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Based on the above results of the calculation of impacts arising due to a drop hammer, work using the Down in the Hole Hammer may be perceptible at all receptors but as the operation is expected to take around 20 minutes then this will not result in a significant adverse effect providing:

- adequate notice is given to residents of receptors with regard to the timing and duration of works;
- the break up of the bedrock at multiple positions is carried out with a reasonable break so impacts do not occur continuously over a prolonged period of time (more than one hour); and
- the works are not undertaken at sensitive times of the day.

In assessing the significance of effects associated with construction vibration due to rotary bored piling, it is concluded that:

- slight or moderate adverse effects are expected at the residential and commercial receptors close to the entrance site in terms of annoyance of occupiers; and
- rotary bored piling is expected to have neutral effects at all receptors in terms of cosmetic damage to buildings.

The assessment has been based on assumed characteristics derived as best fit through case study data. Vibration is highly dependent on many factors and inherently difficult to predict. Therefore, it is recommended that received levels are monitored during the piling works to ensure that levels are not excessive in terms of both annoyance and building damage.
Noise from Construction Traffic

The flows of construction traffic are expected to be relatively low and variable such that it would not be possible to make a meaningful, quantitative assessment of noise impact in terms of the $L_{Aeq}$ descriptor which is the energy average noise level. However, it is conceivable that the community response to noise from construction traffic could be adversely affected by noise from a small number of movements or even a single heavy vehicle occurring in close proximity to sensitive receptors (around the entrance site and Water Lane), especially if movements occur at sensitive times of the day. The limited available space for vehicles in the area of the entrance site and Water Lane is expected to require that the timing and frequency of deliveries will need to be carefully controlled to ensure only a small number of vehicles movements gain access at any one time.

It is considered that significance of effects due to construction traffic will be neutral owing to the following means of control, which are given under incorporated mitigation, and will be applied:

- vehicles should not wait or queue up with engines running on the site or the public highway;
- vehicles should be properly maintained to comply with noise emissions standards;
- deliveries should be restricted to be within working hours of the site minimising significant movements during sensitive times;
- use of adjustable or directional audible vehicle-reversing alarms or use alternative warning systems, e.g. white noise alarms (including arrangements to minimise the need to perform reversing manoeuvres); and
- avoid unnecessary revving of engines, reducing speed of vehicle movement to avoid body slap from empty lorries, designing and maintaining access routes to minimise vehicle noise.

8.6.3.2 Operational phase

Potential permanent noise effects of the arising due to the operation of the LSSE scheme may be associated with the operation of the expanded Public Address/Voice Alarm system (PA/VA) within the enclosed LSSE structure and the operation of lift and escalator motors and building services plant installed as part of the new entrance building.

The scheme is not expected to generate any permanent vibration effects.

Noise from the PA/VA system will be mitigated by the provision of a large number of low power speakers (rather than fewer speakers with higher outputs). These will be within the enclosed and sealed structure of the LSSE which will limit the transmission of sound into the outdoor environment. Automatic volume adjustment will be used during the night period in accordance with current working practices of Leeds station. Noise from fixed plant associated with the lifts, escalators and building services will be mitigated by the selection of quiet equipment, careful positioning and installation and regular maintenance. The specifications of the PA/VA and fixed plant are not known at this stage and it has not been possible to assess potential effects quantitatively. However, it is anticipated that significant effects can be avoided with appropriate design considerations and operating measures.
8.6.4 Significant Residual Effects

8.6.4.1 Construction Phase

No significant residual effects due to noise and vibration during construction are expected based on the best available information within the Constructability Review, stated assumptions regarding the selection of specific plant and that the incorporated mitigation will be applied effectively.

The proximity of sensitive receptors to the works and the requirement that some works are undertaken during the six disruptive railway possessions at sensitive times of the day requires that noise and vibration is carefully managed. Three main commitments to ensure this are:

- agreement between the construction contractor and LCC on appropriate limits and measures for noise and vibration control through Section 61 of the Control of Pollution Act 1974;
- monitoring noise and vibration through the works especially stages where issues may arise such as night works and piling activities (daytime); and
- the selection of appropriate plant for the work should prioritise items with low noise emissions.

8.6.4.2 Operational Phase

It has not been possible to assess whether significant effects would arise due to proposed changes to the PA/VA system as no information is currently available on the number and position of new speakers. This will be addressed at GRIP 5 stage.

Noise from building services plant should not generate significant effects provided equipment is specified and positioned to ensure a Rating Noise Level of no more than 40 dB(A) at any sensitive receptor based on the results of the baseline noise survey. This is expected to be achievable as all plant (lift and escalator motors, heating, ventilation and air conditioning plant) will be enclosed within compartments within the entrance building.

8.6.5 Enhancement Opportunities

LCC has requested that, as a supplementary mitigation measure, any noisy works undertaken on Saturdays during the construction phase are not started until after 09:00. Therefore, it is recommended that, as far as possible, works are managed so that this can be achieved in order to minimise the disturbance at residential receptors.

The noise effects on the key sensitive receptors associated with operations at Leeds station (particularly rail traffic movements and the existing PA/VA) could be reduced by replacing the existing wire mesh fence on Platform 17 with a solid barrier in order to provide screening. Furthermore, repositioning and redirecting the PA/VA system such that the receptors are less affected by announcements would also be beneficial. During consultation, LCC has asked that these recommendations are given consideration by Network Rail.
8.7 Socio-economics

8.7.1 Introduction

This section summarises the socio-economic assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within the Socio-economic Technical Appendix in Volume II of this ES.

Socio-economic issues relevant to this proposed scheme are set out below.

- **Construction**
  - temporary employment for construction works and short term increases in economic activity;
  - temporary impacts on trade and journey times for local businesses; and
  - temporary disruption to residents, including access and community severance, visual disturbance from construction activities and journey times on the local roads.

- **Operation**
  - long benefits for in terms of reduced pedestrian journey times, reduced community severance and potential improvements to social inclusion for local residents;
  - benefits for existing businesses in terms of better access for employees, customers and suppliers and increased future trade;
  - impacts on economic activity through the ability to attract business investment south of the railway station; and
  - contribution to local and sub-national regeneration, economic development and social inclusion objectives.

8.7.2 Baseline Conditions

The potential socio-economic effects have been assessed mainly in terms of the local impact area, but baseline data has also been collected for a wider impact area for purposes of comparison.

The immediate impact area - covering two Lower Super Output Areas (LSOAs) located immediately around the site of LSSE. One of these LSOAs includes Leeds railway station and Holbeck Urban Village is located in the other.

The wider impact area – has been defined as all 476 LSOAs included within the administrative boundary of Leeds City Council.

Figure 8.1 below shows the location of the immediate impact area.
8.7.2.1 Key baseline data

- **Population** – 12,711 people live within the immediate impact area. Of these residents 11,074 live within the LSOA in which Leeds railway station sits; 1,637 live within the Holbeck LSOA. There are 798,769 residents in the wider impact area.

- **Employment and worklessness** – The number of people claiming Job Seekers Allowance (JSA) in the impact area is very small. In addition, the proportion of JSA claimants is lower in the impact area (2.3%) than Leeds (4.4%) and also the national average (3.8%).

- **Deprivation** – The majority of people within the impact area do not experience high levels of deprivation. The LSOA which contains Leeds City Station and (87% of the impact area’s residents) is within the third (middle) deprivation quintile. However, the LSOA in which Holbeck Urban Village is located (with 13% of the impact area’s residents) is in the most deprived quintile.
8.7.3 Mitigation & Prediction of Effects

Direct and indirect effects on socio-economic receptors resulting from the construction and operational phase are considered below.

8.7.3.1 Construction phase

Direct effects

Employment – The development of LSSE will create temporary employment over the 62 week construction period. It is forecast that, at the construction peak, approximately 100 staff and operatives will be employed. At present it is not possible to specify the labour requirements on a month-by-month basis because a detailed construction programme has yet to be developed and sub-contractors have not yet been procured. The construction contractor anticipates that a large proportion of staff will be locally based but further details on the impact on the local economy cannot be specified until sub-contracts have been let.

Level of effect: Moderate beneficial

Significance: Not significant

Construction disturbance resulting from the tower crane – If a tower crane on the east bank of the river is selected, Little Neville Street will be closed for one week for vehicular access while the crane is being erected and dismantled, however pedestrian access will be maintained. During this period residents of the 61 units in the Blue Apartments and businesses on Little Neville Street, primarily the Golf Café Bar and the Hilton Hotel will experience short-term adverse impacts. These businesses and residents will also be affected by visual intrusion from the crane, day and night, over the 62 week construction period.

Level of effect: Moderate adverse

Significance: Significant

Construction disturbance resulting from the self-erecting crane - If the contractor opts to use the self-erecting crane there will be some very short term disruption for users of the Granary Wharf walkway and particularly businesses with outside furniture, as it is expected that chairs and tables will need to be moved as the crane makes its passage to the designated site. Once construction commences some of fire exit doors at Watermans Place (in which there are 122 apartments) on the west of the river will be obstructed. It should be noted that these exit doors are not the only, or considered to be the main, evacuation route from the building. Visual intrusion for the residents of the Blue Apartments will be experienced during the day, although due to the limited slew this is unlikely to be as severe as that caused by the tower crane on the Watermans Place residents. In addition, because the crane will be disassembled at the end of the working day, there will not be any visual intrusion in the evenings.

Level of effect: Moderate adverse

Significance: Significant
Access and severance

As part of the construction of LSSE the existing Dark Neville Street footbridge will be removed. This could cause temporary disruption and severance for communities presently using this footbridge. However, pedestrians will still be able to use the adjacent vehicle bridge on Dark Neville Street to access Granary Wharf so these impacts are anticipated to be minimal. Public pedestrian access will also be segregated or restricted through the Dark Arches to remove the interface with moving delivery vehicles. Other footways will remain in place during the construction period. The only place in which slight disturbance may be realised is the walkway just north of the proposed tower crane site, which will need to be slightly diverted. At present it is not planned that this will be a straight-line diversion will be straight meaning that pedestrians will need to navigate a bend; this reduces the perception of safety of the route and may deter people from using it. It is also worth noting that the main site office and worker welfare facilities are planned to be located approximately 200m from the work site and access between the two areas will be via a busy pedestrian thoroughfare in the Granary Wharf development. Whilst this will not give rise to severance it is likely to mean that pedestrians could experience some disruption and inconvenience whilst using this route during the construction period. Overall, given the mitigations being put in place in the form of footway diversions, access will be maintained and significant severance issues are not anticipated.

Level of effect: Minor adverse
Significance: Not significant

Economic activity - There is presently very limited space in the vicinity of the work area for office and basic welfare facilities for staff. As such, there is the possibility of the contractor using office space within local commercial units or developing some of the arches within Dark Neville Street.

Level of effect: Minor beneficial
Significance: Not significant

Journey times - There is presently very limited space in the vicinity of the work area for office and basic welfare facilities for staff. As such, there is the possibility of the contractor using office space within local commercial units or developing some of the arches within Dark Neville Street. Should these options be selected, this will deliver economic benefits throughout the construction phase.

Level of effect: Minor adverse
Significance: Not significant

4 Ibid.
5 Ibid.
**Personal security** - There is the potential for construction activities to physically obstruct existing security and surveillance systems which could be detrimental to personal security. To mitigate this lighting, hoarding and CCTV surveillance will be installed at numerous locations around the site perimeter.

Level of effect: Minor adverse

Significance: Not significant

**Indirect effects**

**Economic activity** – There is likely to be some increased economic activity as a result of the construction workers utilising local facilities around the LSSE development site with the potential for short-term induced employment.

Level of effect: Minor beneficial

Significance: Not significant

8.7.3.2 Operational phase

**Direct impacts**

**Employment** – It is not expected that there will be any direct employment benefits as a result of LSSE’s operation.

Level of effect: Negligible

Significance: Not significant

**Access, severance and journey times** - Forecasts show that there will be improved pedestrian journey times for local residents, businesses users and commuters by providing more direct access to the station platforms. Pedestrian modelling undertaken for the transport assessment indicates that by 2029 LSSE will be used by between 6,500 and 7,500 people during the three hour morning peak and between 5,800 and 6,300 during the three hour evening peak. Particular benefits will accrue for the following user groups:

- **Current and future workers** - jobs in the City Centre as a whole are expected to increase from around 102,000 in 2009 to 118,000 (+16%) in 2030. Most new jobs are likely to be located in the expanding southern part of the city centre.6 The scheme will provide a direct pedestrian link to and from the southern section of Leeds City Centre, thereby giving easier access to in-commuters to the new employment areas.

- **Businesses** - businesses located south of the station currently experience lengthy access times to and from the station. LSSE will improve access, decreasing journey times for employees and customers. This is likely to improve their ability to attract the best workforce and boost their productivity.7

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Residents - the provision of LSSE will improve existing severance impacts of the station by providing better access to those living or working to the south. This will result in better social inclusion for those residents living to the south of the impact area in highly deprived areas.

Cyclists – LSSE will link directly to the Cycle Network Route 66 and cycle storage will be provided on Little Neville Street. These facilities will improve access to bicycles and potentially encouraging more people to use non-motorised transport to get to the station.

Local highway users - there could be modest time savings for highways users as the new entrance could encourage some modal shift from road to rail.

Level of effect: Moderate beneficial

Significance: Not significant

Indirect effects

Economic activity – Existing businesses are likely to benefit from more trade as result of easier access for customers. This is likely to be particularly beneficial for the bars and restaurants in Granary Wharf. The increased footfall round the south of the station also has the potential to attract new business to the area and further encourage inward investment and regeneration.

Level of effect: Moderate beneficial

Significance: Not significant

8.7.4 Significant Residual Effects

Incorporated mitigation measures for the above socio-economic effects, where relevant are summarised in Table 8.20 below. Significant residual effects (effects following the implementation of incorporated mitigation measures) are presented in the final column in Table 8.20 below.
### Table 8.20: Summary of incorporated mitigation and predicted socio-economic effects

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Receptor</th>
<th>Summary of effect</th>
<th>Incorporated Mitigation</th>
<th>Residual effect (i.e. following mitigation)</th>
<th>Significance following mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Direct Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>It is forecast that, at the construction peak, approximately 100 staff and operatives will be employed. It is anticipated that a large proportion of staff will be locally based and that general labour and potentially some sub-contractors will be sourced from the local area.</td>
<td>N/A</td>
<td>Moderate</td>
<td>Beneficial</td>
<td>Temporary</td>
</tr>
<tr>
<td>Construction disturbance – tower crane</td>
<td>Little Neville Street will be closed to vehicles for one week while the crane is erected and dismantled. During this period residents of the Blue Apartments and businesses on Little Neville Street will experience some visual intrusion from the crane, day and night, over the 62 weeks construction period.</td>
<td>The contractor will employ a Liaison Manager to consult with any third parties to minimise disruption. A Community Engagement Plan will be produced and the Liaison Manager will attend local residents meetings and forums.</td>
<td>Moderate</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
<tr>
<td>Construction disturbance – self erecting crane</td>
<td>Visual intrusion for these residents will be experienced during the day, although unlikely to be as severe as that caused by the tower crane. There will be no visual intrusion in the evenings.</td>
<td>This Liaison Manager will deal not only with craneage disruption but also any other issues that arise. Hoarding will be put in place around the works sites for safety. Again, this will not only apply to the crane but all works sites. If the self-erecting crane is selected access to the electricity substation underneath the arches will be maintained and the cycle storage facilities will be moved to Granary Wharf.</td>
<td>Moderate</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
<tr>
<td>Access and severance</td>
<td>The existing Dark Neville Street footbridge will be removed. This could cause temporary disruption and severance for communities.</td>
<td>Footways will be maintained where possible. Closures and diversions will be fully advertised.</td>
<td>Minor</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
<tr>
<td>Journey times</td>
<td>Construction vehicles transporting plant and materials to the works sites are likely to cause some journey disruption to residents, businesses and commuters.</td>
<td>Pileage for the river piers and other construction materials will be transported by a barge to minimise impacts on local roads. The contractor will also maintain dialogue with the station management staff to minimise disruption.</td>
<td>Minor</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Economic activity</td>
<td>There is the possibility of the contractor using office space within local commercial units or developing some of the arches within Dark Neville Street</td>
<td>N/A</td>
<td>Minor</td>
<td>Beneficial</td>
<td>Temporary</td>
</tr>
<tr>
<td>Personal security</td>
<td>There is the potential for construction activities may physically obstruct existing security and surveillance system which could be detrimental to personal security</td>
<td>Lighting, hoarding and surveillance will be installed at numerous locations around the site perimeter.</td>
<td>Minor</td>
<td>Adverse</td>
<td>Temporary</td>
</tr>
</tbody>
</table>

**Indirect Effects**

| Economic activity | Likely to be some increased economic activity as a result of the construction workers utilising local facilities and also the potential for short-term induced employment. | N/A | Minor | Beneficial | Temporary | Not Significant |

**Direct Effects**

| Employment | It is not expected that there will be any direct employment as a result of the scheme’s operation | N/A | Negligible | N/A | Permanent | Not Significant |
| Access and severance | Between 12,300 and 13,800 pedestrians will benefit from reduced journey times in the three hour morning / evening peaks alone. Particular benefits will accrue to current and future workers; businesses; residents; cyclists and highway users. | N/A | Moderate | Beneficial | Permanent | Not Significant |

**Indirect Effects**

| Economic activity | Likely to benefit from more trade as result of easier access for customers. This is likely to be particularly beneficial for the bars and restaurants in Granary Wharf. | N/A | Moderate | Beneficial | Permanent | Not Significant |
8.7.5 Enhancement Opportunities

During the construction phase there are some potentially significant effects mostly due to the use of a crane. The following supplementary mitigation measure is recommended to limit the effect. Upon a decision being made regarding the crane option and location, either the tower crane on the west bank of the River Aire or a self-erecting crane on the east bank of the River Aire, it is suggested that ongoing consultation is undertaken with those businesses and/or apartment residents which are likely to be effected by the crane’s operation.

Overall the effects during the operational phase are considered to be beneficial. However, during the public consultation exercises, some concerns were raised around personal safety once the scheme is operational. Some members of the community may not perceive this entrance to be safe once the scheme is operational, which will limit the accessibility benefits of the scheme. As such, the following supplementary mitigation measure could be considered to address personal safety concerns. For example, designing-in extra, low level lighting, CCTV or phone help points, which will be considered as part of the detailed design stage. This will help to ensure that the scheme’s access potential is realised.

8.8 Townscape and Visual Amenity

8.8.1 Introduction

This section summarises the townscape, visual and lighting impact assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within the Townscape and Visual Amenity Technical Appendix in Volume II of this ES.

8.8.2 Baseline Conditions

8.8.2.1 Townscape

The proposed scheme will be located over the River Aire and adjoin to the existing railway station, which is located to the south-west of Leeds city centre over Neville Street. The railway station is positioned on a major brick railway viaduct which straddles the River Aire at the station’s location and separates the City Centre from Holbeck Urban Village. The River Aire passes under the station viaduct, where it then runs parallel to some of the eastbound railway lines to and from the station. The Leeds and Liverpool Canal joins the River Aire via a listed lock structure to the south of the proposed site.

There are two recent developments either side of the River Aire, the 16 storey Blue Apartments to the east and the 15 storey Watermans Place apartment building located in Granary Wharf to the west of the site. There are no public footpaths on the eastern bank in the immediate vicinity of the proposed entrance. Along the western bank there is a floodwall of 1.6m in height alongside the ground floor retail unit.

Towards the southern boundary of the TWAO red line boundary area (as shown in Figure 2 in Volume III of this ES) is the proposed location for the site offices, which are located within the Canal Wharf Conservation Area. The Water Lane site, which will be used for loading and unloading the barges is located on the western periphery of the Leeds City Centre Conservation Area.
There are 18 listed buildings within the study area, of which two listed buildings border the red line boundary, namely the river lock and retaining walls to the River Aire and Leeds and Liverpool canal (Grade II*) and the Victoria Bridge (Grade II).

The study area has been classified as ‘E4’ (urban area) Environmental Zone in accordance with the ILP ‘Guidance Notes for the Reduction of Obtrusive Light’ – which also corresponds to the European guidance provided in the International Commission on Illumination (CIE) suite of documents.

The study area can be divided into two main character areas as shown on Figure 17 in Volume III of this ES. These areas are summarised at:
- Leeds Station Transport Hub Character Area; and
- Canal-side Mixed Development – Commercial and Residential.

8.8.2.2 Visual Amenity

The visual envelope is illustrated on Figure 16 in Volume III of this ES and is defined as the extent of potential visibility to or from a specific area or feature. The main site will be located over the River Aire, linking pedestrian access into the existing railway station. The visual envelope is limited by the elevated railway station to the north, high tower blocks to the west and east and the buildings along the junction of Neville Street and Water Lane to the south. The site offices will be located to the west of the main site, adjacent to Office Lock on the Leeds and Liverpool Canal. Similarly, the visual envelope of the site offices is limited by the elevated railway station to the north and the high brick wall to the south.

The barge loading /unloading site on Water Lane is located to the east of the main site, in close proximity to Bridge End. The visual envelope will be limited by the presence of existing buildings along the river. The adjacent listed building is presently residential properties; buildings on the opposite side of the river from the barge loading area are both commercial and residential and are not listed.

8.8.3 Mitigation & Predicted Effects

8.8.3.1 Construction phase

Incorporated Mitigation

The following incorporated mitigation measures are recommended during the construction phase:
- a traffic management plan will be prepared to address potential conflicts between construction traffic and other highway users;
- footpaths/cycleways will remain open throughout the construction period where possible, although localised diversions may be required. Limited access to sections of Dark Neville Street, particularly west of the ISIS Bridge, will be maintained during the construction works, as well as access to a large proportion of the southern boundary of the railway arches, including parking access to the undercroft and access to businesses. The work site will be surrounded by solid hoarding to prevent unauthorised access, screen construction compounds and control dust and litter. The exact alignment and layout of the hoarding will have to be agreed locally with commercial units such as the Golf Bar to provide the most aesthetically pleasing but safe solution. Incorporation of vision panels into the hoarding will be considered;
an EMP will be prepared for the proposed scheme by the construction contractor in accordance with Section 9.8 of Network Rail’s Contract Requirements – Environment documentation. This includes the requirement for the Contractor to, where practicable:

- Protect the existing landscape through, for example, retaining original landscape features and safeguarding trees, soil and water conditions;
- Minimise the impact on the landscape including locating visually prominent infrastructure sensitively and away from residential properties where reasonably practicable;
- Agree with the Employer’s Representative what actions shall be taken to enhance or introduce new public amenity and landscape features.

Light pollution will be managed during construction through the adoption of the guidance set out in the Institution of Lighting Professionals, ‘Guidance Notes for the Reduction of Obtrusive Light’, GN01:2011;

there will generally be no night-time working, other than where night-time railway possessions are necessary to construct the works;

reuse of the basalt setts and improvements to the public realm at Little Neville Street will be implemented;

white lining and surface treatments demarking pedestrian areas and a route in Dark Neville Street will extend from the ramps/steps at the end of arch deck of LSSE, along the south side of Dark Neville Street to the eastern edge of the Little Neville Street arch. Furthermore, the implementation of vehicle access control at the northern end of Little Neville Street to prevent vehicular access from Dark Neville Street routing through to Little Neville Street and vice versa; and

sensitive reinstatement of working areas at the Water Lane site and construction compound areas will be implemented. These are described in more detail in Historic Environment Technical Appendix in Volume II of this ES.

Predicted Effects – Townscape

As discussed in Section 3.4.2, there are two crane options under consideration as part of the construction strategy for the proposed scheme, in summary these include:

- a tower crane located next to the Blue Apartments building on the east bank, which would be erected permanently for the duration of the construction works; and
- a self-erecting crane located on the west bank, between the Watermans Place and Dark Arches. From a townscape and visual amenity perspective, this crane option is the preferred option as the crane would be of smaller size and would be dismantled every night, which would be less visible within the surrounding landscape.

From the townscape and visual point of view, a tower crane located next to the Blue Apartments is considered to be the worst case scenario as this option utilises a taller and larger crane size, which would be visible from distant viewpoints around Leeds for the duration of the construction period. The worst case scenario has been taken into consideration in the assessment.

The predicted effects on townscape for the two identified main character areas are as follows:

Leeds Station Transport Hub Character Area

Construction activity associated with the proposed south station entrance will be concentrated to the south of this character area, along the southern façade and Dark Arches. The crane will over-sail the existing station structure and be visible above the station roof. The magnitude of the predicted impact is low given
that the proposed works are concentrated in the southern boundary of the existing station building. The overall significance of effect is therefore considered to be negligible.

**Canal-side Mixed Development – Commercial and Residential**

The canal-side character area encompasses all three areas of construction activity, the proposed station entrance, the site offices and the barge loading area. Although construction activities associated with the station entrance and the site offices will increase traffic volumes, the main route for delivery of materials will be via Little Neville Street with minor changes to traffic flows along Wharf Approach. Additional traffic movements during working hours will not change the levels of tranquillity and enjoyment of open spaces. Pedestrian access and occasional light vehicles will be permitted between Wharf Approach and the proposed station entrance site. The crane will be a prominent element in the townscape, over sailing the station structure and the Blue Apartments.

The works would not directly affect the structure of the brick arched viaduct but would partially screen these from view through the erecting of hoardings and other construction activities. The extent of hoarding and protective fencing defining the working areas are shown in Figures 13 and 14 in Volume III of this ES, address the requirement for access to the active frontages associated with the public open space between the Doubletree Hotel and Waterman’s Place as well as the Blue Apartments and Hilton Hotel.

The Water Lane site will be located immediately adjacent to the listed building, a warehouse developed as residential properties. Basic welfare facilities will be provided at site compound at Water Lane. Increased traffic movements for deliveries are likely along Water Lane, though this is not expected to change the existing character significantly due to the presence of busy Meadow Lane and the multi-storey car park.

The existing scrubby vegetation would be lost during construction. Although not of great quality, trees/scrub are rare features along the river. The movement of materials along the river would be in keeping with historical context of the character area.

The proposed works will not directly affect any of the listed structures such as the canal walls and lock. Construction activities will, however, partially reduce the view of the brick viaduct due to the presence of hoarding but will not change the dominance of the overall structure within the townscape setting. Given the modern, eclectic style of development in the area, the construction works will not significantly affect the setting and context of the conservation area. Setting and long views to the Tower Works will not be affected. The barge loading area will be close to a further listed building; however, again the setting has been compromised by recent development and the proposed temporary activities will not interfere with the relationship of the former warehouses to the river.

The magnitude of the predicted impact is minor. Pedestrian access to the public realm between the Doubletree Hotel and Waterman’s Place will be largely unaffected. Other elements of the construction works will result in a minor change in townscape character as the activities can be accommodated in the existing activity levels in the area. Although the crane will be a large element, the adjacent built elements are of sufficient scale to partially screen and counterbalance the crane height. The overall significance of effect is slight adverse.
Visual Amenity

Overall, there are moderate adverse significant effects predicted on visual amenity for the closest visual receptors including residents and commercial users of Watermans Place and Blue Apartments during the construction phase of the proposed development. There are no significant construction effects predicted for other visual receptors identified within the study area.

8.8.3.2 Operational phase

Incorporated Mitigation Measures

Improvements to the public realm on Little Neville Street will be implemented; this will include the reinstatement of the existing basalt setts.

The new entrance and the proposed river spans which cross the River Aire as part of the scheme will improve pedestrian permeability and increase activity levels and vibrancy of the public realm areas. Improvements to the existing treatment of the footpath from Dark Neville Street to Little Neville Street will be incorporated as part of the scheme to promote pedestrian linkages.

The following items are suggested incorporated mitigation measures, which are likely to be used in combination with each other, to best resolve the issues identified in the obtrusive light assessment (provided in Appendix B of the Townscape and Visual Amenity Technical Appendix). The exact combination of incorporated mitigation measures will be investigated further at the detailed design stage.

- Switch-off the type ‘G’ luminaires which provide up-lighting to the south façade structure after an agreed ‘curfew’ time. This will alleviate some of the light-spill to the surrounding environment and help reduce the light intrusion into the adjacent building windows.
- Careful consideration to the aiming of luminaires. Whilst it is noted that the majority of the lighting scheme consists of local handrail lighting providing focussed lighting for passenger wayfinding, there are a number of high-output luminaires which provide general illumination of the space. Some have been specified with glare baffles, which will be beneficial, however as part of the detailed design and construction process careful consideration should be given to the precise aiming of luminaires to restrict light being spilled away from the surface and zone of intentional illumination.
- Consider reducing the intensity and luminous output of the upward facing luminaires. The design currently shows 150W metal halide luminaires providing up-light to the space. In order to minimise the light flowing through the upper glazing element both the position and the luminous output should be considered.
- Consider using glass of lower transparency. As part of this assessment, a glazing transparency of 80% has been assumed, however if a lower transparency of glazing can be integrated into the design without disrupting the overall building performance and aesthetic, then this should be strongly considered.
- Investigate whether the internal lighting can be reduced after an agreed ‘curfew’ time. Considering the use of dimming or selective switching will assist with reducing the reflected light spill from the station structure. Whilst it is noted that a number of high-output metal halide luminaires have been used for general illumination to enhance the internal space, it is recommended that consideration be given to the use of alternative dimmable light sources. To achieve an equivalent visible and technical performance it is noted that this may increase the number of total luminaires, which in turn may have financial implications, however this approach would have a positive impact on the overall light spill and the effect on the adjacent buildings.
Although the visible luminaire intensities have been calculated to be within acceptable limits, it is a recommendation of this report that the type ‘G’ luminaires, which provide up-lighting to the southern façade structure, are switched-off after an agreed ‘curfew’ time. In addition to minimising the luminaire intensities visible throughout the night, this measure will also alleviate some of the light-spill to the surrounding environment.

- The building luminance should be limited to avoid overlighting. Since the building is designed to meet the requirements of the station it is assumed that the lighting levels will be reasonable and not excessive, however the ongoing design should consider the effect of any increased internal lighting levels and the effect this would have on the surrounding neighbourhood.

- The building luminance should be related to the general district brightness. Assuming that the surrounding riverside footpath and bridge are well lit, this will have the effect of increasing the general district brightness meaning that the proposed station structure should not appear excessive. It should also be considered that the station entrance will enhance the visual environment, and can provide an attractive component to the nightscape in the local area, as well as creating identity and purpose for the station entrance itself.

**Predicted Effects – Townscape**

The predicted effects on townscape for the two identified main character areas are as follows:

**Leeds Station Transport Hub Character Area**

The upper extent of the proposed southern entrance will be visible above the station roof. Pedestrian permeability from the south into the Leeds Station Transport Hub Character Area would be improved. Otherwise the townscape in character area would be largely unaffected by the operational phase of the scheme. The magnitude of the predicted impact is low given that the proposed works are concentrated in the southern boundary of the existing station building. The overall significance of effect considered to be negligible.

**Canal-side Mixed Development – Commercial and Residential**

Whilst the new entrance structure would not directly affect the brick arched viaduct, this would be partially screened despite the glazed façade. Pedestrian access will be improved through the creation of a new bridge structure across the River Aire. This will create better links with existing pedestrian routes including along Dark Neville Street. The improved pedestrian access will increase activity levels and vibrancy of the public realm areas.

The site offices area will be reinstated following construction, resulting in no change to the existing character. The barge loading area on Water Lane will also be reinstated.

The proposed scheme will not directly affect any of the listed structures. Given the modern, eclectic style of development in the area, the scheme will not significantly affect the setting and context of the conservation area.

The magnitude of the predicted impact is minor given the predicted beneficial impacts on permeability and access to the public realm. Although the entrance structure will be a large element, the adjacent built elements are of sufficient scale to counterbalance the development. The overall significance of effect is slight beneficial.
Predicted Effects – Obtrusive Light

The proposed lighting scheme adopts the principle of down lighting where possible, reducing the potential for light trespass nuisance for adjacent residential properties.

*Light Intrusion (into windows)*

The lighting calculations with no mitigation measures in place demonstrate that considerable light intrusion into the adjacent building would occur at the lower levels in close proximity to the proposed station structure. Inter-reflected light from within the building would spill out of the south façade and directly onto the adjacent buildings. In addition, some of the spilled light would reflect again off the surface of the River Aire and contribute to the light intrusion of the adjacent buildings.

The recommended maximum for an urban area (classified as ‘E4’) is 5 lux for the ‘post-curfew’ hours. A number of windows adjacent to the proposed structure exceed this recommendation and therefore some mitigation measures should be considered as part of the design to reduce the effect these works will have on the surrounding neighbourhood. It is noted that the ‘pre-curfew’ effect on the adjacent buildings is within ILP recommended limits.

However, calculations and modelling based on the fact that mitigation measures are implemented, have provided results which show that the Light Intrusion (into windows) guidance criteria would not exceed the threshold. It is therefore considered that overall the light intrusion impacts on the surrounding buildings would not be significant.

*Sky Glow*

Analysis of the Upward Light Ratio (ULR) with no mitigation measures in place, suggests that quite a considerable proportion of the light spilled from the building passes upwards causing levels of sky glow beyond the limits recommended in ILP guidance.

The upward light emanating from the Southern façade is relatively minimal and within acceptable limits. However, light emanating from the glazing at the top section of the structure would contribute considerably to the sky glow. This is largely a consequence of the upward facing luminaires located at the upper floor of the proposed structure.

Lighting modelling carried out with the assumption that mitigation measures are implemented has demonstrated that the Sky Glow guidance criteria would not be exceeded. It is therefore considered that the sky glow would not be increased significantly as a result of the proposed development.

*Daylight and Sunlight Performance*

The daylight analysis carried out in 2009 and included in the Appendix C of Townscape and Visual Amenity Technical Appendix in Volume II of this ES indicates the majority of test planes identified on the residential properties to the east of the site are likely to experience a major adverse reduction in direct daylight with the proposed development in place as set out in the impact rating scale in Appendix C. Access to direct daylight is inherently limited to these properties due to overshadowing by the Watermans buildings to the west of the site. The daylight analysis indicates that windows/receptors above the 3rd storey adjacent to
Leeds Station and the Dark Arches are likely to have a moderate-minor adverse reduction in direct daylight with the proposed development in place as set out in the impact rating scale in Appendix C.

The sunlight analysis included in the Appendix C of Townscape and Visual Amenity Technical Appendix in Volume II of this ES indicates the residential properties to the east of the site are likely to experience a minor adverse reduction in direct sunlight with the proposed development in place. Access to direct sunlight is inherently limited to these properties due to overshadowing by the under construction mixed use development to the west of the site.

**Predicted Effects – Visual amenity**

The visual envelope generated by the operational activities will be relatively limited due to the density of the urban fabric.

Temporary moderate adverse effects on visual amenity during operational phase have been predicted for the residents in the properties either side of the River Aire, namely Watermans Place and the Blue Apartments. Direct, close and elevated views towards the proposed station entrance and the crane would be possible and the construction works would be a prominent element of the views from the apartments.

**8.8.4 Significant Residual Effects**

**8.8.4.1 Construction Phase - Townscape character**

No significant effects on townscape character are predicted during the construction phase for the transport hub or canal-side character areas. The presences of construction site staff and general construction thoroughfare will not significantly affect the townscape, particularly between the Doubletree Hotel and Watermans Place apartments. Other elements of the construction works will result in a minor change in townscape character as the activities can be accommodated in the existing activity levels in the area. Although the crane will be a large element, the adjacent built elements are of sufficient scale to partially screen and counterbalance the crane height.

**8.8.4.2 Construction Phase - Visual amenity**

Moderate adverse effects on visual amenity have been predicted for the residents in the properties either side of the River Aire, namely Watermans Place and the Blue Apartments. Direct, close and elevated views towards the proposed station entrance and the crane would be possible and the construction works would be a prominent element of the views from the apartments.

**8.8.4.3 Operational Phase - Townscape character**

There are no significant effects predicted during the operational phase.

**8.8.4.4 Operational Phase – Obtrusive Light and Daylight**

There are no significant effects of obtrusive light on surrounding buildings predicted during the operational phase of the proposed development.
As set out in the Daylight report in Appendix C of the Townscape and Visual Amenity Technical Appendix the daylight analysis indicates the majority of test planes identified on the residential properties to the east of the site are likely to have a major adverse reduction in direct daylight with the proposed development in place. Access to direct daylight is inherently limited to these properties due to overshadowing by the Watermans buildings to the west of the site.

8.8.4.5 Operational Phase - Visual amenity

It should be noted that the visual amenity for a small number of residents in Waterman’s Place and Blue Apartments will be adversely affected during operational phase, resulting in localised significant effects on visual amenity. The northernmost apartments at the lower floor levels in the Blue Apartments and Watermans Place will be very close to the proposed station entrance. The residents’ view will tend to be foreshortened through the presence of the prominent new structure. The east and west elevations of entrance structure could be viewed as a large, solid structure in close proximity to the balconies and windows of the apartments. Users of apartments further from the station entrance and at higher floor levels are likely to benefit from the presence of the sleek, iconic structure in views over the river.

8.8.5 Enhancement Opportunities

There is no townscape and visual supplementary mitigation measures are proposed for the scheme.

8.9 Traffic and Access

8.9.1 Introduction

This section summarises the Traffic and Access assessment undertaken as part of the EIA for the LSSE project. Full details of the assessment undertaken are presented within the Traffic and Access Technical Appendix in Volume II of this Environmental Statement.

8.9.2 Baseline Conditions

Leeds City Station’s main entrance is located on New Station Street primarily serving City Square and destinations beyond. Passengers wanting to access or exit the Station from the south of the railway have no alternative but to pass through the tunnel of Neville Street beneath the station and rise up to the station entrance via the ‘Rotunda’ steps. The ‘step-free’ access route for mobility impaired users is even longer, with passengers having to continue from Neville Street, onto Bishopgate Street and access the main entrance via New Station Street.

2008 ‘Base’ Leeds City Station entry/exit counts were reported in Consultant Hyder’s Pedestrian Modelling and Assessment Report and are summarised in Table 8.21 below. The exiting values were taken from 2008 boarding and alighting counts, and Consultant Hyder derived the entering values from assumed entry/exit splits.

<table>
<thead>
<tr>
<th>Movement</th>
<th>AM (7am – 10am)</th>
<th>PM (4pm – 7pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Numbers</td>
<td>4,846</td>
<td>16,269</td>
</tr>
<tr>
<td>Total (3 hour peak)</td>
<td>24,228</td>
<td>21,692</td>
</tr>
</tbody>
</table>

Table 8.21: 2008 'Base' Total Leeds City Station Entry/Exit Flows
Leeds City Station is served by a number of formal and informal on-road cycle routes in all directions emanating from Park Row to the North and Neville Street near Water Lane to the south. Cycle parking is provided at the following locations:

- inside the station, located on Platform 1;
- within the short stay parking area on Princes Square;
- secure cycle parking is provided at Leeds Cycle Point on New Station Street immediately opposite the station entrance; and
- in Granary Wharf on the west bank of the River Aire between the railway viaduct and Watermans Place.

A traffic survey was undertaken in December 2011 during the AM and PM peak periods (0700-1200 and 1300-1800) and just short of 400 vehicle movements were recorded on Little Neville Street. A review of the traffic flows on Little Neville Street throughout the day shows that over one-third of the traffic is either passing through to/from Dark Neville Street or is u-turning presumably because they cannot park. The traffic flows occurring in the AM and PM peak periods were dominated by cars parking at the UKI underground car park (i.e. arriving in the morning peak, and leaving in the evening peak).

A large and well managed taxi rank serves Leeds City Station’s main entrance on New Station Street and offers waiting facilities that are under cover. The taxi rank utilises a marshalling system which queues taxis on Lower Briggate and Meadow Lane, whereby marshals at all ranks facilitate the movement of taxis from Meadow Lane to Lower Briggate to New Station Street once space becomes available at New Station Street.

New Station Street serves as a bus interchange, delivering passengers to Leeds Railway Station and taking them to their destinations throughout the city and further-a-field. Bus services access New Station Street from Boar Lane from both the northwest and east directions. A bus stand is provided on the nearside of New Station Street located on the Neville Street over bridge, with a further 3 bus stops (S8, S7 and S6) located further along on the nearside and two other bus stops (S10 and S9) located on the island between the station entrance and the taxi rank. Match day coaches are provided for Leeds United Football Club games and other local events, which are queued in the southbound direction on Neville Street under Leeds City Station. It should be noted that during local events such as home games at Leeds United Football Club, that Leeds City Station sees an increase in passenger volumes. The movement of passengers during these local events are co-ordinated in accord with Leeds City Station Management Plan.

The principal car park serving Leeds City Station is located on Princes Square and includes surface and multi-storey, short-stay car parks. Further car parking is also available in a privately owned car park within the Arches on Dark Neville Street. On-street parking bays are provided on Little Neville Street near the railway viaduct.

A formal drop-off/pick up area is located on Aire Street adjacent to the JD Wetherspoons Public House. Anecdotally it has been observed in 2011 and 2012 as being well used throughout the day, and queuing vehicles waiting to use the drop off area extending back beyond the junction with Aire Street during the peak periods. There is also a drop-off/pick-up area on Wellington Street/Bishopgate Street which also serves the Queens Hotel. Similarly, this was observed to be well used but it is considered that a large proportion of manoeuvres here are solely associated with the Queens Hotel and not the railway station.
8.9.3 Mitigation & Predicted Effects

8.9.3.1 Construction phase

Incorporated Mitigation

The main mitigation measures involve the minimisation and appropriate scheduling of construction traffic from the vicinity of receptors and limiting their impact on the road network. The Contractor will be required to produce a Construction Traffic Management Plan which will identify the following:-

- temporary or permanent road closures and diversions;
- any interference with a carriageway or footway, including control of tracking of mud;
- temporary traffic control measures;
- temporary or permanent access to the works;
- temporary road layouts;
- routes to be used by construction traffic and any restrictions which may be applied, e.g. area within which materials must be sourced and routes for waste disposal;
- means on monitoring lorry use; and
- site specific controls.

Abnormal loads are to be delivered where possible outside of highway peak hours to minimise the impact on congestion during these periods. Temporary signing will be provided to direct construction traffic onto the agreed routes with no access to other local roads. Temporary TRO’s would be implemented on Water Lane during construction to facilitate the movement of large vehicles along water lane to the barge loading/launch site.

A Liaison Manager will be employed to consult with any relevant third parties and will compile a Community Engagement Plan that would detail the measures that would be undertaken to help mitigate the disruptive impact that the scheme may have on the local area and its residents. The Liaison Manager will attend local residents meetings and forums to keep people updated on progress and future activities; and they will attempt to engage the local community in the scheme development and consider factors such as the environment and sustainability.

A 24 hour emergency number will be operated by Network Rail and will be available for any urgent or emergency action. Detailed incident and emergency management plans will be developed by the construction contractor in conjunction with Network Rail, and in line with the Network Rail’s Contract Requirements.

Solid hoarding, preferably Heras will be used (when safe to do so) to enclose the work site adjacent to Granary Wharf to prevent unauthorised access. The exact alignment and layout of the hoarding should (where possible) be agreed with local stakeholders to provide the least disruptive but safe solution. Clear signage will be affixed to the hoarding to direct the public around the work area and to describe the scheme and to highlight the hazards and risks that are associated with the project.

Some existing footpaths and walkways will be closed or have access restricted along them as shown in Carillion’s LSSE Constructability Review Revision 02 – 31st January 2012. Figure 13 and 14 in Volume III of this ES show the two potential construction options with the differing access routes. When a closure is in place, clear signage and information boards will be erected providing clear direction for the diversion.
Temporary pedestrian barriers will also be erected to create an obvious walkway, and if uneven ground conditions are encountered temporary membranes can be rolled out to provide a better walking surface.

Similar measures to the ones described above (for Granary Wharf) will be employed at Water Lane where secure fencing or hoarding will be erected around the perimeter of the site, and a footpath diversion will be established with temporary pedestrian barrier if necessary.

**Predicted effects**

A full assessment detailing the effects of the proposed scheme can be found in the Traffic and Access Technical Appendix in Volume II of this ES. The predicted effects resulting from the construction phase of the proposed scheme are summarised in Table 8.22 below.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Description</th>
<th>Importance</th>
<th>Magnitude</th>
<th>Adverse / Benefit</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little Neville Street Users</td>
<td>Restricted access, road closures and loss of on-street parking</td>
<td>Medium</td>
<td>Moderate</td>
<td>Adverse</td>
<td>Potentially Significant</td>
</tr>
<tr>
<td>Water Lane Users</td>
<td>Restricted access and loss of on-street parking</td>
<td>Low</td>
<td>Low</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Leeds City Station Passengers</td>
<td>Hoardings on platforms and potential platform changes</td>
<td>Medium</td>
<td>Moderate</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Non Motorised Users</td>
<td>Provision of hoardings to segregate NMUs from the construction site and footway closures with diversions. Loss of cycle parking during construction.</td>
<td>Low</td>
<td>Moderate</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Businesses in the Granary Wharf Area</td>
<td>Provision of hoardings surrounding the main site to segregate the general public from construction. However this will not affect access.</td>
<td>Low</td>
<td>Low</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Commercial Properties in the Arches on Dark Neville Street</td>
<td>Reduced access when Little Neville Street is temporarily closed. Four arches used for storage and provision of site staff welfare facilities</td>
<td>Low</td>
<td>Low</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Staff at Asda House and Patrons of the Old Red Lion Inn</td>
<td>Loss of use of car park</td>
<td>Low</td>
<td>Moderate</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

8.9.3.2 Operational phase

**Incorporated Mitigation**

Little Neville Street will be upgraded to become a pedestrianised route including a prohibition of driving with specified exemptions to permit access to the users of the UKI underground car park, the Blue Apartments, the Hilton Hotel and general service access. Vehicular access onto Dark Neville Street from Little Neville Street and vice-versa will be blocked via means of physical means of access control (exact details to be
determined). This is to prevent the through movement between these two roads which would facilitate a drop-off / pick-up movement which is to be discouraged. It is also to prevent access and egress to the car parking spaces within the station undercroft via Little Neville Street in order to reduce potential conflicts in the pedestrian zone.

A turning head will be provided on Little Neville Street in the immediate vicinity of the Railway Viaduct. It would not be delineated by a kerb, but by street furniture, bollards and trees. This would mean that during general operation the turning head space would be part of the wider public realm improvements.

A 3m wide, pedestrian route / ‘safe space’ will be provided along the south side of Dark Neville Street connecting LSSE with Little Neville Street.

Cycle parking stands that are located in Granary Wharf between the railway viaduct and Watermans Place are situated in the landing position of the western link bridge. These will be removed and replaced by 20 cycle lockers situated in one of the arches on Dark Neville Street.

The Leeds Station Management Plan will be updated to reflect that LSSE is likely to become the choice of access/egress for those passengers attending local events in Leeds or Leeds United Football Club matches due to improved access to the existing bus stops and coach stands on Neville Street and Sovereign Street.

Predicted effects

A full assessment detailing the effects of the proposed scheme can be found in the Traffic and Access Technical Appendix in Volume II of this ES. The predicted effects resulting from the operation phase of the proposed scheme are summarised in Table 8.23 below.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Description</th>
<th>Importance</th>
<th>Magnitude</th>
<th>Adverse / Benefit</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little Neville Street Users</td>
<td>Restricted vehicular access, road closure and loss of on-street parking.</td>
<td>Low</td>
<td>Low</td>
<td>Adverse</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Leeds City Station Passengers</td>
<td>NMUs would benefit from an alternative means of access and improved journey times.</td>
<td>Medium</td>
<td>Moderate</td>
<td>Benefit</td>
<td>Significant</td>
</tr>
<tr>
<td>Non Motorised Users</td>
<td>Creation of more pedestrian friendly environments on Little Neville Street and Dark Neville Street (between LSSE and Little Neville Street).</td>
<td>Medium</td>
<td>Moderate</td>
<td>Benefit</td>
<td>Significant</td>
</tr>
<tr>
<td>Commercial Properties in the Arches on Dark Neville Street</td>
<td>Greater exposure of commercial properties as a consequence of increased footfalls passing existing commercial properties.</td>
<td>Low</td>
<td>Low</td>
<td>Benefit</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>
8.9.4 Significant Residual Effects

8.9.4.1 Construction Phase

Little Neville Street will be temporarily obstructed during the construction and removal of a tower crane on the east bank of the River Aire. Vehicular access to Little Neville Street will be maintained via Neville Street and Dark Neville Street. However vehicular through movements between Little Neville Street and Dark Neville Street will not be possible. The temporary closure on Little Neville Street will be managed and mitigated by the CTMP, but it is considered that this effect may be potentially significant.

8.9.4.2 Operational Phase

LSSE would improve pedestrian accessibility and provide stepped and step-free access to Leeds City Station from the south of the city, resulting a significant beneficial effect for station passengers and non-motorised users.

8.9.5 Enhancement Opportunities

The contractor may wish to appoint a Traffic Officer who would also oversee all matters pertaining to construction traffic and safety. This role could be combined with the Liaison Manager’s Duties. They would be responsible for traffic issues arising from the construction, including timing of deliveries, stacking of vehicles, the effect on junctions and control of vehicles onto and off site. They would also monitor the condition and cleanliness of the highway and liaise with the highway authority over any traffic or signing concerns and address other issues should they arise.

The demarcated pedestrian route (3m wide, pedestrian route / ‘safe space’) on the south side of Dark Neville Street could be extended between Little Neville Street and Neville Street.

8.10 Water Resources

8.10.1 Introduction

This section summarises the water resources assessment undertaken as part of the EIA for the LSSE scheme. Full details of the assessment undertaken are presented within the Water Resources Technical Appendix in Volume II of this ES.

8.10.2 Baseline Conditions

8.10.2.1 Hydrology

The proposed LSSE building will be built directly over the River Aire, which runs through the city centre of Leeds, flowing approximately from north-west to south-east of the city. The River Aire flows beneath Leeds
The Leeds Railway Station (Southern Entrance) Order  
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station viaduct (locally known as the Dark Arches), through an engineered channel. Immediately downstream of the Dark Arches, the River Aire forms part of the Aire and Calder Navigation, and flows within a canalised channel.

To the south of the main site, the Leeds and Liverpool Canal runs from west to east and joins the Aire and Calder Navigation at a canal lock, directly south of the proposed LSSE building, see Figure 8.2 below. The Millshaw Beck tributary enters the River Aire just to the east of the canal lock.

Figure 8.2: Site location in relation to water resource features

There are five discharge consents within 250m of the proposed scheme. They discharge to the River Aire and Hol/Millshaw Beck. There are no current surface water licensed abstractions within 250m of the proposed scheme. There are no private water supplies within 250m of the proposed scheme.

8.10.2.2 Flood Risk

The baseline relating to flood risk is considered in the stand alone Flood Risk Assessment (FRA) (in Volume IV of this ES) in accordance with the requirements of Planning Policy Statement (PPS) 25: Development and Flood Risk.
8.10.2.3 Geology

The majority of the study area, including the main site, is underlain by the Pennine Lower Coal Measures Formation. The formation is present in outcrop in the north tip of the study area. The outcrop includes the Thick Stone, a generally fine-grained sandstone located between the Black Bed Coal and the Better Bed Band Coal.

In the majority of the study area bedrock is overlain by superficial deposits comprising Alluvium. The deposits generally comprise soft to firm silty clay, but can contain layers of silt, sand, peat and basal gravel.

8.10.2.4 Hydrogeology

The bedrock underlying the study area is classified by the EA as a ‘Secondary A’ aquifer. Secondary A aquifers comprise permeable layers capable of supporting water supplies at a local rather than a strategic scale. In some cases they form an important source of base flow to rivers. The superficial deposits underlying the site are also classified by the EA as a ‘Secondary A’ aquifer.

There are no consented discharges to groundwater within 1km of the site. Within the study area there are three groundwater abstractions and one private water supply. However it is noted that three of these boreholes are within the extents of the Carlsberg Tetley Brewery in Leeds, which closed in June 2011.

Information presented on the EA website shows that the study area is not within any groundwater source protection zones, and that there are no groundwater source protection zones within 1km of the site.

8.10.3 Mitigation & Predicted Effects

8.10.3.1 Construction phase

During the construction phase, good construction practices will be followed and documented with an EMP, to be prepared by the construction contractor prior to commencement of works on site in line with Network Rail Contract Requirements - Environment. This will take into account all incorporated mitigation measures identified within this ES and measures will be set out in accordance with industry guidelines.

The advice given in the following PPG, published by the EA, will be applied:
- PPG 1: General Guide to the Prevention of Pollution;
- PPG 2: Above Ground Oil Storage Tanks;
- PPG 5: Works and Maintenance in or near Water;
- PPG 6: Working at Construction and Demolition Sites;
- PPG 8: Safe Storage and Disposal of Used Oils;
- PPG 18: Managing Fire Water and Major Spillages;
- PPG 21: Pollution Incident Response Planning; and
- PPG 22: Dealing with Spills.

Guidance given in other construction industry manuals covering environmental good practice will also be followed. These include the Construction Industry Research and Information Association (CIRIA) Report 532 Control of Water Pollution from Construction Sites (2001) and the BW Code of Practice for Works affecting British Waterways. These will be considered minimum requirements.
The measures will cover issues such as:

- ensuring that any potential contaminants are stored on site in an appropriate location (away from potential receptors, and where possible not within 10m of a watercourse) and in an appropriate manner;
- damping down and sweeping the site to preventing build up of debris or particulates which may result in contaminated or silt laden runoff, whilst also minimising the generation of construction dust and potential for pollution by wind blow;
- ensuring that surface water and groundwater is not degraded during construction activities, by preventing or containing any spillage or seepage combined with the rapid removal of spilled substances through implementation of the emergency response plan (to be prepared in accordance with the EA PPG 18 and PPG 21);
- ensuring the correct disposal of site drainage and any polluted water, including obtaining the necessary consents and approval for disposal of liquids to the public sewer, or (only if appropriate) to a watercourse in accordance with EA guidelines;
- preventing objects and pollutants from falling directly into the water, whilst working in or above watercourses;
- ensuring piling methods are adopted which minimise the disturbance of the bed and pollution during works in the River Aire channel, and minimise the risk of pollution to groundwater; (as outlined in Section 5.2 of the Geology and Soils technical appendix, presented in Volume II of this ES)
- removing from site arisings from piling to prevent discharge into the River Aire;
- emergency response plans for dealing with flood risk (and the increased risk of pollution during flooding); and
- consents and approval for temporary and permanent works in or near the River Aire will be obtained from the EA and BW (as appropriate).

Surface watercourses could be affected through runoff of contaminants, including sediment rich runoff or accidental spillages of contaminating substances (e.g. cement/concrete and fuel/oil). This will be mitigated through adhering to the construction EMP and implementation of provisions for the control of hazardous substances. The watercourses in the vicinity of the site are of low environmental value and are not used for potable supply. Therefore, any impact will be temporary and not significant.

Contamination of the groundwater could be affected through spillage of contaminating substances or as a result of piling. This will be mitigated through adhering to the Network Rail Contract Requirements – Environment which require, under Section 11, the production of an Incident Response Plan which will outline the site specific incident response and reporting procedures in the event of the spillage of contaminating substances. In addition piling methods which minimise potential for groundwater pollution will be agreed with the Environment Agency. The groundwater in the vicinity of the site is of medium environmental value as the aquifer provides a water source for a number of local groundwater abstractions. However, the magnitude of the impact is considered to be low and any impact will be temporary and therefore not significant.

Floodplains could be affected through contamination as a result of the mobilisation of pollutants by flood waters. This will be mitigated through producing emergency response plans to manage both flood risk and the increased risk of pollution during flooding. The watercourses in the vicinity of the site are of low environmental value and are not used for potable supply. Therefore, any impact of the scheme during flooding will be temporary and not significant.
8.10.3.2 Operational phase

During the operation phase, good maintenance practices will be followed, and appropriate procedures for preventing pollution adopted during regular cleaning. In particular the building Operation and Maintenance (OM) manual will outline measures to prevent pollutants (e.g. window cleaning chemicals, particulates and litter) being washed or swept into the River Aire. Following implementation of the proposed mitigation the operational impact of the scheme is not considered to be significant.

Flood risk mitigation measures incorporated into the LSSE scheme design are outlined in the standalone FRA which is included within Volume IV of this ES.

8.10.4 Significant Residual Effects

It is considered that if the mitigation measures described are implemented effectively, there will be no significant residual effects on water resources as a result of the construction or operation of the scheme.

8.10.5 Enhancement Opportunities

At this stage no supplementary mitigation measures have been identified.

8.11 Wind Assessment

A wind assessment of the proposed new station entrance has been undertaken, and the following section presents a summary of the key findings. For reference, the wind assessment has been included within Volume IV of this ES.

Where practical and affordable, it is an aim of LSSE that the wind environment around the development should allow safe and comfortable access for pedestrians using the entrance. Additionally, the presence of the proposed scheme should cause no significant adverse wind effects on its surroundings.

In the assessment, the wind environment around the proposed scheme has been assessed using steady-state Computational Fluid Dynamics (CFD) simulations on an accurate 3D model of the scheme and its surrounding environment. The comfort levels for pedestrians were assessed on and around LSSE by judging the severity of the mechanical effects of the wind against the intended usage of a given location. The airflow patterns around the LSSE scheme have been analysed, in order to highlight wind effects that contribute to the possible discomfort of pedestrians. The assessment of comfort levels has been made in reference to a set of criteria which are calibrated for mean wind speeds; the effects of gusts are implicitly accounted for.

The study concluded that the LSSE building is not expected to have a strong influence on the wind environment in its surrounding area, which is dominated by the presence of a number of high rise buildings. Once operational, the effect of the LSSE building on the wind environment for the surrounding pedestrian routes, station platforms and River Aire is assessed to be low. However, the operation of LSSE will lead to an increase in the pedestrian use of the area and therefore the assessment has sought to determine whether the wind environment in the area is suitable for the anticipated increase in pedestrian use.

Much of the area around the site may not be comfortable for users to sit or stand for extended periods of time under typical wind conditions. However, since the area is intended principally as a pedestrian access
route to Leeds City Railway Station, pedestrians will be typically moving and have short exposure. The wind environment is generally deemed suitable for this purpose.

Under strong winds, accelerations caused by corner effects around the Waterman’s Place building could occasionally cause hazardous wind speeds for pedestrians accessing the western link bridge. It may therefore be necessary to temporarily remove access to the western link bridge, which serves as one of the entrance routes to LSSE. As an alternative, pedestrians can use the eastern link bridge and the Dark Neville Street footbridge, which provide more sheltered wind environments. Such a closure is expected to be necessary for approximately 27 hours per year, when winds in this area are expected to affect the progress and balance of pedestrians. Hand rails, which are installed along pedestrian routes on the western bank of the River Aire, will help pedestrians steady themselves. The installation of a wind monitoring device and the development of appropriate operational procedures are recommended to inform the Station Manager at Leeds City Railway Station when closure of the western link bridge is necessary.

In general, the wind environment in the area south of Leeds City Railway Station is subject to relatively frequent adverse wind effects due to the presence of several tall buildings such as Candle House, Doubletree Hotel and Bridgewater Place. It is likely that pedestrians accessing the LSSE will be subject to conditions of stronger winds in the surrounding area, than at the LSSE itself. The presence of the additional entrance to the station will reduce walking times significantly for pedestrians who wish to access the station from this area and so its installation is concluded to have a beneficial effect for station users during strong winds.

The river deck of the LSSE building which is for maintenance use only, is expected to be subject to mixed comfort levels. The west side of the deck may often provide uncomfortable conditions for maintenance staff working for extended periods of time. The use of the river deck for maintenance during strong wind conditions should therefore be restricted.

8.12 Cumulative Effects

As far as it is known, the only development, which has been granted planning permission in the last two years, in close proximity to LSSE is the conversion of part of the disused ground floor at the Hilton Hotel into additional car parking, which was granted full planning permission by LCC in August 2011. It is not known when construction works will commence or the duration of these works, however it is assumed that these works will be completed by the time construction work begins on LSSE. Therefore, cumulative effects resulting from the construction phase for either proposal is not considered to be significant to the operation of other facilities in the local area.

In addition, the plans for the new car park exit on Little Neville Street have been fully considered when developing the proposals for public realm improvements in this area, and this new exit is clearly shown in Figure 11 in Volume II of this ES. As stated in Section 3.4.1.6, there will be a prohibition of vehicular access for the complete length of Little Neville Street. However, access will still be maintained for vehicles using the new exit at the Hilton Hotel.

Given the nature of the proposed public realm improvements for Little Neville Street, it is not considered that the operation of LSSE or the additional car parking at the Hilton Hotel will be of sufficient magnitude to have any cumulative effects when considered in conjunction of the operation of other facilities in the local area.
9. Conclusions

9.1 Application of due EIA process

LSSE presents an opportunity to maximise accessibility and support sustainable economic growth to the south of Leeds. A due EIA process has been applied to the proposed LSSE scheme. This Environmental Statement has considered the environmental implications of the scheme, in line with the EIA Scoping Report (Appendix A), the EIA Scoping Opinion (Appendices B and C) and appropriate regulations and guidance. Furthermore, ongoing consultation has been undertaken by both Metro and Mott MacDonald with the statutory authorities throughout the EIA process to ensure that, where appropriate, all relevant aspects have been taken into consideration (see Consultation Log presented in Appendix D).

9.2 Application of Mitigation Measures

The general principle of the EIA process is to avoid, or reduce to acceptable level, predicted environmental effects which may otherwise occur as a result of a proposed development. This has been achieved largely through the application of mitigation measures which have been incorporated into the scheme design ('incorporated mitigation') and their appropriate implementation is considered to be a firm commitment by the co-promoters (in this case Metro and Network Rail) (see Mitigation Register in Appendix E).

It is recommended that the mitigation register is included in the specification documentation to be provided at GRIP 5 stage and the selected contractor will be obliged to take on the responsibilities outlined within the register as a minimum. The mitigation measures will also be outlined in greater detail within an EMP to be undertaken during GRIP 5 which the contractor must provide to Network Rail prior to commencement of works.

The construction contractor will also be encouraged to include provision for environmental opportunities, such as the supplementary mitigation measures which have been recorded within this ES and within the mitigation register. Whilst these measures, unlike the incorporated mitigation, are not mandatory and should not be considered a complete list of opportunities, they have been included to provide practical suggestions for further environmental enhancement as a result of the proposed scheme.

9.3 Significant Residual Effects

On the basis of the assessments undertaken appropriate implementation of the incorporated mitigation proposed, most environmental effects anticipated to occur as a result of the construction works and the operation of LSSE can be appropriately mitigated. However, there are some remaining residual effects which are considered to be significant in terms of the definitions provided within each technical assessment. These residual significant effects, which include both adverse and beneficial effects, are outlined below, grouped by effects caused during the construction works (Table 9.1) and effects which result from the operation of LSSE (Table 9.2):
### Table 9.1: Significant Residual Effects – Construction phase

<table>
<thead>
<tr>
<th>Technical Assessment</th>
<th>Significant Residual Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Ecology</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Historic Environment</td>
<td>• A permanent moderate adverse significant residual effect on the Little Neville Street basalt setts have been identified as a result of removing and reinstating these as part of the public realm improvements.</td>
</tr>
<tr>
<td>Noise &amp; Vibration</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Socio-economics</td>
<td>• A temporary moderate adverse significant residual effect resulting from the week long closure of Little Neville Street for erecting and dismantling the tower crane.</td>
</tr>
<tr>
<td>Townscape &amp; Visual Amenity</td>
<td>• No significant residual effects on townscape character are predicted during the construction phase for the transport hub and canal-side character areas.</td>
</tr>
<tr>
<td></td>
<td>• Moderate adverse effects on visual amenity have been predicted for the residents in the properties either side of the River Aire, namely Waterman’s Place and the Blue Apartments. Direct, close and elevated views towards the proposed station entrance and the crane would be possible and the construction works would be a prominent element of the views from the apartments.</td>
</tr>
<tr>
<td>Traffic &amp; Access</td>
<td>• Potentially significant residual effect on Little Neville Street users as the area will be temporarily obstructed during the construction and removal of a tower crane on the east bank of the River Aire. Vehicular access to Little Neville Street will be maintained via Neville Street and Dark Neville Street. However vehicular through movements between Little Neville Street and Dark Neville Street will not be possible. The temporary closure on Little Neville Street will be managed and mitigated by the CTMP.</td>
</tr>
<tr>
<td>Water Resources</td>
<td>No significant residual effects</td>
</tr>
</tbody>
</table>

### Table 9.2: Significant Residual Effects – Operation phase

<table>
<thead>
<tr>
<th>Technical Assessment</th>
<th>Significant Residual Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Ecology</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>Scoped out of the EIA – no significant effect anticipated</td>
</tr>
<tr>
<td>Historic Environment</td>
<td>• A beneficial significant residual effect on the Canal Wharf Conservation Area has been identified as a result of indirect operational effects. It is considered that the high quality, striking design of the proposed new entrance has been assessed as an improvement resulting in a beneficial effect on the overall setting of the Canal Wharf Conservation Area including the Dark Arches.</td>
</tr>
<tr>
<td>Noise &amp; Vibration</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Socio-economics</td>
<td>No significant residual effects</td>
</tr>
<tr>
<td>Townscape &amp; Visual Amenity</td>
<td>• It should be noted that the visual amenity for a small number of residents in Waterman’s Place and Blue Apartments will be adversely affected during operational phase, resulting in localised significant effects on visual amenity. The northernmost apartments at the lower floor levels in the Blue Apartments and Waterman’s Place will be very close to the proposed station entrance. The residents’ view will tend to be foreshortened through the presence of the prominent new structure. The east and west elevations of entrance structure could be viewed as a large, solid structure in close proximity to the balconies and windows of the apartments.</td>
</tr>
<tr>
<td></td>
<td>• The obtrusive light modelling and calculations results indicate that there would only be one exceedance of Institution of Lighting Professionals guidance values; this is for building illuminance, however the levels predicted are considered satisfactory for a city centre location.</td>
</tr>
<tr>
<td></td>
<td>• The Daylight report and analysis indicates the majority of test planes identified on the residential properties to the east of the site are likely to have a major adverse</td>
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</table>
### 9.4 Overall Conclusions

It is considered that the construction and operation of LSSE will ultimately bring benefits to the surrounding areas, especially to the south of Leeds. At present, passengers who need to access or exit Leeds railway station from the south currently have no alternative to the existing indirect route via the main entrance on the north side of the station, the ‘Rotunda’ steps and through the Neville Street underpass, which results in a significantly longer journey time. Once the LSSE is operational, it is estimated that between 22% to 24% of station users will use LSSE in the morning and afternoon peak hours.

As outlined in Tables 9.1 and 9.2 above, a number of temporary and permanent significant residual effects will occur as a result of the construction works and the operation of LSSE. It is considered that the proposed scheme would be environmentally acceptable overall, as is indicated by the results of the EIA. This is due to the thorough constructability review which has been undertaken, the incorporated environmental mitigation measures and the proposed iconic design of LSSE which all reduce the overall environmental effects of the scheme. In addition, the LSSE scheme is anticipated to bring wider benefits by opening up opportunities for employment sites in south Leeds, by providing an attractive and accessible gateway to Leeds railway station, and the proposals have been generally well received by the public at the recent consultation events.

<table>
<thead>
<tr>
<th>Technical Assessment</th>
<th>Significant Residual Effect</th>
</tr>
</thead>
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<tr>
<td></td>
<td>reduction in direct daylight resulting from the proposed scheme, however direct daylight is inherently limited to these properties due to overshadowing by the Watermans buildings to the west of the site.</td>
</tr>
<tr>
<td>Traffic &amp; Access</td>
<td>Significant beneficial effects for station passengers and non-motorised users as LSSE would improve pedestrian accessibility and provide stepped and step-free access to Leeds City Station from the south of the city.</td>
</tr>
<tr>
<td>Water Resources</td>
<td>No significant residual effects</td>
</tr>
</tbody>
</table>
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Leeds Station Southern Entrance

EIA Scoping Report

Report No. 296480/RPT02
October 2011
Metro
Leeds Station Southern Entrance

EIA Scoping Report

October 2011

Metro

Wellington House, 40-50 Wellington Street, Leeds, LS1 2DE
## Issue and revision record

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<td>N. Parker</td>
<td>F. Kilmurray</td>
<td>J. Smith</td>
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<th>Description</th>
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<tr>
<td>AADT</td>
<td>Annual Average Daily Traffic</td>
</tr>
<tr>
<td>AQMA</td>
<td>Air Quality Management Area</td>
</tr>
<tr>
<td>AQS</td>
<td>Air Quality Strategy</td>
</tr>
<tr>
<td>BAP</td>
<td>Biodiversity Action Plan</td>
</tr>
<tr>
<td>BGS</td>
<td>British Geological Survey</td>
</tr>
<tr>
<td>BPM</td>
<td>Best Practicable Means</td>
</tr>
<tr>
<td>BS</td>
<td>British Standard</td>
</tr>
<tr>
<td>CoCP</td>
<td>Code of Construction Practice</td>
</tr>
<tr>
<td>CoPA</td>
<td>Control of Pollution Act</td>
</tr>
<tr>
<td>CRTN</td>
<td>Calculation of Road Traffic Noise</td>
</tr>
<tr>
<td>DIT</td>
<td>Department for Transport</td>
</tr>
<tr>
<td>DMRB</td>
<td>Design Manual for Roads and Bridges</td>
</tr>
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<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>EcIA</td>
<td>Ecological Impact Assessment</td>
</tr>
<tr>
<td>ECML</td>
<td>East Coast Main Line</td>
</tr>
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<td>EMP</td>
<td>Environmental Management Plan</td>
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<tr>
<td>EPUK</td>
<td>Environmental Protection UK</td>
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<tr>
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<td>Environmental Statement</td>
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<tr>
<td>FRA</td>
<td>Flood Risk Assessment</td>
</tr>
<tr>
<td>HDV</td>
<td>Heavy Duty Vehicle</td>
</tr>
<tr>
<td>HER</td>
<td>Historic Environment Record</td>
</tr>
<tr>
<td>IEEM</td>
<td>Institute of Ecology and Environmental Management</td>
</tr>
<tr>
<td>IEMA</td>
<td>Institute of Environmental Management and Assessment</td>
</tr>
<tr>
<td>km</td>
<td>Kilometres</td>
</tr>
<tr>
<td>LAI</td>
<td>Local Area of Influence</td>
</tr>
<tr>
<td>LCC</td>
<td>Leeds City Council</td>
</tr>
<tr>
<td>LDF</td>
<td>Local Development Framework</td>
</tr>
<tr>
<td>LEP</td>
<td>Local Enterprise Partnership</td>
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<tr>
<td>LI</td>
<td>Landscape Institute</td>
</tr>
<tr>
<td>LNA</td>
<td>Leeds Nature Area</td>
</tr>
<tr>
<td>LPA</td>
<td>Local Planning Authority</td>
</tr>
<tr>
<td>LSSE</td>
<td>Leeds Station Southern Entrance</td>
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<tr>
<td>LTP</td>
<td>Local Transport Plan</td>
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<tr>
<td>m</td>
<td>Metres</td>
</tr>
<tr>
<td>MAGIC</td>
<td>Multi-Agency Geographic Information for the Countryside</td>
</tr>
<tr>
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</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>NGR</td>
<td>National Grid Reference</td>
</tr>
<tr>
<td>NMR</td>
<td>National Monument Record</td>
</tr>
<tr>
<td>NO₂</td>
<td>Nitrogen dioxide</td>
</tr>
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<td>NO₄</td>
<td>Nitrogen oxide</td>
</tr>
<tr>
<td>NPPF</td>
<td>National Planning Policy Framework</td>
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<tr>
<td>NR</td>
<td>Network Rail</td>
</tr>
<tr>
<td>NTS</td>
<td>Non-Technical Summary</td>
</tr>
<tr>
<td>ONS</td>
<td>Office of National Statistics</td>
</tr>
<tr>
<td>PA/VA</td>
<td>Public Address/Voice Alarm</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>Particulate Matter</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>PPG</td>
<td>Planning Policy Guidance</td>
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<td>PPS</td>
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<tr>
<td>RDB</td>
<td>Red Data Book</td>
</tr>
<tr>
<td>RES</td>
<td>Regional Economic Strategy</td>
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<tr>
<td>RIGS</td>
<td>Regionally Important Geological Site</td>
</tr>
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<tr>
<td>SA</td>
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<tr>
<td>SAC</td>
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<td>SEGI</td>
<td>Site of Ecological and Geological Importance</td>
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<td>Sound Exposure Level</td>
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<td>Special Protection Areas</td>
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<td>TWAO</td>
<td>Transport and Works Act Order</td>
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<td>UDP</td>
<td>Unitary Development Plan</td>
</tr>
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Leeds Station Southern Entrance

296480/EVT/EMS/002/B 3 October 2011
http://pims01/pims/llisapi.dll/Open/1484028560
Executive Summary

Mott MacDonald has been appointed by the West Yorkshire Passenger Transport Executive (Metro) as the Technical Advisor to deliver a range of services relating to the delivery of a Transport and Works Act Order for the Leeds Station Southern Entrance scheme.

Once complete the new entrance will contribute to the on-going regeneration and development of Leeds, by linking directly with the new developments located to the south of the station. The new entrance will include a concourse deck over the River Aire within a visually iconic enclosed building. Open link span bridges will provide direct access from this concourse to the east and west banks of the River Aire. The concourse also extends back through the span of the station viaduct to link with a further footbridge running parallel to Dark Neville Street. From the concourse, access to the station footbridge is provided by steps, escalators and lift. At the existing station footbridge level, the widened bridge provides an upper concourse with customer information screens, ticket vending machines, automated ticket barriers and ticket purchasing facilities.

Permission to undertake the development will be sought through a Transport and Works Act Order. An important aspect of the application is provision of the findings of an Environmental Impact Assessment (EIA), presented within an Environmental Statement (ES). This EIA Scoping report provides the proposed scope for the EIA for review by the Department for Transport and statutory consultees. The scope of the EIA will take into account the comments raised within the Scoping Opinion and any subsequent recommendations. It may also be updated as the understanding of environmental conditions in the vicinity of the scheme change.

One of the aims of this EIA Scoping Report is to identify the technical environmental disciplines that will be assessed for potential effects during the construction and operational phases of the proposed scheme. A summary of the proposed assessments is presented in Table 1 below.
<table>
<thead>
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<td>Operation</td>
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<td>✓</td>
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<tr>
<td>Geology &amp; soils</td>
<td>✓</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>With the inclusion of mitigation measures, it is considered unlikely that there</td>
</tr>
<tr>
<td></td>
<td></td>
<td>will be significant impacts from soils or contaminated land during the</td>
</tr>
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<td></td>
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<td>operational phase of the scheme. It is therefore proposed to scope this aspect</td>
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<td>✗</td>
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<tr>
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<td></td>
<td>Due to the urban nature of the site and surrounding area, it is proposed that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the assessment will focus on the effects on townscape, rather than landscape as</td>
</tr>
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<td></td>
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<td>this is considered more appropriate for the site setting.</td>
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<tr>
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<tr>
<td>Socio-Economics</td>
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<td>Waste Management</td>
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<td>Waste management has been scoped out of the EIA at this stage as it is assumed</td>
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<td>that construction waste will be managed via a site waste management plan (SWMP)</td>
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<td></td>
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<td>and it is considered unlikely that significant waste will be created through</td>
</tr>
<tr>
<td></td>
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<td>the operation of the new entrance.</td>
</tr>
<tr>
<td>Water Environment</td>
<td>✓</td>
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1. Introduction

Mott MacDonald has been appointed by the West Yorkshire Passenger Transport Executive (Metro) as the Technical Advisor to deliver a range of services relating to the delivery of a Transport and Works Act Order (TWAO) for the Leeds Station Southern Entrance (LSSE) scheme. This document is the Scoping Report for the Environmental Impact Assessment (EIA) which will be required to accompany the application for the TWAO.

1.1 Background

Leeds City Station is one of Network Rail’s seventeen managed stations, serving the city centre of Leeds in West Yorkshire, UK with local, regional and inter-city rail services. At present, it hosts 85,000 passengers per day, mainly commuters, shoppers, business travellers, and leisure visitors. As well as serving the dense network of local railway stations around the hub of Leeds, the station is also located on the busy east-west Transpennine rail route and the main north-south East Coast Main Line (ECML), linking Scotland to London Kings Cross.

The scheme will contribute to the on-going regeneration and development of Leeds, particularly to the south of the rail station, which has created demand for a new station entrance linking directly with the new developments located to the south of the station. It will include a concourse deck over the River Aire within a visually iconic enclosed building. Open link span bridges will provide direct access from this concourse to the east and west banks of the River Aire. The concourse also extends back through the span of the station viaduct to link with a further footbridge running parallel to Dark Neville Street. From the concourse, access to the station footbridge is provided by steps, escalators and lift. At the existing station footbridge level, the widened bridge provides an upper concourse with customer information screens, ticket vending machines, automated ticket barriers and ticket purchasing facilities.

In October 2009, a planning application for the LSSE project was submitted to Leeds City Council (LCC) and permission was granted in May 2010. In June 2011, the Department for Transport (DfT) confirmed that a Transport and Works Act Order should be sought potentially under Sections 1(a) and Section 3(1)(b) of the Transport and Works Act (1992) regulations as the project has the potential to affect the operation of a railway (at City Station) and interfere with rights of navigation for an inland waterway (River Aire) respectively. As such Metro and Network Rail (NR) are acting as co-Promoters of the LSSE scheme and approval to construct and operate the scheme will be sought under the TWA regulations. It is intended that a draft order will be submitted to the Secretary of State in March 2012. The completion of an EIA, and subsequent production of an Environmental Statement (ES), is a legal requirement for a TWA Order and its purpose is to present the findings of the EIA in order to determine whether or not there are any predicted significant adverse or beneficial residual environmental effects from a scheme’s construction or operation. The ES for the scheme must meet the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. This EIA Scoping Report comprises the initial stage of the EIA process.

1.2 LSSE Objectives

The objectives of the LSSE project are:

- to minimise pedestrian journey times accessing Leeds Station to/from the south;
- to develop a new southern entrance to Leeds Station in line with the Railway Standards;
- to meet existing and future passenger flow requirements to the south of Leeds Station;
- to develop a DDA compliant entrance;
- to provide gating and security arrangements to the new entrance;
- ensure the current passenger flows within the station are maintained or improved;
- ensure Network Rail’s operational safety is maintained or improved;
- ensure Network Rail’s operational performance is maintained or improved; and
- to develop an entrance in keeping with the existing Leeds Station and surrounding environs.

1.3 Purpose of Scoping

This EIA scoping report describes how the EIA will be undertaken and identifies the technical environmental disciplines that will be considered. Defining the environmental scope is one of the most critical parts of the study, as it sets out the method for the detailed assessment. This EIA Scoping Report will be submitted to the DfT in their role as the determining authority, and they will co-ordinate inputs from statutory consultees into the formal Scoping Opinion. It will also be used as a basis for consultation on the methods that will be used in the EIA with key stakeholders.

The scope for the EIA will be amended following a five week consultation period, based on the Scoping Opinion from the DfT and the recommendations of key stakeholders to ensure consideration when undertaking the EIA. It may also be updated as understanding of environmental conditions change.

A substantial amount of work has already been undertaken for the scheme as part of the GRIP 4 study (Faber Maunsell AECOM), completed in April 2009. This study formed the basis of the planning application for the scheme which was submitted to LCC and approval granted in May 2010. The EIA process for the TWAO submission will be primarily based on the existing environmental baseline information from the GRIP 4 study, as presented in the appendices of the GRIP 4 report and the supporting documents for the planning application. It is understood that the environmental baseline data contained in these documents is considered to be relevant and sufficiently up-to-date, and that the statutory environmental consultees will be familiar with the environmental conditions and issues on the site following the award of planning permission in May 2010. Where it is deemed necessary, additional site visits may be undertaken; an outline of the scope for the environmental works by discipline is provided in Chapter 5.

1.4 Scoping Objectives

The objectives of the scoping process are to:
- describe the overall approach to the EIA;
- identify the environmental topics that will be assessed;
- eliminate any topics not to be assessed (i.e. be “scoped out”);
- define the technical, spatial and temporal scope of the study for each topic;
- define the approach and methodology for baseline studies;
- define the approach and methodology for predicting environmental effects and for evaluating the significance of each effect;
- identify the methods to be adopted for incorporation of mitigation and other environmentally driven modifications into the design, as it develops; and
- provide a basis for agreeing the approach to the EIA and the methodologies to be followed with relevant stakeholders.

The scoping report aims to take these objectives into account.
1.5 Environmental Impact Assessment

EIA is a process which identifies the environmental effects (both adverse and beneficial) of a proposed development. It ensures that the importance of these effects, and the opportunity for reducing any adverse effects, are properly considered as part of the design development process and are understood by the public, the relevant competent authorities, statutory authorities and other interested parties. EIA assists in decision making so that environmental factors can be given due weight, along with economic or social factors, when applications for development consent are being considered by local planning authorities or the Secretary of State. EIA also helps developers to prevent, reduce and offset adverse environmental effects and can provide a mechanism to take into account environmental issues during the design of the scheme.

The requirements for EIA are defined by EC Directive 85/337/EEC, as amended. The required content of an ES is set out in Schedule 4, Parts I and II of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

The ES for the LSSE scheme will present the findings of the EIA. It is anticipated that the ES will comprise the following parts:

- Non-Technical Summary (NTS);
- Volume I: Main Statement, including all relevant scheme information, description of alternatives, summary of all technical disciplines, etc;
- Volume II: Technical Appendices volume(s), to present detailed findings from the EIA; and
- Volume III: Figures.

1.6 Supporting Information

The following documents will be prepared as stand alone documents and will also form part of the TWAO submission:

- Flood Risk Assessment Strategy (FRA);
- Transport Statement (TS);
- Energy Demand Assessment & Climate Proofing Strategy;
- Sustainability Appraisal (SA);
- Code of Construction Practice (CoCP);
- Design & Access Statement; and
- Planning Statement.

Where relevant, information from these standalone reports will be incorporated into the ES and referenced appropriately; the EIA process will similarly inform these studies as appropriate.
2. Project Overview

2.1 Introduction

The co-Promoters intend to submit a TWAO application to obtain the necessary powers to construct and operate a new station entrance at Leeds City station. Once complete, the new station entrance will provide a direct link to new and emerging development areas in Leeds, particularly to the south of the rail station. An overview of the site location is provided in Figure B.1.

2.2 Project History

In April 2009, the LSSE scheme reached the end of GRIP 4, Network Rail’s design process, resulting in a single preferred design option which formed the basis of a planning application to LCC in October 2009.

The GRIP 4 report and the planning application included the following documents:

- archaeology report;
- ecological assessment;
- bat survey report;
- air quality and dust report;
- noise and vibration assessment;
- water quality report;
- daylight study report;
- flooding assessment (including two addendums);
- planning design and access statement; and
- a transport assessment.

Full Planning Permission for the proposed development was granted by LCC under the Town and Country Planning Act 1990 in May 2010.

Following the UK General Election in May 2010 and the Comprehensive Spending Review, development of the project was paused. However, following the DfT’s review of the Major Schemes, DfT reissued approval funding for the construction of the new entrance in late February 2011.

In June 2011, Metro informed the Secretary of State for Transport about their proposed TWAO application for LSSE. The DfT confirmed that a TWAO should be sought under Sections 1(a) and potentially Section 3(1)(b) of the TWA regulations as the project has the potential to affect the operation of a railway (at City Station) and interfere with rights of navigation for an inland waterway (River Aire) respectively.

In parallel to the reapproval of the scheme in February 2011 by the DfT, Metro approved its third Local Transport Plan (LTP 3). Documented within the LTP 3, Metro identified the LSSE project as a priority to be progressed over the next three years.

2.3 Site Location and Description

As shown in Figure B.1 in Appendix B, Leeds City Station is located to the south-west of Leeds city centre. The main station entrance is situated on New Station Street for pedestrians, cyclists, buses and taxis. Additional entrances are located on Wellington Street for pedestrians only and off Princes Square adjacent to the station car parking and drop off areas.
The station is surrounded by office accommodation, two hotels and car parking to the north, north-east and south-east. To the south-west of the station, and on the west banks of the River Aire, there is a new development at Granary Wharf. This development includes residential apartments, retail and leisure units and a hotel.

2.4 Proposed Scheme

2.4.1 Scheme design

The proposed scheme comprises bridge decks over the River Aire, supporting lifts, escalators and stairs to provide a connection into the existing western footbridge, which will be extended and widened to the south and west over platforms 15, 16 & 17 to meet the new entrance. As shown by the indicative visualisation image in Figure 2.1, the whole of the new entrance will be enclosed.

Figure 2.1: Indicative visualisation image of the Leeds Station Southern Entrance (GRIP 4 design)

Since planning permission was granted in May 2010, Metro has been working with an architect to review the design to investigate possibilities for step-free access. The outcome of this review was not available at the time of writing this scoping report, but it is considered that the main footprint of the scheme is unlikely to change significantly and anticipated changes will be predominantly inside the proposed building. As such, it is considered unlikely that any amendments to the design post-GRIP 4 will significantly affect the environmental scope presented within this document. The Environmental Statement will present the findings from assessment of the design that will form the basis of the TWAO application.

The following sections provide further details of the proposed works, based on the design at GRIP 4:

River Deck and Entrance Building

The river deck is the central section of the new entrance and forms the concourse, at ground level for the entrance building. This concourse and entrance building will house four escalators, two lifts and a 1.5m wide staircase up to the widened section of the existing station footbridge.
The river deck will be constructed from steel beams in-filled with reinforced concrete to form a composite deck. The entrance building and river deck will be supported by two new piers located in the channel of the River Aire. The piers will be aligned with the piers of the existing viaduct to minimise restriction on river flows. The piers will be founded on piles which will be end bearing on rock.

**River Spans**

These two external river spans will provide direct stepped access to the river deck from the east and west banks of the River Aire. Where the river spans meet the river deck, these will be supported on the two new river piers. On the east and west river banks, piled bank-seats will provide end support to the spans.

**Arch Deck**

This deck will connect back into the existing railway viaduct from the river deck and external entrance building. The deck is at a higher level than the existing footbridge at Dark Neville Street; this footbridge will be replaced and ramps and steps provided to allow access from the arch deck to Dark Neville Street. Access to Granary Wharf to the west and Neville Street to the east will be provided via ramps or steps onto Dark Neville Street.

**Existing Footbridge Extension**

The existing main footbridge in the station will be widened and extended over platform 15 to the southern face of the existing railway viaduct. A new support column will be located on platform 15 adjacent to the lift motor rooms and the existing roof support column will be strengthened. The southern end of the extension will be supported by columns which extend down to and are supported by the two new river piers.

This structure will also support the continuation of the curved entrance roof, to tie in with the existing station roof as shown in Figure 2.2. This structure allows the form of the existing footbridge to continue on into the new entrance. The upper level of the escalators will be supported by the footbridge extension, which will also incorporate ticket purchasing facilities and automated ticket barriers.

Figure 2.2: Indicative visualisation image showing the extension of the existing western footbridge with the new station entrance structure

Source: Metro, 2010
2.4.2 Construction works

A constructability review is currently being undertaken on behalf of Network Rail, although the final results of this study are not yet available. Initial findings have indicated that materials could be transported by barge to the site along the River Aire; however, this will require a barge loading/unloading area. At the time of writing, an area on Water Lane adjacent to the River Aire and to the east of the site is being considered for this loading/unloading area, as indicated by the red circle in Figure B.1 in Appendix B. For the purposes of this EIA scoping report, this area will be included in the EIA and the red line boundary of this site is shown in Figure B.3 in Appendix B; however, this may be subject to change during the iterative design process and upon confirmation of the constructability assessment.

A crane is also likely to be required and the initial constructability review has indicated that an area of land between the apartments on Little Neville Street and railway viaduct would be suitable (see Figure B.2). The Draft Order limits for the TWA application will include the land which will be temporarily used for oversailing of the crane; however, whilst the effects that the crane may have will be considered, the actual area to be oversailed is not considered to be part of the red line site boundary for the purposes of the EIA. The loading/unloading area for construction traffic and the crane is anticipated to be via Little Neville Street and this area has been included within the red line boundary as shown in Figure B.2 in Appendix B.

2.5 Programme Outline

The current programme is dependent on third party approvals and other matters outside of the project's control, therefore it may be subject to change. However, Metro is currently working towards the following target dates:

- Submission of TWAO application: March 2012
- DfT decision expected: May 2013
- Construction begins: November 2013
- Final commissioning before operational service: Late 2014

The construction programme is anticipated to start in late 2013 and be approximately 12 months in duration.

2.6 Project Justification

Leeds Station is situated on a major brick railway viaduct which straddles the River Aire at the station's location, but also generally transects the entire city centre in the vicinity. The viaduct impedes traffic and pedestrian circulation into the city centre, the only significant road link being Neville Street beneath the station, which, despite recent renovation, is constricted in its dimensions and capacity.

The main station entrances are located to the north of the viaduct primarily feeding City Square and the city centre beyond. Passengers wanting to access or exit the station from the south of the railway currently have no alternative to the existing indirect route through the tunnel of Neville Street beneath the station and up to the main station entrance on New Station Street via the ‘Rotunda’ steps.

With many new developments and regenerated areas now being completed to the south of the railway, especially Holbeck Urban Village and Granary Wharf, there is a need to develop a new entrance link which encompasses the approaches from the southern area of the city directly into the station.
3. The EIA Methodology

3.1 Technical Scope

The technical scope outlines the disciplines that will be addressed in the EIA. The EIA regulations require the ES to include, amongst other things;

"a description of the aspects of the environment likely to be significantly affected by the proposed project, including in particular:

- population;
- fauna;
- flora;
- soil;
- water;
- air;
- climatic factors;
- material assets (including the architectural and archaeological heritage);
- landscape; and
- inter-relationships between the above factors."

For the purposes of LSSE scheme, it is proposed that the following aspects and any relevant inter-relationships will be considered as part of the EIA:

- air quality;
- ecology;
- geology and soils (including contaminated land);
- historic environment;
- noise and vibration;
- socio-economics;
- townscape and visual amenity; and
- water resources.

These environmental factors were reviewed on the basis of EIA best practice, the requirements of the EIA Directives as they apply to planning applications, professional judgement, knowledge of the proposals, the previous planning application submitted in January 2011 and a review of the baseline environment.

The following topics have been scoped out of the EIA process:

- landscape; and
- waste management.

Due to the urban nature of the site and surrounding area, it is proposed that the assessment will focus on the effects on townscape, rather than landscape as this is considered more appropriate for the site setting. Waste management has been scoped out of the EIA at this stage as it is assumed that construction waste will be managed via a site waste management plan (SWMP) and it is considered unlikely that significant waste will be created through the operation of the new entrance.
Should this situation change, for example, through design development, then these topics will be reconsidered and if appropriate, scoped back into the assessment. Consultation will be undertaken with relevant consultees if such a situation arises to ensure that the revised scope is satisfactory.

Planning and policy matters will be addressed within each discipline; however, the ES will also contain a chapter that sets out the planning policy context for the scheme at national, regional and local level (see Chapter 4 for proposed planning policy scope).

### 3.2 Temporal Scope

The ES will address effects arising from the construction, temporary and permanent land take and operation of LSSE as follows:

- construction effects that may arise directly from construction activities (e.g. piling) and from the temporary use of land (e.g. construction site compounds), or from associated changes in traffic movements (e.g. diversions); and
- operational effects that may arise from the new infrastructure associated with LSSE.

The temporal scope may vary for specific disciplines but will generally extend from commencement of construction works until 15 years after commencement of operations.

### 3.3 Spatial Scope

The spatial scope is the geographical area that will be covered by the EIA. The definition of the spatial scope has taken account of:

- the footprint of the proposed works;
- the nature of the existing baseline environment;
- the manner in which effects are likely to be propagated (e.g. effects on watercourses may extend some distance downstream);
- the area affected (positively and negatively) by transport movements; and
- the geographical boundaries of the political and administrative authorities which provide the planning and policy context for the project.

The above text sets out the basic principles to define the spatial scope. The spatial scope may vary for each discipline, as described in the sections in Chapter 4.

### 3.4 Baseline

Environmental effects will be described in terms of the extent of change to the baseline environment. This baseline is generally taken to mean the environmental conditions that are prevalent at the time of the assessment or predicted to be the case at key points in the scheme’s development.

Baseline environmental conditions, including those that are predicted to exist immediately prior to the construction and operation of the LSSE as well as those currently existing, will be identified by a number of means. They can be identified solely through desk-based review of existing and available data, or through undertaking additional surveys, studies and modelling where considered necessary.

During the EIA process, relevant resources and receptors will be identified for each environmental topic and an appropriate baseline determined in respect of these. Resources are defined as the biophysical
feature or item, such as elements of ecological, landscape or heritage value, watercourses, dwellings, places of employment and community facilities. Receptors comprise human beings, either collectively or individually, and the socio-economic system upon which they depend.

Each of the environmental disciplines will prepare a baseline section for the ES in respect of their particular topic area. This will document the baseline conditions upon which the assessment of their topic area has been based. The baseline sections will be amended throughout the EIA process as new information emerges in line with the design development and with the consultation process. Where a significant volume of information is held for certain disciplines, separate baseline reports may be prepared and will be presented as technical appendices to the ES.

The main ES report will clearly set out the following aspects for the baseline:
- sources of information used;
- methodology used for any additional survey or modelling work;
- extent of consultation with external bodies;
- any limitations pertaining to the baseline information or to the collation process; and
- the spatial extent of the search area.

3.5 Assessment of Effects

An ES must report the likely significant environmental effects (whether beneficial or adverse) that will result from the construction and operation of the scheme. There is no statutory definition of what constitutes a significant effect. However, the primary purpose of identifying the significant effects of a scheme is to inform the decision maker so that a balanced decision in respect of the development can be reached. On this basis, and in accordance with established EIA practice, a significant effect is considered to be: “an impact that, in isolation or in combination with others, should in the opinion of the EIA team be taken into account in the decision-making process.”

The significance of an effect is assessed by looking at the change against existing and/or predicted baseline conditions as a result of the construction and operation of the scheme. The way that the significance of an effect is determined varies for each topic, but in broad terms it is the product of the degree of change (or the magnitude of the effect) and the sensitivity or value of the receptor or resource that is affected. The individual methodologies used for the assessment of significance of effects for each of the technical areas are shown in Chapter 4.

The following type of effects will be considered:
- **direct effects** - effects that arise from activities that form an integral part of the project (e.g. land take and new infrastructure);
- **indirect effects** - effects that arise from activities not explicitly forming part of the project (e.g. noise changes due to an increase or decrease in road traffic flows on existing roads resulting from construction vehicles accessing the site);
- **secondary effects** - effects that arise as a consequence of a direct or indirect effect of constructing or operating the scheme (e.g. reduced amenity of a recreation facility as a result of construction noise);
- **permanent effects** - effects that result from an irreversible change to the baseline environment or which persist for the foreseeable future;
- **temporary effects** - effects that persist for a limited period only. Where possible, these will be classified as short term (less than 1 year), medium term (1 to 3 years) and long term (more than 3 years);
- **positive effects** - effects that have a beneficial influence on receptors and resources;
- **negative effects** - effects that have an adverse influence on receptors and resources;
- **combined effects** – effects on one receptor due to different impacts from the same scheme; for example, where a combination of noise, dust and visual intrusion during construction has an overall effect of disturbance on a residential area; and
- **cumulative effects** - cumulative effects can be defined as the impacts on the environment which result from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (IEMA 2004). Cumulative effects may arise from the interaction of the LSSE scheme in conjunction with other existing or proposed development projects (DTLR, 2000) on the resources and / or receptors which benefit from planning permission. The DCLG consultation paper “Environmental Impact Assessment: A guide to good practice and procedures” describes other developments as those that are ‘already begun or constructed or those that have not been commenced but have a valid planning permission’ (DCLG, 2006). These criteria will be used for the purposes of the LSSE EIA.

The above types of effects will be assessed for both construction and operational phases of the scheme.

At present, no other planning applications have been identified for developments located within the vicinity of LSSE. This situation will be kept under review; however, should this remain the case, then a cumulative assessment will not be considered necessary and will therefore not be undertaken as part of the EIA.

The ES will also describe significant environmental effects that are relevant to the scheme as a whole i.e. scheme wide effects. These may include:

- individual local effects that are significant in a national or regional context, e.g. an impact on a nationally important resource;
- effects that are attributable to the scheme as a whole, e.g. enhanced accessibility across a wide area or a recognisable contribution to economic regeneration; or
- effects that support or compromise the ability of national or regional government to achieve its objectives.

### 3.6 Mitigation

An ES should also include a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment. The identification of such measures is an iterative process which will be undertaken in parallel with the design to aid in incorporation of measures into the design during project development. This early adoption of appropriate mitigation will help reduce significant environmental effects to a practicable minimum.

Where significant effects are identified as part of the EIA, mitigation measures will be proposed to avoid or reduce these effects. Where measures are integral to the design and the scheme promoter(s) (in this case, Metro and NR) has committed to their implementation, mitigation will be termed “incorporated mitigation”. Where significant effects still remain after application of incorporated mitigation, they are termed significant residual effects and such effects will be reported within the ES.

Any further mitigation measures suggested in respect of addressing significant adverse environmental effects, but which are not incorporated into the design of the scheme for which planning permission is being sought, is termed “supplementary mitigation”. Supplementary mitigation can also take the form of enhancement measures which aim to improve existing baseline conditions. These further supplementary mitigation measures may be discussed in the ES as activities which could be potentially undertaken but
does not commit the developer to undertaking them. They will not form part of the assessment process (therefore do not reduce the level of an effect in terms of the assessment), and should not be considered as part of the application.
4. Planning Policy

The ES will include a chapter that provides an overview of the planning policy framework within which the LSSE scheme would be considered. A full policy review and assessment of compliance of the scheme will be carried out. The planning policy framework will be considered at four levels:

**European Level**

- European Transport White Paper “Roadmap to a Single European Transport Area: Towards a Competitive and Resource Efficient Transport System” (2011);
- EU Sustainable Development Strategy (2006);
- EU Air Quality Directive 2008/50/EC (2008); and

**National Level**

- Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen – White Paper (2011);
- Towards a Sustainable Transport System (2007);
- Delivering a Sustainable Transport System (2008);
- Draft National Planning Policy Framework (NPPF) (2011);
- Consultation paper on a new Planning Policy Statement: Planning for a Natural and Healthy Environment (2010);
- Planning Policy Statement 1 (PPS1): Delivering Sustainable Development (2005);
- Planning Policy Statement 1 (PPS1): Planning and Climate Change – supplement to PPS1;
- Planning Policy Statement 4 (PPS4): Planning for Sustainable Economic Growth (2009);
- Planning Policy Statement 5 (PPS5): Planning for the Historic Environment (2010);
- Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation (2005);
- Planning Policy Statement 10 (PPS10): Planning for Sustainable Waste Management (2005);
- Planning Policy Guidance 13 (PPG13): Transport (2011);
- Planning Policy Statement 23 (PPS23): Planning and Pollution Control (2004);
- Planning Policy Guidance 24 (PPG24): Planning and Noise (1994);
- Planning Policy Statement 25 (PPS25): Development and Flood Risk (2010);
- Draft Planning Policy Statement: Planning for a Natural and Healthy Environment (2010); and

**Regional Level**

- The Yorkshire and Humber Plan: Regional Spatial Strategy to 2026 (2008);
- The Regional Adaptation Study for Yorkshire and Humberside (2009);
- Northern Way Growth Strategy: Moving Forward: The Northern Way (2004);
- Regional Economic Strategy for Yorkshire and the Humber (2006-2015);
- Integrated Regional Framework – Growing Together (2008);
- Revised Regional Climate Change Plan for Yorkshire and the Humber (2009); and

**Local Level**

- Saved policies of the Leeds Unitary Development Plan (originally adopted in 2001 and Review published in 2006);
- Emerging Local Development Framework (including the draft Core Strategy and other draft Development Plan Documents); and
- Supplementary Planning Guidance and Documents.
5. EIA Technical Scope and Methodologies

5.1 Introduction

This chapter provides information about the scope and methodologies for the specialist impact assessments which will form the EIA and be presented within the ES. Each topic is presented in a separate section which provides the discipline-specific approach to the following:

- potential impacts of the project;
- assessment scope;
- resources and environmental receptors pertinent to the assessment;
- baseline conditions;
- assumptions and limitations;
- predication of significant effects;
- evaluation of significant effects; and
- mitigation and significant residual effects.

5.2 Air Quality

5.2.1 Introduction

The proposed scheme has the potential to cause air quality effects during the construction phase and, to a limited degree, the operation phase. The key pollutants for consideration within the assessment of air quality effects are:

- nitrogen oxides (NO\(_x\)), particularly nitrogen dioxide (NO\(_2\));
- fine particles (particulate matter defined as those less than 10 and 2.5 microns in diameter; PM\(_{10}\) and PM\(_{2.5}\) respectively); and
- dust (defined as particulate matter in the size range 1-75 microns in diameter).

No assessment is considered necessary for emissions of any pollutants other than those identified above as no significant emission sources of these pollutants are introduced or affected by the scheme.

In the UK, the presence of the above pollutants in ambient air is managed through legislation (including that transposed from EU Directives) and Government policy. With respect to NO\(_x\), NO\(_2\), PM\(_{10}\) and PM\(_{2.5}\) a key tool in this management process is the establishment of air quality ‘limit values’ and ‘objectives’. Air quality limit values and objectives specify the ambient concentration of a pollutant, a time period over which that concentration is measured, and a date by which compliance with the limit value or objective should be achieved.

No statutory numerical criteria exist in relation to concentrations of dust in ambient air, or that deposited to land or other surfaces, and therefore none are included within Table 5.1 below. However, Section 79(1)(d) of the Environmental Protection Act 1990 defines a ‘statutory nuisance’ as “any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance”. Where a local authority is satisfied that a statutory nuisance exists, or is likely to occur or recur, it must serve an abatement notice. Failure to comply with an abatement notice is an offence. However, it is a defence if an operator employs the best practicable means to prevent or to counteract the effects of the nuisance.
Part IV of the Environment Act 1995 requires that every local authority shall periodically carry out a review of air quality within its area, including likely future air quality. As part of this review, the authority must assess whether air quality objectives are being achieved, or likely to be achieved within the relevant periods. Any parts of an authority’s area where the objectives are not being achieved, or are not likely to be achieved within the relevant period must be identified and declared as an Air Quality Management Area (AQMA). Further discussion of AQMAs within Leeds is presented in the following sections.

The air quality objectives specifically for use by local authorities in carrying out their air quality management duties are set out in the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002. Reference should also be made to the Air Quality Standards Regulations 2010 which came into force in June 2010 implementing relevant parts of EU Directive 2008/50/EC on ambient air quality.

The Environment Act requires that the UK Government produces a national ‘Air Quality Strategy’ (AQS) containing standards, objectives and measures for improving ambient air quality and to keep these policies under review. The current AQS was made in 2007 under Section 80 of the Environment Act 1995.

On the basis of the above, numerical environmental quality standards relevant to the assessment are summarised in Table 5.1 hereafter referred to as air quality ‘objectives’.

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<td>-</td>
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<tr>
<td>Particulates (PM₂.₅)</td>
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<td>25 µg.m⁻³</td>
<td>-</td>
<td>1st January 2015(b) 2020(c)</td>
</tr>
</tbody>
</table>

Notes:  
(a) Air Quality (England) Regulations 2000 (as amended)  
(b) Air Quality Strategy 2007  
(c) EU Directive 2008/50/EEC on ambient air quality and cleaner air for Europe  
(d) For the protection of vegetation and ecosystems

Planning Policy Statement (PPS) 23 - Planning and Pollution Control offers guidance to local authorities on the relationship between controls on development under planning laws, and under pollution control legislation. PPS23 states that any air quality consideration that relates to land use and its development is capable of being a material planning consideration. However, it specifies that compliance with statutory air quality objectives is a material planning consideration and notes that effects on air quality are likely to be particularly important where:

- the development is proposed inside, or adjacent to, an AQMA as designated under Part IV of the Environment Act 1995;
- the development could in itself result in the designation of an AQMA; and/or
to grant planning permission would conflict with, or render unworkable, elements of a local authority's Air Quality Action Plan.

PPS23 advises that not all planning applications for developments inside or adjacent to AQMAs should be rejected if developments would result in a deterioration of local air quality. Local Planning Authorities (LPA), transport authorities and pollution control authorities should explore the possibility of securing mitigation measures that would allow the proposal to proceed.

When considering planning applications, which may raise issues concerning ambient air quality, planning authorities should bear in mind the following:

- air quality within AQMAs is subject to local variation e.g. increases are likely along heavily trafficked roads. An air quality assessment at the proposed development site can clarify its position within the AQMA and where possible may result in less onerous mitigation than the AQMA average might otherwise suggest;
- where developments include housing, hospitals, schools, nurseries or elderly persons homes within or close to an AQMA, the LPA needs to consider the location of opening windows and doors in relation to the local exposure source;
- emissions from point sources may be more easily be controlled and mitigated than an increase in diffuse pollution from vehicles associated with the new development. However, changing travel patterns may alter overall emissions; and
- air quality deterioration may be cumulative therefore LPAs will need to consider the effects of multiple developments, and effects of additional load from further development proposals.

PPS23 provides guidance on the relationship between provisions under the Environmental Protection Act 1990 to protect against pollution that causes statutory nuisance and those provided by the planning system. It notes that LPAs should consider potential loss of amenity as a result of emissions associated with proposed developments during the planning process, as significant loss of amenity will often occur at lower levels of emission than would constitute a statutory nuisance.

5.2.2 Potential impacts

5.2.2.1 Construction

Impacts during the construction phase of LSSE which have the potential to affect local air quality include:

- emissions associated with on-site plant and vehicles used in the construction of the scheme;
- emissions associated with construction traffic on the local road network;
- emissions associated with diversions/changes to base traffic flows on the local road network; and
- on-site dust emissions arising from construction activities and vehicle movements. Dust can be mechanically transported (either by wind or re-suspension by vehicles). It can also arise from wind erosion on material stock piles, earth moving etc.

5.2.2.2 Operational

Impacts during the operation phase of LSSE which have the potential to affect local air quality include:

- changes in emissions associated with changes in traffic flows (including composition and speed) on the local road network; and
changes in road layout which may bring road traffic emission sources closer to, or farther away from, sensitive receptors, including within AQMAs.

At this stage it is anticipated that these effects would be limited as the scheme will not significantly alter features of the road layout which could change the nature, quantity or location of vehicle emissions.

5.2.3 Scope

5.2.3.1 Spatial scope

Impacts on air quality arising from dust emissions from construction site activities and traffic are unlikely to occur more than 200m from the location in which they are carried out and hence the primary spatial scope for construction impacts will be confined to a study area within 200m of construction activity and site compounds, which for the purposes of the EIA will include barge loading/unloading site on Water Lane (as shown by the red circle in Figure B.1 in Appendix B).

For impacts on air quality arising from traffic, guidance advises that contributions from vehicle emissions are generally imperceptible above background concentrations farther than 200m from the source. Therefore, for the assessment of road traffic emissions, consideration will not be given to receptors which are located farther than 200m away from any affected roads. The assessment will primarily focus on those receptors likely to experience the highest concentrations and/or greatest change in concentrations as a result of the scheme. Such receptors are normally located close to the roadside.

At this stage it is not possible to identify which roads will undergo sufficient changes in traffic flows or warrant inclusion within the assessment as traffic flow data is currently unavailable. However, Environmental Protection UK suggests that the following should be considered in determining which roads are to be assessed and therefore determine the spatial scope of the assessment:

- a change in annual average daily traffic (AADT) or peak traffic flows of greater than ±5% (if within an AQMA) or ±10%; or
- a change in vehicle speed of more than ±10 kph on a road with more than 10,000 AADT (5,000 if ‘narrow and congested’); or
- a change in the number of Heavy Duty Vehicles (HDV) by around 200 movements or more per day.

LCC have currently declared six AQMAs, all of which come under one AQMA Order (AQMA No. 1, declared 1st July 2010). All of these have been declared due to exceedences of the nitrogen dioxide ($NO_2$) annual mean objective and all 6 of them are in residential areas. This new AQMA order replaces previous AQMAs which have since been revoked, including one for $PM_{10}$ and 3 smaller areas for annual mean $NO_2$.

Areas 1/10, 2/10 and 3/10 were all included in the original 2001 AQMA Order for exceedences of the NO$_2$ annual mean objective but have since been enlarged to include adjacent roads. They are all located near each other along the ring road, close to the city centre. Of these, the closest to Leeds Rail Station is Area 3/10, which is approximately 800m from the site at its closest point. Areas 2/10 and 1/10 are approximately 1 kilometre (km) and 1.4km from the station respectively. Area 4/10, a newly declared area for the 2010 AQMA Order, is roughly 4.3km north-west of the train station in the Kirkstall area. Area 5/10 is approximately 2km south-west of the station, near the A643 junction of the M621 and area 6/10 is in Morley, nearly 6.5km south-west of Leeds rail station. On this basis, no consideration of the proposed scheme’s potential impact on the declared AQMAs is required.
5.2.3.2 Temporal scope

For construction, the assessment will be based on the construction period and key phases within it. The period for which any identified receptors may be exposed will also be considered.

Consideration will be given to the operational effects resulting from changes in road traffic emissions for the opening year based on the affected roads identified.

5.2.4 Resources and receptors

The assessment will consider the resources and receptors in the study area, including those identified in Table 5.2.

Table 5.2: Air quality resources and receptors

<table>
<thead>
<tr>
<th>Resource/Receptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential properties</td>
<td>Residential properties in the study area</td>
</tr>
<tr>
<td>Sensitive community facilities</td>
<td>For example: hospitals, schools</td>
</tr>
<tr>
<td>Amenity areas</td>
<td>For example: parks and paths, sport facilities</td>
</tr>
<tr>
<td>Commercial properties</td>
<td>Commercial properties in the study area</td>
</tr>
<tr>
<td>Designated Sites</td>
<td>Sensitive vegetation and ecosystems</td>
</tr>
</tbody>
</table>

The air quality objectives are applicable at specific locations related to the various averaging periods over which they are measured (see Section 5.2.1). The receptors described in Table 5.2 will therefore be assessed in accordance with the guidance provided in Table 5.3.

Table 5.3: Locations where the air quality objectives are applied

<table>
<thead>
<tr>
<th>Averaging Period</th>
<th>Objectives should apply at:</th>
<th>Objectives should generally not apply at:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Mean</td>
<td>All locations where members of the public might be regularly exposed, or at designated sites</td>
<td>Building façades of offices or other places of work where members of the public do not have regular access. Sites designated for geology or aquatic environments</td>
</tr>
<tr>
<td>24 Hour Mean</td>
<td>Building façades of residential properties, schools, hospitals, libraries.</td>
<td>Gardens of residential properties.</td>
</tr>
<tr>
<td>1 Hour mean</td>
<td>All locations where the annual mean objective would apply.</td>
<td>Kerbside sites (as opposed to locations at the buildings façades), or any other location where public exposure is expected to be short-term.</td>
</tr>
</tbody>
</table>

5.2.5 Baseline

5.2.5.1 Sources of information

The method for determining and appraising baseline conditions will be based on that proposed in best practice guidance for EIAs and will involve a desk study only. The primary sources examined in the desk study will include:
5.2.5.2 Baseline surveys

It is considered that there are sufficiently robust air quality data publicly available for the study area. For this assessment, the most representative publicly available air quality data will be derived from LCC air quality monitoring sites and air quality background data available from Defra's UK AIR website.

5.2.6 Assumptions and limitations

5.2.6.1 Assumptions concerning the baseline

Assessments will be based on the most recent data available for the study area. Projections of background air quality concentrations for future years will be based on guidance provided by Defra.

5.2.6.2 Assumptions concerning prediction of impacts

The assessment of impacts from vehicle emissions will rely on traffic data, which may include predicted averaged speeds and traffic flows, provided by the project traffic consultants and therefore any assumptions made in the production of the traffic data will also be relied upon in the air quality assessment.

5.2.7 Prediction of effects

5.2.7.1 Construction

Emissions of construction dust are associated with the movement and handling of minerals and therefore predominantly composed of the larger fraction of this range which does not penetrate far into the respiratory system. Particles such as PM_{10} and PM_{2.5} which have a greater potential for health effects normally represent a smaller fraction of emissions. Therefore, the primary air quality issue associated with construction phase dust emissions is loss of amenity and/or nuisance caused by, for example, soiling of buildings, vegetation and washing and reduced visibility. There is no formally recognised methodology for determining these effects and, as described above, no statutory environmental quality standards for which to compare levels of deposited dust or concentrations in air.

The usefulness of numerical criteria to determine effects from construction dust is limited as the perception of loss of amenity or nuisance is affected by a wide range of factors such as character of the locality and sensitivity of receptors. As a result, assessment methodologies that are based on a qualitative approach are advocated in a range of guidance, including that produced by the Mayor of London, Buildings Research Establishment and Defra. On this basis, a qualitative approach will be adopted for the assessment based on key issues identified in the guidance described above. Key stages in the assessment will be the identification of potential dust raising activities, the locations and types of sensitive receptors and resources and any other existing exacerbating or controlling factors such as meteorological conditions and screening.

Construction plant and vehicles are a source of the same pollutants as those associated with road traffic. If the potential exists for significant change in traffic flows as a consequence of construction or significantly increased levels of road traffic pollutants caused by traffic congestion or increased traffic flows on diversionary routes during construction, then local air quality effects will be assessed using the
methodology set out for the operational phase assessment. Consideration will also be required of emissions associated with deliveries by barge from the Water Lane loading/unloading area as shown by the red circle in Figure B.1 in Appendix B. Due to the expected location and quantity of these emissions, a qualitative assessment will be carried out based on the number of barge movements required.

5.2.7.2 Operation

As described above, it is anticipated that the operational phase impacts of the proposed scheme will be limited. If necessary, effects on ambient pollutant concentrations as a result of road traffic emissions will be assessed using the Design Manual for Roads and Bridges Screening Model. The model output will be used to consider:

- the relative and absolute changes in concentrations of NO\textsubscript{2} and PM\textsubscript{10} as a result of the scheme;
- whether or not there is an exceedence of relevant air quality objectives; and
- the number of resources and receptors affected.

5.2.8 Evaluation of effects

5.2.8.1 Importance of receptors

Receptors described in Section 5.2.4 will be considered as part of the air quality assessment. Evaluation of effects on local air quality from the proposed scheme will be assessed against the significance criteria established in the sections below.

5.2.8.2 Magnitude of effect

A number of approaches can be used to determine whether the potential air quality effects of a development are significant. However, there remains no universally recognised definition of what constitutes ‘significance’ for air quality effects.

Guidance is available from a range of regulatory authorities and advisory bodies on how best to determine and present the significance of effects within an air quality assessment. It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively.

Any description of an effect of a development is informed by numerical results. However, an element of professional judgement must also be involved. To ensure that the descriptions of effects used within the assessment are clear, consistent and in accordance with recent guidance, definitions for the assessment of road traffic emissions will be adapted from the Environmental Protection UK (EPUK) Development Control: Planning for Air Quality 2010 guidance. Table 5.4 provides descriptors for changes in NO\textsubscript{2} and PM\textsubscript{10} concentrations as a result of proposed scheme.

<table>
<thead>
<tr>
<th>Description</th>
<th>NO\textsubscript{2}/PM\textsubscript{10} Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Increase / decrease &gt;10% of the Air Quality Standard</td>
</tr>
<tr>
<td>Medium</td>
<td>Increase / decrease 5-10% of the Air Quality Standard</td>
</tr>
<tr>
<td>Low</td>
<td>Increase / decrease 1-5% of the Air Quality Standard</td>
</tr>
<tr>
<td>Negligible</td>
<td>Increase / decrease &lt;1% of the Air Quality Standard</td>
</tr>
</tbody>
</table>

Note: Adapted from EPUK Guidance
The magnitude of any change identified must be considered in the context of existing air quality conditions within the study area to determine the significance of that magnitude. The most important aspects to consider are whether existing concentrations are above or below the relevant air quality objectives and whether existing receptors are within an AQMA.

5.2.8.3 Level of significance

Table 5.5 provides descriptors for the significance of air quality effects based on the magnitude of change in the context of existing conditions. Table 5.4 is applicable to receptors where concentrations increase or decrease as a result of the proposed scheme. EPUK recognise that professional judgement is required in the interpretation of air quality assessment significance. Table 5.5 is intended as a tool to help interpret the results to the air quality assessment and will therefore be employed in conjunction with professional judgement.

<table>
<thead>
<tr>
<th>Absolute Concentrations in Relation to Objective / Limit Value</th>
<th>Increase with Scheme</th>
<th>Decrease with Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above objective/limit value with scheme (&gt; Standard)</td>
<td>Minor adverse</td>
<td>Minor beneficial</td>
</tr>
<tr>
<td>Just below objective/limit value with scheme (&gt;90% of the Standard)</td>
<td>Minor adverse</td>
<td>Minor beneficial</td>
</tr>
<tr>
<td>Below objective/limit value with scheme (&gt;75% of the Standard)</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Well below objective/limit value with scheme (&lt;75% of the Standard)</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Change in Concentration \(^{(a)}\)

<table>
<thead>
<tr>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor adverse</td>
<td>Moderate adverse</td>
<td>Major adverse</td>
</tr>
<tr>
<td>Minor adverse</td>
<td>Moderate adverse</td>
<td>Moderate adverse</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
<td>Minor adverse</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
<td>Minor beneficial</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
<td>Minor beneficial</td>
</tr>
</tbody>
</table>

Source: EPUK Guidance.
Note: \(^{(a)}\) A negligible change would not be considered significant.

Using the above framework, in conjunction with professional judgement, effects classed as ‘major’ and above will be considered significant.

As described in Section 5.2.7.1, the assessment of construction phase dust effects will follow a qualitative approach and therefore an evaluation of effects based on numerical results is not possible. Nevertheless, the criteria of the assessment will be structured to ensure that conclusions are made based on a clear and logical framework. Key elements taken account of in the evaluation of effects will be:

- classification of dust emission potential for activities to be carried out;
- identification of impact magnitude based on the emission potential and length of time the activities will be carried out; and
- identification of receptor sensitivity based on type and distance from the emission source.

The significance of other impacts relating to the operational phase of the scheme (such as those on any affected designated sites) will be assessed qualitatively in the absence of any other formal assessment guidelines. In determining significance of impacts, consideration will be given to any standards against which the impacts can be assessed, the prevailing conditions to which the scheme may contribute and the presence of any receptors that might be affected.
Mitigation strategies for any identified impacts from the construction and operational phases, as identified above, will be provided based on advice from recognised bodies as well as from previous project experience. Any significant effects remaining following consideration of incorporated mitigation will be classed as significant residual effects.

5.2.9 Mitigation and significant residual effects

Mitigation strategies for any identified impacts from the construction phase, as identified above, will be provided based on advice from recognised bodies as well as from previous project experience. This will enable subsequent assessment of any significant residual effects remaining after application of mitigation.

Incorporated mitigation will also be documented within the Code of Construction Practise (CoCP) and Environmental Management Plan (EMP) for the scheme, which will be implemented throughout the construction period. The EMP will identify a series of measures to reduce the environmental effects during the construction period and will cover environmental and safety aspects affecting the interests of residents, businesses, the general public and the natural environment in the vicinity of the works.

5.3 Ecology

5.3.1 Introduction

This section presents the methodology and scope for assessing impacts and associated effects of the project on ecological features and receptors as a result of the proposed works. The scope of works for ecology has been significantly reduced due to the availability of information produced for the planning application which includes an ecological assessment (Faber Maunsell AECOM, April 2009), bat survey report (AECOM, July 2009), an addendum to the ecological assessment (AECOM, December 2009) and an updated bat survey report (Access Ecology, August 2011) which will be fully utilised for the baseline sections.

5.3.2 Potential impacts

5.3.2.1 Construction

Potential ecological impacts anticipated to arise during the construction works include the following:

- noise and vibration and associated dust deposition on foliage;
- temporary land take;
- temporary drainage arrangements;
- temporary fragmentation of habitats due to vegetation clearance;
- disturbance of aquatic environment;
- creation of barriers to animal movement;
- loss of habitats and disturbance for protected species through vegetation clearance;
- creation of barriers to animal movement;
- disturbance due to human presence; and
- accidental pollution of watercourses from dust and spillages.

5.3.2.2 Operation

Potential ecological impacts anticipated to arise during the operational phase include the following:
- permanent land take;
- permanent loss of habitats and disturbance for any protected species present;
- permanent structure within aquatic habitat;
- fragmentation of habitats due to vegetation clearance and associated habitat loss;
- permanent creation of barriers to animal movement;
- positive reinstatement or creation of habitats; and
- enhancement through changes in habitat management.

### 5.3.3 Scope

#### 5.3.3.1 Spatial scope

The spatial scope will comprise the site area and a buffer of 500m around the site. It is not intended that any surveys will be undertaken, but desk study information will be obtained in order to verify and update, if needed, the existing information as documented in Section 5.3.5.1.

#### 5.3.3.2 Temporal scope

The temporal scope of the assessment covers the construction period, commencement of operations and a period of 15 years thereafter.

### 5.3.4 Resources and receptors

#### Designated sites

There are no statutory biodiversity sites within or adjacent to the site.

There are three non-statutory designated sites with 2km of the site. These are:

- the Leeds Liverpool Canal – Site of Ecological and Geological Importance (SEGI), approximately 100m south of Leeds Station (National Grid Reference (NGR) SE 297 331) upstream to a point north of Armley Museum (NGR SE 273 342). In the citation it is described as one of the best examples of a linear wetland habitat in the county;
- Aireside Embankment Leeds Nature Area (LNA) (NGR SE 298 833) adjacent to the site (right bank looking downstream); and
- St Matthew’s LNA, NGR SE 291 322, 1.75km to the east of the site in Holbeck.

Leeds Nature Areas are areas within the city that have higher levels of fauna and flora to allow people who live in the city access to nature.

#### Habitats with biodiversity value

The proposed development site consists mainly of a section of river that is highly canalised with steep high sided stone or metal piled banks with very limited natural features, aquatic habitat or bankside vegetation. The area between the development area and the riverbank consists of heavily disturbed bare ground, patchy tall ruderal vegetation and grass species. According to the previous ecological report (Faber Maunsell AECOM, April 2009), these areas are of low botanical diversity and of limited ecological value.
Protected and notable species

The site was described in the Bat Survey Report (AECOM, July 2009) as having low to medium potential to support roosting, commuting and bats; all 18 UK species of bats are European Protected Species under the Conservation of Habitats and Species Regulations 2010; and seven species are on the UK Biodiversity Action Plan (BAP). Surveys were initially carried out in 2009 by AECOM which identified no roosts but the River Aire was used by a small number of common pipistrelles *Pipistrellus pipistrellus* for foraging. These surveys were updated in July and August 2011, as documented in the Bat Survey Report (Access Ecology, August 2011). This confirmed the results found in the previous survey work.

According to the previous ecological assessment (Faber Maunsell AECOM, April 2009), the site has potential to provide habitat for nesting birds. These could be within trees, buildings or nesting on the ground. All nesting birds, their nests, eggs and dependent young are protected under the Wildlife and Countryside Act 1981 (as amended) whilst the nest is active.

The previous ecological assessment (Faber Maunsell AECOM, April 2009) documents that otters are known to be using the River Aire. During the survey work, carried out in 2009 for the ecological assessment, two spraints were found. This confirms data records which suggest that otters are using the watercourse, probably for commuting in this area. No holts were found but some areas were inaccessible to the surveyors. The footprint of the entrance was deemed to have no potential for holts due to the lack of suitable vegetation.

There are no records of invasive species within the development footprint according to the previous ecological assessment (Faber Maunsell AECOM, April 2009).

5.3.5 Baseline

5.3.5.1 Sources of information

The following existing reports prepared for the site will be reviewed:

- Leeds Station Southern Entrance - ecological assessment (Faber Maunsell AECOM, April 2009);
- Leeds Station Southern Entrance - addendum to the ecological assessment (AECOM, December 2009);
- Leeds Station Southern Entrance - bat survey report (AECOM, July 2009);

5.3.5.2 Desk study

The previous reports prepared for the site and outlined in Section 5.3.5.2 will form the basis of the desk study, along with consultation with the local records centre for updated species records and details of locally designated sites. Up-to-date data on statutory designated sites will also be obtained form the Multi-Agency Geographic Information for the Countryside (MAGIC) website (magic.defra.gov.uk).

5.3.5.3 Baseline surveys

It is intended to undertake only a brief site visit to confirm whether or not conditions have remained constant since the time of the previous ecological surveys undertaken. It is not intended to conduct a full Phase 1 habitat survey or to undertake any detailed protected species surveys at this stage, due to the availability of relatively recent survey data collected for the project. A visit will also be made to the potential
Leeds Station Southern Entrance

barge loading/unloading site at Water Lane to determine if any potential ecological habitats are present, as no previous baseline surveys have been undertaken at this location.

5.3.6 Assumptions and limitations

5.3.6.1 Assumptions concerning the baseline

The ecology assessment for the LSSE project will be primarily based on the existing environmental baseline information as outlined in Section 5.3.5.1 which has been undertaken by Faber Maunsell AECOM and Access Ecology. Due to the dates when the ecological surveys were undertaken, the results are considered to be sufficiently up to date for the purposes of this ES. It is assumed that the findings presented with the reports outlined in Section 5.3.5.1 is accurate.

Biological records are only based on the information that is available at the time for the site. Therefore, a lack of species records does not imply that the species is necessarily absent from any given area.

It should be noted that the absence of records of certain protected or rare species does not preclude their presence on a site. There is always a risk of protected or rare species being over-looked, either owing to the timing of the survey or the scarcity of the species at the site. In addition, the protected species surveys from the previous ecological assessments upon which the EIA is based will cover a single season rather than being drawn from any long term data sets (although the previous studies offer some context), and so the baseline description of the project area prior to development is largely based on a narrow window of time. Desk-based information and data has been used to inform the baseline description, which is based on previous field surveys and the professional judgement of the assessors.

5.3.6.2 Assumptions concerning the prediction of effects

The prediction of impacts and the description of the ecological baseline will be based largely on a third party’s survey data which is was obtained during a single season of field surveys for habitats and protected species, rather than on long term data sets spanning multiple years. Therefore, baseline information and impact assessment is based on a relatively limited data set, although desk study elements, such as long term species records and information on designated sites help to set the field survey data in context. In addition, information on concurrent developments in the same area and on long term changes in the distribution of species and habitats in the Zone of Influence (ZoI) is limited.

5.3.7 Prediction of effects

The prediction of ecological effects takes into account the importance of each ecological resource/feature, known as an ecological receptor, and the magnitude, duration, reversibility, extent, timing and frequency of impacts on the receptors. The evaluation of receptors uses a geographical frame of reference, using the baseline data and assessors’ professional judgement, to determine the relative value of receptors.

An effect is considered to be significant if it affects an ecological receptor above a certain threshold value. If the receptor is below that threshold value, then effects to it are not considered to be significant. This approach is in accordance with the IEEM (2006) guidance on Ecological Impact Assessment (EclA). For the purposes of this assessment the threshold value for effects to a receptor to be considered significant has been set at local.
5.3.7.1 Construction

Prediction of construction effects will focus on activities that will directly and indirectly affect the integrity of ecological receptors within the ZoI. This will include activities such as:

- vegetation clearance and associated habitat loss (temporary and permanent);
- noise and vibration and associated disturbance;
- disturbance resulting from site works;
- land take leading to habitat loss (temporary and permanent); and
- accidental pollution of watercourses (the River Aire).

Potential impacts will be assessed with regard to their:

- extent;
- magnitude;
- severity;
- duration;
- reversibility;
- timing (e.g. if they occur in a breeding season); and
- frequency.

5.3.7.2 Operation

Prediction of operational effects will focus on activities that will directly and indirectly affect the integrity of ecological receptors within the ZoI. This will include activities such as:

- land take (including within the River Aire) leading to permanent habitat loss;
- increased human activity and lighting and associated disturbance; and
- maintenance and management of vegetation.

Potential impacts from operation are outlined in Section 5.3.2.2. They will be assessed with regard to their:

- extent;
- magnitude;
- severity;
- duration;
- reversibility;
- timing (e.g. if they occur in a breeding season); and
- frequency.

5.3.8 Evaluation of effects

Effects are evaluated based on the importance or value of each receptor and the importance of the effects to those receptors. Effects are considered significant only if the receptors in question are of at least local value, as outlined below.

The levels of value assigned to ecological receptors include:

- International;
- UK;
- National (England);
- Regional (Yorkshire and Humber);
- County (West Yorkshire);
- District (Leeds);
- Local or parish (i.e., individual boroughs in Leeds);
- less than local (i.e., within a few streets of the site but across a wider area than just within the site footprint; and
- within zone of influence (ZoI) only (i.e. the development footprint).

In this case, the ZoI is the LSSE site footprint unless otherwise stated for specific animal groups. Where no signs were found and/or where the habitats were deemed unsuitable for an ecological receptor, a grading of ‘no value’ will be assigned.

Some of the criteria to be used in the assessment of value of ecological features and resources are: designation of the site; rarity of the species or habitats supporting them; presence of Red Data Book (RDB) or endemic species; habitat diversity and connectivity; presence of UK BAP and local Biodiversity Action Plan (BAP) species and habitats (IEEM, 2006).

An impact is considered likely to be significant for nature conservation if it affects an ecological receptor of sufficiently high value or conservation importance. If the receptor is below that value, then effects upon it are considered to be non-significant, not only due to the magnitude of effect, but also because the receptor itself is of little nature conservation value. In this case the key level of value is set at local or above, based on the assessor’s professional judgement on which receptors were important. This ‘professional judgement’ approach is in accordance with the IEEM (2006) guidance on EcIA. Only impacts likely to be significant, i.e., effects on receptors of at least local value for nature conservation, will be assessed in detail.

Effects are also described as permanent where there is a permanent loss of habitat or any other impact that could be said to be sufficiently long term to have a permanent impact on an ecological receptor. Temporary impacts include short term and reversible disturbances such as noise during the works. Adverse impacts are those impacts that will have an adverse effect on the conservation status of the ecological receptor being assessed.

Where multiple effects with different magnitudes occur, the highest level of magnitude is used to give an overall description of magnitude. In addition, if multiple low-level effects occur, they may be cumulatively assessed as having a higher level of magnitude, allowing assessment of the worst-case effect.

The assessment will also consider combined effects, where several types of effect act on the same resources and/or receptors. In some cases it may be that several “slight” effects may, individually, be insignificant but acting together may produce a significant effect on a sensitive ecological resource. Professional judgement will be applied to the results of the assessment to identify any perceived significant combined effects of the project on ecological receptors.

Mitigation strategies for any identified impacts, as identified above, will be provided based on advice from recognised bodies as well as from previous project experience. Any significant effects remaining following consideration of incorporated mitigation will be classed as significant residual effects.

5.3.9 Mitigation and significant residual effects

Mitigation may be incorporated as part of the design (“incorporated mitigation”) in order to address effects that may otherwise would be considered significant; if possible and appropriate this may include habitat enhancements. Alternatively, mitigation may be carried out in addition to that which is inherent in the
project design, known as “supplementary mitigation”. Supplementary mitigation can also include creation of replacement habitats for any valued habitats that are lost and, if appropriate, enhancements could also be included. This latter mitigation will not be taken into consideration during the assessment. Mitigation will also take into account the possibility of obtaining protected species licenses from Natural England under the Conservation of Species and Habitats Regulations 2010 and other relevant legislation, where required.

5.4 Geology and Soils

5.4.1 Introduction

Developments such as the LSSE project can have an impact on both the geology and soils of the area. Constraints could also be imposed on the project as a result of existing ground conditions. There is also an opportunity for environmental gain through remediation where proposed works impinge on contaminated land.

Reference will be made to the Environment Agency’s (EA) Guidance on Requirements for Land Contamination Reports and the following information will be obtained and review as part of the desk study phase of the EIA:

- local authority site surveys including contaminated land surveys;
- historical information about land use in the area;
- published information on previous soil surveys in the area; and
- information compiled as part of any investigative works associated with the project

5.4.2 Potential impacts

5.4.2.1 Construction

Direct and indirect impacts on geology and geomorphology may occur during the works. This may lead to issues such as cutting through important geological exposures and creating new exposures.

Potential ground risks resulting from the proposed works include:

- risk of high groundwater affecting design and construction of the works;
- risk of exposure of site users/workers to contaminated ground or groundwater; and
- financial risks associated with the possible disposal costs of removing or remediating contaminated material off site.

5.4.2.2 Operation

With the inclusion of mitigation measures, it is considered unlikely that there will be significant impacts from soils or contaminated land during the operational phase of the scheme. It is therefore proposed to scope this aspect out of the EIA.

5.4.3 Scope

5.4.3.1 Spatial scope

This study will consider all locations where physical works and ground disturbance will take place, i.e. during the construction of foundations.
The spatial scope will be defined by the initial baseline desk studies which will identify those locations of likely geotechnical risk and contamination sources, and where pathways and pollutant linkages could result from construction activities. In addition, the desk studies will identify where the geological conditions may impact the methodology used to construct the scheme.

It is intended that a river bed intrusive investigation will be undertaken to identify the underlying conditions and assess their suitability for the proposed development. The information from the investigation will be used to inform the Geology and Soils impact assessment.

5.4.3.2 Temporal scope

The baseline scenario will consider the existing condition of the site and the current impacts on any particular resources or receptors. The future baseline will take into account any currently planned remediation works which may affect the contamination status of land affected by the project.

Assessment during the works will consider the impact and associated effects of the project on areas of potentially contaminated land within the spatial scope of the proposed project, including any remediation of any contamination if deemed to be required.

5.4.4 Resources and receptors

The following resources outlined in Table 5.6 will be considered in the assessment. It is not anticipated that these resources will all be significantly affected but it is necessary to demonstrate that these important receptors have been considered. Incorporated mitigation such as Personal Protective Equipment (PPE) and health and safety precautions for site workers will address the majority of any potential health risks associated with the project.

Table 5.6: Geology & soils resources and receptors

<table>
<thead>
<tr>
<th>Resource/Receptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated Land</td>
<td>Including site workers, local residents and users of the site area</td>
</tr>
<tr>
<td>Controlled Waters</td>
<td>Pollution could occur to aquifers and local surface watercourses</td>
</tr>
</tbody>
</table>

Potential impacts that may occur during the project include:

- health impacts from exposure of site workers and occupants of adjacent sites to contaminated soil, dust or groundwater during excavation, construction or remediation works;
- contamination of the River Aire and underlying deposits; and
- creation of pathways for potential soil, groundwater and gas contaminants, thereby increasing the likelihood of migration.

5.4.5 Baseline

5.4.5.1 Sources of information

The method for determining and appraising baseline conditions will be based on that proposed in best practice guidance for EIAs. This will involve both the desk study and intrusive ground investigation survey work.
An indicative list of sources for baseline information is given below:

- historical Ordnance Survey mapping;
- consultation with LCC;
- British Geological Survey (BGS) data including maps and boreholes;
- Department of the Environment Industry Profiles;
- EA Groundwater Source Protection Zones;
- EA Groundwater Vulnerability Maps;
- EA surface water classifications; and
- search of designated ecologically and geologically sensitive receptors (Ramsar, SSSI, RIGS);
- historical ground investigation information collated by LCC as part of their potentially contaminated land database.

5.4.5.2 Baseline surveys

Reference will be made to the EA Guidance on Requirements for Land Contamination Reports, and the following information will be obtained and reviewed as part of the desk study phase of the EIA;

- local authority site surveys including contaminated land surveys;
- historical information about land use in the area;
- published information on previous soil surveys in the area; and
- information compiled as part of any investigative works already completed, or associated with the scheme.

5.4.6 Assumptions and limitations

Principal assumptions and limitations for this assessment are as follows:

- baseline conditions will be established in part from historical data;
- potentially contaminating land uses, which may have existed between the dates of the historical OS surveys, may have been omitted from the maps;
- the presence of contamination will only be assessed based on existing site investigation and sampling data. This data will be accepted at face value and will not be validated;
- if made ground is excavated during the works, it is assumed that a policy will be adopted to re-use it elsewhere on the project where feasible; and
- the project will adopt a strategy for the disposal of any contaminated spoil which cannot be re-used elsewhere that complies with all relevant waste management legislation in order to ensure that potential significant effects from contaminated spoil disposal is avoided.

5.4.7 Prediction of effects

Potential effects arising from land contamination at the project, prior to the incorporation of mitigation measures are detailed in Table 5.7 below.

<table>
<thead>
<tr>
<th>Sensitive/Important Receptors</th>
<th>Potential Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Workers</td>
<td>Direct or indirect ingestion of contaminated soil and groundwater, inhalation, dermal contact</td>
</tr>
<tr>
<td></td>
<td>Concentration of flammable or asphyxiating gases in confined spaces</td>
</tr>
<tr>
<td></td>
<td>Inhalation of asbestos fibres during building demolition</td>
</tr>
</tbody>
</table>
The EA provides guidance on EIA with regard to contamination issues (Scoping Guidelines on EIA; The Environment Agency, May 2002). There is also a considerable body of guidance that has been prepared in order to assist both local authorities and practitioners in assessing the degree to which land is contaminated and deciding whether such land is contaminated within the meaning of the Part IIA of the Environmental Protection Act 1990 (as amended) and associated guidance.

The Environmental Protection Act provides a statutory definition of contaminated land:

“Contaminated Land is any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that…

- significant harm is being caused or there is a significant possibility of such harm being caused; or
- significant pollution of controlled waters is being, or is likely to be caused.”

Underpinning the guidance is a source-pathway-receptor methodology, which is used to identify Significant Pollutant Linkages (SPLs). The following definitions apply:

- Source/ hazard: contamination identified (exceeding corresponding guideline values);
- Pathway: the means by which the hazardous contamination can come into contact with the receptor; and
- Receptor: the entity which is vulnerable to harm from the source.

Without a significant pollutant linkage the contamination source may be a hazard but does not constitute a risk to human health or the environment. Therefore, when assessing the potential for contamination to cause a significant effect, the extent and nature of the potential source or sources of contamination must be assessed, the pathways identified, and any sensitive receptors or resources identified and appraised, to determine their value and sensitivity to contamination related impacts.

If a significant hazard has been identified and potential sensitive receptors are present, then the potential impacts will be determined by considering the pathways whereby the hazard may affect the receptors. During the assessment it will be assumed that there will be (either during or after construction) a pathway present between the source and the receptor, unless there is a clear indication that this will not be the case.

The pathway is invariably strong for site workers on contaminated sites, because they are likely to be in close proximity to the soils, particularly during groundworks. However, the effect may be weaker as the effects are acute (short-term), as opposed to being chronic (long-term).
5.4.8 Evaluation of effects

The combination of the sensitivity of the receptor and the magnitude of the effect will provide an indication of the level of contamination on the site, and the nature and severity of possible effects. It should be noted that both rankings may vary in accordance with the different scenarios being considered (i.e. baseline or during the works).

The likely severity of the effects will be assessed using the matrix in Table 5.8, in conjunction with professional judgement to consider the site specific factors that may be of relevance. Where there is no pathway, it is considered that there would be no impact.

Table 5.8: Severity of effects incorporating mitigation

<table>
<thead>
<tr>
<th>Magnitude of Impact</th>
<th>Sensitivity of Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
</tr>
</tbody>
</table>

A descriptive meaning for each of the five points on the severity of effects scale, and the corresponding significance of the impact is detailed in Table 5.9. Indicative examples of potential impacts for each scale point are included for illustration (adapted from CIRIA publication C552).

Table 5.9: Significance criteria

<table>
<thead>
<tr>
<th>Scale Point</th>
<th>Description and examples</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Negligible Impact</td>
<td>- No discernible negative effects</td>
<td>Not Significant</td>
</tr>
<tr>
<td>2 Slight Impact</td>
<td>- Easily preventable, non-permanent health effects on humans</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Minor, low-level and localised contamination of on-site soils</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Easily repairable damage to crops/buildings/infrastructure</td>
<td></td>
</tr>
<tr>
<td>3 Minor Impact</td>
<td>- Easily preventable, permanent health effects on humans</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pollution of non-sensitive water resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Localised damage to crops/buildings/infrastructure (on or off site)</td>
<td></td>
</tr>
<tr>
<td>4 Moderate Impact</td>
<td>- Medium/long-term (chromic) risk to human health</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>- Medium long-term risk of pollution of sensitive water resource or ecosystem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Significant damage to crops/buildings/infrastructure (on or off site)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Contamination of off-site soils</td>
<td></td>
</tr>
<tr>
<td>5 Major Impact</td>
<td>- Short-term (acute) risk to human health</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Short-term risk of pollution of sensitive water resource or ecosystem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Catastrophic damage to crops/building/infrastructure</td>
<td></td>
</tr>
</tbody>
</table>

Where identified, significant effects for the scheme, following the incorporation of typical mitigation measures, will be reported in the ES.
5.4.9 Mitigation and significant residual effects

Once potentially significant effects are identified, consideration will be given to how such effects can be mitigated. The approach to mitigation will focus on four aspects:

- design measures required to ensure that the final design of the project does not lead to any long term degradation of the environment;
- mitigation required prior to the commencement of works to render the site suitable for the works or to minimise existing adverse effects;
- mitigation required during the works to minimise effects on areas of contaminated ground; and
- remedial methods required to treat or, where this is not possible, appropriately remove and dispose of contaminated material.

5.5 Historic Environment

5.5.1 Introduction

This section sets out the methodology for the assessment of effects on the historic environment resource within the study area. For the purpose of this assessment, this resource is considered to include scheduled monuments, listed buildings, Conservation Areas, registered battlefields, registered historic parks and gardens and non-designated features of national, regional or local archaeological, historical or architectural interest and value. These features include archaeological remains, palaeo-environmental deposits, historic buildings, historic open spaces, historic features and the wider historic landscape. Such sites can make an important contribution to the local distinctiveness of an area and its sense of place.

The assessment to be presented within the ES will describe the baseline historic environment resource within the study area and consider the potential for previously unrecorded remains within the site of proposed works. It will describe how the proposals will impact on this resource and assess the significance and severity of the effects arising from both the construction and operational impacts.

Mitigation measures will be recommended where appropriate. The assessment will conclude with the significance of the residual effects taking into account this mitigation. Indirect, cumulative impacts and secondary effects will also be assessed and the assessment will draw on the conclusions from other disciplines notably, landscape and visual amenity, noise and vibration.

Consultation and dialogue with statutory and non-statutory consultees who have an interest in the protection, conservation and management of the archaeology and cultural heritage resource will be maintained throughout the duration of the assessment.

5.5.1.1 Existing information

A preliminary appraisal of information relating to the archaeology and built environment has been undertaken using the following data sources:

- Leeds Station Southern Entrance – Archaeology Report (April 2009);
- West Yorkshire Archaeological Services Historic Environment Record (HER);
- the National Monuments Record (NMR);
- documentary sources from the West Yorkshire Archives Service in Leeds;
- www.magic.gov.uk;
- www.lbonline.english-heritage.org.uk;
This preliminary appraisal indicated that there were no World Heritage sites, Scheduled Monuments, Registered Parks and Gardens or Battlefields within the study area. In total, forty-four sites were identified. This included eighteen listed buildings, of which two listed buildings border the red line boundary (as shown in Figure B.2), namely the river lock and retaining walls to the River Aire and the Victoria Bridge. However, neither of these listed structures will be directly impacted by the proposed scheme. The site footprint is also partially within the Central Area Canal Wharf Conservation Area, as designated by LCC. The visual impact of the proposed development will be addressed in the ES.

5.5.2 Potential effects

5.5.2.1 Construction

Construction impacts on archaeological and cultural heritage remains may arise as a result of the following activities:

- temporary and permanent land take;
- demolition and site clearance;
- excavation, ground disturbance and compaction;
- use of plant and machinery;
- building up site levels with made-ground;
- construction of new infrastructure;
- modification of existing infrastructure;
- visual intrusion and disruption to access during construction;
- creation of increased noise / dust during construction;
- diversion or alteration of existing services;
- installation of new services; and
- landscaping and planting.

These activities could lead to the following effects on the historic resource:

- total or partial loss/damage of the above- and/or below-ground archaeological remains;
- structural damage to historic buildings due to proximity of excavation, demolition works and vibration etc;
- severance or loss of features such that the physical or visual integrity of a site is compromised and the ability to understand and appreciate the remaining elements is diminished;
- long-term burial of archaeological remains;
- temporary alteration and/or visual intrusion into the historic setting/character of a designated site or undesigned site of national or regional significance;
- temporary effects on the access to, and amenity of, designated sites or undesigned sites of national or regional significance; and
- opportunity to investigate and record archaeological remains and buildings of architectural or historic interest.
There may also be cumulative effects from the accumulation of different effects on the same resource, or accumulation of impacts on the same type of receptor.

5.5.2.2 Operational

Effects from the operational phase of the scheme may arise as a result of the adverse or beneficial impacts upon the special architectural or historic interest of a designated site (or undesignated site of national importance) and its setting, character or appearance. This is of relevance to LSSE particularly due to the proximity of a Conservation Areas and several listed structures.

Impacts can arise as a result of:

- physical and visual changes arising from new or modified infrastructure;
- the scale, mass, design or form of a new development and its relationship to the designated resource; and
- changes in noise levels.

These changes could lead to the following effects on the historic resource:

- increased visual intrusion both to and from sites/buildings of national or regional importance;
- alteration to the historic setting/character of a designated site or undesignated site of national or regional significance;
- increase or decrease in noise, vibration or dust such that the amenity or physical fabric of a nationally or regionally important site is either adversely affected or improved; and
- opportunities to enhance the character and setting of a designated site or undesignated site of national or regional significance.

5.5.3 Scope

5.5.3.1 Spatial scope

Based on the location of the LSSE site, the proposed detailed study areas are as follows depending on the receptors being assessed:

- Scheduled Monuments, Listed Buildings, Conservation Areas: 1km study area; and
- other archaeological sites and finds and non-listed buildings of local importance: 1km study area.

It is has already been identified that there are no registered parks and gardens or registered battlefields within 2km of the development site and therefore they will not be considered within the EIA.

5.5.3.2 Temporal scope

The assessment will consider the significance of the effects that will arise during both the construction and operational phases based on any changes compared to the baseline (i.e. the conditions which would exist if the proposals did not go ahead). The operational effects will be assessed for the year of opening and the year of maximum growth/decline, which is normally assumed to be within 15 years of opening.

5.5.4 Resources and receptors

The assessment will consider the resources outlined in Table 5.10 below.
Table 5.10: Archaeological resources and receptors

<table>
<thead>
<tr>
<th>Resource/Receptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Monuments</td>
<td>Nationally designated (statutorily protected) sites.</td>
</tr>
<tr>
<td>Known archaeological sites and finds</td>
<td>Sites and finds as noted on the West Yorkshire Archaeological Services Historic Environment Record (HER), the National Monuments Record (NMR) database, or identified during the course of the study. Data will be collated and analysed as part of the baseline study.</td>
</tr>
<tr>
<td>Areas of archaeological potential</td>
<td>Areas with reasonable potential to contain previously unrecorded archaeological deposits, including palaeo-environmental remains. Such areas will be identified by the baseline study.</td>
</tr>
<tr>
<td>Listed Buildings</td>
<td>Nationally designated (statutory protection) sites</td>
</tr>
<tr>
<td>Conservation Areas</td>
<td>Areas designated by Leeds City Council (statutory protection)</td>
</tr>
<tr>
<td>Locally Listed Buildings</td>
<td>Undesignated historic buildings identified as being ‘valued’ for their contribution to the local scene, local architecture, or for local historical associations.</td>
</tr>
</tbody>
</table>

As identified in Section 5.5.3.1 above, there are no registered battlefields or historic parks and gardens within the defined study area for the LSSE, and therefore no assessment of such resources is required.

5.5.5 Baseline

5.5.5.1 Objectives

The principal objectives of the baseline assessment would be to:

- identify recorded archaeology and cultural heritages sites, buildings/structures and finds within the specified study areas;
- assess the potential for previously unrecorded sites of archaeological, architectural or historic interest;
- identify those features that should be retained and/or enhanced because of their intrinsic importance;
- identify those features or areas which require further evaluation in order to fully establish either importance or likely development impacts;
- assess the potential effects of the proposals in terms of the effects of construction and operational impacts on the archaeology and cultural heritage resource; and
- assess the degree of conflict and/or compliance with regional and local planning policies relevant to archaeology and the built environment.

5.5.5.2 Method

The method for determining and appraising baseline conditions will involve both desk study and field survey. The assessment will be undertaken in accordance with the published standards and guidance set out below:

- DoT (1995) Design Manual for Roads and Bridges, Environmental Assessment (Volume 11, Section 3, Part 2 – Cultural Heritage);
- DoT (2003) Transport Analysis Guidance Unit 3.3.9: the Heritage of Historic Resources; and
Consultation during the assessment process will be maintained with the following organisations and individuals:

- Leeds City Council;
- West Yorkshire Advisory Service County Council Historic Environment Record (HER); and
- English Heritage, Yorkshire and Humberside Regional Office.

### 5.5.5.3 Sources of information

Information relating to the historic environment will be obtained from the following organisations:

- West Yorkshire Archaeology Advisory Service;
- English Heritage;
- West Yorkshire Archives Service in Leeds

The information sources consulted will include:

- West Yorkshire Advisory Service County Council Historic Environment Record;
- English Heritage National Monument Record (archaeology);
- English Heritage listed buildings data base;
- Online Sources (such as MAGIC and Listed Buildings Online)
- vertical and oblique aerial photographs;
- published and unpublished sources (documentary material, archaeological studies, fieldwork reports, local histories);
- cartographic information; and
- relevant borehole and geotechnical data.

### 5.5.5.4 Baseline survey

The desk-based assessment will include a walkover survey of the proposed site. This will be undertaken to assess the character, survival, condition and setting of aspects of the cultural heritage resource. It will also assess the visual impact upon built heritage features by the proposed development.

### 5.5.6 Assumptions and limitations

#### 5.5.6.1 Assumptions concerning the baseline

The assessment will be reliant on available data provided by third parties, the accuracy of which will not be validated for the purposes of this EIA. The baseline data will be based on desk-based assessment and visual inspection, but no detailed surveys are proposed at this stage. However, databases are limited in their ability to predict new sites and the information should be seen as a starting point for further research rather than a definitive list.

#### 5.5.6.2 Assumptions concerning prediction of impacts

The current understanding of the extent and survival of archaeological remains within the study area is likely to be limited due to lack of data. The exact nature, extent, date, degree of preservation and significance of known and potential archaeological remains can be difficult to accurately predict from desk-based studies alone. The uncertainty in predicting impacts and effects upon such resources is inherent in all such studies and should be stressed. The baseline surveys will be restricted to external visual
inspection, which will limit the ability to assess the effects of visual intrusion from within property boundaries or interiors of historic buildings.

5.5.7 Prediction of effects

5.5.7.1 Construction

The prediction of construction effects will be based upon an assessment of detailed scheme drawings of the proposals, the nature and extent of groundworks, proposed construction methods and duration of construction.

5.5.7.2 Operation

The prediction of operational effects will be based on an assessment of the scheme design, and the predicted change from the existing baseline environment. Reliance will be placed on the assessment of the impacts of the operational effects from other disciplines in particular landscape and visual, noise and vibration.

5.5.8 Evaluation of effects

5.5.8.1 Importance of receptor

The importance and sensitivity of historic environment receptors will be based on Table 5.11 below. Assessment of importance is based on a combination of designated status and professional judgement. It takes into account the Secretary of State’s non-statutory criteria for the scheduling of ancient monuments; assessment criteria adopted by English Heritage as part of its Monuments Protection Programme and the Secretary of State’s Principles of Selection Criteria for Listed Buildings.

It is also recognised that occasionally sites can have a lower or higher than normal sensitivity within a local context. Assessment of sensitivity also needs to take into account the component of the site that is being affected and the ability of the site to absorb change without compromising the understanding or appreciation of the resource.

Table 5.11: Assessment of importance of archaeological resources and receptors

<table>
<thead>
<tr>
<th>Importance Scale</th>
<th>Example of Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>National (High sensitivity)</td>
<td>Scheduled Monument; Grade I or II* Listed Building; Grade I or II* Registered Park and Garden</td>
</tr>
<tr>
<td></td>
<td>Undesignated feature or landscape of national or international importance and value</td>
</tr>
<tr>
<td>Regional (High sensitivity)</td>
<td>Grade II Listed Building; Grade II Registered Park and Garden; Registered Battlefields; Conservation Areas</td>
</tr>
<tr>
<td>County (Medium sensitivity)</td>
<td>Undesignated feature or landscape of county importance and value</td>
</tr>
<tr>
<td>Local (Low sensitivity)</td>
<td>Undesignated feature or landscape of local importance and value</td>
</tr>
<tr>
<td></td>
<td>Sites so badly damaged that too little remains to justify inclusion into a higher grade</td>
</tr>
<tr>
<td></td>
<td>The receptor is tolerant of change without detriment to its character</td>
</tr>
</tbody>
</table>
5.5.8.2 Magnitude of effect

The magnitude of effect will be determined as the predicted change to the existing baseline environment during construction and operation of the LSSE. Impact and effects are described both quantitatively and qualitatively, as appropriate. The effect of this impact refers to the consequence of the change on the receptor, or particular value or sensitivity.

Table 5.12: Relationship between magnitude of impact and effect

<table>
<thead>
<tr>
<th>Magnitude of Impact</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Significant change to baseline conditions, or causing breaches of legislation or statutory objectives</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate change to baseline conditions</td>
</tr>
<tr>
<td>Low</td>
<td>Slight change to baseline conditions</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible change to baseline conditions</td>
</tr>
<tr>
<td>Nil</td>
<td>No discernible change to baseline conditions</td>
</tr>
</tbody>
</table>

5.5.8.3 Level of significance

Each type of effect will be allocated a level of significance as shown in Table 5.13.

Table 5.13: Evaluation of significance

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Low Importance</th>
<th>Medium Importance</th>
<th>High Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Nsig</td>
<td>Nsig</td>
<td>Nsig</td>
</tr>
<tr>
<td>Moderate</td>
<td>Sig</td>
<td>Sig</td>
<td>Sig</td>
</tr>
<tr>
<td>High</td>
<td>Sig</td>
<td>Sig</td>
<td>Sig</td>
</tr>
</tbody>
</table>

Key: Nsig: not significant; Sig: significant.

The assessment will also consider cumulative effects, where several types of effect act on the same resources and/or receptors. In some cases it may be that several “slight” effects may, individually, be insignificant but acting together may produce a significant effect on a sensitive archaeological resource.

5.5.9 Mitigation and significant residual effects

Mitigation measures for archaeology and cultural heritage will be incorporated at various stages during the design, construction and operation of the development. The main stages would be as follows:

- during the design stage to avoid or minimise impacts and associated effects;
- during the design stage to incorporate beneficial effects;
- in advance of construction to remedy effects;
- during construction to minimise effects; and
- after commencement of operation of the development to mitigate significant residual effects arising from the development which are unavoidable and cannot be reduced further.

Within the assessment and throughout the duration of the scheme, mitigation measures will be considered in the following hierarchy:

- first, avoid adverse effects as far as possible by use of preventative measures including scheme design;
second, minimise or reduce adverse effects to ‘as low as practicable’ levels; and
third, remedy or compensate for adverse effects which are unavoidable and can be reduced further.

5.6 Noise and Vibration

5.6.1 Introduction

The LSSE project is expected to give rise to noise and vibration impacts with the potential to cause effects at sensitive receptors in the vicinity of the site. Such effects will be considered as part of the noise and vibration assessment following the methodology outlined below.

An impact is considered to be a physical change (e.g. in the level of noise or vibration) that is expected to occur in the implementation of any aspect of the project. An ‘effect’ is considered to be the observed result of an impact with respect to the sensitivity of identified receptors.

5.6.2 Potential impacts

5.6.2.1 Construction

Potential noise impacts arising from the construction works include:
- impacts arising from the use of construction plant including piling equipment;
- impacts arising from site traffic using the public highways and accessing the site and contractors compounds; and
- activities within contractors compounds.

5.6.2.2 Operational

Potential permanent noise impacts arising from the operation of the project are currently anticipated to be in relation to:
- operation of the expanded Public Address/Voice Alarm system (PA/VA);
- changes in road traffic noise due to vehicles accessing new drop-off points; and
- operation of lift and escalator drive motors and building services plant.

5.6.2.3 Vibration

Piling operations are expected to be undertaken using bored concrete piles to minimise vibration impacts affecting adjacent structures.

Ground-borne vibration due to the movement of vehicles is generally a localised problem and generated predominantly by the passage of rolling loads over discontinuities in the road surface. Ground-borne vibration due to the construction or operation of the scheme will be considered and assessed where receptors may be exposed to perceptible levels of vibration.

5.6.3 Scope

5.6.3.1 Spatial scope

It is expected that the spatial extent of the assessment would include:
all locations where construction impacts generated by activities within the site boundary are likely to directly affect sensitive receptors;
- diversion routes on public highways during construction if required;
- access routes for site traffic; and
- areas where existing traffic will be changed as part of the scheme.

In terms of construction noise the extent of the assessment will be limited to areas where the calculated total noise (construction noise plus pre-construction ambient noise) is expected to exceed the pre-construction ambient noise level by 5 dB or more subject to the threshold values follows:

- 45 dB(A) during the night periods defined as 23:00 to 07:00 on any day of the week;
- 55 dB(A) during evenings and weekends defined as 19:00 to 23:00 on weekdays; 13:00 to 23:00 on Saturdays and 07:00 to 23:00 on Sundays; and
- 65 dB(A) during the daytime periods defined as 07:00 to 19:00 on weekdays and 07:00 to 13:00 on Saturdays.

The spatial extents will be defined by the application of this criterion within the calculations carried out in predicting the potential effects and refined as the details of the scheme are more certain.

In terms of operational effects associated with road traffic noise, the assessment will be limited to receptor locations expected to be exposed to a change of at least a 1.0 dB change in the level of noise from road traffic in the year of opening compared to the baseline year. The spatial scope of the assessment of noise from the PA/VA system of building services plant will be limited to receptors expected to be exposed to noise impacts expected to have marginal significance as defined by BS 4142 'Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas' (1997)\textsuperscript{1}.

5.6.3.2 Temporal scope

The noise and vibration assessment will encompass:

- the duration of construction activities on site; and
- typical conditions in the opening and design years if these can be estimated.

5.6.4 Resources and receptors

The assessment will consider any of the resources outlined in Table 5.14 within the spatial extents of the assessment. The list is not exhaustive and site specific receptors will be identified through consultation, the use of mapping and existing site details, during walk-over surveys and site visits. This will be used to guide the selection of baseline survey positions and make appropriate allowances in the evaluation of effects.

<table>
<thead>
<tr>
<th>Resource/Receptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwellings</td>
<td>Houses and any other building in residential use such as public houses, hotels etc.</td>
</tr>
<tr>
<td>Commercial premises</td>
<td>Shops, offices etc.</td>
</tr>
<tr>
<td>Community facilities</td>
<td>Libraries, public halls, sports centres, theatres, concert halls, places of worship etc.</td>
</tr>
<tr>
<td>Recreational facilities</td>
<td>Amenity areas, footpaths, sports grounds etc</td>
</tr>
<tr>
<td>Educational establishments</td>
<td>Schools, university campus</td>
</tr>
<tr>
<td>Designated sites</td>
<td>If relevant, environmentally sensitive areas and buildings sensitive to the effect of noise and vibration</td>
</tr>
</tbody>
</table>
5.6.5 Baseline

5.6.5.1 Sources of information

The method for determining and appraising baseline conditions will be based on that proposed in best practice guidance for EIAs. This will involve both desk study and survey work.

Sources examined in the desk study will include:

- project details, drawings and mapping;
- Leeds Station Southern Entrance GRIP 4 Report and accompanying Noise & Vibration Assessment;
- road traffic flows; and
- any previous surveys and assessments conducted in the area or for a similar scheme.

In addition, consultation will be undertaken with LCC, to establish other sources of information which may assist in deriving the baseline noise and vibration conditions for the areas of interest.

5.6.5.2 Baseline surveys

Baseline noise surveys will be undertaken to describe the noise climate in the vicinity of the nearest sensitive receptors to the scheme extents (proposed station entrance, drop-off points, etc). Measurement positions will be selected through observations made during a site walkover. The key receptors that have been identified at this stage comprise residents at the following locations:

- blue residential apartments and commercial premises;
- Granary Wharf residential apartments and commercial premises; and
- Hilton Hotel.

5.6.6 Assumptions and limitations

5.6.6.1 Assumptions concerning the baseline

It is recognised that it is not possible to conduct noise monitoring that accounts for all periods of the day and week at positions representative of all the sensitive receptors within the study area. Priority would be given to characterising the baseline noise climate at the most sensitive times of the day that fall within the site hours of working. Individual monitoring locations will be selected to provide a suitable overall representation of the baseline noise climate at the sensitive receptor locations.

5.6.6.2 Assumptions concerning the prediction of effects

Typically, information on site traffic movements (e.g. timings, vehicles types, speeds) is uncertain and it is unlikely that the full details of the plant to be used, methodology and programme will be known prior to selection of a contractor for the works. Therefore, best available information will be used and any limitations shall be described.
5.6.7 Prediction of effects

The assessment of the effects of noise and vibration impacts generally comprises some or all the following elements:

- identification of potential sources and prediction of noise and vibration impacts likely to be generated at nearby sensitive receptors including dwellings;
- comparison of impacts with the baseline conditions and appropriate criteria for acceptability;
- evaluation of the effects; and
- consideration of possible additional mitigation measures and review of effects if appropriate and an assessment of any residual effects.

The character, nature, times and durations of the potential impacts often vary widely, thus a simple single approach to the prediction and assessment procedure is not appropriate. The following two approaches will be adopted for the assessment procedure:

- based on exceeding an absolute threshold level; and
- based on an increase relative to the prevailing or existing baseline noise level.

Reference will be made to the following documents:

- Planning Policy Guidance 24: Planning and Noise^4;
- British Standard (BS) 4142 ‘Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas’ (1997)^3;
- DMRB Volume 11 Section 3 Part 7 HD 213/11 Noise and Vibration (2011)^5 (henceforth referred to as DMRB HD/ 213/11). This is not a statutory or regulatory document but provides a detailed methodology for the assessment of noise from road traffic and will be used to assess the noise impacts from affected public highways during the works. The methodology requires the use of the Department of Transport Memorandum ‘Calculation of Road Traffic Noise’ (CRTN) (1988)^6;
- BS 5228 Code of practice for noise and vibration control on construction and open sites, Parts 1 and 2, Noise and Vibration (2009)^7;
- BS 7385 Parts 1 and 2 Evaluation and measurement for vibration in buildings (1990)^10; and

The list is not exhaustive and, in addition, relevant local/regional policies and guidelines will be taken into account where appropriate.

5.6.7.1 Construction

BS 5228–1:2009^6 provides a methodology for calculating noise levels generated by fixed and mobile plant used for a range of typical construction operations. The standard does not define strict criteria to determine the significance of effects of noise impacts although examples of how limits of acceptability have been applied historically and some examples of assessing significance are presented. ‘Example Method 1 – The ABC method’ (Annex E ‘Significance of Noise Effects’ section E.3.2) will be adopted for the assessment of
effects at residential receptors as the approach considers the expected changes in ambient noise levels and better reflects conventional EIA methodologies compared with the use of fixed/absolute noise limits.

The method is summarised in Table 5.15 below. The method uses threshold noise levels for daytimes, evenings and weekends and night-times which are derived from the baseline $L_{Aeq}$ noise levels at the façade of receptor rounded to the nearest 5 dB(A).

Table 5.15: BS 5228 Threshold values used in the ABC Method

<table>
<thead>
<tr>
<th>Assessment category threshold value period</th>
<th>Threshold value $L_{Aeq}$ dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Category A</td>
</tr>
<tr>
<td>Night-time (2300-0700)</td>
<td>45</td>
</tr>
<tr>
<td>Evenings and weekends</td>
<td>55</td>
</tr>
<tr>
<td>Daytime (0700-1900) and Saturdays (0700-1300)</td>
<td>65</td>
</tr>
</tbody>
</table>

Category A threshold values apply where baseline noise levels rounded to the nearest 5 dB are less than these values.
Category B threshold values apply where baseline noise levels rounded to the nearest 5 dB are equal to Category A values.
Category C threshold values apply where baseline noise levels rounded to the nearest 5 dB are higher than the Category A values.

A significant effect is indicated where the overall ambient noise level exceeds the threshold level in the category appropriate to the baseline noise level at the receiver.
Where baseline noise levels exceed the Category C threshold values then a significant effect is indicated where the overall ambient noise level is 3 dB greater than the baseline.

In assessing the significance of effects on other building type receptors such as hotels, educational establishments etc (defined in BS 5228–1:2009) the ‘Example method 2 – 5 dB(A) change method’ will be adopted. A significant effect is indicated where noise levels due to the works exceeds the Category A levels defined above. For public open space, a significant impact is indicated where activities increase the ambient noise level ($L_{Aeq, period}$) by 5 dB or more.

Vibration from site activities will be calculated in accordance with BS 5228 Part 2, and evaluated in terms of both building damage risk and human disturbance in accordance with guideline levels provided in BS 5228–2:2009.

### 5.6.7.2 Operational

Road traffic noise from free flowing traffic will be calculated using the methodology described within CRTN. Where vehicle movements are expected to be outside the range of validity of CRTN (e.g. low flows, engine noise from dwelling vehicles) then the impacts will be described based on measured noise levels of specific events as appropriate. This may involve descriptors such as the Sound Exposure Level (SEL) and/or the maximum sound pressure level ($L_{A(max)}$).

Noise from fixed plant installed on site, including the public address system and building services plant, will be assessed to ascertain the likelihood of complaint at residential receptors in accordance with BS 4142.

### 5.6.8 Evaluation of effects

The evaluation of effects is presented in the following sections. At this stage, it should be stressed that the tables are indicative and are likely to be subject to alteration as the baseline studies and noise impact assessment commence, and further information becomes available.
5.6.8.1 Importance of receptor

Noise affects people in a number of different ways. This may include factors such as sleep disturbance, enjoyment of quiet spaces, ability to communicate with others, ability to concentrate at home or at work, participation in social and community activities. As a consequence it is not appropriate to consider a single criterion when assessing the value of an existing noise environment.

Table 5.16 gives three criteria that will be used to determine the value of a noise environment. The four criteria will be used individually or in combination to determine the value of any particular area affected by the proposed project.

<table>
<thead>
<tr>
<th>Value</th>
<th>1 Ability to absorb change (increase) in noise without altering character</th>
<th>2 Geography</th>
<th>3 Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>No ability to absorb change (increase) in noise without fundamentally altering character</td>
<td>International importance</td>
<td>People or operations are extremely susceptible to noise where any change (increase) would permanently stop people working</td>
</tr>
<tr>
<td>High</td>
<td>Low ability to absorb change (increase) in noise level without fundamentally altering character</td>
<td>National importance</td>
<td>People or operations are particularly susceptible to noise where any change (increase) would stop people working for long periods</td>
</tr>
<tr>
<td>Moderate</td>
<td>Some ability to absorb change (increase) in noise level without fundamentally altering character</td>
<td>Regional/county importance</td>
<td>People or operations are moderately sensitive to noise, where any change (increase) would stop people working for short periods</td>
</tr>
<tr>
<td>Low</td>
<td>High ability to absorb change (increase) in noise level without fundamentally altering character</td>
<td>District/parish importance</td>
<td>People or operations are not very sensitive to noise, where any change (increase) would stop people working for very short periods</td>
</tr>
<tr>
<td>Negligible</td>
<td>Tolerant of change (increase) in noise without altering its character</td>
<td>No listed importance</td>
<td>People or operations are not at all sensitive to noise, where any change (increase) would not stop people working</td>
</tr>
</tbody>
</table>

5.6.8.2 Magnitude of effect

The magnitude of a noise impact is related generally to the ability of a human to perceive a change in the noise level. For example, changes of up to +/-1 dB are generally considered barely perceptible and can reasonably be assumed to have negligible effect.

Table 5.17 presents the magnitude of impact resulting from different changes in noise level arising from road traffic.

<table>
<thead>
<tr>
<th>Noise change LAeq,T</th>
<th>Magnitude of impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; -5.0</td>
<td>Major beneficial</td>
</tr>
<tr>
<td>-4.9 to -3.0</td>
<td>Moderate beneficial</td>
</tr>
<tr>
<td>-2.9 to -1.0</td>
<td>Minor beneficial</td>
</tr>
<tr>
<td>-0.9 to 0.1</td>
<td>Negligible beneficial</td>
</tr>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>0.1 to 0.9</td>
<td>Negligible adverse</td>
</tr>
</tbody>
</table>
Noise change $\text{L}_{\text{Aeq,T}}$ & Magnitude of impact \\
1.0 to 2.9 & Minor adverse \\
3.0 to 4.9 & Moderate adverse \\
> 5.0 & Major adverse \\

5.6.8.3 Level of significance

The significance of the effect of any noise impacts will be based on a consideration of the environmental noise value, or sensitivity, of existing features and the magnitude of the noise impacts on them.

Using the receptor values described in Table 5.16 and the impact magnitude classification in Table 5.17 the significance of any effects will be considered using the matrix presented in Table 5.18.

In addition to the adoption of the evaluation of significance matrix in Table 5.18, it will be appropriate to also give due consideration to resulting absolute noise levels, and other emerging guidance on best practice.
Table 5.18: Evaluation of significance

<table>
<thead>
<tr>
<th>Environmental Value</th>
<th>Major Beneficial</th>
<th>Moderate Beneficial</th>
<th>Minor Beneficial</th>
<th>Negligible Beneficial</th>
<th>None</th>
<th>Negligible Adverse</th>
<th>Minor Adverse</th>
<th>Moderate Adverse</th>
<th>Major Adverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>Very Substantial Beneficial</td>
<td>Substantial Beneficial</td>
<td>Moderate Beneficial</td>
<td>Low Beneficial</td>
<td>Neutral</td>
<td>Low Adverse</td>
<td>Moderate Adverse</td>
<td>Substantial Adverse</td>
<td>Very Substantial Adverse</td>
</tr>
<tr>
<td>High</td>
<td>Substantial Beneficial</td>
<td>Moderate Beneficial</td>
<td>Low Beneficial</td>
<td>Slight Beneficial</td>
<td>Neutral</td>
<td>Slight Adverse</td>
<td>Low Adverse</td>
<td>Moderate Adverse</td>
<td>Substantial Adverse</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate Beneficial</td>
<td>Low Beneficial</td>
<td>Slight Beneficial</td>
<td>Negligible Beneficial</td>
<td>Neutral</td>
<td>Negligible Adverse</td>
<td>Slight Adverse</td>
<td>Low Adverse</td>
<td>Moderate Adverse</td>
</tr>
<tr>
<td>Low</td>
<td>Low Beneficial</td>
<td>Slight Beneficial</td>
<td>Negligible Beneficial</td>
<td>Negligible Beneficial</td>
<td>Neutral</td>
<td>Negligible Adverse</td>
<td>Negligible Adverse</td>
<td>Slight Adverse</td>
<td>Low Adverse</td>
</tr>
<tr>
<td>Negligible</td>
<td>Slight Beneficial</td>
<td>Negligible Beneficial</td>
<td>Negligible Beneficial</td>
<td>Negligible Beneficial</td>
<td>Neutral</td>
<td>Negligible Adverse</td>
<td>Negligible Adverse</td>
<td>Negligible Adverse</td>
<td>Slight Adverse</td>
</tr>
</tbody>
</table>

**Note:** Effects will be considered to be significant when identified as having a moderate, substantial or very substantial effect.
5.6.9 Mitigation and significant residual effects

5.6.9.1 Construction

An Environmental Management Plan (EMP) for the proposed scheme will be prepared as part of standard NR procedures and in accordance with The Delivery Manual DEL04–Environment and NR Contract Requirements – Environment. Under the EMP, Contractors will be required to prepare a Noise and Vibration Management Plan and seek local authority consent for construction works under Section 61 of the Control of Pollution Act 1974 (CoPA). These consents will specify the method of working, the hours of work and noise controls to be applied in accordance with ‘best practicable means’ (BPM) (as defined in Section 72 of CoPA).

The NR environmental guidance note NR/GN/ENV/00023 ‘Best Practicable Means: Control of Noise and Vibration from Construction Operations’ provides advice on best practice that contractors can use in developing a Section 61 Consent application. The general approach set out in the guidance note is as follows:

- as a matter of course, low noise plant and equipment should be used which conform to standards prescribed by the Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001, implementing EU Directive 2000/14/EC. All plant used by main contractors and sub-contractors should be sourced from the company’s nominated supplier, which in turn, should be approved by NR;
- plant and equipment should be examined on a daily basis, for defects, prior to the start of works and under no circumstances should defective plant be used;
- in connection with demolition and other works of a similar nature, the presumption should be to ensure the minimum amount of breaking up of material on-site and the material should be removed from site to a less sensitive location where the material can be broken down further as necessary;
- there should be a general presumption towards the screening/enclosure of mobile and fixed plant as a simple and effective means of containing noise at source;
- vehicles should not wait or queue up with engines running on the site or on the public highway; and
- wherever it is logistically practicable to do, noisy works should be programmed to take place during normal daytime hours.

The NR environmental guidance note includes specific controls for various types of works and refers to further advice within BS 5228 and CIRIA publications. Guidance on applications for prior consent under a Section 61 agreement is given in the NR advice note NR/GN/ENV/00022 ‘Construction noise mitigation through the Section 61 consent process (formerly RT/LS/G/00022)’.

NR operates a 24-hour National Helpline (tel. 08457 114111) which is available for residents to report disturbance. Furthermore, the contact details of the main contractor for the works will be provided to the local authority within the application for Section 61 consent.

The main noise and vibration effects are anticipated to be in relation to the construction works. Potential methods to mitigate noise from construction projects are as follows:

- location of static plant to take advantage of any screening to break the line of sight from receptors;
- locate plant as far as possible from noise sensitive properties;
- direct traffic site accessing the site along less exposed routes and limit the times that vehicles can access the site to avoid sensitivities times of the day;
- manage deliveries to prevent queuing of site traffic at access points and the need for vehicles to reverse;
- selection of quiet plant;
- use of adjustable or directional audible vehicle-reversing alarms or use of alternative warning systems, e.g. white noise alarms;
- maintenance of plant;
- use of rubber linings in chutes, dumpers, transfer points, etc to reduce noise from the handling of waste materials;
- enclose tool compressors and generators;
- within limits of efficient production, limit use of particularly noisy plant. Also limit the number of items in use at any one time, operate plant one-by-one and switch off when not in use;
- avoid unnecessary revving of engines, reducing speed of vehicle movement, to avoid body slap from empty lorries, designing and maintaining access routes to minimise vehicle noise; and
- temporary acoustic screening can be used - this can be in the form of a site hording or an acoustic blanket attached to fencing.

5.6.9.2 Operation

Noise from the PA/VA system could be mitigated by curtailing announcements during the quiet evening and night period or by repositioning/redirecting speakers or by adjusting the volume of speakers. Noise from fixed plant such as lift and escalator motors and building services plant can be mitigated by the selection of quieter equipment and by fitting enclosures or screens to limit the spread of noise.

5.7 Socio-Economics

5.7.1 Introduction

This section presents the scope and methodology of the assessment of potential effects resulting from the LSSE scheme on the socio-economic baseline. A socio-economic assessment includes analysing, monitoring and managing the impacts on local socio-economic conditions, such as employment, the labour market and deprivation, and receptors, primarily local residents and businesses. Beneficial and adverse; direct and indirect; and temporary and permanent effects are considered as part of the assessment.

Impacts and effects relating to other environmental topics such as noise, visual amenity, traffic and air quality will be addressed in the respective topic-specific chapters of this EIA. Issues will only be raised in the socio-economic assessment if there is a particular effect which is likely to be realised above and beyond the impacts identified in the topic specific chapters. This will avoid double counting of significant effects.

The assessment will be undertaken with due regard and reference to the key national (UK and England); regional (Yorkshire & Humber); and local (Leeds) socio-economic policy documents. This will include relevant Planning Policy Statements and Guidance (PPSs and PPGs); the Government's new economic development White Paper 'Local Growth: Realising Every Place's Potential' and Localism Bill; the 2007 Sustainable Communities Act; the Regional Spatial Strategy (RSS)

1 The RSS is likely to be withdrawn following the recent publication of the Government's Localism Bill. However, at present it remains part of the Statutory Development Plan so is relevant in terms of the socio-economic policy framework. The RSS will be reviewed if, at the time that the EIA is conducted, it has not been revoked.
(RES)² for Yorkshire and the Humber; Leeds City Region’s Local Enterprise Partnership (LEP) proposal and objectives; and LCC’s Unitary Development Plan (UDP) and emerging Local Development Framework (LDF).

5.7.2 Potential impacts

5.7.2.1 Construction

Potential socio-economic impacts during construction include:

- social and community issues: temporary community severance, reduced residential amenity, loss of facilities and/or services used by the community;
- economic issues: temporary employment through construction; short-term increase in economic activity due to construction process; temporary disruption to local businesses; and
- accessibility issues: reduced or disrupted access to community facilities, loss of access to recreational land; more congestion on existing road network due to works traffic, diversions and/or lane closures services.

5.7.2.2 Operational

Potential socio-economic impacts during operation include:

- social and community issues: permanent land take from community facilities and/or services, impacts on community severance and social inclusion (positive or negative);
- economic issues: permanent increases in local employment; retention and attraction of new businesses; permanent increases in wider employment opportunities and/or economic activity; contribution to wider regeneration, economic growth, investment and tourism objectives and challenges; and
- accessibility issues: permanent impacts for access to community facilities (positive or negative); reduced traffic and congestion on local roads; reduced journey times for residents, employers, businesses, commuters and tourists.

5.7.3 Scope

5.7.3.1 Spatial scope

Localised and wider impacts on socio-economic receptors and resources will be assessed. The local area of influence (LAI) will include the LSSE site itself and the wards in which the route and any construction sites are located. The wider area of influence (WAI) will be Leeds Metropolitan area.

5.7.3.2 Temporal scope

The scheme will be assessed by comparing the existing socio-economic conditions (the baseline) with the change expected over time as a result of impacts predicted in the construction period and once the scheme is operational. The effects of the project on socio-economic conditions will be assessed at the peak of the construction period, and at the opening year of the project.

² The future status of the RES is unclear as the role of RES’s is under review by the Coalition Government. If the RES remains a live document at the time that of the EIA is undertaken it will be considered as part of the socio-economic assessment.
5.7.4 Resources and receptors

Socio-economic receptors are individuals, groups or entities whose access to, and control over, socio-economic assets, resources and opportunities may be affected by the project.

In terms of LSSE, receptors and resources include existing and potential:

5.7.4.1 Receptors
- local businesses;
- employees and job-seekers;
- local residents;
- users of community facilities; and
- tourists.

5.7.4.2 Resources
- commercial, residential and recreational;
- local business customer bases and growth opportunities;
- employment and training opportunities; and
- community facilities and services, including for example public transport, healthcare, education, retail outlets, telecommunication, recreation and leisure, religious, etc.

5.7.5 Baseline

5.7.5.1 Sources of information

The method for determining and appraising baseline conditions will be based on that proposed in best practice guidance for EIAs. Baseline data on resources and receptors will be collected for the spatial scopes identified above. The data will comprise maps locating these resources and receptors, together with a description of their number and location.

The following sources will be used:
- population and employment data (mainly from the Office of National Statistics (ONS) and Neighbourhood Statistics);
- directories of local services;
- local, regional and national government economic, social and planning policies and strategies;
- consultation with local residents, businesses and community groups, where relevant; and
- websites of local voluntary sector and community organisations.

5.7.6 Assumptions and limitations

5.7.6.1 Assumptions concerning the baseline

Assessments will be based on the most recent data available for the study area.
5.7.6.2 Assumptions concerning the prediction of effects

The assessment will not attempt to predict and changes in socio-economic behaviour or assume changes in the pattern of use of facilities or business operations over time.

5.7.7 Prediction of effects

Socio-economic effects will be predicted by setting the degree of change due to the project (magnitude) against the type and sensitivity of each resource or receptors (importance).

5.7.7.1 Construction

There are a number of potential effects that may arise during the construction phase of the scheme. These include:

- effects on community access. Construction activities can potentially have a negative impact on the access of local community to community facilities and services;
- effects of construction disturbance (e.g. temporary closure, truck movements, diversions). The temporary effect of construction activities can potentially annoy people and cause psychological disturbance during construction phase; and
- effects on temporary employment and economic activity due to construction workers use of facilities and businesses in both the LAI and WAI.

5.7.7.2 Operation

Potential socio-economic effects that may arise once the LSSE scheme becomes operational include:

- local and wider employment and regeneration effects due to improved access to the south area of Leeds City Centre;
- the number of jobs at each skill level; and
- increased investment opportunities due to improved strategic transport links.

5.7.8 Evaluation of effects

The assessment will focus on those impacts that are likely to have significant effects on socio-economic conditions. Effects will be categorised as follows:

- positive or negative;
- temporary or permanent;
- long or short term;
- direct or indirect; and
- whether impacts will be felt in the immediate or wider impact area or both.

Cumulative effects will also be considered as part of the assessment. Cumulative effects arise where several types of effect, individually not significant, act on the same resources and/or receptors, thereby making them more important / sensitive.
5.7.8.1 Importance of receptor

Receptors relevant to the socio-economic assessment are described in Section 5.7.4 above. The importance of receptors is defined by their sensitivity to and capacity to cope with change. For example, for businesses, their sensitivity can be measured in terms of their resilience to access disruption or loss of premises. For community residents, sensitivity can be considered as their ability to adapt to reduced access to local amenities or temporary/permanent community severance. High, medium and low sensitivity are defined below in Table 5.19.

Table 5.19: Community sensitivity criteria

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>An already vulnerable receptor with very little capacity and means to absorb changes</td>
</tr>
<tr>
<td>Medium</td>
<td>A non-vulnerable receptor with limited capacity and means to absorb changes</td>
</tr>
<tr>
<td>Low</td>
<td>A non-vulnerable receptor with sufficient capacity and means to absorb changes</td>
</tr>
</tbody>
</table>

5.7.8.2 Magnitude of effect

Magnitude concerns the degree of change in baseline conditions that may arise due to the construction and operation of the scheme. The following factors are taken into account when assessing this:

- spatial scope – whether the effect is localised (within the LAI) or more widespread (within the WAI);
- extent – the number of people, households, businesses or community facilities affected and whether available resources / facilities are available for use;
- duration – whether the impacts will be short, medium or long term;
- reversibility – whether the effects are permanent or not; and
- likelihood – extent to which effects are likely to be realised.

Project specific guidelines have been used to classify the magnitude of each effect. These are outlined in Table 5.20 below.

Table 5.20: Socio-economic magnitude criteria:

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Criteria Guidelines</th>
</tr>
</thead>
</table>
| Major     | **Spatial scope**: LAI and WAI  
**Extent**: Affects the well-being of many socio-economic receptors and/or a high value community resource.  
**Duration**: Long term  
**Reversibility**: Permanent  
**Likelihood**: Probable |
| Moderate  | **Spatial scope**: LAI and all or some of WAI  
**Extent**: Affects the well-being of socio-economic receptors and/or a medium value socio-economic resource  
**Duration**: Medium term  
**Reversibility**: Socio-economic baseline likely to be re-established within a year  
**Likelihood**: Possible |
| Minor     | **Spatial scope**: LAI  
**Extent**: Small number of community receptors and/or a lower value socio-economic resource  
**Duration**: Short-medium term  
**Reversibility**: Socio-economic baseline re-established within a few months  
**Likelihood**: Possible |
| Negligible| **Spatial scope**: Part of the LAI |
The magnitude of both beneficial and adverse is recorded for the socio-economic assessment.

### 5.7.8.3 Level of significance

Significance is a product the magnitude of an effect and the sensitivity (importance) of the receptor that is experiencing the impact. Each type of effect will be allocated a level of significance as shown in Table 5.21.

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Low Importance</th>
<th>Medium Importance</th>
<th>High Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Nsig</td>
<td>Nsig</td>
<td>Nsig</td>
</tr>
<tr>
<td>Moderate</td>
<td>Nsig</td>
<td>Nsig</td>
<td>NSig</td>
</tr>
<tr>
<td>High</td>
<td>Sig</td>
<td>Sig</td>
<td>Sig</td>
</tr>
</tbody>
</table>

**Key**: Nsig: not significant; Sig: significant.

### 5.7.9 Mitigation and significant residual effects

The socio-economic assessment will propose appropriate mitigation measures that may reduce any negative effects and enhance any positive effects. Any significant residual effects remaining after consideration of mitigation will be detailed within the ES.

### 5.8 Townscape and Visual Amenity

#### 5.8.1 Introduction

This section sets out the proposed methodology for carrying out the Townscape and Visual Impact Assessment (TVIA). Due to the urban nature of the site and surrounding area, it is proposed that the assessment will focus on the effects on townscape, rather than landscape as this is considered more appropriate for the site setting. The TVIA will determine the likely effects of the LSSE scheme on the townscape resource and visual amenity within the defined study area.

This section describes the methods used for determination of the baseline conditions, how the potential for impacts of the proposed development will be derived and how the effects will be assessed. In addition, mitigation measures required to prevent, reduce or offset the effects and the residual effects remaining after mitigation will also be considered. The assessment will also consider the likely effects of other ‘granted’ developments in the vicinity of the project insofar as they may change the effects of the development proposals. For the purpose of this assessment, a clear distinction is drawn between townscape and visual effects:
**Townscape effects**

Townscape effects are changes in the fabric and physical features of the urban environment, which form the character of the townscape.

Townscape effects can include direct effects upon specific townscape elements (such as loss of buildings, trees or areas of grass) or indirect effects on the townscape character and, importantly, designated areas of townscape such as Conservation Areas. However, though of relevance to this assessment, development effects upon the setting of townscape heritage features (e.g. Scheduled Monuments, listed buildings or Conservation Areas) will be more fully described under Section 5.5 covering the Historic Environment.

**Visual effects**

Visual effects relate to specific changes in the composition of views and the effects of those changes on visual receptors (e.g. residents, business users, users of recreational open space).

### 5.8.2 Potential impacts

#### 5.8.2.1 Construction

Potential impacts during construction include:

- total or partial loss of existing townscape resource or features, open space and/or street space for temporary landtake (e.g. work sites) during construction;
- impact of temporary features (e.g. construction plant, hoardings) on surrounding townscape character;
- visual effects associated with construction traffic;
- removal of or change to built fabric (buildings, frontages etc); and
- loss of or change to public realm.

#### 5.8.2.2 Operation

Potential impacts during operation include:

- total or partial loss of existing townscape resources or features and structures in the area of permanent landtake;
- impact of permanent new features on surrounding townscape character;
- changes in the overall townscape character as a result of the above; and
- visual effects of new structure.

### 5.8.3 Scope

#### 5.8.3.1 Spatial scope

The TVIA will determine the likely effects of the proposed interim site uses on the townscape resource and the visual receptors within a defined area. The spatial scope will be developed via identification of the visual envelope (VE).
5.8.3.2 Temporal scope

The temporal scope of the assessment will commence with the assessment of the baseline townscape conditions that currently exist on the site. Permanent effects of the proposed works will be assessed one year after completion of the works.

5.8.4 Resources and receptors

There are a number of visual receptors surrounding the LSSE site that currently have views of the proposed works and are therefore likely to be affected by the proposed works. In decreasing order of sensitivity, these visual receptors are categorised into the following groups and the potential effects of the development proposals on these receptors will be described:

- people residing at properties with views of the proposed development;
- users of outdoor recreational facilities including public rights of way, and public realm whose attention or interest may be focussed on the townscape;
- people engaged in outdoor sport or recreation;
- travellers on roads and railway lines within and around the study area; and
- occupiers of business and commercial properties.

5.8.5 Baseline

5.8.5.1 Sources of information

The assessment methodology that will be used will be developed from guidance set out in:

- ‘Landscape Character Assessment’ produced by the Countryside Agency in April 2002;
- ‘Guidelines for Landscape and Visual Assessment’ produced by the Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA) in 2002 (Second Edition);
- ‘By Design’, Department of the Environment, Transport and the Regions and Commission of Architecture and the Built Environment, 2000; and
- The DfT Design Manual for Road and Bridges Volume 11.

As part of the consultation process, close liaison with officers from LCC, and other statutory bodies where relevant will be carried out to ensure a robust TVIA.

5.8.5.2 Baseline surveys

Existing baseline conditions will be identified by both desktop and field study, including townscape character, planning designations, approved developments, the visual envelope, key visual receptors and townscape features in the vicinity of the proposed development.

The assessment will seek to identify the significance of changes to the character of the existing townscape and visual amenity which would arise from the LSSE scheme.
5.8.5.3 Evaluation of baseline conditions

Townscape

The existing site conditions will be described by studying the characteristic and locally distinctive features forming the townscape of the area. The features contributing to townscape character that will be used for the assessment include:

- urban layout;
- land uses;
- density and scale;
- appearance and culture;
- activities;
- legibility;
- accessibility;
- public open spaces/squares; and
- ‘soft’ landscape features.

The assessment of the sensitivity of the townscape character features will be based on the criteria in Table 5.22.

Table 5.22: Criteria for sensitivity of townscape character features

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>A townscape of high or moderate quality, in good condition and largely intact, with a strong sense of place. It may be a scarce or fragile townscape, with historic or ecological interest which contributes to townscape quality. A townscape which is highly susceptible to change.</td>
</tr>
<tr>
<td>Medium</td>
<td>A townscape of moderate or low quality and condition, with some intactness, a moderate sense of place and mainly common features. It may have some historical or ecological interest which contributes to townscape quality. A townscape which is reasonably tolerant of changes.</td>
</tr>
<tr>
<td>Low</td>
<td>A townscape of low quality and condition with disparate elements. It demonstrates a high degree of change and has limited historic or ecological interest. A townscape which is potentially tolerant of substantial changes with little overall effect.</td>
</tr>
</tbody>
</table>

Visual Amenity

The sensitivity of different visual receptors will vary according to the interest in their visual environment, viewing opportunity and duration. The visual receptors were categorised into groups reflecting proximity to the site and viewers expectations as set out below:

- “high sensitivity” - viewers with proprietary interest and/or prolonged viewing opportunities, such as residents, tourists, visitors and recreational users of public open space and public rights of way;
- “moderate sensitivity” - viewers with moderate interest in their environment and/or transitory viewing opportunities, such as office and other workers and cyclists and pedestrians in the streets; and
- “low sensitivity” - viewers with low interest in their everyday surroundings and/or fleeting viewing opportunities, such as commuters, train passengers, car drivers and commercial users.
5.8.6 Assumptions and limitations

5.8.6.1 Assumptions concerning the baseline

Where appropriate, visual receptors will be grouped rather than identified individually for the purposes of the assessment.

The assessment will focus on the public domain where possible. However, if it is deemed important to gain access to private land/properties, a request will be submitted to Metro to agree access with the appropriate landowner.

It is assumed that no photomontages or Zone of Visual Influence (ZVI) will be required by the local authority as part of the assessment.

5.8.6.2 Assumptions concerning the prediction of effects

The description of the significance of the visual effect will relate to groups of receptors rather than individual receptors. In quantifying effects, the assessment process aims to be as objective as possible. However, whilst in some instances changes to a view can be factually defined, or direct loss of features quantified, the evaluation of townscape character and visual effect frequently requires qualitative judgements to be made. This is generally considered acceptable if based on ‘professional expertise’, supported by clear evidence, reasoned argument and informed opinion. The conclusions of this assessment therefore combine objective measurement with informed professional interpretation.

5.8.7 Prediction of effects

This section will provide a description of the proposed construction works and completed LSSE scheme. This will be followed by an assessment of the likely effect of the scheme on baseline conditions. The predicted impacts on the townscape and visual receptors, together with the significance of the effects, will be assessed using the methodology described below.

5.8.8 Evaluation of effects

5.8.8.1 Magnitude of effect

Magnitude of impact is a means of predicting the degree to which the townscape character and elements or existing visual amenity would be changed by the proposed development. For visual amenity receptors magnitude would generally tend to increase with proximity to the scheme.

The magnitude of impact will be assessed on a five point scale from ‘no change’ to ‘major’ (which could be either positive or negative), as shown in Table 5.23.

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Fundamental change in key townscape elements and character and/or existing visual amenity resulting in temporary and/or permanent change.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Detectable change in townscape elements and character and/or existing visual amenity resulting in non-fundamental temporary or permanent change.</td>
</tr>
<tr>
<td>Minor</td>
<td>Detectable but minor change in townscape elements and character and/or existing visual amenity.</td>
</tr>
</tbody>
</table>
5.8.8.2 Level of significance

In order to ascertain the effect of the proposed development within the townscape context, it is necessary to evaluate the proposals in relation to the receptors that may be affected by the development. The significance of the impact of a development will be in part dependent on the sensitivity of the receptor to the proposed change. Sensitivity refers to the ability of a townscape character area (or individual townscape element or feature) to accommodate change associated with the proposed development without significant detriment.

The assessment of the significance of the effect on townscape character will depend on the degree to which the proposal and mitigation measures:

- complement, respect and fit into the existing scale, pattern and cultural aspects of the townscape;
- maintain existing townscape character and enable a sense of place to be retained through beneficial and sensitive design;
- blend in with surrounding townscape features and elements; and
- avoid conflict with national and local policy towards protection/enhancement of landscape areas.

Both townscape and visual amenity effects will be evaluated by combining the assessment of both magnitude and sensitivity to predict the significance of effect, as shown in Table 5.24. These effects can be beneficial or adverse, temporary or permanent depending on the nature of the development and the mitigation and any enhancement measures proposed.

The assessment of the significance of the visual amenity effect will depend on the degree to which the proposal and mitigation measures:

- cause an improvement or deterioration to a view; and
- affect strategic and important views to landmarks in addition to the visual context of receptors.

A significant effect is considered to be very large; large or moderate effect as shown by the grey in Table 5.24.

Table 5.24: Significance of effects on Townscape Resource and Visual Amenity

<table>
<thead>
<tr>
<th>Magnitude of Impact</th>
<th>Townscape and Viewer Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Major</td>
<td>Large/ very large</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate/Large</td>
</tr>
<tr>
<td>Minor</td>
<td>Slight/ Moderate</td>
</tr>
<tr>
<td>Negligible</td>
<td>Slight</td>
</tr>
<tr>
<td>No change</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

Based on GLVIA, IEMA and Li, 2002
5.8.9 Mitigation and significant residual effects

The identification of potential townscape and visual effects is an important part of the iterative design process because it can help avoid or minimise potential adverse effects of the works and, where appropriate, will also help to identify opportunities for townscape/landscape enhancement. Whilst the scheme design was largely fixed prior to commencement of the EIA process, mitigation and design considerations will identified to offset or reduce identified effects as the scheme progresses through the detailed design phase. The effects will be reassessed on the basis of mitigation measures being in place, to enable determination of any remaining significant residual effects.

5.9 Traffic and Transportation

5.9.1 Introduction

This section describes the scope and methodology that will be used to assess the traffic and transportation effects of the LSSE project. The operational, site specific issues and the implications of the project as a whole will be addressed. The relationship with adjoining areas as well as construction impacts will be considered.

A Transport Statement was produced in September 2009 to accompany the planning application. It is intended that the existing Transport Statement (TS) will be updated and form a standalone document which will accompany the TWA application and inform the traffic information contained within the Environmental Statement.

Both the TS and the ES will utilise guidance contained within the Department for Transport (DfT) Transport Assessment Guidelines, March 2007. During construction, the LSSE project will have an effect on the surrounding trunk road network; however once operational, the project should have little or no impact on the trunk road network. UK Government Policy contained within Circular 02/2007 “Planning and the Strategic Road Network”, which relates to the impact of developments on the trunk road network, will be complied with when considering the impacts of the LSSE project.

5.9.2 Potential impacts

5.9.2.1 Construction

The potential impacts of construction will be informed by the DfT Guidance on Transport Assessments (referred to as the DfT Guidance from hereafter). Potential effects during construction will include:

- changes in road traffic levels and amenity as a result of road closures/diversions due to construction traffic. Also changes to traffic levels, the environment and amenity from transportation of materials, waste and staff will be considered;
- changes to transport trips and amenity for the general public for all modes as a result of the construction; and
- consideration of potential severance caused by temporary closure/diversion of roads.

5.9.2.2 Operational

Once operational, the LSSE is intended to be a pedestrian only entrance. The current scheme does not include provision of a formal pick up/drop off area for the new entrance on the surrounding road network and it has not been confirmed at this stage whether or not one will be required. It is intended that Traffic
Regulation Orders (TRO) will be imposed on Little Neville Street as part of the TWAO application. Any TRO's are likely to include no waiting and no loading provision to avoid congestion on the local road network.

The potential impacts of the operation of the LSSE scheme will be informed by the DfT Guidance. Potential impacts during the operation of the scheme will include:

- changes to the frequency, amenity, journey times or availability of public transport services;
- changes to traffic flows, capacity, routing, amenity and journey times as result of the LSSE scheme;
- changes to amenity for residential premises, business premises, pedestrians and cyclists as result of the LSSE scheme; and
- consideration of the potential impact of severance caused by any road permanent closure/diversion, if proposed.

5.9.3 Scope

5.9.3.1 Spatial scope

The assessment will consider significant changes to traffic and transport conditions as a result of the operation and construction of the LSSE scheme. The assessment will include:

- the transport and highway network in the vicinity of the LSSE scheme. The assessment may consider the highway network that construction traffic may utilise up to the strategic road network;
- the local public transport scheme and its interfaces with the LSSE project; and
- the pedestrian and cycling network and its interfaces with the LSSE project.

5.9.3.2 Temporal scope

The assessment and design horizons will be defined in accordance with the DfT Guidance.

5.9.4 Resources and receptors

The assessment will consider the potential resources and receptors outlined in Table 5.25.

Table 5.25: Traffic and Transport Resource and Receptors

<table>
<thead>
<tr>
<th>Resource/Receptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private and Commercial vehicles</td>
<td>Cars, Commercial Vehicles and Taxis</td>
</tr>
<tr>
<td>Users of public transport</td>
<td>Buses and Rail</td>
</tr>
<tr>
<td>Emergency vehicles</td>
<td>Police vehicles, Ambulances and Fire Engines</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>Pedestrian</td>
</tr>
<tr>
<td>Cyclists</td>
<td>Cyclists</td>
</tr>
<tr>
<td>People with disabilities</td>
<td>People with disabilities</td>
</tr>
<tr>
<td>Equestrians</td>
<td>Equestrians</td>
</tr>
<tr>
<td>Other key receptors defined by air quality and noise specialists</td>
<td>Defined in Sections 5.2 and 5.6 respectively</td>
</tr>
</tbody>
</table>
5.9.5 Baseline

5.9.5.1 Sources of information

The method for determining and appraising baseline conditions will be based on that proposed in best practice guidance for EIAs and the DfT Guidance. This will involve mainly desk study and survey work.

Sources examined in the desk study will include:
- existing Transport Statement produced in September 2009 for the planning application;
- the updated Transport Statement to be produced for the TWA application;
- Leeds City Council and Highways Agency information;
- liaison with stakeholders;
- information from the traffic surveys, where available; and
- traffic and pedestrian information, where available and appropriate.

The assessments will utilise traffic flows using traffic growth agreed with the highway authorities.

5.9.5.2 Baseline surveys

No baselines surveys are planned as part of the assessment as it is intended to use the existing information available in the Transport Statement and the data available from the sources given in Section 5.9.5.1.

5.9.6 Assumptions and limitations

5.9.6.1 Assumptions concerning the baseline

The baseline information will be based on the best information available at the time. The information will be obtained from the sources identified in Section 5.9.5.1.

5.9.6.2 Assumptions concerning the prediction of effects

The operational and construction impacts of the LSSE project will be considered based on the best available information. The sources of information and assumptions will be consistent with the updated Transport Statement.

5.9.7 Prediction of effects

5.9.7.1 Construction

The assessment of effects, during the construction phase, on traffic and transportation will be considered and based on the information provided by the construction contractor.

5.9.7.2 Operation

The assessment of effects, resulting from the operation of LSSE project, on traffic and transportation will be considered and based on the information contained within existing Transport Statement.
5.9.8 Evaluation of effects

5.9.8.1 Importance of receptor

Low importance
Any transport effects are insignificant with regard to the construction of the LSSE project. The transport network continues to operate as normal.

Medium importance
Any transport effects which lead to degradation of performance of the transport network as a result of the construction or operation of the LSSE project, which leads to temporary difficulties, annoyance or delay that may be incurred by any third party or member of the public.

High importance
Any transport effects lead to degradation of performance of the transport network as a result of the construction or operation of the LSSE project, in such a way that leads to permanent or substantial difficulties, annoyance, delay or injury that may be incurred by any third party or member of the public.

5.9.8.2 Magnitude of effect

Low magnitude
Any transport effects that happen infrequently and so are usually accepted as a rare occurrence e.g. fault conditions.

Moderate magnitude
Any transport effects that happen more frequently.

High magnitude
Any transport effects that occur regularly during the construction or operation of the LSSE project.

5.9.8.3 Level of significance

Each type of effect will be allocated a level of significance as shown in Table 5.26.

Table 5.26: Evaluation of Significance

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Low Importance</th>
<th>Medium Importance</th>
<th>High Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Nsig</td>
<td>Nsig/Psig</td>
<td>Psig</td>
</tr>
<tr>
<td>Moderate</td>
<td>Nsig/Psig</td>
<td>Psig</td>
<td>Sig</td>
</tr>
<tr>
<td>High</td>
<td>Psig</td>
<td>Sig</td>
<td>Sig</td>
</tr>
</tbody>
</table>

Key: Nsig: not significant; Sig: significant; Psig: potentially significant

Where potentially significant effects arise there will be a professional assessment undertaken to determine those effects which are deemed significant; these effects and the rationale behind the assessment will be reported in the ES.
The assessment will also consider cumulative effects, where possible, where several types of effect act on the same resources and/or receptors. In some cases it may be that several “slight” effects may, individually, be insignificant but acting together may produce a significant effect on a sensitive resource.

5.9.9 Mitigation and significant residual effects

Any significant residual effects resulting from the construction and operation of the LSSE project will be considered in accordance with the DfT Guidance. The need to mitigate the effects will be considered in line with those documents, as well as with national, regional and local policy. The type of mitigation will also be dependent upon policy and guidance documents.

5.10 Water Resources

5.10.1 Introduction

This section describes the methodology to be used in the assessment of the potential effects of the proposed development with respect to water resources, flood risk and drainage.

A Flood Risk Assessment (FRA) was produced for the planning application which was submitted to LCC in October 2009. Two addendums for the FRA were issued in November 2009 and January 2010 to cover further enquiries during the planning process.

The existing FRA will be reviewed to provide input, where appropriate, into an updated FRA Strategy. This will be presented as a stand alone document, although data from the updated FRA will be reviewed and incorporated into the ES where appropriate. The scoping and methodology for the flood risk assessment are not described in this EIA Scoping Report.

Any consideration of the significance and magnitude of potential effects on the water environment will also have regard to Planning Policy Statement (PPS) 23: Planning and Pollution Control and the Water Framework Directive. The Environment Agency Policy and Practice for the Protection of Groundwater will be followed as appropriate. Assessment for water resources will also involve close liaison with the work on land contamination and flood risk.

5.10.2 Potential impacts

The proposed project is not expected to lead to major interventions in the water environment. Pollution will be controlled by reference to the relevant laws and guidelines and appropriate mitigation measures identified as part of this EIA process.

Potential impacts during the construction and operation of the LSSE are outlined in Sections 5.10.2.1 and 5.10.2.2.

5.10.2.1 Construction

Potential impacts during the construction of the LSSE include:

Water quality

- Direct discharges (accidental or otherwise) of drainage or effluent from the site to groundwater or surface waters;
- the potential for pollution of surface water passing to watercourses or drains; and
- the potential for groundwater pollution.

**Hydrogeology**

- Changes to recharge; and
- changes to groundwater flows resulting from temporary dewatering projects if they are needed.

**Hydrology**

- The potential for any diversion and interruption of flows in the River Aire;
- temporary changes to drainage patterns due to works as a result of construction works;
- changes to surface water flows resulting from temporary dewatering projects if they are needed;
- increased flood risk due to works;
- the potential for the blocking of culverts and sewers due to build up of sedimentation or debris;
- impacts on surface water flow passing to drains and the River Aire;
- the proposed works are located within flood zones 2 and 3, and therefore construction works may result in temporary flood storage volume loss.
- potential for disturbance to unmapped drains/culverts.

### 5.10.2.2 Operation

Potential impacts during the operational phase of the LSSE include:

**Water Quality**

- Potential for pollution of water resources due to oil spillages from machinery (e.g. lifts and escalators) in the entrance; and
- contaminated land and resulting potential on groundwater or surface water contamination are dealt with separately.

**Hydrogeology**

- Changes to groundwater recharge patterns; and
- changes to groundwater flows resulting from permanent dewatering projects if needed or from obstructions to groundwater flow created by the foundation constructed as part of the project.

**Hydrology**

- Changes in drainage (flow rate and volume) and infiltration patterns (including groundwater recharge) due to additional areas of permanent hard-standing and other drainage arrangements.

Potential impacts to be covered separately by the flood risk assessment will include:

- permanent restrictions to flows and conveyance in the River Aire, including the potential for blockage in critical areas;
- permanent loss of floodplain and flood storage capacity; and
- restrictions imposed by the development on the ability to upgrade any existing flood defence structures in the future, necessary as a consequence of predicted global climate change.
5.10.3 Scope

5.10.3.1 Spatial scope

The spatial scope for identification of effects on receptors and resources will be taken as:

**Water quality**
- Surface waters within 250m of the site footprint;
- Aquifers within 250m of the site footprint; and
- Groundwater abstractions with published Source Protected Zone (SPZ) or equivalent time of travel zone (TTZ) which are located within 250m of the site footprint.

**Hydrogeology**
- Groundwater abstractions located within 250m of the project footprint (it is currently assumed that no large scale dewatering is planned during the works, so a larger scoping radius is not required).

**Hydrology**
- Surface waters and drainage patterns within 250m of the project footprint and implications for wider catchment management.

5.10.3.2 Temporal scope

Effects will be considered in relation to both construction and operation. This includes impacts associated with the construction phase that may have effects persisting in the long term e.g. changes in river morphology due to gradual deposition of sediment.

In all cases, the assessment will need to take into consideration the implications of climate change, as described in Annex B of PPS25: Development and Flood Risk.

5.10.4 Resources and receptors

The assessment will consider the resources and receptors identified in Table 5.27.

Table 5.27: Hydrology resources and receptors

<table>
<thead>
<tr>
<th>Resource/Receptor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface water</td>
<td>Any controlled waters or other surface water features that may be affected by the proposed development. This comprises the River Aire and any local drainage to the river. It also includes licensed or protected rights to abstract or discharge to surface water.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>The presence and quality of any aquifers. Key receptors are licensed and protected rights to abstract or discharge to groundwater. Consideration will also be given to rights under application through Section 32 consents or in determination. The EIA will focus on those abstractions which are most likely to be impacted based on an assessment of their location relative to the site and groundwater flow directions. It is not thought that there are any groundwater dependent ecosystems in the area.</td>
</tr>
<tr>
<td>Floodplains</td>
<td>Land with pre-existing flooding potential. Key receptors are the LSSE, Granary Wharf and surrounding areas.</td>
</tr>
<tr>
<td>Drainage patterns</td>
<td>Key receptors include any areas that may be affected by changes in the surface water flow regime on site. This could include areas at significant distances from the site which may be subject to increased flooding due to increased overland flows from site or from changes to flow patterns through the site.</td>
</tr>
</tbody>
</table>
5.10.5 Baseline

A baseline study will be carried out to establish the existing water regime, including drainage patterns, and to assess its sensitivity to the construction and operation of LSSE. It will use data collected relating to hydrology, hydrogeology, flood records, surface water quality, water abstraction locations, land drainage systems, surface water management plans and identification of critical drainage areas.

5.10.5.1 Sources of information

The method for determining and appraising baseline conditions will be based on that proposed in the Institute of Environmental Management and Assessment (IEMA) Guidelines for EIAs. This will involve both desk study and survey work.

Sources examined in the desk study will include:

- Leeds Station Southern Entrance – Water Quality report (Faber Maunsell AECOM, March 2009);
- private water supply information (Protected Rights) held by the Environmental Health Department in LCC, although no private water supplies are expected close to the development;
- any information held by the Environment Agency on abstractions from and discharges to groundwater and surface water;
- SPZ information where available from the Environment Agency. The equivalent time of travel zones will be calculated using analytical formulae if SPZs are unavailable;
- existing hydraulic modelling of the River Aire from the Environment Agency;
- groundwater data from site investigations and Mott MacDonald geo-environmental desk studies;
- relevant groundwater vulnerability maps;
- discussions with the Environment Agency regarding the management of flood risk and environmental impacts during both the permanent and temporary works;
- data on surface water quality from the Environment Agency;
- river flow data collected by the Institute of Hydrology;
- the Leeds Strategic Flood Risk Assessment (SFRA) and Preliminary Flood Risk Assessment;
- topographic data;
- British Geological Survey (BGS); and
- information compiled as part of any investigative works associated with the project.

Additional and supplementary information on surface water features will be obtained from Ordnance Survey maps, site surveys and aerial photographs.

5.10.6 Assumptions and limitations

The principal assumptions and limitations for this assessment are outlined in Sections 5.9.6.1 and 5.9.6.2. Additional assumptions may be revealed during the environmental appraisal process.

5.10.6.1 Assumptions concerning the baseline

- No monitoring of water bodies is assumed to be necessary;
- no new topographic survey of watercourses is assumed to be necessary;
- no new hydraulic modelling of watercourses is assumed to be necessary;
- baseline conditions will be established in part from historical data, and it is assumed that conditions are not expected to change before or during the project;
the detailed design of the surface water drainage system will be carried out outside the scope of this assessment;
no major dewatering works will be required during the works;
it is assumed that data provided by third parties is accurate;
source protection zones may not be available from the Environment Agency for all groundwater receptors and it is assumed that equivalent ‘Time of Travel Zones (TTZ)’ will be calculated as part of the assessment using a similar methodology to that used by the Environment Agency;
the baseline groundwater quality data presented is expected to include limited coverage of the parameters listed under the Drinking Water Regulations or as List 1 and List 2 substances under the groundwater regulations. If available data for selected major ions (usually chlorides or sulphates) or gross physical chemistry such as electrical conductivity or suspended solids may be available; and
contaminated land and potential impacts on groundwater and surface water quality will be assessed separately.

5.10.6.2 Assumptions concerning the prediction of effects

Climate change estimates include uncertainty. The assessment will be limited to the scenarios described in PPS25. Estimates may be modified as climate change research advances, bringing a potential need for the flood risk assessment to be reviewed in the future;
further ground investigations may be undertaken, and thus further groundwater level data will become available in future as a result of monitoring. This data would be reported to the Environment Agency through the EMP process but would not be available within the ES; and
cumulative effects on groundwater and surface water flooding due to other developments planned or proposed within the area of the spatial scope cannot be predicted and would not be assessed within the ES.

5.10.7 Prediction of effects

This section will provide a description of the proposed construction works and completed LSSE scheme. This will be followed by an assessment of the likely effect of the scheme on baseline conditions. The predicted impacts on water resources and receptors, together with the significance of the effects, will be assessed using the methodology described below.

5.10.7.1 Construction

The prediction of construction effects will be based upon an assessment of detailed design drawings for the proposed LSSE scheme, the nature and extent of groundworks, proposed construction methods and duration of construction.

It is anticipated that appropriate provisions will be made in the Code of Construction Practise (CoCP), following best practice and incorporated mitigation measures to ensure that there will be no significant effects on hydrogeology, hydrology and surface water flood risk effects during the construction phase, it is assumed. Pollution will be controlled by reference to the relevant laws and guidelines and appropriate provisions of the CoCP and no prediction methodologies will be needed; and it is anticipated that the construction of the works will have a minor impact upon flood routes within the catchment.

5.10.7.2 Operation

The prediction of operational effects will be based on an assessment of the scheme design, and the predicted change from the existing baseline environment. No impacts on groundwater quality or surface
water quality are considered likely during operation and therefore no prediction methodology for the effect is proposed. In addition, it is anticipated that the proposed works may slightly reduce the flood storage capacity within the local area, although this is not expected to be a significant amount, provided it does not increase flood risk elsewhere. It is anticipated that flood routes could be permanently affected by the proposed works.

5.10.8 Evaluation of effects

5.10.8.1 Importance of receptor

There are no defined significance criteria for the assessment of water resources in the context of this type of construction. Thus the impacts and associated effects will be assessed against the criteria described below, which are based on those within the DfT’s Transport Analysis Guidance, Unit 3.3.11. The overall impacts of the LSSE will be summarised in an evaluation summary table.

The value of water resources is in part defined by legislation which protects all controlled waters in England and Wales and which, in effect, protects all water bodies (surface or groundwater). Thus, there cannot be a water feature that has negligible value. The value of controlled waters can also be defined taking into account the use and conservation importance of the water body. This is set out in Table 5.28.

<table>
<thead>
<tr>
<th>Value</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>High importance and rarity, international scale and limited potential for substitution</td>
<td>Internationally shared water resources. Catchments used for interbasin transfers. Water resources that perform major function in relation to internationally protected sites (Special Protection Area (SPA), Special Areas of Conservation (SAC), Ramsar site).</td>
</tr>
<tr>
<td>High</td>
<td>High importance &amp; rarity, national scale, or regional scale with limited potential for substitution</td>
<td>Water resources used for major potable supplies (i.e. by a water supply utility) with limited potential for substitution. Water resources that perform major function in relation to nationally protected sites (SSSI).</td>
</tr>
<tr>
<td>Medium</td>
<td>Medium importance and rarity, local or regional scale, and some potential for substitution</td>
<td>Locally important water resources used for public water supplies but which can be substituted. Private water supplies. Water resources that perform major function in relation to regionally important sites (SINCs, SNICs etc).</td>
</tr>
<tr>
<td>Low</td>
<td>Low or medium importance and rarity, local scale. Good potential for substitution.</td>
<td>Controlled waters with limited potable use, or limited input to sensitive or important ecosystems.</td>
</tr>
</tbody>
</table>

5.10.8.2 Magnitude of effect

The magnitude of an effect can vary considerably and should also consider the timescale over which the impact occurs. The impact must be defined as temporary or permanent and whether it is reversible or not. Typical criteria are set out in Table 5.29 below.
Table 5.29: Criteria for determining the magnitude of impact

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Typical criteria</th>
</tr>
</thead>
</table>
| High      | The proposal (either on its own or with other proposals) may affect the integrity of the water body either in terms of quality or quantity and could render it permanently unusable, or such that it would require substantial permanent treatment to return it to use. For example:  
  - deterioration within 50 day TTZ/SPZ and loss of supply  
  - contamination of main river causing deterioration to a condition below the RQO score |
| Moderate  | The quality or quantity of the water body would be reduced (or improved) such that some mitigation works would be required to ensure continuity of its existing use or function. The function of the water body is impacted such that there is a moderate and measurable change (+ve/-ve) in function (e.g. as a means of transmitting flood flows). Or, a major impact that only affected the water body for a limited time frame and was reversible and could be mitigated by some temporary works. For example:  
  - temporary deterioration within 400 day TTZ/SPZ or permanent deterioration in used aquifer outside the 400 day TTZ/SPZ  
  - temporary risk of contamination affecting main river or receptor (e.g. abstraction) |
| Low       | The impacts would affect the quantity or quality but in a manner which does not materially affect its use or function. For example:  
  - temporary deterioration outside 400 day TTZ/SPZ  
  - temporary risk of contamination of minor watercourse |
| Neutral   | No observable impact. |

5.10.8.3 Level of significance

Each type of effect will be allocated a level of significance as shown in Table 5.30.

Table 5.30: Evaluation of significance

<table>
<thead>
<tr>
<th>Magnitude of effect</th>
<th>Value of feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very high</td>
</tr>
<tr>
<td>High</td>
<td>Significant</td>
</tr>
<tr>
<td>Moderate</td>
<td>Significant</td>
</tr>
<tr>
<td>Low</td>
<td>Not significant</td>
</tr>
<tr>
<td>Neutral</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

Where appropriate, the assessment will also consider cumulative effects, where several types of effect act on the same resources and/or receptors. In some cases it may be that several “slight” effects may, individually, be insignificant but acting together may produce a significant effect on a sensitive water resource.

5.10.9 Mitigation and significant residual effects

The initial effects on water quality, hydrogeology, hydrology and flood risk may be mitigated using a range of techniques. Mitigation measures may potentially include:

- prevention of sediment and pollutants from entering watercourses during the works; and
- maintain flood routes;
The objective of these measures would be to avoid or reduce the significance of effects; any remaining significant residual effects will be identified within the ES.
Appendices

Appendix A. Report References _________________________________________________________________ 74
Appendix B. Report Figures _________________________________________________________________ 76
Appendix A. Report References

A.1. General Report References

Faber Maunsell AECOM (April 2009) Leeds Station Southern Entrance Archaeology Report
Faber Maunsell AECOM (April 2009) Leeds Station Southern Entrance Ecological Assessment
Faber Maunsell AECOM (April 2009) Leeds Station Southern Entrance Air Quality and Dust
Faber Maunsell AECOM (March 2009) Leeds Station Southern Entrance Noise and Vibration Assessment
Faber Maunsell AECOM (March 2009) Leeds Station Southern Entrance Water Quality Report
Faber Maunsell AECOM (April 2009) Leeds Station Southern Entrance GRIP 4 Report
AECOM (July 2009) Leeds Station Southern Entrance Bat Survey Report
Faber Maunsell AECOM (April 2009) Leeds Station Southern Entrance Daylight and Sunlight Performance Study
Faber Maunsell (October 2009) Leeds Station Southern Entrance Flooding Assessment
AECOM (November 2009) Leeds Station Southern Entrance Flooding Assessment Addendum #1
AECOM (January 2010) Leeds Station Southern Entrance Flooding Assessment Addendum #2
Leeds Station Southern Entrance Planning, Design and Access Statement
AECOM (September 2009) Leeds Station Southern Entrance Transport Statement

A.2. Noise & Vibration References

Appendix B. Report Figures

Figure B.1: Location Plan
Leeds Station Southern Entrance

Figure B.2: Red Line boundary and proposed project footprint
Key

- Initial Planning Boundary
- Proposed Building Footprint
- Not Included within planning boundaries

Notes:
1. This is an Initial Planning Boundary to allow environmental scoping. This boundary may be revised to reflect inputs from contractors once received and the baseline assessment progressed.
Figure B.3: Red Line boundary for the proposed barge loading/unloading area on Water Lane
This is an initial Planning Boundary to allow environmental scoping, based on the initial draft of the Order Limits (296480/SKE/004). These are to be revised once inputs from contractors are received and the baseline assessment progressed.

Key
Initial Planning Boundary
(to be revised further)

Area Not Required

Note:
1. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

Leeds Station South Entrance
Environmental Statement
Draft Red Line Plan (Water Lane)

Rev Date Drawn Title
P1 Sep 11 JCK Draft for Discussion

Scale at A3 1:1000

296480/SKE/005

Rev Status
P1 PRE
Appendix B. DfT Scoping Opinion
Robert Fox
Transport and Works Act Orders Unit
General Counsel's Office
Department for Transport
Zone 1/18
Great Minster House
33 Horseferry Road
LONDON
SW1P 4DR
Direct Line: 020-7944 3293
Fax: 020-7944 9637
Email: Robert.fox@dft.gov.uk
Web Site: www.dft.gov.uk/topics/legislation/twa
Our Ref: TWA 2/2/89; TWA 3/5/2
Your Ref: 202606-000001
10 November 2011

Eversheds LLP
One Wood Street
LONDON
EC2V 7WS

Dear Sirs,

Transport and Works Act 1992 (“TWA”)
Leeds Station Southern Entrance Scheme

1. I refer to Stephen Collings’ email of 3 November requesting a direction as to any organisation representing users of the Leeds and Liverpool Canal or the River Aire who should be served notice of the proposed application for a TWA Order in relation to the above scheme.

2. For the purposes of paragraph 3 of the Table at Schedule 6 to the Rules, the Secretary of State requires that the applicants for the proposed TWA Order serve notice of the application on the Leeds and Liverpool Canal Society.

Yours faithfully

Robert Fox
Dear Sirs,

Transport and Works Act 1992
Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006
Leeds Station Southern Entrance Scheme

1. I refer to your letter of 5 October 2011 on behalf of your clients, West Yorkshire Passenger Transport Executive (“Metro”), in which you requested a scoping opinion under rule 8 of the above Rules on the information to be provided in the environmental statement (“ES”) for the scheme. You enclosed with your letter a report entitled “Leeds Station Southern Entrance: EIA Scoping Report” dated October 2011 produced by Mott MacDonald (Report No: 296480/RPT02).

2. We have considered your request in accordance with rule 8 of the above Rules. In doing so we have consulted British Waterways, English Heritage, the Environment Agency, Leeds City Council and Natural England.

Scoping Opinion

3. The Secretary of State considers that the information to be included in the ES for this project should include an assessment of those environmental impacts identified in the Scoping Report as ones which the environmental impact assessment must consider. She considers also that the ES should address the matters set out below.

4. Please note that this scoping opinion is given without prejudice to our consideration of any application for an Order under the Transport and Works Act 1992 which may be made for the proposed Leeds Station Southern Entrance scheme. The giving of this opinion implies no view on the Department’s part about the merits or otherwise of the scheme. The sections and paragraphs referred to below are those of the Scoping Report.
Climatic factors

The ES should include information on Metro’s approach to climate change mitigation and climate change adaptation.

Ecology (5.3)

In relation to the impact of the scheme on aquatic habitat and species likely to be present or transient in the River Aire, the ES should assess the impact of the scheme on the existing fish population, including impacts on migratory fish species of conservation importance, and otters, and the potential for ecological enhancement.

Geology and soils (5.4)

In assessing the risks to controlled waters from contamination at the site of the scheme, Metro should have regard to the risk management framework provided in CLR11, Model Procedures for the Management of Land Contamination.

Noise and Vibration (5.6)

The ES should include an assessment of any potential for improving the current noise climate through the scheme.

Distribution

5. Copies of this letter are being sent to those bodies listed in paragraph 2.

Yours faithfully

Martin Woods
Dear Robert

Transport and Works Act 1992 ("TWA")
Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006 ("AOPR")

The proposed Leeds Station Southern Entrance Scheme

Thank you for seeking our advice on the scope of the Environmental Statement (ES) in your consultation dated 6 October 2011, which we received on 6 October 2011.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

We would expect the final ES to include all necessary information as outlined in Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011. Appendix A to this letter provides further detail on what Natural England as a statutory consultee expects with reference to this application.

It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the ‘in combination’ effects of the proposed development with any existing developments and new applications. A full consideration of the implications of the whole scheme should be included in the ES.

The Habitats Regulations, in particular Regulations 61 and 62, require the Local Planning Authority (LPA) to determine whether or not the proposals are likely to have a significant effect, alone or in combination with other plans or projects, on any internationally protected sites (Special Area of Conservation, Special Protection Area and Ramsar sites). Natural England advises that the ES should include sufficient information to allow the LPA to make the judgements required of them under the Habitats Regulations.

Appendix A to this letter provides detailed advice to help in the production of the ES.

Yours sincerely

Jane Morton
Land Use Operations
Appendix A

Detailed advice from Natural England on the scope of the Environmental Statement

1 General Principles

We would expect the final ES to include all necessary information as outlined in Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011, specifically:

- A description of the development – including physical characteristics and the full land use requirements of the site during construction and operational phases.
- Expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.
- An assessment of alternatives and clear reasoning as to why the preferred option has been chosen.
- A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.
- A description of the likely significant effects of the development on the environment – this should cover direct effects but also any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects. Effects should relate to the existence of the development, the use of natural resources and the emissions from pollutants.
  This should also include a description of the forecasting methods to predict the likely effects on the environment.
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- A non-technical summary of the information.
- An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the ‘in combination’ effects of the proposed development with any existing developments and new applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

2 Biodiversity and Geology

2.1 Ecological Aspects of an Environmental Statement

Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. Guidelines for Ecological Impact Assessment (EcIA) have been developed by the Institute of Ecology and Environmental Management (IEEM) and are available on their website.

EcIA is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. EcIA may be carried out as part of the EIA process or to support other forms of environmental assessment or appraisal.

Key Principle (vi) of PPS9 Biodiversity and Geological Conservation, begins ‘The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests’ and the Royal Town Planning Institute (RTPI) ‘Five Point Approach to Planning Decisions for Biodiversity’ (which are summarised within the joint Communities & Local Government, Defra and English Nature companion guide to PPS9, entitled Planning for Biodiversity and Geological Conservation: A Guide to Good Practice) are both relevant. The ES should aim to address these principles to help the LPA identify whether they have been met by the proposals within the planning application.

2.2 Internationally and Nationally Designated Sites
The ES should thoroughly assess the impact of the proposals on designated sites, including Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites and Sites of Special Scientific Interest (SSSI). Should a Likely Significant Effect on a European/Internationally designated site be identified, the competent authority (in this case the Local Planning Authority) may need to prepare an Appropriate Assessment under the Conservation of Habitats and Species Regulations 2010 (the full process being termed Habitats Regulations Assessment), in addition to consideration of impacts through the EIA process.

Statutory site locations can be found at www.magic.gov.uk. Further information concerning particular statutory sites can be found on the Natural England website.

2.3 Protected Species
The ES should assess the impact of all phases of the proposal on protected species. Records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment.

The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.

Natural England has adopted standing advice for protected species. It provides a consistent level of basic advice which can be applied to any planning application that could affect protected species. It also includes links to guidance on survey and mitigation.

The ES will need to consider the impact of the proposals on bird populations including the potential impact of the proposals on bird flight lines, breeding and wintering populations and high tide roosts. Where these are included as an interest feature of a European or Internationally designated site, an Appropriate Assessment under the Habitats Regulations may be required.

Natural England does not hold comprehensive information regarding the locations of species protected by law, but advises on the procedures and legislation relevant to such species.

2.4 Regionally and Locally Important Sites
The ES should thoroughly assess the impact of the proposals on non-statutory sites, for example Local Wildlife Sites (LoWS), Local Nature Reserves (LNR) and Regionally Important Geological and Geomorphological Sites (RIGS). Natural England does not hold comprehensive information on these sites. We therefore advise that the appropriate local biological record centres, nature conservation organisations, Local Planning Authority and local RIGS group should be contacted with respect to this matter.

2.5 Biodiversity Action Plan Habitats and Species
The ES should thoroughly assess the impact of the proposals on habitats and/or species listed in the UK Biodiversity Action Plan (BAP). These Priority Habitats and Species are listed as ‘Habitats and Species of Principal Importance’ within the England Biodiversity List, recently published under the requirements of S14 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available in the Defra publication ‘Guidance for Local Authorities on Implementing the Biodiversity Duty’.

PPS9 Paragraph 16 states ‘Planning authorities should ensure that these species (Habitats and Species of Principal Importance identified in the Countryside and Rights of Way Act 2000 section 74 list) are protected from the adverse effects of development…’. Government Circular 06/2005 adds that
BAP species and habitats, ‘are capable of being a material consideration...in the making of planning decisions’. Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP.

3 Landscape, Access and Recreation
The ES should address in an appropriately broad and detailed way any impacts on the landscape as well as access and recreation assets. This assessment should include thorough consideration of any impacts on National Parks, Areas of Outstanding Natural Beauty (AONB), Heritage Coasts and National Trails.

3.1 Landscape and Visual Impacts
Natural England expects the methodology of consideration of landscape impacts to reflect the approach set out in the Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute, 2002), the Landscape Character Assessment Guidance for England and Scotland (Scottish Natural Heritage and The Countryside Agency, 2002) and good practice. The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England would expect the cumulative impact assessment to include those proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.

The assessment should refer to the relevant National Character Areas which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.
Dear Mr. Fox

Transport and Works Act 1992 ("TWA")
Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006 ("AOPR")

The proposed Leeds Station Southern Entrance Scheme

Thank you for your letter dated 6 October 2011. I can confirm that English Heritage is satisfied with the proposed contents of the environmental statement and is happy for you to proceed on that basis.

Yours sincerely

Kathryn Gibson
Historic Buildings and Areas Adviser
West Yorkshire
This EIA Scoping report identifies a range of topics for investigation, listed in Chapter 5. I realise there are several supporting documents that will cover other environmental topics, listed in Section 1.6. However, I would be interested to know whether the relevant reports will cover climate change mitigation & adaptation. Both these topics relate to ‘Climatic Factors’ that need to be covered within the EIA Regulations

- **Climate change mitigation**: I would be interested to understand your approach & proposed actions to reduce energy demand & resultant GHG emissions arising from:-
  - All construction activities of the above project
  - The operation & use of the LSSE.

- **Climate change adaptation**: Would be interested to know how you propose to climate proof this development against:-
  - The effects of flooding & water scour on supporting river piers
  - Resilience to intense rainfall on proposed structure
  - Thermal comfort inside the LSSE structure, during heat wave conditions
  - Resilience to high winds etc.
  - To assist in the above, will you consider using the UK Climate Projections 2009?

**Air Quality**

As stated in the report AQMA’s do exist in central Leeds, the closest AQMA is located just 800 metres from the development. Background emissions of NO₂ are generally high in the vicinity of the LSSE, due mainly to emissions from city centre road transport & local emissions from diesel trains.

An air quality assessment will be required to assess the likelihood of local air quality exceedances &/or potential air pollution or odour nuisance, & to develop appropriate mitigation. Our main concerns are likely at:-

- Any residential/hotel units affected by vehicular access & drop off points, especially if vehicles keep engines running in contained urban environment
- Potential dust & air pollution nuisance from construction activities, affecting the adjacent residential dwellings.

**Noise**

- Clearly during the construction phase there is massive potential for noise to affect the residents of the 2 apartment blocks overlooking the site
- Any measures to ameliorate these effects would obviously be good – enclosure/covering of works (working within Dark Arches where possible?)
- It will be important to keep affected residents informed in advance of works – when the particularly noisy activities are to take place, how long they will last etc and to avoid anti-social hours working where possible
• Any improvements to the current noise climate which could be achieved via the scheme would clearly be beneficial – it was noted during a site visit that the existing tannoy’s on the southern platform of the station are parallel to the station perimeter (rather than pointing inwards as might be expected) – as such announcements can be heard from outside the station and could potentially be an annoyance to the residents of the apartments. It is recommended that any new tannoy’s point back into the station (and if possible the existing ones could be re-aligned to do so too).
• If the existing barrier/shelter along the southern edge of the station were to be ‘beefed-up’, then some acoustic benefits might be felt by the apartment dwellers.
• It is possible that the structure of the proposal itself might screen some existing station noise from the apartments.

Vibration

• Vibration levels should be monitored during construction works and residents informed if perceptible levels are likely within the apartments (an explanation of the levels at which vibration is felt compared to that at which damage can occur could be reassuring).

Other

• Consideration should be given to the possibility of claims under Part 1 of the Land Compensation Act in relation to the public works associated with this scheme. (Claims may be put forward if the claimant feels there has been a change in physical factors such as noise, vibration, lighting, fumes etc as a result of the use of new public works).
• Care should be taken in relation to potential loss of privacy to the adjacent apartment buildings (frosted glass in appropriate areas of the entrance façade?).
Dear Mr. Fox

LEEDS STATION SOUTHERN ENTRANCE SCHEME - EIA SCOPING OPINION
(TRANSPORT AND WORKS ACT 1992)
CITY STATION, NEW STATION STREET, LEEDS

Thank you for your EIA Scoping consultation letter of the 6th October 2011. The letter was received on the 7th October 2011.

Environment Agency position
We have reviewed the scoping report submitted and have further comments to make in respect of Flood Risk, Groundwater and Contaminated Land, Fisheries and Biodiversity to ensure that the Environmental Statement will appropriately address the environmental issues we consider are of most importance for this proposal.

Our technical comments detailing the information we consider should be provided in the environmental statement and information which is available from the Environment Agency are provided below.

Flood Risk
In addition to the flood risk information included in the EIA Scoping the following should be noted:

Under the terms of the Water Resources Act 1991, and the Yorkshire Land Drainage Byelaws, the prior written consent of the Environment Agency is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of the River Aire, designated a ‘main river’.

Environment Agency
Phoenix House Global Avenue, Leeds, West Yorkshire, LS11 8PG.
Customer services line: 03708 506 506
www.environment-agency.gov.uk
Cont/d..
Groundwater and Contaminated Land
The EIA should address risks to controlled waters from contamination at the site, following the requirements of PPS23 and the Environment Agency ‘Guiding Principles for Land Contamination’. The developer should also follow the risk management framework provided in CLR11, Model Procedures for the Management of Land Contamination, when dealing with land affected by contamination.

Fisheries
The culvert under the railway station is itself a barrier to fish migration, as are the several weirs along its length. Making the culvert and weirs passable to fish will provide mitigation for the continued presence of the culvert, and an ecological enhancement (over the condition that exists at present). This should be considered by the EIA as ‘incorporated mitigation’. Improving fish passage will be in accordance with PPS1 and PPS9, the Water Framework Directive, and Leeds City Council’s planning policies.

The EIA scoping report states that the river around the station is ‘highly canalised with steep high sided stone or metal piled banks with very limited natural features’. However, this section of the River Aire holds large numbers of fish, of a wide variety of species, as evidenced during an Environment Agency electric fishing survey conducted there in summer 2011. The impact of the development on the existing fish population in this recovering river therefore needs to be considered as part of the EIA. For further information about the recent fish survey, in the first instance please contact Jerome Masters, Environment Agency Fisheries Team Tel no 0113 2134710 email Jerome.masters@environment-agency.gov.uk.

In addition to the existing fish populations, as barriers to migration downstream of the railway station are made passable to fish, the River Aire will once again become a major migration route for fish species of conservation importance. The ‘protected and notable species’ section of the EIA should therefore consider the impact of the works, and the continued presence of the culvert and weirs, on migratory fish species of conservation importance (salmon, sea trout, river lamprey, sea lamprey, eel). The EIA should also take into account Section 14 of the Eels (England and Wales) Regulations 2009, under which the owners of the weirs under the railway station (presumably Network Rail) will be required to make them passable to eels.

Biodiversity
An Environmental Impact Assessment for this site should at a minimum include:

- an ecological survey (habitats and species) of the site and adjacent areas undertaken at an appropriate time of year by a suitably qualified ecologist;
- the likely impacts on the water environment at the site and impacts upstream and downstream;
- the extent to which it is possible to avoid or mitigate against adverse effects, and any limitations of mitigation.

Characteristics of the potential impacts:

- **direct damage to/or loss of aquatic habitat** and biodiversity associated with the proposed development

- **direct and indirect impacts on species** likely to be present at the site or transient, in particular fish and otters, effects on migration and likely increases in disturbance e.g. increased lighting
• impacts on surface water hydrology and quality

Assessments should have regard to the above and should address the effects that might occur during construction and operational stages.

The comments we set out above are without prejudice to future decisions we make regarding any applications subsequently made to us for our permits or consents for operations at the site.

Should you require any further information or clarification, please contact me on the details below.

Yours sincerely

Ms Rachel Jones
Planning Liaison Technical Specialist

Direct dial 01132134909
Direct fax 01132134609
Direct e-mail rachele.jones@environment-agency.gov.uk
Robert

Sorry for the delay in our response.

The main issues that need to be considered as part of the scoping request are:

Prior to the commencement of development, full construction details of the foundations, supporting structures on the river bed should be submitted to and agreed by the local planning authority in conjunction with British Waterways. In order to ensure that there will be no detrimental impact on the bed or banks of the River Aire and the associated waterway infrastructure.

Prior to the commencement of development, full construction details of the bridge span where it lands on the side of the navigation should be submitted to and agreed by the local planning authority in conjunction with British Waterways. In order to ensure that there will be no detrimental impact on the bed or banks of the River Aire and the associated waterway infrastructure.

Prior to the commencement of development, full details of the surface water drainage arrangements including means of discharging into the watercourse should be submitted to and agreed by the local planning authority in conjunction with British Waterways. In order to prevent any damage to the waterway structure, protect water quality and users of the waterway and to make an assessment of the increased volume of water entering the watercourse.

The recommendations of the Ecological Assessment Report and Bat Survey Report must be fully implemented. Prior to the commencement of development, full details of the ecological mitigation measures must be submitted to and agreed by the local planning authority in conjunction with British Waterways. The ecological environment in this location is sensitive and should be protected from disturbance, dust, run off, waste etc. from entering the waterway, impacting on water quality and the environment.

Prior to the commencement of development, full details of appropriate mitigation measures to prevent pollution of the waterway during construction of the proposed development shall be submitted to and agreed in writing by the Local Planning Authority and thereafter implemented in accordance with the agreed details unless otherwise agreed in writing. In order to avoid contamination of the waterway and ground water from wind blow, seepage or spillage at the site.

In addition, the applicant/developer is advised to contact British Waterways’ Estates Manager Simon Currass (0113 281 6800) in order to negotiate our explicit agreement and approval to construct and locate the structure on our property and...
our Third Party Works Engineer, Alan Daines (0113 200 5713) in order to ensure that all necessary consents are obtained and the works are compliant with the current British Waterways’ ‘Code of Practice for Works Affecting British Waterways.

Regards,

Martyn Coy
Area Planner
British Waterways 0113 281 6803

From: Enquiries Northeast
Sent: 17 October 2011 10:49
To: Martyn Coy
Importance: High

Please see the attached 2 page letter formally consulting you in respect of these proposals, and an 81 page EIA Scoping Report.

As requested in the letter, please confirm within a week whether you or another is the person in your organisation who will be dealing with this matter, and provide your substantive response within 28 days.

Robert J Fox
Transport and Works Act Orders Unit
General Counsel's Office
Department for Transport
Zone 1/18
Great Minster House
Appendix C. Response to Scoping Opinion
Table C.1: Table of comments from the Scoping Opinion and Mott MacDonald response

<table>
<thead>
<tr>
<th>Scoping Opinion Comment</th>
<th>Document Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department for Transport</strong></td>
<td></td>
</tr>
<tr>
<td>The Secretary of State considers that the information to be included in the ES for this project should include an assessment of those environmental impacts identified in the Scoping Report as ones which the environmental impact assessment must consider. She considers also that the ES should address the matters set out below. Please note that this scoping opinion is given without prejudice to our consideration of any application for an Order under the Transport and Works Act 1992 which may be made for the proposed Leeds Station Southern Entrance scheme. The giving of this opinion implies no view on the Department’s part about the merits or otherwise of the scheme. The sections and paragraphs referred to below are those of the Scoping Report:</td>
<td>No response required, included for information purposes.</td>
</tr>
<tr>
<td><strong>Climatic factors</strong></td>
<td></td>
</tr>
<tr>
<td>The ES should include information on Metro’s approach to climate change mitigation and climate change adaptation.</td>
<td>See Climate Change Management Assessment in Volume IV of this ES</td>
</tr>
<tr>
<td><strong>Ecology (5.3)</strong></td>
<td></td>
</tr>
<tr>
<td>In relation to the impact of the scheme on aquatic habitat and species likely to be present or transient in the River Aire, the ES should assess the impact of the scheme on the existing fish population, including impacts on migratory fish species of conservation importance, and otters, and the potential for ecological enhancement.</td>
<td>See Ecology Technical Appendix in Volume II of this ES</td>
</tr>
<tr>
<td><strong>Geology and soils (5.4)</strong></td>
<td></td>
</tr>
<tr>
<td>In assessing the risks to controlled waters from contamination at the site of the scheme, Metro should have regard to the risk management framework provided in CLR11, Model Procedures for the Management of Land Contamination.</td>
<td>See Geology &amp; Soils Technical Appendix in Volume II of this ES</td>
</tr>
<tr>
<td><strong>Noise and Vibration (5.6)</strong></td>
<td></td>
</tr>
<tr>
<td>The ES should include an assessment of any potential for improving the current noise climate through the scheme.</td>
<td>See Noise &amp; Vibration Technical Appendix in Volume II of this ES</td>
</tr>
<tr>
<td><strong>Natural England</strong></td>
<td></td>
</tr>
<tr>
<td>We would expect the final ES to include all necessary information as outlined in Schedule 4 of the Town &amp; Country Planning (Environmental Impact Assessment) Regulations 2011. Appendix A to this letter provides further detail on what Natural England as a statutory consultee expects with reference to this application.</td>
<td>No response required, included for information purposes.</td>
</tr>
<tr>
<td>It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the ‘in combination’ effects of the proposed development with any existing developments and new applications. A full consideration of the implications of the whole scheme should be included in the ES.</td>
<td>See Section 8.12 of this document.</td>
</tr>
<tr>
<td>The Habitats Regulations, in particular Regulations 61 and 62, require the Local Planning Authority (LPA) to determine whether or not the proposals are likely to have a significant effect, alone or in combination with other plans or projects, on any internationally protected sites (Special Area of Conservation, Special Protection Area and Ramsar sites). Natural England advises that the ES should include sufficient information to allow the LPA to make the judgements required of them under the Habitats Regulations.</td>
<td>See Ecology Technical Appendix in Volume II of this ES</td>
</tr>
<tr>
<td><strong>English Heritage</strong></td>
<td></td>
</tr>
<tr>
<td>Confirm that English Heritage is satisfied with the proposed contents of the environmental statement and is happy for you to proceed on that basis.</td>
<td>No response required, included for information purposes.</td>
</tr>
</tbody>
</table>
### Scoping Opinion Comment

**Leeds City Council**

This EIA Scoping report identifies a range of topics for investigation, listed in Chapter 5. I realise there are several supporting documents that will cover other environmental topics, listed in Section 1.6. However, I would be interested to know whether the relevant reports will cover climate change mitigation & adaptation. Both these topics relate to 'Climatic Factors' that need to be covered within the EIA Regulations.

**Climate change mitigation**

I would be interested to understand your approach & proposed actions to reduce energy demand & resultant GHG emissions arising from:-

- All construction activities of the of the above project
- The operation & use of the LSSE

**Climate change adaptation**

Would be interested to know how you propose to climate proof this development against:-

- The effects of flooding & water scour on supporting river piers
- Resilience to intense rainfall on proposed structure
- Thermal comfort inside the LSSE structure, during heat wave conditions
- Resilience to high winds etc.
- To assist in the above, will you consider using the UK Climate Projections 2009?

**Air Quality**

As stated in the report AQMA’s do exist in central Leeds, the closest AQMA is located just 800 metres from the development. Background emissions of NO2 are generally high in the vicinity of the LSSE, due mainly to emissions from city centre road transport & local emissions from diesel trains. An air quality assessment will be required to assess the likelihood of local air quality exceedances &/or potential air pollution or odour nuisance, & to develop appropriate mitigation. Our main concerns are likely at:-

- Any residential/hotel units affected by vehicular access & drop off points, especially if vehicles keep engines running in contained urban environment
- Potential dust & air pollution nuisance from construction activities, affecting the adjacent residential dwellings.

**Noise**

Clearly during the construction phase there is massive potential for noise to affect the residents of the 2 apartment blocks overlooking the site. Any measures to ameliorate these effects would obviously be good – enclosure/covering of works (working within Dark Arches where possible?)

It will be important to keep affected residents informed in advance of works – when the particularly noisy activities are to take place, how long they will last etc and to avoid anti-social hours working where possible.

Any improvements to the current noise climate which could be achieved via the scheme would clearly be beneficial – it was noted during a site visit that the existing tannoys on the southern platform of the station are parallel to the station perimeter (rather than pointing inwards as might be expected) – as such announcements can be heard from outside the station and could potentially be an annoyance to the residents of the apartments.  It is recommended that any new tannoys point back into the station (and if possible the existing ones could be re-aligned to do so too).

If the existing barrier/shelter along the southern edge of the station were to be ‘beefed-up’, then some acoustic benefits might be felt by the apartment dwellers.

See Climate Change Management Assessment in Volume IV of this ES

See Climate Change Management Assessment in Volume IV of this ES

See Climate Change Management Assessment in Volume IV of this ES

See Air Quality Technical Appendix in Volume II of this ES

See Noise & Vibration Technical Appendix in Volume II of this ES
<table>
<thead>
<tr>
<th>Scoping Opinion Comment</th>
<th>Document Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is possible that the structure of the proposal itself might screen some existing station noise from the apartments.</td>
<td>See Noise &amp; Vibration Technical Appendix in Volume II of this ES</td>
</tr>
<tr>
<td>Vibration</td>
<td></td>
</tr>
<tr>
<td>Vibration levels should be monitored during construction works and residents informed if perceptible levels are likely within the apartments (an explanation of the levels at which vibration is felt compared to that at which damage can occur could be reassuring).</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Care should be taken in relation to potential loss of privacy to the adjacent apartment buildings (frosted glass in appropriate areas of the entrance façade?).</td>
<td>See Townscape &amp; Visual Impact Assessment Technical Appendix in Volume II of this ES</td>
</tr>
</tbody>
</table>

**Environment Agency**

We have reviewed the scoping report submitted and have further comments to make in respect of Flood Risk, Groundwater and Contaminated Land, Fisheries and Biodiversity to ensure that the Environmental Statement will appropriately address the environmental issues we consider are of most importance for this proposal.

Our technical comments detailing the information we consider should be provided in the environmental statement and information which is available from the Environment Agency are provided below:

**Flood Risk**

In addition to the flood risk information included in the EIA Scoping the following should be noted:

*Under the terms of the Water Resources Act 1991, and the Yorkshire Land Drainage Byelaws, the prior written consent of the Environment Agency is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of the River Aire, designated a ‘main river’.*

**Groundwater and Contaminated Land**

The EIA should address risks to controlled waters from contamination at the site, following the requirements of PPS23 and the Environment Agency ‘Guiding Principles for Land Contamination’. The developer should also follow the risk management framework provided in CLR11, Model Procedures for the Management of Land Contamination, when dealing with land affected by contamination.

**Fisheries**

The culvert under the railway station is itself a barrier to fish migration, as are the several weirs along its length. Making the culvert and weirs passable to fish will provide mitigation for the continued presence of the culvert, and an ecological enhancement (over the condition that exists at present). This should be considered by the EIA as ‘incorporated mitigation’. Improving fish passage will be in accordance with PPS1 and PPS9, the Water Framework Directive, and Leeds City Council’s planning policies.

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In addition to the existing fish populations, as barriers to migration downstream of the railway station are made passable to fish, the River Aire will once again become a major migration route for fish species of conservation importance. The ‘protected and noteable species’ section of the EIA should therefore consider the impact of the works, and the continued presence of the culvert and weirs, on migratory fish species of conservation importance (salmon, sea trout, river lamprey, sea lamprey, eel). The EIA should also take into account Section 14 of the Eels (England and Wales)
### Scoping Opinion Comment

Regulations 2009, under which the owners of the weirs under the railway station (presumably Network Rail) will be required to make them passable to eels.

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<td>• direct and indirect impacts on species likely to be present at the site or transient, in particular fish and otters, effects on migration and likely increases in disturbance e.g. increased lighting</td>
<td></td>
</tr>
<tr>
<td>• impacts on surface water hydrology and quality</td>
<td></td>
</tr>
</tbody>
</table>

### British Waterways

The main issues that need to be considered as part of the scoping request are:

Prior to the commencement of development, full construction details of the foundations/supporting structures on the river bed should be submitted to and agreed by the local planning authority in conjunction with British Waterways. In order to ensure that there will be no detrimental impact on the bed or banks of the River Aire and the associated waterway infrastructure.

Prior to the commencement of development, full construction details of the bridge span where it lands on the side of the navigation should be submitted to and agreed by the local planning authority in conjunction with British Waterways. In order to ensure that there will be no detrimental impact on the bed or banks of the River Aire and the associated waterway infrastructure.

Prior to the commencement of development, full details of the surface water drainage arrangements including means of discharging into the watercourse should be submitted to and agreed by the local planning authority in conjunction with British Waterways. In order to prevent any damage to the waterway structure, protect water quality and users of the waterway and to make an assessment of the increased volume of water entering the watercourse.

The recommendations of the Ecological Assessment Report and Bat Survey Report must be fully implemented. Prior to the commencement of development, full details of the ecological mitigation measures must be submitted to and agreed by the local planning authority in conjunction with British Waterways. The ecological environment in this location is sensitive and should be protected from disturbance, dust, run off, waste etc. from entering the waterway, impacting on water quality and the environment.

Prior to the commencement of development, full details of appropriate mitigation measures to prevent pollution of the waterway during construction of the proposed development shall be submitted to and agreed in writing by the Local Planning Authority and thereafter implemented in accordance with the agreed details unless otherwise agreed in writing. In order to avoid contamination of the waterway and ground water from wind blow, seepage or spillage at the site.

See Ecology Technical Appendix in Volume II of this ES

See Water Resources Technical Appendix in Volume II of this ES
Appendix D. EIA Consultation Log
<table>
<thead>
<tr>
<th>Advisor Details</th>
<th>Organisation Consulted/Contacted</th>
<th>Date of Discussions/Contact</th>
<th>Topic e.g. Air Quality</th>
<th>Brief Details of Discussion/Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Monk-Steel</td>
<td>Leeds City Council</td>
<td>Tim Summers</td>
<td>26/09/2011</td>
<td>Noise and vibration</td>
</tr>
<tr>
<td>Paul Millard</td>
<td>Environment Agency</td>
<td>Mark Garford</td>
<td>27/09/2011</td>
<td>Flood Risk</td>
</tr>
<tr>
<td>Paul Millard</td>
<td>Leeds City Council</td>
<td>Liam Cooper</td>
<td>04/10/2011</td>
<td>Private Water Supplies</td>
</tr>
<tr>
<td>Paul Millard</td>
<td>Environment Agency</td>
<td>Cheryl Beech</td>
<td>27/10/2011</td>
<td>Flood Risk</td>
</tr>
<tr>
<td>Paul Millard</td>
<td>British Waterways</td>
<td>David Crane</td>
<td>31/10/2011 and 8/11/2011</td>
<td>Flood Risk and Water Quality</td>
</tr>
<tr>
<td>Paul Millard</td>
<td>British Waterways</td>
<td>Alan Daines</td>
<td>09/11/2011</td>
<td>third party code of practice</td>
</tr>
<tr>
<td>Andrew Monk-Steel</td>
<td>Leeds City Council</td>
<td>Mike Bird</td>
<td>21/11/2011</td>
<td>Noise and vibration</td>
</tr>
<tr>
<td>James Dunham</td>
<td>Leeds City Council</td>
<td>Dave Cherry</td>
<td>22/02/2012</td>
<td>Climate change</td>
</tr>
<tr>
<td>James Sugrue</td>
<td>Leeds City Council</td>
<td>Phil Ward</td>
<td>06/02/2012</td>
<td>Conservation Area Consent</td>
</tr>
<tr>
<td>James Sugrue</td>
<td>Leeds City Council</td>
<td>Phil Ward</td>
<td>09/02/2012</td>
<td>Conservation Area Consent</td>
</tr>
<tr>
<td>James Sugrue</td>
<td>Leeds City Council</td>
<td>Chris Briggs</td>
<td>09/02/2012</td>
<td>Planning Permission</td>
</tr>
<tr>
<td>James Sugrue</td>
<td>West Yorkshire Archaeological Advisory Service</td>
<td>David Hunter</td>
<td>21/02/2012</td>
<td>Archaeology</td>
</tr>
</tbody>
</table>
Appendix E. Mitigation Register

Table E.1: Construction Stage Mitigation Requirements

I = Incorporated mitigation (MANDATORY); S = Supplementary mitigation (OPTIONAL/OPPORTUNITY)
The Leeds Railway Station (Southern Entrance) Order
Environmental Statement Volume I: Main Statement

<table>
<thead>
<tr>
<th>Mitigation Ref:</th>
<th>Construction Impact/Effect</th>
<th>Mitigation Details</th>
<th>Type</th>
<th>Responsibility</th>
<th>Mitigation Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td></td>
<td>The Contractor will undertake work in accordance with the Network Rail Contract Requirements – Environment (December 2011). The Contractor will undertake work in accordance the mitigation measures set out in the Network Rail CR-E and Register of Consents &amp; Commitments and comply with all relevant legislation.</td>
<td>✓</td>
<td>Main Contractor</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>Air Quality</td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>Control of dust and other emissions to the atmosphere</td>
<td>Metro and Network Rail will ensure that its construction contractor will abide by Network Rail’s Contract Requirements - Environment (CR-E) and Register of Consents &amp; Commitments which includes requirement to implement Best Practicable Means (BPM) for the control of dust and other emissions to the atmosphere. These requirements will form part of the construction contractor’s Environmental Management Plan (EMP) which will be adopted and implemented by the construction contractor. In addition to adopting Network Rail’s CR-E, the site specific mitigation measures listed below will be adopted and will also form part of the construction contractor’s EMP.</td>
<td>✓</td>
<td>Metro and Network Rail</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C3</td>
<td>Control of dust and other emissions to the atmosphere</td>
<td>The ‘Greater London Authority and London Councils Best Practice Guidance - The Control of Dust and Emissions from Construction and Demolition’ 2006 provides a comprehensive overview of BPM mitigation measures to control dust and combustion related emissions from construction sites. Although the proposed LSSE scheme is located outside of London, the BPM mitigation measures will be adopted for the LSSE scheme.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
</tbody>
</table>
| C4              | Control of dust and other emissions to the atmosphere | The BPM mitigation measures, from the London Guidance, that are considered appropriate and will be imposed on site by the construction contractor during the construction phase are as follows:

**Site Planning**
- Erect effective barriers around dusty activities or the site boundary;
- No bonfires;
- Plan site layout – machinery and dust causing activities should be located away from receptors (where possible);
- Ensure site construction routes are hard standing;
- Use nearby waterways for transportation to/from site, where feasible;
- Establish a method for visual dust monitoring across site and ensure key site personnel are fully trained in this respect; and | ✓ | Main Contractor (Site Manager) | Network Rail CR-E |
**Mitigation Details**

<table>
<thead>
<tr>
<th>Mitigation Ref:</th>
<th>Construction Impact/Effect</th>
<th>Requirement</th>
<th>Mitigation Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

- A trained and responsible manager on site during working times will supervise and oversee site inspections to monitor compliance with dust control procedures set out above and record the results of the inspections, including nil returns, in a site log book.

**Construction Traffic**

- All vehicles to switch off engines – no idling vehicles;
- Effective vehicle cleaning and specific wheel-washing on leaving site and damping down of haul routes if required;
- Routinely clean the public highway using wet sweeping methods;
- All loads entering and leaving site to be covered;
- No site runoff of water or mud;
- On-road vehicles to comply to set emission standards;
- All non road mobile machinery (NRMM) to use ultra low sulphur tax-exempt diesel (ULSD) where available and be fitted with appropriate exhaust after-treatment from the approved list;
- On-road vehicles to comply with the requirements of a possible future Low Emission Zone (LEZ) as a minimum;
- Minimise movement of construction traffic around site;
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site; and
- Ensure all vehicles carrying loose or potentially dusty material to or from the site are fully sheeted.

**Site Activities**

- Strip and wrap any areas of the site to be demolished to reduce the amount of dust which may be liberated;
- Cutting equipment to use water as suppressant or suitable local extract ventilation;
- Use enclosed chutes and covered skips;
- Wrap structures to be demolished;
- Minimise dust generating activities;
- Use water as dust suppressant where applicable;
- Keep stockpiles on site for the shortest possible time; and
<table>
<thead>
<tr>
<th>Mitigation Ref:</th>
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<th>Mitigation Details</th>
<th>Type</th>
<th>Responsibility</th>
<th>Mitigation Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5</td>
<td>Temporary drainage and accidental pollution of river and canal, ruderal habitat and temporary land take of buildings and hardstanding</td>
<td>The Contractor will undertake work in accordance with Environment Agency's Pollution Prevention Guidance Note 5: Works on near, or liable to affect watercourses (EA PPG05) The Contractor will ensure that materials are stored in bunded site compounds</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C6</td>
<td>Disturbance of nesting birds during construction</td>
<td>The Contractor will clear vegetation between September and February. Where this is not feasible a suitably qualified ecologist will check vegetation for nesting birds 24 hours before clearance. If actively breeding birds are found at any time, the area will be cordoned off and left undisturbed until chicks have fledged</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C7</td>
<td>Site lighting causing alterations to the foraging behaviour of bats and disturbance to otters and fish</td>
<td>The Contractor will adopt the following mitigation measures to reduce the impact of site lighting: - unidirectional lights will be used at LSSE construction sites; - lights will not shine on the river where otters are known to travel; - lights will be movement activated and of low intensity; - security camera systems will use infra-red lighting or a passive detector system; and - night time working will be avoided or minimised where possible. Given the timing of construction in late 2013, a preconstruction check for bats in spring 2013 is needed in accordance with BCT guidance.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C8</td>
<td>Construction noise and vibration causing alterations to foraging behaviour of bats and disturbance to breeding birds, otters and fish</td>
<td>The Contractor will follow standard best practice noise reduction in construction Given timing of construction in late 2013, a preconstruction check for bats in spring 2013 is needed in accordance with BCT guidance</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Planning Condition and Network Rail CR-E</td>
</tr>
<tr>
<td>C9</td>
<td>Impeded access for the migration of fish upstream due to construction work</td>
<td>The Contractor will undertake work in accordance with the Environment Agency’s Pollution Prevention Guidance Note 5: Works on near, or liable to affect watercourses (EA PPG05) Design of pier supports and use of pontoons avoids changes to run-off and flow.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C10</td>
<td>Impeded access along river for otters</td>
<td>Overland travelling routes for otters will be maintained by the Contractor and will be fenced where feasible and clearly demarcated away from works areas. Scheme to tie-in to mitigation for otters at Granary Wharf which will include the</td>
<td>✓</td>
<td>Main Contractor (Site)</td>
<td>Planning Condition and Network Rail CR-E</td>
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* Avoid double handling of material wherever reasonably practicable.
### Mitigation Details

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<td>provision of:</td>
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<td>- an artificial holt under the walkway, 60m from the viaduct and 20m from the existing footbridge;</td>
<td></td>
<td>Main Contractor (Site Manager)</td>
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<td>- plants selected to provide year-round cover for otters;</td>
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<td>- two haul-out ledges on the existing footbridge wall over the River Aire and over the Leeds and Liverpool Canal east of Canal Wharf Bridge; and</td>
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<td>- an underground tunnel under the Granary Wharf development.</td>
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<td></td>
<td>The Contractor will ensure that the construction of LSSE will avoid damage to any of these newly created habitats associated with Granary Wharf.</td>
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#### Historic Environment

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<tbody>
<tr>
<td>C10</td>
<td>Temporary removal of the Archway and the low level wall at Water Lane</td>
<td>The Contractor will reinstate the Archway and the low level wall during the final stage of the construction process. A dismantling and reinstatement method statement will be agreed by the Contractor and the Conservation Officer at Leeds City Council. Application of Conservation Area Consent will be made prior to commencing works.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Planning Condition and Network Rail CR-E</td>
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</table>

#### Geology, & Soils

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<tbody>
<tr>
<td>C12</td>
<td>Excavated material characterised as inert or Hazardous Waste and requires off site disposal</td>
<td>The Contractor will adopt measures in order to deal with any unforeseen contaminated materials encountered during the course of the development. This will be incorporated into the Earthworks Specification for the site, which will follow guidelines set out in The Definition of Waste: Development Industry Code of Practice</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C13</td>
<td>Contamination from imported fill materials required at the LSSE site</td>
<td>To avoid the potential for the importation of contaminated materials to the site, only certified suitable fill materials will be used in the developments.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C14</td>
<td>Removal or treatment of potentially contaminated soils which would</td>
<td>The Contractor will undertake a site investigation and risk assessment to decide whether soils may remain or require remedial action.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>Mitigation Ref:</td>
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<td>otherwise remain in-situ and pose a risk to other receptors.</td>
<td>The scope of investigation and in particular the need for any remedial measures will be agreed with the relevant regulators (Leeds City Council and the Environment Agency) prior to implementation.</td>
<td></td>
<td></td>
<td>Manager)</td>
</tr>
<tr>
<td>C15</td>
<td>Creation of additional pollution pathways into the underlying aquifer during piling works.</td>
<td>The Contactor will undertake piling works in accordance with the ‘Piling into contaminated sites’ guidance note (Environment Agency, 2002), Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention National Groundwater &amp; Contaminated Land Centre report NC/99/73 &amp; Network Rail standard, ‘Piling Adjacent to the Running Line - NR/L3/INL/CP0063113. The Contractor will agree a Method Statement for works with the Environment Agency prior to commencing works on site.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
</tbody>
</table>
| C16            | Potential contamination from storage and use of hazardous materials during construction. | The Contractor will adhere to the Environment Agency’s Pollution Prevention Guidelines, in particular Pollution Prevention Guidance Note 6 “Working at Construction & Demolition Sites” will be followed and a Pollution Incident Control Plan will be produced by the Contractor. The Contractor will adhere to the following specific mitigation measures:  
  • no polluting material, or polluting construction or demolition material or refuse, will be permanently deposited anywhere other than appropriate licensed waste disposal sites. Such material will be temporarily deposited in steel containers, or removed directly to wagons;  
  • no rainwater contaminated with silt or soil from disturbed ground during construction work will be permitted to drain directly to controlled waters without sufficient settlement;  
  • no foul drainage or contaminated surface water run-off will be discharged into any borehole, soakaway, foul sewer, or water space;  
  • the prior approval of the manner of construction of any storage facilities for oils, fuels or chemicals will be obtained from Leeds City Council before the development works commence. Furthermore, the EMP will detail safe handling and storage procedures for fuel and other potentially polluting material. Fuel storage will be stored within bunded double lined tanks with a bund capacity of 110%; and  
  • no drainage or surface water run off or any other run off or drainage will be discharged by any means into controlled waters, and the developer and his consultants and contractors will at all times comply with any requirements of the Environment Agency and Leeds City Council. | ✓ | Main Contractor (Site Manager) | Network Rail CR-E |
### Mitigation Details

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<tbody>
<tr>
<td>C17</td>
<td>Disturbance of river bed sediments which may have been impacted by contamination from off site sources.</td>
<td>The Contractor will undertake site investigations to inform ground conditions and sediment quality and in turn mitigation that may be required. On completion of the site investigation the Contractor will agree mitigation measures with the Environment Agency and Leeds City Council.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C18</td>
<td>Short term human health risk from dust and ground gas accumulating in excavations during construction works.</td>
<td>The Contractor will undertake a ground investigation which will inform potential risks posed to construction workers from contaminated soils. Good working practices will be put in place and appropriate Health &amp; Safety training and PPE to be provided by the Contractor where required. Contact numbers of a qualified contamination specialist to be included within CEMP to ensure immediate and appropriate advice is sought should site workers come in contact with potentially contaminated land.</td>
<td>✓</td>
<td>Main Contractor (Site Health and Safety Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C19</td>
<td>Short term human health risk from ground gas accumulating in confined spaces (e.g. service areas)</td>
<td>A site investigation will be undertaken by the Contractor to inform ground conditions and provide a risk assessment, in accordance with CIRIA guidance, for ground gases to indicate whether mitigation (e.g. gas resistant membrane) needs to be incorporated. On completion of the site investigation the Contractor will agree mitigation measures with the Environment Agency and Leeds City Council.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C20</td>
<td>Degradation of concrete due to sulphate attack.</td>
<td>Site investigation to be undertaken to inform ground conditions and concrete mix design.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
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</table>

### Noise and Vibration

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<tr>
<td>C21</td>
<td>Predicted noise and vibration effects associated with the construction phase.</td>
<td>An Environmental Management Plan (EMP) for the proposed scheme will be prepared as part of standard Network Rail procedures and in accordance with The Delivery Manual DEL04—Environment and Network Rail Contract Requirements – Environment. Under the EMP, Contractors will be required to prepare a Noise and Vibration Management Plan and seek consent from LCC for construction works under Section 61 of the Control of Pollution Act (CoPA) 1974. These consents will specify the method of working, the hours of work and noise controls to be applied in accordance with ‘Best Practicable Means’ (BPM)</td>
<td>✓</td>
<td>Main Contractor (Site and Health and Safety Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
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<tr>
<td>C22</td>
<td>Noise and vibration effects associated with the works, demolition and the use of plant and machinery during the construction phase</td>
<td>The Network Rail environmental guidance note NR/GN/ENV/00023 ‘Best Practicable Means: Control of Noise and Vibration from Construction Operations’ provides advice on best practice that contractors can use in developing a Section 61 Consent application. The general approach set out in the guidance note is as follows: &lt;ul&gt;&lt;li&gt;as a matter of course, low noise plant and equipment should be used which conform to standards prescribed by the Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001, implementing EU Directive 2000/14/EC. All plant used by main contractors and sub-contractors should be sourced from the company’s nominated supplier, which in turn, should be approved by Network Rail;&lt;/li&gt;&lt;li&gt;plant and equipment should be examined on a daily basis, for defects, prior to the start of works and under no circumstances should defective plant be used;&lt;/li&gt;&lt;li&gt;in connection with demolition and other works of a similar nature, the presumption should be to ensure the minimum amount of breaking up of material on-site and the material should be removed from site to a less sensitive location where the material can be broken down further as necessary;&lt;/li&gt;&lt;li&gt;there should be a general presumption towards the screening/enclosure of mobile and fixed plant as a simple and effective means of containing noise at source;&lt;/li&gt;&lt;li&gt;vehicles should not wait or queue up with engines running on the site or on the public highway; and&lt;/li&gt;&lt;li&gt;wherever it is logistically practicable to do, noisy works should be programmed to take place during normal daytime hours.&lt;/li&gt;&lt;/ul&gt;</td>
<td>✓</td>
<td>Main Contractor (Site and Health and Safety Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C23</td>
<td>Noise and vibration effects associated with the works</td>
<td>The Network Rail environmental guidance note will be complied with and includes specific controls for various types of works and refers to further advice within BS 5228 and Construction Industry Research and Information Association (CIRIA) publications. Guidance on applications for prior consent under a Section 61 agreement is given in the Network Rail advice note NR/GN/ENV/00022 ‘Construction noise mitigation through the Section 61 consent process (formerly RT/LS/G/00022)’.</td>
<td>✓</td>
<td>Main Contractor (Site and Health and Safety Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C24</td>
<td>Disturbance to local residents</td>
<td>Network Rail operates a 24-hour National Helpline (08457 11 41 11) which is available for residents to report disturbance. The contractor will appoint a liaison</td>
<td>✓</td>
<td>Main Contractor (Site</td>
<td>Network Rail CR-E</td>
</tr>
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</table>
| C25            | Noise effects associated with the works | Based on advice provided by Network Rail in December 2011, methods to mitigate noise from construction projects will be adopted as part of the EMP as follows:  
• the local authority will be consulted at least 6 weeks in advance of the works;  
• local residents will be informed in advance by leafleting and adverts in local newspapers;  
• activities will be limited to the daytime where possible;  
• low noise equipment will be used where possible;  
• plant and equipment will be positioned as far as possible from sensitive areas;  
• plant and equipment will be placed on dampers to reduce noise and vibration;  
• static plant will be located to take advantage of any screening to break the line of sight from receptors and/or introduce an acoustic barrier;  
• plant and equipment will be switched off when not in use;  
• staff will be briefed on keeping noise to a minimum including voice levels; and  
• staff will be briefed on working restrictions/controls for mitigating noise whilst working on site. | ✓ | Main Contractor (Site and Health and Safety Manager) | Network Rail CR-E |
| C26            | Effect on local residents as a result of construction activities outside of normal working hours | In relation to working hours above:  
• the programme of construction activities should be carefully managed so that as many activities as possible are carried out during normal working hours to minimise the activities that are undertaken in the 23:00 to 07:00 period when residents are expected to be most sensitive to construction noise impacts. It should be noted that noise from daytime construction activities would still have potential to have significant effects on the nearest receptors; and  
• where works are necessary outside the normal working hours, then noisy activities should, if possible, be planned to be undertaken as early possible in the evening and night period, ideally before 23:00. | ✓ | Main Contractor (Site and Health and Safety Manager) | Network Rail CR-E |
| C27            | Noise and vibration effects during the construction phase | Further to this, other measures to be considered include:  
• monitor noise and vibration during the construction phase especially during | ✓ | Main Contractor (Site and Safety Manager) | Network Rail CR-E |
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<tr>
<td>C28</td>
<td>Disruption to residential receptors as a result of noisy construction activities</td>
<td>LCC has requested that any noisy works undertaken on Saturdays during the construction phase are not started until after 09:00. Therefore, it is recommended that, as far as possible, works are managed so that this can be achieved in order to minimise the disturbance at residential receptors.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
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<td>Socio-</td>
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<td>Economic</td>
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<tr>
<td>C29</td>
<td>The Tower Crane may cause a visual intrusion over the construction period.</td>
<td>The contractor will employ a Liaison Manager to consult with any third parties to minimise disruption. A Community Engagement Plan will be produced and the Liaison Manager will attend local residents meetings and forums. This Liaison Manager will deal not only with craneage disruption but also any other issues that arise. Hoarding will be in place throughout the construction period to provide a safe</td>
<td>✓</td>
<td>Main Contractor (Project Manager) &amp; Liaison Manager</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
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<tr>
<td>C30</td>
<td>Removal of the footbridge on Dark Neville Street could cause temporary disruption and severance for communities.</td>
<td>Footways will be maintained by the Contractor where possible. Closures and diversions will be fully advertised.</td>
<td>✓ Main Contractor (Project Manager) Network Rail CR-E</td>
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</tr>
<tr>
<td>C31</td>
<td>Construction vehicle movements transporting plant and materials are likely to cause some journey disruption to residents, businesses and commuters.</td>
<td>Pileage for the river piers and other construction materials will be transported by a barge to minimise impacts on local roads. The Contractor will also maintain dialogue with the station management staff to minimise disruption.</td>
<td>✓ Main Contractor (Project Manager) Network Rail CR-E</td>
<td></td>
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</tr>
<tr>
<td>C32</td>
<td>There is the potential for construction activities to obstruct existing residential and commercial properties</td>
<td>The Contractor will ensure that access to residential and commercial properties will be maintained throughout the construction phase, although this may comprise alternative arrangements where appropriate.</td>
<td>✓ Main Contractor (Site Manager) Network Rail CR-E</td>
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</tr>
<tr>
<td>C33</td>
<td>There is the potential for construction activities to obstruct existing security and surveillance systems.</td>
<td>Lighting, hoarding and surveillance will be installed at numerous locations around the site perimeter and agreed in advance with Leeds City Council.</td>
<td>✓ Main Contractor (Site Manager) Network Rail CR-E</td>
<td></td>
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</tr>
<tr>
<td>C34</td>
<td>There is the potential for construction activities to disrupt passenger movements at Leeds Station</td>
<td>The contractor will maintain dialogue with the station management staff throughout the planning and construction works to minimise disruption to the travelling public and maintain passenger movements.</td>
<td>✓ Main Contractor (Site Manager) Network Rail CR-E</td>
<td></td>
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</tr>
<tr>
<td>C35</td>
<td>Visual intrusion and disturbance as a result of construction activities.</td>
<td>Contractor will ensure that overburden stockpiles not to exceed height of existing storage stockpiles on site and/or height of hoarding/walling. The Contractor will restrict night time working restricted to where night-time railway possessions are necessary to construct the works.</td>
<td>✓ Main Contractor (Site Manager) Planning Condition and Network Rail CR-E</td>
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The alignment and location of the hoarding will be locally agreed with businesses and Leeds City Council to ensure that it as aesthetically pleasing as reasonable practicable. Vision panels are likely to be incorporated in the hoarding to enable the general public to view the works.

If the self-erecting crane is selected access to the electricity substation underneath the arches will be maintained and the cycle storage facilities will be moved to Granary Wharf. The Contractor will consider the option of a self-erecting crane on the west bank of the River Aire which would be preferable because it can be dismantled at night reducing the visual effect on the Conservation Area.
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<tr>
<td>C36</td>
<td>Visual impact from construction compounds</td>
<td>Where scaffolding is required the Contractor will provide scaffolding screening and netting.</td>
</tr>
<tr>
<td>C37</td>
<td>Deterioration in the visual/townscape amenity at the barge loading/unloading area at Water Lane</td>
<td>Sensitive reinstatement of working areas at the barge loading and unloading site on Water Lane will be implemented.</td>
</tr>
<tr>
<td>C38</td>
<td>Light Pollution resulting in a nuisance for adjacent residential properties</td>
<td>Light pollution will be managed during construction through the adoption of the guidance set out in the Institution of Lighting Professionals, ‘Guidance Notes for the Reduction of Obtrusive Light’, GN01:2011.</td>
</tr>
<tr>
<td>C39</td>
<td>Additional pressure added to existing public traffic and access arrangements</td>
<td>A traffic management plan will be prepared to address potential conflicts between construction traffic and other highway users.</td>
</tr>
</tbody>
</table>
| C40            | Minimisation and appropriate scheduling of construction traffic from the vicinity of receptors and limiting their impact on the road network | The Contractor will be required to produce a Construction Traffic Management Plan (CTMP) in line with Network Rail’s Contract Requirements – Environment documentation, which will identify the following:  
  - temporary or permanent road closures and diversions;  
  - any interference with a carriageway or footway, including control of tracking of mud;  
  - temporary traffic control measures;  
  - temporary and permanent access to the works;  
  - temporary road layouts;  
  - routes to be used by construction traffic and any restrictions which may be applied, e.g. area within which materials must be sourced and routes for waste disposal;  
  - means on monitoring lorry use; and  
  - site specific controls. |
<p>| C41            | Minimisation and appropriate scheduling | Abnormal loads are to be delivered, where possible outside of highway peak |</p>
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<td></td>
<td>of construction traffic from the vicinity of receptors and limiting their impact on the road network</td>
<td>Requirement</td>
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<tr>
<td>C42</td>
<td>Minimisation and appropriate scheduling of construction traffic from the vicinity of receptors and limiting their impact on the road network</td>
<td>Temporary TRO’s would be implemented on Water Lane during construction to facilitate the movement of large vehicles along water lane to the barge loading/launch site.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C43</td>
<td>Minimisation and appropriate scheduling of construction traffic from the vicinity of receptors and limiting their impact on the road network</td>
<td>Temporary signing will be provided to direct construction traffic onto the agreed routes with no access to other local roads.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C44</td>
<td>Minimisation of the disruptive impact that the scheme may have on the local area and residents</td>
<td>A Liaison Manager will be employed to consult with any relevant third parties and will compile a Community Engagement Plan that would detail the measures that would be undertaken to help mitigate the disruptive impact that the scheme may have on the local area and its residents.</td>
<td>✓</td>
<td>Main Contractor (Site Manager) and Liaison Manager</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C45</td>
<td>Incidents and emergency actions</td>
<td>A 24 hour emergency number will be operated by Network Rail and will be available for any urgent or emergency action. Detailed incident and emergency management plans will be developed by the construction contractor in conjunction with Network Rail, and in line with the Network Rail’s Contract Requirements.</td>
<td>✓</td>
<td>Network Rail</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C46</td>
<td>Closure and restricted access of public footpaths and walkways</td>
<td>Some existing footpaths and walkways would have to be closed or have access restricted along them as shown in Carillion’s LSSE Constructability Review Revision 02 – 31st January 2012. Figures 13 and 14 in Volume III of the ES show the two potential crane options with differing access routes. These closures/restricted accesses are provided for within the TWAO. When a closure is in place, clear signage and information boards will be erected providing clear direction for the diversion. Temporary pedestrian barriers will also be erected to create an obvious walkway, and if uneven ground conditions are encountered temporary membranes will be rolled out to provide a better walking surface. Similar measures will be employed at Water Lane where secure fencing or hoarding will be erected around the perimeter of the site, and a footpath diversion will be established with temporary pedestrian barrier if necessary.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>C47</td>
<td>The need to maintain passenger movements</td>
<td>Consultation with the station management would be crucial through the planning and construction of the works to time in key operations to minimise any disruption to the travelling public.</td>
<td>✓</td>
<td>Main Contractor (Project and Site Manager)</td>
<td>Network Rail CR-E</td>
</tr>
<tr>
<td>Mitigation Ref:</td>
<td>Construction Impact/Effect</td>
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<td>Responsibility</td>
<td>Mitigation Implementation</td>
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<tr>
<td>C48</td>
<td>Disruption to local residents, businesses and tourists using the existing pedestrian routes that links Dark Neville Street to the river area and the offices/hotels and apartments in Granary Wharf.</td>
<td>Solid hoarding will be used to enclose the work site adjacent to Granary Wharf to prevent unauthorised access. Where it is safe to do so, Heras type hoarding will be used following feedback from the consultation exercises. The exact alignment and layout of the hoarding should (where possible) be agreed with local stakeholders to provide the least disruptive but safe solution. Clear signage will be affixed to the hoarding to direct the public around the work area and to describe the scheme and to highlight the hazards and risks that are associated with the project.</td>
<td>✓</td>
<td>Network Rail</td>
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</tbody>
</table>
| C49            | General pollution of watercourse as a result of construction works | The Contractor will adhere to the measures outlined in the following Pollution Prevention Guidelines (PPG), published by the EA, including:  
  • PPG 1: General Guide to the Prevention of Pollution;  
  • PPG 2: Above Ground Oil Storage Tanks;  
  • PPG 5: Works and Maintenance in or near Water;  
  • PPG 6: Working at Construction and Demolition Sites;  
  • PPG 8: Safe Storage and Disposal of Used Oils;  
  • PPG 18: Managing Fire Water and Major Spillages;  
  • PPG 21: Pollution Incident Response Planning; and  
  • PPG 22: Dealing with Spills. | ✓ | Main Contractor (Site Manager) |
| C50            | Contamination, including sediment rich runoff entering watercourses via surface runoff and accidental spillages of contaminating substances (e.g. cement/concrete and fuel/oil) | The Contractor will adhere to the Network Rail CR-E and Register of Consents & Commitments to ensure site runoff is managed appropriately. The following mitigation measures will be included:  
  • any potential contaminants will be stored on site in an appropriate location (away from potential receptors, and where possible not within 10m of a watercourse) and in an appropriate manner;  
  • damping down and sweeping the site to preventing build up of debris or particulates which may result in contaminated or silt laden runoff will be undertaken to minimise the generation of construction dust and potential for pollution by wind blow; | ✓ | Main Contractor (Site Manager) |
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<tr>
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<tbody>
<tr>
<td>C51</td>
<td>Contamination of groundwater resulting from spillage of contaminating substances or as a result of piling</td>
<td>• ensuring that surface water and groundwater is not degraded during construction activities, by preventing or containing any spillage or seepage combined with the rapid removal of spilled substances through implementation of the emergency response plan (to be prepared in accordance with the EA PPG 18 and PPG 21); • ensuring the correct disposal of site drainage and any polluted water, including obtaining the necessary consents and approval for disposal of liquids to the public sewer, or (only if appropriate) to a watercourse in accordance with EA guidelines; • preventing objects and pollutants from falling directly into the water, whilst working in or above watercourses; • ensuring piling methods are adopted which minimise the disturbance of the bed and pollution during works in the River Aire channel, and minimise the risk of pollution to groundwater; • removing site arisings from piling to prevent discharge into the River Aire; • emergency response plans for dealing with flood risk (and the increased risk of pollution during flooding); • consents and approval for temporary and permanent works in or near the River Aire will be obtained from the EA and BW (as appropriate). • Development of a Pollution Incident Control Plan • The contractor will make provision for the control of hazardous substances, including oil drums or chemical containers on the site. The Contractor will undertake piling works in accordance with the ‘Piling into contaminated sites’ guidance note (Environment Agency, 2002), Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention National Groundwater &amp; Contaminated Land Centre Report NC/99/73 &amp; Network Rail standard, ‘Piling Adjacent to the Running Line’ - NR/L3/INI/CP0063113.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
<td>Network Rail CR-E</td>
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<td>Mitigation Ref:</td>
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<td>(away from potential receptors, and where possible not within 10m of a watercourse) and in an appropriate manner;</td>
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<td>• damping down and sweeping the site to preventing build up of debris or particulates which may result in contaminated or silt laden runoff will be undertaken to minimise the generation of construction dust and potential for pollution by wind blow;</td>
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<td></td>
<td>• ensuring that surface water and groundwater is not degraded during construction activities, by preventing or containing any spillage or seepage combined with the rapid removal of spilled substances through implementation of the emergency response plan (to be prepared in accordance with the EA PPG 18 and PPG 21);</td>
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<td>• ensuring the correct disposal of site drainage and any polluted water, including obtaining the necessary consents and approval for disposal of liquids to the public sewer, or (only if appropriate) to a watercourse in accordance with EA guidelines;</td>
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<td>• preventing objects and pollutants from falling directly into the water, whilst working in or above watercourses;</td>
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<td>• ensuring piling methods are adopted which minimise the disturbance of the bed and pollution during works in the River Aire channel, and minimise the risk of pollution to groundwater;</td>
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<td>• removing site arisings from piling to prevent discharge into the River Aire;</td>
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<td>• emergency response plans for dealing with flood risk (and the increased risk of pollution during flooding);</td>
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<td></td>
<td>• consents and approval for temporary and permanent works in or near the River Aire will be obtained from the EA and BW (as appropriate).</td>
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<td></td>
<td>• Development of a Pollution Incident Control Plan</td>
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<td></td>
<td>• The contractor will make provision for the control of hazardous substances, including oil drums or chemical containers on the site.</td>
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<tr>
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<th>Mitigation Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C52</td>
<td>Contamination of surface waters as a result of the mobilisation of pollutants by floodwaters</td>
<td>Emergency response plans will be produced by the Contractor to manage flood risk (and the increased risk of pollution during flooding). The Construction Contractor will register with the Environment Agency flood warning scheme to provide advance warning of extreme flood events.</td>
<td>✓</td>
<td>Main Contractor (Site Manager)</td>
</tr>
</tbody>
</table>
Table E.2: Operational Stage Mitigation Requirements

I = Incorporated mitigation (MANDATORY); S = Supplementary mitigation (OPTIONAL/OPPORTUNITY)
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Air Quality</td>
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<tr>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>Ecology</td>
<td></td>
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<tr>
<td>O1</td>
<td>Loss of nesting sites for birds</td>
<td>Landscaping where feasible will be provided using native species of local provenance</td>
<td>✓ Project Proponent/Site Manager</td>
</tr>
<tr>
<td>O2</td>
<td>Disturbance from operational lighting on ecological resources</td>
<td>Operational lighting will also seek to minimise excess light spill, and will, where feasible and safe:  - direct light on the LSSE and away from the river’s surface where bats will feed and where otters will travel through;  - be of low intensity; and  - be fitted with hoods, louvres or cowls to ensure light is directed only to where it is needed.</td>
<td>✓ Project Proponent/Site Manager</td>
</tr>
<tr>
<td>O3</td>
<td>Loss of habitat following construction</td>
<td>Additional planting for otter habitat could be provided following the same recommendations as provided for Granary Wharf</td>
<td>✓ Project Proponent/Site Manager</td>
</tr>
<tr>
<td>O4</td>
<td>Disturbance of otters</td>
<td>Faber Maunsell AECOM additionally recommended otter ledges on the LSSE entrance structure, and complementary planting. Holts on the proposed ledges should be installed above normal flood levels and provide a width of 300-450mm.</td>
<td>✓ Project Proponent /Site Manager</td>
</tr>
<tr>
<td>Historic Environment</td>
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</tr>
<tr>
<td>O5</td>
<td>Removal of the basalt setts from Little Neville Street</td>
<td>The basalt setts will be retained and incorporated into the design of the pedestrian zone as a trim. The trim will be 1m wide around the Hilton Hotel street frontage, and a narrower trim around the Blue Apartments and the Dark Arches. In order to retain the historic character the basalt setts will be laid diagonally.</td>
<td>✓ Project Proponent/Site Manager</td>
</tr>
<tr>
<td>Geology, Soils and Land Quality</td>
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<td>Mitigation Ref:</td>
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<tr>
<td>NONE</td>
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<tr>
<td>Noise and Vibration</td>
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</table>
| O6              | Noise arising from the PA/VA system and fixed plant | Noise from the PA/VA system will be mitigated by the provision on a large number of low power speakers within the enclosed and sealed structure and by the use of automatic volume adjustment during the night period in accordance with the current working practices of Leeds station. Noise from fixed plant such as lift and escalator motors and building services plant will be mitigated by:  
• the careful selection of quieter equipment to achieve an appropriate Rating Noise Level at nearby sensitive receptors;  
• careful positioning and installation; and  
• regular maintenance. | ✓ | Operator | Network Rail |
<p>| O7              | Operational noise effects on key sensitive receptors | The noise effects on the key sensitive receptors associated with operations at Leeds station (particularly rail traffic movements and the existing PA/VA) could be reduced by replacing the existing wire mesh fence on Platform 17 with a solid barrier in order to provide screening. Furthermore, repositioning and redirecting the PA/VA system such that the receptors are less affected by announcements would also be beneficial. During consultation, LCC has asked that these recommendations are given consideration by Network Rail. | ✓ | Operator | Network Rail |
| Socio-Economic |                            |                    |      |                |                           |
| NONE            | NONE                      |                    |      |                |                           |
| Townscape and Visual Amenity |                            |                    |      |                |                           |
| O8              | Adverse impacts from light pollution as a result of site operations. | The final lighting design will adopt the guidance set out in the Institution of Lighting Professionals, ‘Guidance Notes for the Reduction of Obtrusive Light’, GN01.2011. The proposed lighting scheme adopts the principle of down lighting where possible, reducing the potential for light trespass. | ✓ | Project Proponent/Site Manager | Planning Condition |
| O9              | Adverse impacts from light pollution as | The following items are suggested incorporated mitigation measures, which are likely to be used in combination with each other, to best resolve the issues | ✓ | Designer | Planning |</p>
<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>a result of site operations.</td>
<td>identified in the obtrusive light assessment (provided in Appendix B of the Townscape and Visual Amenity Technical Appendix). The exact combination of incorporated mitigation measures will be investigated further at the detailed design stage.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Switch-off the type ‘G’ luminaires which provide up-lighting to the south façade structure after an agreed ‘curfew’ time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Careful consideration to the aiming of luminaires. Whilst it is noted that the majority of the lighting scheme consists of local handrail lighting providing focussed lighting for passenger wayfinding, there are a number of high-output luminaires which provide general illumination of the space. Some have been specified with glare baffles, which will be beneficial, however as part of the detailed design and construction process careful consideration should be given to the precise aiming of luminaires to restrict light being spilled away from the surface and zone of intentional illumination.</td>
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<td></td>
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<td>• Consider using glass of lower transparency. As part of this assessment, a glazing transparency of 80% has been assumed, however if a lower transparency of glazing can be integrated into the design without disrupting the overall building performance and aesthetic, then this should be strongly considered.</td>
</tr>
<tr>
<td></td>
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<td>• Investigate whether the internal lighting can be reduced after an agreed ‘curfew’ time. Considering the use of dimming or selective switching will assist with reducing the reflected light spill from the station structure. Whilst it is noted that a number of high-output metal halide luminaires have been used for general illumination to enhance the internal space, it is recommended that consideration be given to the use of alternative dimmable light sources. To achieve an equivalent visible and technical performance it is noted that this may increase the number of total luminaires, which in turn may have financial implications, however this approach would have a positive impact on the overall light spill and the effect on the adjacent buildings.</td>
</tr>
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<td></td>
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<td>• Although the visible luminaire intensities have been calculated to be within acceptable limits, it is a recommendation of this report that the type ‘G’ luminaires, which provide up-lighting to the southern façade structure, are switched-off after an agreed ‘curfew’ time. In addition to minimising the luminaire intensities visible throughout the night, this measure will also alleviate some of the light-spill to the surrounding environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The building luminance should be limited to avoid overlighting. Since the building is designed to meet the requirements of the station it is assumed that the lighting levels will be reasonable and not excessive, however the ongoing</td>
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Condition
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</thead>
<tbody>
<tr>
<td>O10</td>
<td>Adequate provision of facilities for cyclists</td>
<td>Cycle parking stands that are located in Granary Wharf between the railway viaduct and Watermans Place, will be removed and replaced by 20 cycle stands situated in one of the arches on Dark Neville Street once the construction phase is completed.</td>
</tr>
<tr>
<td>O11</td>
<td>Effects on station users and surrounding residents on football match days</td>
<td>The Leeds Station Management Plan will be updated to reflect that LSSE is likely to become the choice of access/egress for those passengers attending local events in Leeds or Leeds United Football Club matches due to improved access to the bus stops and temporary coach stands on Neville Street and Sovereign Street.</td>
</tr>
<tr>
<td>O12</td>
<td>Traffic and health and safety issues</td>
<td>The contractor may wish to appoint a Traffic Officer who would also oversee all matters pertaining to construction traffic and safety. This role could be combined with the Liaison Manager’s Duties. They would be responsible for traffic issues arising from the construction, including timing of deliveries, stacking of vehicles, the effect on junctions and control of vehicles onto and off site. They would also monitor the condition and cleanliness of the highway and liaise with the highway authority over any traffic or signing concerns and address other issues should they arise.</td>
</tr>
<tr>
<td>O13</td>
<td>Impact on pedestrian routes</td>
<td>It is recommended (although not provided for in the current promoted scheme) that the demarcated pedestrian route (3m wide, pedestrian route / ‘safe space’) on the south side of Dark Neville Street is extended between Little Neville Street and Neville Street.</td>
</tr>
<tr>
<td>O14</td>
<td>Effects on visual amenity as a result of the construction work and the proposed impact on Granary Wharf</td>
<td>Carillion has suggested that incorporation of vision panels into the hoarding in Granary Wharf would offer some mitigation to those affected by providing views of the on-going construction and to make the hoarding less imposing.</td>
</tr>
</tbody>
</table>
## Mitigation Details

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Water Resources</strong></td>
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<tr>
<td>O15</td>
<td>Pollutants (e.g. window cleaning chemicals, particulates and litter) entering watercourses via increased surface runoff from development</td>
<td>During the operation phase, good maintenance practices will be followed, and appropriate procedures for preventing pollution adopted during regular cleaning. In particular the building Operation and Maintenance (OM) manual will outline measures to prevent pollutants (e.g. window cleaning chemicals, particulates and litter) being washed or swept into the River Aire.</td>
<td>✓</td>
<td>Operator</td>
<td>Network Rail CR-E</td>
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<tr>
<td><strong>Wind</strong></td>
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</tbody>
</table>
| O18             | Hazardous wind speeds for pedestrians | - Temporarily remove access to the western link bridge. As an alternative, pedestrians can use the eastern link bridge and the Dark Neville Street footbridge, which provide more sheltered wind environments. Such a closure is expected to be necessary for approximately 27 hours per year, when winds in this area are expected to affect the progress and balance of pedestrians.  
- Hand rails, which are installed along pedestrian routes on the western bank of the River Aire, will help pedestrians steady themselves against being blown into the river. Ensure these hand rails are reinstated, if necessary, upon completion of LSSE  
- The installation of a wind monitoring device and the development of appropriate operational procedures are recommended to inform the Station Manager at Leeds City Railway Station when closure of the western link bridge is necessary. | ✓    | Designer/Operator | None  |

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http://pims01/pims/llisapi.dll/open/1501081616