

1.0 BACKGROUND

ENVIRON UK Limited was commissioned by Westlink Group Limited (WGL) to compile an Environmental Statement (ES) as defined by the *Town & Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* associated with the planned development of the subject site. The proposed development is a High Bay regional distribution centre, in Ditton, near Widnes in Cheshire (NGR: SJ 503 844). This development is known and will be a key part of a wider strategic rail freight objective for the area.

It should be noted that there has been a previous planning application on this site for a similar development comprising 7 rail fed freight warehouses and this was granted consent on 24/03/2006 (planning reference 05/00212/FULEIA). The developer who was granted that consent (INNOVIS) planned to secure a range of tenants for each of the buildings but subsequently decided to divest the site to Westlink Group Limited, prior to any development taking place. Westlink have taken an alternative approach to the development of the site and are seeking to place one primary occupier on the majority of the site in an integrated high bay and low bay distribution centre that will act as a central hub for a wider network of distribution centres, which in turn feed a national network of stores. In addition they are seeking to relocate an existing long-term tenant (logistics warehouse) to a new warehouse building as the one they occupy currently will be demolished as part of the proposals. Although the new proposals conceptually do not represent a different use of the site from those previously approved for INNOVIS, they do involve a slightly larger land area and different scale of built development. Furthermore proposed finished site levels are higher than previously proposed and there is a need to divert a water course (Steward's Brook) which currently bisects the site (not necessary previously). Consequently it is necessary to submit a new planning application which necessitates a new EIA and associated ES. Given, however, that the site conditions and surrounding areas have changed very little since the INNOVIS EIA and that the proposals are effectively for the same type of development, Halton Borough Council (the Planning Authority) has agreed that most of the data used for the INNOVIS EIA is still valid and relevant and the technical assessments associated with this are still appropriate. As such, it was agreed with HBC that the design team could re-visit the INNOVIS EIA and associated ES and re-assess and edit them respectively in the light of the new proposals, taking due cognisance of changes in policy, practice and environmental conditions since the original assessments were undertaken (2004/2005). This document represents the output of that process.

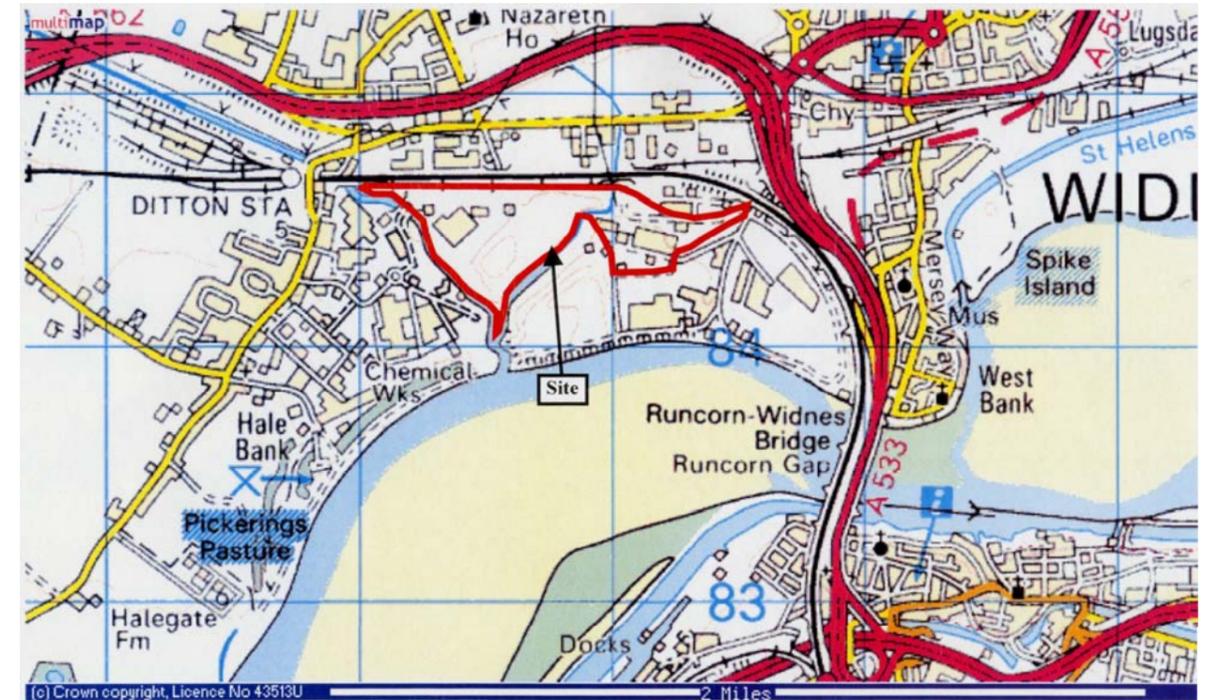


Figure 1.1 ; Site Location Plan

At the outset of the Environmental Impact Assessment (EIA), which this ES summarises, an Environmental Scoping Study was carried out to identify the key environmental issues associated with the proposed development and to prepare and agree an assessment methodology. The Scoping Report comprised the collective input of a number of key specialists employed by WGL to undertake the necessary technical studies and was submitted formally to Halton Borough Council, which involved consultation with the following statutory bodies and information sources:

- Environment Agency information on water quality and abstractions, groundwater source protection zone, flood risk, land contamination and waste management/remediation;
- English Nature (now Natural England) information on sites designated for their nature conservation value;
- English Heritage information on scheduled and un-scheduled monuments;
- Landmark Report/Historical Maps (<http://www.landmark.co.uk>);
- Draft Unitary Development Plan for Halton Borough;

- the UK National Air Quality Information Archive (<http://www.airquality.co.uk>);
- MAGIC (Multi-Agency Geographic Information for the Countryside) website for land designations;
- Joint Nature Conservation Committee (JNCC) for land designations;
- Sites and Monuments office for information of un-scheduled archaeology;
- Previous reports available for the site; and
- Information provided by members of the development design team.

This ES has been prepared by ENVIRON (UK) Limited, with assistance and input from other members of the Project Design Team, as follows:

- **Westlink Group Limited (incorporating Stobart Group, Port of Weston and AHC Warehousing)** – the Client, site owner & developer;
- **Ashton Smith Architects (ASA)** – principal design of the scheme and visualisations for visual impact assessment; building design and layout;
- **W A Fairhurst & Partners (Fairhurst)** – Civil, Structural and Geotechnical Engineering Consultants;
- **GVA Grimley (GVA)** – Planning Consultants, Planning Application Co-ordination, Project Management and Socio-economic impact assessment ;
- **Bell Fischer Landscape Architects (BFLA), with Ecology Consultancy Limited** – Ecological and Landscape Consultants;
- **ADL** – Traffic and Transport Consultants;
- **WA Developments** – Galigu remediation design and earthworks strategy;

- **Liverpool Museum Field Archaeological Unit** – Archaeology and Cultural Heritage; and

In addition to overseeing the collation of the ES, ENVIRON was responsible for undertaking technical studies in the following disciplines:

- Air Quality & Climate
- Noise and Vibration
- Soils, Geology and Land Contamination;
- Waste Management
- Sustainability
- COMAH Risk Assessment; and
- Water Quality, Hydrology and Flood Risk Assessment.

The various technical studies are presented in separate chapters in the main Environmental Statement (ES).

1.1 STRUCTURE OF THE ENVIRONMENTAL STATEMENT

This Non Technical Summary is volume one of a three volume set of documents that comprise the following:

Volume 1 – Non Technical Summary

Volume 2 – Environmental Statement

Volume 3 – Supporting Technical Appendices

Section 2 of this document comprises an outline of the current local and regional planning regime and policy in respect of the site and surroundings. *Section 3* comprises a summary of the main findings of each of the technical areas assessed in relation to the proposed development,

together with the potential impacts and mitigation measures and conclusions, for each of the sections where relevant. The sections covered in the ES are:

Section 1 - Introduction

Section 2 - Existing Site Description

Section 3 – The Development Proposals

Section 4 - Details of the Assessment Methodology

Section 5 - Planning Policy Context for the Development Proposals

Section 6 – Archaeology & Cultural Heritage

Section 7 - Air Quality

Section 8 - COMAH Risk Assessment

Section 9 - Ecology & Nature Conservation

Section 10 - Landscape and Visual Character

Section 11 – Night Light

Section 12 - Noise and Vibration

Section 13 - Socio-economic Issues

Section 14 - Soils, Geology & Land Contamination

Section 15 - Sustainability

Section 16 - Traffic and Transport

Section 17 - Water Quality and Hydrology

Section 18 – Waste Management

An overall summary and conclusion is provided in **Section 19**.

Given the iterative nature of the EIA process, some of the drawings have of necessity changed during the process so for avoidance of doubt all drawings in the main planning submission should take precedence where this is a discrepancy between drawings and site statistics. This does not materially affect the appropriateness or robustness of the ES or EIA process as such differences if they exist will be minimal environmentally.

1.2 SITE DESCRIPTION

The site is located approximately 1km west of Widnes town centre, Merseyside/Cheshire at an approximate National Grid Reference (NGR) of SJ 503 844. The site is bounded by Desoto Road to the east and Hale Road to the west.

The proposed development area is located on the north bank of the Mersey estuary and close to Widnes industrial areas and approximately 1km downstream of the Widnes-Runcorn road bridge .

The 42 ha site comprises three principal areas; the Foundry Lane Estate (Site) to the west, the Reclamation Site (The Mound) in the centre and the West Bank Dock (Mathieson Road) Estate (Site) on the eastern part of the development area. The Foundry Lane and West Bank Dock sites are currently occupied by industrial units whilst the Reclamation Site is a chemical waste (galligu) landfill and is capped and vegetated and planted with trees. An aerial photograph of the site and surrounding areas (*Figure 1.2*) shows the adjacent land uses with the River Mersey to the south and two notable watercourses running across the area (Ditton Brook and Steward's Brook). A drawing of the existing site layout is presented at the rear of this report.

A topographical survey indicates the Foundry Lane site is approximately 11.5ha in extent. Ground elevations vary across the site from 7.5m above Ordnance Datum (AOD) in the north east corner to 6.35m AOD in the middle of the site, rising again to 7.5m AOD along the south east boundary adjacent to the reclamation site. Most of the area is between 6.3m and 6.5m AOD.

The 18.5 ha Reclamation Site consists of an engineered mound of galligu; a by-product of the local chemicals (and particularly alkali) industry, primarily associated with the *Le Blanc* Process. The Reclamation Site rises above the surrounding land from 7.0m AOD to a maximum of 28.5m AOD. The Foundry Lane and West Bank Dock parts of the site have also been built up in parts by galligu deposits.

The West Bank Dock (Mathieson Road) Site is approximately 7ha in extent and slopes from west to east with a maximum elevation of 15.7m AOD in the south west corner falling to 8.68m at the east at the junction with Mathieson Road.



Figure 1.2: Aerial Photograph of Site

The site's setting can best be characterised as a mixture of heavy and light industrial land uses, but it is recognised that there are potentially sensitive residential areas and habitat sites in the locality that need to be taken into account in the assessment and implementation of the development.

1.3 DEVELOPMENT PROPOSALS

The intention of the proposed development is to provide a high quality inter-modal freight distribution centre for a key customer (international retailer) to support their regional network of distribution centres. This involves the demolition of a number of old, redundant and often unsafe buildings on the West Bank Dock Estate and the construction of a number of new, purpose built warehouse facilities. The proposed layout of development is presented in the drawing at the rear of this report.

It is intended that these units will be let to "blue chip" freight/logistics companies and well known retailers (for product storage). There will be no chemicals storage firms or materials likely to fall under the COMAH Regulations or other hazardous substance notification or permitting regimes stored on site. The intended occupier of the main distribution centre sees this as a major strategic facet of their supply and delivery chain.

1.4 SITE MANAGEMENT

The site will be managed by the future occupier under a fully repairing lease. The facilities management obligations will cover the maintenance and control of issues such as:

- Site drainage and roadways
- Environmental Management
- Wastewater Disposal
- Landscaping and Buried Services
- Security (Access and Boundary)
- Community/Regulatory Liaison.

In addition a Tenants Handbook will be produced and agreed with the Local Authority that will set the conditions of operation on the site and spell out the site's environmental charter. This will include legislative compliance requirements such as controlling nuisance (noise dust and odours) and sustainability provisions (see ES *Section 15 – Sustainability*) such as adhering to waste management principles (promoting recycling and recovery).

1.5 ENVIRONMENTAL ASSESSMENT CRITERIA

Environmental impacts may be both negative and positive. Quantification of these impacts, particularly in relation to comparative assessment between environmental disciplines, requires consistent assessment criteria to be used throughout. The criteria used in this assessment are as follows:

- *Major Positive or Major Negative effect* – where the development would cause a significant improvement (or deterioration) to the existing environment;
- *Moderate Positive or Moderate Negative effect* – where the development would cause a noticeable improvement (or deterioration) to the existing environment;
- *Minor Positive or Minor Negative effect* – where the development would cause a barely perceptible improvement (or deterioration) to the existing environment; and
- *Insignificant* – no discernible improvement or deterioration to the existing environment.

2.0 PLANNING POLICY

The development proposals have been analysed against prevailing national, regional and local planning policies. The outcome of this analysis is summarised below.

The proposal site is situated within an area that has a long history of industrial development. Some of the development, and particularly that associated with the chemical industry, has caused the complex contaminated land and associated environmental issues that the applicants and the Council are attempting to contain and/or mitigate today.

In terms of land use, the developed sections of land within the site fall primarily within Use Class B8 (Storage and Distribution) with elements of B1 (Office) and, possibly, B2 (General Industry). There is also a large reclamation site, The Mound, that, although inaccessible to the public, has certain value as a green space in terms of nature conservation.

National planning policy and guidelines relevant to the proposals are set out in various Planning Policy Guidance (PPG) Notes, Planning Policy Statements (PPS) and White Papers covering a range of policy areas. Crucially, the DSRFP concept conforms to prevailing, national best practice with regard to transport policy for the sustainable movement of freight, industrial development policy and urban & economic regeneration policy. The regeneration of a large contaminated site does, however, raise national pollution control and nature conservation issues but these have been addressed in the context of the prevailing local planning policy framework.

Regional planning policy in relation to Ditton is primarily concerned with boosting the regional economy through the development of a sustainable inter-modal freight park: the DSRFP initiative. This is recognised as a project of regional significance, a Regional Investment Site, and the applicants' proposals are wholly in line with the NWDA's expectations.

The local planning policy framework is based on national and regional planning policy guidance but applies such policies to the local context. For Ditton, local planning policy is set down in the Halton UDP, adopted April 2005, and several Supplementary Planning Documents relating to the DSRFP and the Hale Bank Action Area.

In terms of land allocation and use, the UDP contains two key policies, Strategic Policy S20 and Employment Policy E7, which chart the future direction of the site and a considerable area of adjoining land.

The UDP Proposals Map and Policy S20 identify the site as part of a Regional Investment Site requiring development to make a significant contribution to the regional economy. Policy E7 locates the site within the Ditton Strategic Rail Freight Park (DSRFP), a phased strategic inter-modal freight park to be used by businesses of national or regional distribution importance that utilise the railway for the transportation of freight or provide supporting services. Development within the DSRFP is also required to demonstrate that it will create employment opportunities for local residents and contribute to urban regeneration without adverse impact on the environment, the amenity of the local populace or local transport, trunk road & rail networks.

In addition to these two key policies, the UDP sets down a raft of protective policies intended to minimise the impact of the development on the local populace, the environment (including designated Greenspace such as the Mound), any archaeological remains and the surrounding road & rail network.

Turning to the proposals, the scheme will offer a sustainable, "state of the art" rail linked distribution cluster in full compliance with the aims of national, regional and local planning and transport policies. Specifically, the proposal accords with key UDP policies S20 and E7 outlined above. The proposal will be a development of regional, if not national, significance and will attract considerable inward investment and create a significant number of jobs. In addition, the operators of the facility will use their best efforts to ensure that a substantial proportion of the large number of jobs created by this flagship project will be allocated to local residents and those from surrounding areas.

Specialist consultants have examined every aspect of the development in terms of the relevant planning policies and produced "best practice" strategies to mitigate all likely impacts, particularly in relation to pollution from existing ground & water contamination.

The infringement of the Mound's designated Greenspace, protected under UDP Policy GE5, is necessary to achieve development on the site of the scale proposed. This loss is compensated for by way of improved tree planting and landscaping on and off-site (by way of financial contribution) and by planting up of the north east bank of the Ditton Brook and the north west bank of the Steward's Brook along the southern edge of the site.

Design quality in all aspects of the development has been a key priority to ensure the site can be marketed to premier national and regional distribution businesses in line with guidance in the DSRFP Masterplan SPD. To this end, the setting of the development is considered as important as the design of the buildings themselves and a robust landscape strategy has been produced to unify the site. Crucially, the new development is located close to, but not immediately adjacent to, an existing community. Every effort has been made to minimise the visual and physical impact of the development on the residents of Hale Bank, through the considerate siting and orientation of large units and the inclusion of landscape screening. In addition, the existing vehicular bridge over the Ditton Brook, at the western end of the site, will be closed to HGVs except in an emergency.

The applicants consider that the proposals conform to current national, regional and local planning policy and, where there is any minor conflict with, or between, policies, these have been satisfactorily resolved by introducing appropriate compensatory or mitigation measures.

3.0 BASELINE CONDITIONS AND MITIGATION OF IDENTIFIED IMPACTS

3.1 ARCHAEOLOGY

Whilst the site is not located within an area of key archaeological importance, and the land form has been largely re-modelled in the past century, the applicant recognises the importance of establishing and preserving any archaeological record. Consequently, a Cultural and Archaeological Assessment has been carried out by the National Museum of Liverpool's (NML's) Archaeological Unit. The applicants have accepted NML's findings and their recommendation to maintain a watching brief on any peat extraction from the site, as set out in *Section 6* of the Environmental Statement.

The desk study consulted the following sources:

- The Cheshire Sites & Monuments Record.
- Lancashire Record Office.
- Cheshire Record Office.
- Widnes Local Studies Library.
- The internet/world wide web.

Sources used included:

- Printed and manuscript maps, including estate maps, Tithe maps and Ordnance Survey maps.
- Place and fieldname evidence.
- Aerial photographs.
- Published and unpublished documentary sources.
- Engineering/borehole data as available from the client.
- Geological/soil surveys.

The study also included a walkover of the site.

No recent archaeological fieldwork has taken place either in the study area or within the immediate vicinity, though this may at least in part reflect the past neglect of archaeologists in investigating the archaeology of the Lancashire lowlands (see *Appendix 6.1*). Consequently the only available evidence for settlement within the study area is documentary and cartographic, supplemented by the site visit.

The name Widnes is probably of Old English origin meaning the Wide Promontory (*Wid + Ness*) (Mills 1976) taking its name from the headland which still projects into the Mersey to the east of the study area. The town grew largely as a response to the expansion of the chemical industry in the mid-19th century, though Baines (1891, 252) also lists bone manure works, iron foundries, sail cloth making, oil, paint and railway grease works. The chemical industry developed at Widnes partly because of the availability of raw materials (salt from Cheshire and coal from Lancashire) and partly because of the construction of canals and railways enabling the easy transport of both raw materials and finished products.

In general little survives above ground of the areas' industrial past, with most structures on the site being modern (i.e. late 20th century). On the present site the most prominent features are the large mounds of chemical waste, largely alkali waste (*galligu*) derived from the Le Blanc process. One mound lies at the centre of the development, the other lies to the south of Steward's Brook. These have recently been landscaped to form large regular mounds. In archaeological terms the two most significant features are the courses of the Ditton and Steward's Brooks. Both are tidal where they cross the area and the site visit was undertaken at low tide. This exposed the muds and silts in the beds of each, though there is currently no safe access to either.

Most of the identifiable sites within the proposed development relate to its industrial development since the late 19th century. However, the majority of these have been demolished and replaced successive development of the area since 1950 and the area retains little evidence of its industrial heritage. From the mid-19th century much of the area was used for the dumping of chemical waste which still covers much of the area.

Prior to its industrialisation the area was occupied salt marsh crossed by the Ditton and Steward's Brook and was subject to periodic flooding by the Mersey. Map evidence suggests that the area was not occupied during the medieval and later periods. However, there is significant evidence for the presence of Roman and earlier deposits within the area.

In addition borehole data suggests that the Roman deposits found during the excavation of a well at Ditton Station situated close to the north-west corner of the site, may be present within the proposed development. There is the additional possibility that deposits relating to Prehistoric land use also lie deeply buried within the proposed development.

It has not been possible to establish the extent of survival of below-ground archaeological remains within the study area. However, the site is very likely to be waterlogged and any organic remains present, e.g. timber, are likely to be well preserved. However, the site's past history as a disposal site for Widnes's chemical industry suggests that any such deposits are likely to be contaminated with alkali and other potential contaminants waste.

Despite recent fieldwork the late prehistoric and Romano-British settlement of the region remains poorly understood, in particular in relation to coastal change. The deposits of peat present within the site boundaries are likely to contain significant evidence for these periods. Consequently on the above criteria, the study area contains remains of at least local importance, though it is possible that the deposits of peat discussed above contain evidence of at least regional significance.

The opportunity for investigating potential archaeological finds will be taken during the construction works by employing an archaeologist to maintain a watching brief over excavation works and assessing any findings of potential archaeological significance or interest. Samples may also be taken for pollen analysis if suitable.

3.2 AIR QUALITY AND CLIMATE

Potential sources of emissions have been identified and placed in the context of existing air quality and emission sources, as well as being considered in the context of locally sensitive receptors, most notably persons living and working in the area. Potential impacts arising from the construction phases associated with the proposed development have also been considered in this regard.

The assessment has been considered in the context of potential impacts on locally sensitive receptors, including residential properties, schools and hospitals and any locations where the

young, elderly and infirm could be exposed to elevated pollution levels for extended periods of time and thus where there may be potential human health impacts.

The key issues considered are as follows:

- Nuisance impacts from construction dust;
- Impacts from site vehicles and mobile plant on local air quality; and
- Impacts from traffic and rail emissions during the operation of the development on local air quality.

It is known that Nitrogen Dioxide and PM₁₀ (particulate matter with a diameter of less than 10 microns) exceed the objective levels in heavily trafficked areas throughout the UK due to the impact of road traffic emissions. For this reason this assessment focuses mainly on these two pollutants. Due to the close proximity of the development site to various industrial processes sulphur dioxide concentrations have also been considered as part of this assessment.

Background Legislation

The *Environment Act 1995* provides for the development of a national *Air Quality Strategy*^{1 2} (AQS), containing a framework for the continual improvement of ambient air quality. Within the strategy health-based standards for the nine main pollutants are set together with dates for their achievement in the short to medium term. The standards are set to protect the most vulnerable members of society. In addition, it sets objectives for two pollutants for the protection of vegetation and ecosystems.

The Air Quality (England) Regulations 2000 (SI 2000/928), *Air Quality (England) (Amended) Regulations 2002* and *Air Quality Standards (England) Regulations 2007* set out the standards and objectives for the purposes of local air quality management for the period between the end of 2003 to the end of 2010. Air quality objectives for seven pollutants including sulphur dioxide (SO₂), nitrogen dioxide (NO₂), the fraction of fine particulate matter of less than 10 micron diameter (PM₁₀), benzene and carbon monoxide (CO) have been derived.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (January 2000).

² The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum (February 2003).

The air quality objectives in the UK have been derived from the *European Commission Directives*. The *EU Air Quality Framework Directive (1996³)* established a framework under which the EU can set limit or objective values for a number of air pollutants. The Directive identified 12 target pollutants for which limits have been or will be set within Daughter Directives. The first of these Daughter Directives⁴ relating to sulphur dioxide, PM10, oxides of nitrogen and lead was formally adopted in April 1999 and was required to be implemented by all member states by July 2001.

Baseline Conditions

A baseline assessment has been carried out of the site and the surrounding area through the review of HBC air quality review and assessment documents, through the use of available monitored data and with regards to UK pollutant objective limits. The objective limits are set with regard to the protection of human health to ensure that even the most vulnerable members of society will not be unduly affected by ambient air pollutant concentrations. This has concluded that there will be no breaches of the UK objective limits within HBC and there is no requirement to declare an AQMA.

Impacts during Construction

The immediate surroundings of the development site, including the buildings, roads and open area, together with the people who access them, will be those most at risk of being exposed to dust effects. Receptors downwind of the predominant wind direction from a development site will be at greater risk of impacts than those upwind. According to the HBC USA report there is a prevailing westerly wind which blows along the Mersey Estuary, impacting on communities at West Bank, Widnes and Runcorn. Receptors located to the east of the development site would therefore be at most risk from dust impacts.

The development site is located in a predominantly industrial area, bounded to the southeast and southwest by industrial developments and to the north by the rail line servicing the current rail freight terminal. Industrial land uses are generally not sensitive to dust impacts, and in

themselves can be a source of dust emissions. Therefore the potential for dust impacts to arise at the land uses in the immediate vicinity of the site is considered low.

The closest residential receptors are as follows:

- Hale Bank – residential dwellings approximately 220 m north of the site;
- Ditton – residential dwellings approximately 375 m west of the site; and
- West Bank – Residential dwelling approximately 400 m east of the site.

As the nearest receptors are located over 200m from the site boundary nuisance dust impacts from construction activities are likely to be low. Additionally the prevailing wind is westerly, thus greatest impacts would be to the east, significantly reducing any potential for impacts at Hale Bank and Ditton.

Impacts of the construction phase on both nuisance dust and local air quality have been assessed with regards to the location of locally sensitive receptors. Impacts are predicted to be low at all receptors and insignificant with the implementation of common practice (and often mandatory) mitigation measures.

Operational Impacts

Impacts from the operation of the development have been predicted as low. The location and nature of the site, being open and adjacent to the Mersey, promotes the dispersion of pollutants, reducing any possible impacts on local air quality. Data from the national atmospheric emissions inventory indicates that rail transport contributes less than 2% of all pollutant emissions in the vicinity of the proposed development. A maximum increase in rail movements of 4 trains per day would have an insignificant impact on local air quality.

Freight will also be delivered and removed from the site by HGVs. Changes in road traffic emissions along links in close proximity to identified receptors have been predicted and the impacts on local air quality assessed. It is predicted that the proposed development will cause an increase in annual mean nitrogen dioxide and PM₁₀ concentrations of no more than 1.5 and 0.5 µgm⁻³ respectively. Given the existing ambient concentrations of pollutants this equates to a

³ Council Directive 1996/62/EC Framework Directive on Ambient Air Quality Assessment and Management 27 Sept 1996.

⁴ Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air.

very small increase in pollution concentrations and is therefore considered to have a slight adverse impact on local air quality, based on the guidance provide by the NSCA.

There are limited options to mitigate impacts arising from the operational traffic associated with the proposed development. However, a green travel plan will be developed to encourage the workforce to adopt sustainable methods of travel to and from the development thereby reducing the number of car movements.

3.3 COMAH ASSESSMENT

There is a large concentration of heavy industry in the Widnes area and in particular the chemicals industry. Many of these sites contain hazardous substances and thus have the potential for significant environmental incidents to occur, which implicitly pose a risk to the health and safety of site occupiers and neighbouring sites within the potential zone of influence of such incidents. For large installations that fall under the *Control of Major Accidents and Hazards Regulations 1999* (which is determined by chemical type and inventory), these so called COMAH sites have certain legal obligations. In particular, it is a legal requirement of all top tier COMAH sites that they undertake a detailed risk assessment of all potential accidental chemical releases from their installation and the possible resultant consequences of such releases. From this risk assessment an appropriate emergency response plan must be developed to deal with such incidents. These COMAH reports are formally lodged with the Health and Safety Executive (HSE) and the local authority. The Local Authority must also have an off-site emergency response plan for such sites. Furthermore there is an explicit need for consultation on any proposed development within the defined consultation zone for each COMAH installation.

There are also a large number of so called "lower tier" COMAH installations that carry lesser inventories of hazardous substances. These too can require consultation to be entered into but the defined zones are much smaller.

The *Halton Borough Council Major Accident Plan* identifies 5 sites in particular that are registered as top tier COMAH sites (i.e. satisfy the upper threshold criteria set out in the *Control of Major Accidents and Hazards Regulations 1999*). The identified sites are:

- Bayer Crop Science UK Limited, Widnes;
- INEOS Chlor Limited, Runcorn;

- INEOS Fluor Limited, Runcorn;
- European Vinyls Corporation Limited, Runcorn; and
- Tessenderlo Limited, Widnes.

Each of these sites has a 1km consultation zone which requires amongst other things that any development proposals within the consultation zone take into account the potential risks that the COMAH installation may have on the development and visa versa (i.e. could some incident on the development site trigger a major incident on the COMAH site). Only the Tessenderlo site encroaches upon the development area in terms of consultation zone, but the Tessenderlo facility has been shut down and demolished so the COMAH consultation is in fact redundant.

Note: *The plan shows two COMAH installations on the site itself, associated with AHC. These designations relate to former activities that took place on the site and are no longer valid. WGL has confirmed with the Local Authority, and the Health and Safety Executive that these designations are no longer applicable as there are no COMAH activities on the AHC Westlink site.*

3.4 ECOLOGY AND NATURE CONSERVATION

This chapter reports on the baseline ecological studies that have been carried out as part of the environmental assessment work. It provides an assessment of the current ecological status of the site and identifies the likely ecological impacts of the proposed Strategic Rail Park Development, both on the site itself and on the nearby Mersey Estuary.

Methodology

In order to characterise the site and establish the baseline conditions the following ecological studies were carried out:

- A desk study and data search;
- An extended Phase 1 habitat survey;
- A protected species assessment;

- A bat survey;
- A reptile survey;
- A survey of aquatic invertebrates associated with the Steward's Brook and Ditton Brook; and
- A wintering bird survey covering the site and adjacent parts of the Mersey Estuary.

Baseline

Responses obtained from the Local Biological Records Centre at Chester Zoo (record) confirm that the site is not designated in any way for its nature conservation interest.

The Mersey Estuary, which is situated about 150 metres to the south of the site, is designated as a Special Protection Area (SPA) under the EU Birds Directive 1979, as a Ramsar Site under the 1971 Convention on Wetlands of International Importance (Ramsar Convention) and as a Site of Special Scientific Interest under the Wildlife & Countryside Act 1981 (as amended). The Estuary comprises large areas of inter-tidal sand and mudflats together with areas of reclaimed marshland, saltmarsh, brackish marshes and boulder clay cliffs with freshwater seepages.

It is one of the key estuaries in the UK for wintering waterfowl. It supports internationally important numbers of five regularly occurring migratory waterfowl in winter: dunlin *Calidris alpina*, redshank *Tringa totanus*, shelduck *Tadorna tadorna*, pintail *Anas acuta* and teal *Anas cracca*. It also supports internationally important numbers of redshank and ringed plover *Charadrius hiaticula* in the autumn. It also qualifies as internationally important for its overall wintering waterfowl assemblage, regularly supporting over 20,000 birds. The following species occur in nationally important numbers in winter; wigeon *Anas penelope*, grey plover *Pluvialis squatarola*, black-tailed godwit *Limosa limosa* and curlew *Numenius arquata*.

The SSSI, SPA and Ramsar site extends eastwards as far as the Runcorn-Widnes Bridge. The Upper Mersey Estuary to the east of the bridge is designated as a Local Nature Reserve (LNR) under the National Parks & Access to the Countryside Act 1949 and as a non-statutory Site of Importance for Nature Conservation.

Pickerings Pasture Local Nature Reserve is located on the north bank of the Mersey Estuary at Hale Bank. The main part of Pickerings Pasture is some 0.8 km to the south-west, but a narrow tongue of land within the LNR extends north-east along the bank of the estuary to the mouth of the Ditton Brook, which is some 175 metres to the south of the INNOVIS site. A former industrial and domestic waste tip, Pickerings Pasture has been restored and landscaped with wildflower meadows and native tree and shrub planting.

The site is located within the Mersey Forest, which is the largest of England's 12 Community Forests. The Forest covers an area of 420 square miles in Merseyside and North Cheshire and is being developed by a Forest Partnership comprising local authorities, the Countryside Agency, the Forestry Commission and others. The aim of The Forest Partnership is to create 8,000 hectares of new community woodlands plus a range of associated environmental, economic and social benefits through sustainable landscape improvements over a 30-year development period.

Ecological Evaluation

The majority of the site is either covered by bare, un-vegetated hard standing or is used for warehousing and other industrial uses. Apart from possible use of buildings by nesting birds, these areas are of no intrinsic ecological interest. There is no evidence that any of the buildings are used by roosting bats.

The main features of ecological interest within the site are the Mound and the two watercourses (Steward's Brook and Ditton Brook).

The Mound, although created comparatively recently, is beginning to develop a good habitat structure and supports a range of bird species including skylark, a UK and Local Biodiversity Action Plan priority species. The meadow area has a moderately diverse flora and may be an important invertebrate habitat.

Steward's Brook is heavily polluted (see *Section 17*) and for that reason the ecological value of the watercourse itself is low. It has an extremely impoverished invertebrate fauna and, as a result, is of no importance to wintering birds. Nevertheless it has potential for improvement and plans are being developed to remediate the Golf Course landfill site to the north, which is thought to be the main source of the pollution problem, but there are site based contributions also.

The banks and slopes above Steward's Brook support a varied habitat mosaic, including a fringe of saltmarsh/emergent vegetation, areas of grassland, scrub and broadleaved woodland. Saltmarsh is a priority habitat in both the Cheshire and Halton Local Biodiversity Action Plans. The alkaline soils, probably influenced by the presence of gullies, are of particular ecological interest as they support a diverse flora that includes orchids and several calcicole species that are uncommon in the region. Lime beds, another artificial habitat that supports a similar flora, are a priority habitat in the Cheshire Biodiversity Action Plan.

Ditton Brook is a much larger watercourse and, at least in comparison to Steward's Brook, its water quality is better (although the latest Environment Agency data still classify the water quality as Grade E and Poor). A good cover of saltmarsh, reedbed, emergent, tall herb and scrub vegetation occurs along its banks. Saltmarsh and reedbed are priority habitats in the Cheshire and Halton Local Biodiversity Action Plans. Areas of inter-tidal mud are exposed along the channel bottom at low tide. Mudflats are listed as a priority habitat in the Cheshire Biodiversity Action Plan.

Ditton Brook is the largest freshwater feed into the north side of the Mersey basin and as such may be an important factor in the ecology of the Estuary. It supports a typical brackish water creek fauna and is used to a limited extent by water birds from the Mersey Estuary.

Mitigation Measures

In developing mitigation proposals the need to preserve the integrity of the Mersey Estuary SPA, Ramsar Site and SSSI has been paramount. Consideration has also been given to targets identified in local and regional Biodiversity Action Plans and other policy documents.

The following mitigation measures are proposed:

- The drainage design (ES *Section 17*) has been designed to remove sediment and oil interceptor systems will be in place and managed through the site management system. These measures will assist in the protection of sensitive habitats and sites such as the Ditton Brook and Mersey Estuary.
- Steward's Brook will be re-aligned to join Marsh Brook which will eliminate polluting inputs from contaminated soils on the site and will enable the substantial improvement and

remediation of Marsh Brook. This will involve some loss of bankside vegetation from Steward's Brook but there will be compensatory planting elsewhere and an overall improvement in the quality of water entering the River Mersey.

- New planting will also be carried out along the other boundaries and elsewhere within the site to provide additional screening and landscaping to the development. The planting will be in character with the existing ecology of the area and will comprise species that are native to and already occur within the vicinity.
- In order to avoid potential impacts on nesting birds, relevant clearance work will be undertaken outside of the bird nesting season, which lasts from mid-March to the end of July. If any vegetation clearance or demolition works need to be carried out within the nesting season, they will be preceded by inspections made by an experienced ecologist to check for the presence of any nesting birds.

Conclusions

The site is located about 150 metres to the north of the Mersey Estuary, which is designated as a Site of Special Scientific Interest (SSSI), a Special Protection Area (SPA) and as a Wetland of International Importance under the Ramsar Convention. The Estuary comprises large areas of intertidal sand and mudflats together with areas of reclaimed marshland, saltmarsh, brackish marshes and boulder clay cliffs with freshwater seepages. It is one of the key estuaries in the UK for wintering waterfowl. It supports internationally important numbers of five regularly occurring migratory waterfowl in winter, together with other species in nationally important numbers. It is also important for some passage migrants in the spring and autumn. The proximity to the Mersey Estuary is a key issue with respect to the development.

Desk studies and baseline ecological surveys have shown that the site is in itself of limited ecological and nature conservation interest. Most of the site is covered by bare, un-vegetated hard standing or is used for warehousing and other industrial uses. Apart from possible use of buildings by nesting birds, these areas are of no intrinsic ecological interest. There is no evidence that any of the buildings are used by roosting bats. The key features of ecological interest within or adjacent to the site are concentrated along the two watercourses – Steward's Brook and Ditton Brook – and on the Mound, a reclamation site that was subject to landscaping in the late 1990's.

Effects on the Mersey Estuary SPA/Ramsar Site/SSSI

- A risk of negative impacts water quality impacts on the Ditton Brook and Steward's Brook during the construction phase and minor positive impacts during the operational phase, with consequent effects on the Estuary.
- Temporary disturbance to small numbers of teal using the upper part of the Ditton Brook over the construction period. Minor positive impacts during the operational phase. These birds are part of a wider population associated with the Mersey Estuary and one of the interest features for which it is designated as an SPA.

These are classed as being of minor significance and loss of what habitat does occur on the site will be compensated for elsewhere as part of this development project.

3.5 LANDSCAPE AND VISUAL CHARACTER

This section describes the existing and proposed landscape of the site and its surroundings and the likely impact of the proposed development on landscape character and visual amenity. Mitigation measures are also described where appropriate.

Impacts on Landscape Character and impacts on visual amenity are separate but related issues. Landscape impacts are changes in the character and quality of the landscape as a result of the development. Visual impacts are changes in the available views of the landscape and the effects of those changes on viewers.

Local Landscape Character

The Ditton site and its surroundings have been subdivided into local character areas by site survey and analysis. The local landscape character largely reflects the regional industrial character. However, the Mersey estuary is not very apparent, as it is at a distance of approximately 200m and hidden by intervening development.

Local Landscape Character Areas

- The Mound, together with the adjacent Hutchinson Hill. These form a distinctive local character area due to their height and green and wooded nature. This area has moderate visual quality and moderate sensitivity to change.
- The courses of Steward's Brook and Ditton Brook. Important green features with interesting ecology providing wildlife corridors and potential for enhancement. Moderate visual quality and moderate sensitivity to change.
- The Railway Corridor on the north and east boundaries. Busy elevated main line with some lineside vegetation forming a strong visual barrier. The Runcorn-Widnes Bridge is an important local landmark. Low visual quality and low sensitivity to change.
- The Site Entrance Area. Consisting mainly of the entrance road from the DeSoto Road roundabout. Some narrow grass verges and roadside trees. Potential for some enhancement. Moderate visual quality and high sensitivity to change.
- The Industrial Area including the hardstandings, roads and railways on the remainder of the site. Gritty, degraded, utilitarian areas with very few green areas or trees. Low visual quality and low sensitivity to change

Conclusions

The existing site and the surrounding area have an overall large scale, often degraded, industrial landscape character with low visual quality, low value and low sensitivity to change. The Mound and the two watercourses, however, are of moderate quality and sensitivity

There are few views into the area. The main views are from the main Liverpool - Warrington railway line to the north and east. Some views from Hale Bank may also be possible.

The proposed development will replace the existing run down buildings and facilities of various ages and designs with a good quality, well designed and coordinated development including substantial tree planting and good quality landscape treatment to create a 'flagship' development which will result in a considerable improvement to the existing landscape character of the area.

The impact of the proposed development on landscape character is assessed as moderately beneficial. The visual impact will generally be low and beneficial.

3.6 NIGHT LIGHT

The current site has a number of existing luminaire (light fittings) and lamp types, ranging from column mounted street lanterns to wall mounted floodlights. However, the site is not entirely illuminated, as the lighting tends to be concentrated in and around existing buildings, storage yards and security lodges. The existing lighting consists of mostly High Pressure Sodium (SON) and Metal Halide (HQL) lamp types but also includes some Tungsten Halogen (TH) and Low Pressure Sodium (SOX). As mentioned the site is not entirely lit and therefore large areas remain in darkness after hours and are not suitable as a safe working environment. In addition most lighting tends to be badly aimed and do not have necessary louvers or baffles and, as a consequence produce Light Pollution⁵ in the forms of Direct Upward Light, Spill Light & Light Trespass. Another associated problem is that of glare caused by the visibility of the light source (lamp) due to the location, aiming positions, optic type and the fact that baffles and louvers are not fitted.

Baseline

the maximum illuminance level is 151 lux and the minimum 0.32. It should be noted that the high level (151 lux) is located directly beneath wall mounted HQL floodlights, adjacent to existing buildings and the low value (0.32 lux) is located in open ground away from direct illumination and is therefore indicative of the general ambient illuminance levels within the area. The average illuminance level, taken from the point measurements within the site boundary, is 23.3 lux, but again this is not a good guide for the site in general as some areas are well lit, such as the container storage yard (37.74 lux average) whereas the cylinder storage area, on the north side of the central green space, is not lit (with an average illuminance of only 0.4 lux).

The main potential for impact with the proposed development will be birds using the foreshore as the use of the Reclamation Mound site with lit parking areas will bring light sources closer to the shore. The sections of shore that could be directly affected by this light, however, are already subjected to closer light sources from PDM and Hale Bank. The only section that is not affected

by background light in this way is the shore in front of the HEDCO landfill, but this landform will effectively block light spillage onto that section of foreshore from the new car-park area.

Conclusions

The proposed lighting design increases the number of luminaires and resulting illuminance levels around the site, whilst utilising a more efficient and controlled light distribution. Upward Wasted Light is reduced to 1.5% due to the full cut-off light distribution produced by the luminaires. The luminaire design, full cut-off optic and mounting arrangements (no tilt) means that glare is reduced to a minimum, especially from outside the site boundary. The location of the site, away from residential properties and the nature of the surrounding industrial areas mean that light trespass will not be an issue. It should also be noted that certain aspects of the site, such as the central green space, embankments lining the perimeter and high level conifer hedges also help conceal and control both light spill and visibility of the site and lighting equipment. The proposed redevelopment of the site together with the new lighting installation will help enhance and improve the quality of the site whilst providing a safe working environment, in-line with current guidance and codes of practice.

There will only be functional operational lighting of the site, not showcase lighting.

3.7 NOISE AND VIBRATION

In the context of this study, noise can be defined as unwanted or undesirable sound derived from sources such as road traffic, industrial operations or construction works that interfere with normal activities, including conversation, sleep or recreation. Vibration can be defined as the transmission of energy through the medium of ground or air that can result in small movements of the transmitting medium, such as a building, which can cause discomfort or even damage to structures if the movements are large enough.

Scope of Study

The assessment was based on consultation with Halton Borough Council (HBC) to confirm their requirements in terms of the scope of the assessment, the desired noise climate upon completion of the development proposals and the acceptability of certain noise emissions, such as construction noise and operational noise. Following consultation, the primary issues and

⁵ The Institution of Lighting Engineers "Guidance Notes for the Reduction of Light Pollution". 2000

proposed approach to the assessment were confirmed in the Noise and Vibration Section of the Environmental Scoping Report issued in October 2004, and contained in *Appendix 1*.

The assessment considers the following potential noise and vibration impacts at noise-sensitive receptors in the vicinity, as a result of the proposed development:

- Plant operation during the site preparation and construction of the proposed development;
- Road and rail movements during the operation of the proposed development; and
- External loading and unloading activities associated with the proposed development's operation.

The existing noise conditions are identified in *ES Section 12.3*, which includes a general description of the receiving environment, sources of noise and noise climate in the area, and presents the results of baseline environmental noise measurements undertaken at the closest noise-sensitive receptors to the site. Specific noise measurements to determine the noise emitting characteristics of existing external rail freight loading and unloading operations at the site are also described in this section.

ES Section 12.4 provides an assessment of the likely noise and vibration impacts associated with the construction and operation of the proposed development, identifies mitigation measures to control the impacts and assesses the effectiveness of any mitigation measures that are recommended. *ES Section 12.5* provides a summary and the conclusions of this noise and vibration assessment.

Assessment Methodology

Each of the potential noise and vibration impacts identified above has been assessed and the significance of each impact identified is presented in the form of scale, ranging from **no** significance to **major** significance. The significance scale in respect of noise impacts is described below, with **moderate** significance being considered as the trigger for the requirement of detailed mitigation measures;

- **No** significance – no perceptible affect on noise levels;
- **Minor** significance – barely perceptible adverse affect on noise levels;
- **Moderate** significance – noticeable adverse affect on noise levels; and
- **Major** significance – very noticeable adverse affect on noise levels.

The assessment of noise and vibration impacts is based upon the principles of a number of official guidance notes and British Standards which are described below.

Existing Conditions

The existing noise conditions at the closest noise-sensitive receptors to the site have been determined by a series of environmental noise measurements. Baseline noise measurements were carried out within the three closest residential receptor areas to the site at various times of the day and the night, to identify the principal sources of noise affecting the area.

Specific noise measurements were also carried out to determine the noise emitting characteristics of the loading and unloading activities of the existing rail freight distribution operations.

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445: 1991: Parts 1-3, *Description and Measurement of Environmental Noise* and following the guidance given in BS 4142. Noise parameters were recorded during the measurement period at each position.

Conclusions

A series of environmental noise measurements have been undertaken and noise predictions carried out to identify any noise impacts that are likely as a result of the construction and operation of the proposed development.

Noise levels from the construction of the development have been predicted at noise-sensitive properties in the vicinity of the site and impact of the noise assessed. Impacts are predicted to

be of **minor** significance during the site preparation phase at receptors located in Hale Bank, and of **no** significance during any of the remaining phases or at any other receptors.

It is predicted that construction of the proposed development will not give rise to perceptible levels of vibration at any off-site receptor, and as such impact of vibration from construction of the proposed development is predicted to be of **no** significance.

Changes in noise emissions for the roads that are likely to be used to access the proposed development have been predicted, and the impact of changes in noise level assessed. All the roads considered in this assessment will experience imperceptible increases in noise, which when compared with the criteria adopted for this assessment are considered to be of **no** significance.

Increases in railway movements as a result of the proposed development are predicted to be negligible when compared with the relatively high levels of passenger trains that currently travel past the site. As such, it is considered that any increases in railway noise levels will be imperceptible at receptors and as such, of **no** significance.

Noise from external operations at the proposed development, such as the arrival and manoeuvring of freight trains, manoeuvring of HGV's and the operation of forklift trucks have been predicted at noise-sensitive receptors. The impact of noise from these operations has been assessed and the advice contained within BS 4142 indicates that during daytime, there is a positive indication that complaints are unlikely from operation of the proposed development. During the night-time, the advice contained within BS 4142 indicates that operational noise is much less than marginal in significance, approaching the complaints unlikely situation in most cases. When compared with the assessment criteria, operational noise during the day is likely to be of **no** significance at all receptors and during the night it is likely to range from **minor** significance at Hale Bank to **no** significance at all other receptors.

3.8 SOCIO-ECONOMIC ISSUES

The development on the existing AHC Warehousing Ltd holdings on the West Bank Dock (Mathieson Road) Estate, Widnes, is presently an underused land resource with direct links to the main line network to Liverpool and Crewe. Historically a manufacturing location, the site is now utilised for predominantly warehousing and distribution purposes. This successful AHC operation is already providing benefits to what has been a declining area in need of regeneration. The

identification of this initial success has led to its allocation as a Regional Investment Site with a specific branding as an Inter-modal Freight Park.

The proposal to expand and intensify usage of the site will bring greater benefits to both the development and the local area. These include:

- Economic reuse of poor quality development land;
- Improvements to the built environment with new quality distribution buildings, increasing the accommodation by approximately a factor of two;
- An opportunity to develop support and administrative services within the estate, for example office functions, vehicle maintenance, café/canteen/recreational facilities, crèche etc., on a fully managed site.;
- Contribution to sustainable transport policies with a projected increase in rail freight traffic; and
- Increase in both direct and indirect employment, on both a temporary and permanent basis.

Ordinarily, the West Bank Dock Estate would not attract either the investment or the occupiers solely as a road centred distribution park. The unique selling point is its access to the national rail network, enabling integrated rail linked warehousing.

Baseline

The baseline for the existing site provides a mixed picture. Existing accommodation, which is a mix of old, part refurbished and more modern accommodation, totals in excess of 60,385 m² (650,000 ft²). On completion of the development, the usable accommodation will increase over twofold and provide an efficient new and integrated distribution park, served by both road and rail.

Combining the areas of employment generation together, the new development will provide for over 1700 jobs and will regenerate a substantial key strategic site in the Widnes area..

Conclusions

In its present condition, the existing operation makes a limited contribution to the local community. Therefore, a successful implementation of the proposal will enable regeneration and expansion of Ditton as an employment area and have a beneficial ripple effect on local services and amenities.

3.9 SOILS, GEOLOGY AND LAND CONTAMINATION

This section of the assessment discusses the historical and current use of the proposed development site in relation to the issue of contaminated land and the underlying geology and hydrogeology. It details the objectives, methodology and findings of a Phase I Desk Based review and a Phase II intrusive site investigation, conducted by ENVIRON and also considers the potential impacts of disturbance of the soils on the site associated with the redevelopment proposals.

In particular the site is known to have had a long potentially contaminative history and there are polluted soils, surface waters and groundwater on the site. Most notably, there is known to be a widespread presence of galligu contamination on the site (chemical waste from the alkali industry and in particular the *Le Blanc* Process). As such WGL and AHC are conscious of the potential for these materials to be disturbed during the redevelopment programme and have developed a strategy for managing these materials. This necessitated a comprehensive site investigation across the proposed development area, which is discussed in detail later in this section of the report.

Assessment Methodology

The study involved a combination of desk-based studies, consultations with interested parties and regulators and site based investigation and sampling. The site investigation was designed based upon known site conditions from earlier investigations, geotechnical requirements for the proposed development and the need to characterise those materials most likely to be disturbed during the proposed redevelopment of the site.

Desk Based Review

The methodology employed in completing the desk-based review of the site and surroundings involved the following:

- a review of historical maps of the site and surrounding area to determine any historical potential for contamination at or within the vicinity of the site;
- consultation with Halton Borough Council and the Environment Agency regarding contaminated land issues associated with the site and surroundings, including the presence of licensed landfills and other sites that may have been identified under Part IIA of the *Environmental Protection Act 1990*;
- a search of the Environment Agency website (www.environment-agency.co.uk), regarding the ground condition of the site and immediate vicinity (landfill and waste sites, pollution incidents) and groundwater and surface water information;
- a review of records held on an environmental database (Envirocheck), including records of landfills, water abstractions, pollution incidents, enforcements and prosecution actions;
- interpretation of the British Geological Survey (BGS) map of the area (BGS Sheet 97, Runcorn, Scale 1:50,000);
- consultation of the Radon Atlas of England and Wales, published by the National Radiological Protection Board (2002) and Radon: guidance on protective measures for new dwellings, published by the Department of the Environment, Transport and the Regions (1999);
- interpretation of the Environment Agency Groundwater Vulnerability Map of the area (Sheet 16, West Cheshire, 1:100,000) and the Policy and Practice for the Protection of Groundwater Regional Appendix;
- a review of previous intrusive investigations of the proposed development site. Some of these facilitated the assessment of chemical conditions across the site but some were restricted to geotechnical testing and were thus of limited value to this study; and

- numerous site visits and interviews with current site personnel to assess current site activities and environmental setting.

Information from the desk-based review and earlier site investigations identified potential pollution sources on the site and provided some limited quantification of these and identified potential pathways for pollutants to migrate from the source areas to potential receptors (humans, ecosystems, buildings, etc). Based upon the preliminary desk based risk assessment it was then possible to identify likely risk scenarios and design a comprehensive site wide investigation that could be used to fully characterise the site, assess the risks and develop appropriate mitigation measures.

Summary of Potential for Contamination from Current Activities

At the **Foundry Lane site** the potential for contamination to be present due to current activities is considered to be low, given that the activities on site have predominantly been warehousing and warehouse distribution since the late 1990s when AHC (Warehousing) Ltd took ownership of the site from Meyers Forests Products Ltd, a former saw mill. Potential areas of concern noted on the Foundry Lane site include the following:

- the site comprises a rail head, which consists of three railway lines, which encroach onto the site in the north-western corner from the main Widnes railway located to the north. Contaminants often associated with railways include various metal species, sulphate, PAHs and PCBs, however the railhead is a recent activity following its recent construction in 1998;
- four above ground fuel storage tanks; two of which are unbunded and used for site vehicle refuelling (i.e. fork lift trucks and container lifting trucks) with the remaining two tanks, which comprise secondary containment used for gas oil heating, one of which serves the boiler within the office block located on the western section of the site, with the other AST serving the boiler for the office area within the Exel building located on the eastern section of the site;
- Potential contaminants may include hydrocarbons as a result of any uncontrolled loss of fuel, accidental spills or leaks, however, all of the ASTs are sited on hardstanding and with the exception of staining noted on the bund wall of the AST, which serves the office block, no visual evidence of contamination was noted;

- the potential for PCBs to be present due to the old electricity sub station located within the eastern section of the site. The sub station is likely to be contemporary to the surrounding buildings. However, the electricity sub station is owned and maintained by the local electricity supply company, and therefore, since the sub station is the responsibility of a recognised operator the presence of PCBs at concentrations above the designated threshold is considered to be low;
- the storage of demountable tanks/containers, which can contain chemicals in a liquid, gaseous or powdered form on an unsurfaced/ unprotected area located to the north of the warehouses. However, these containers are likely to be internally banded and are not filled or emptied on site, only stored; and
- the potential for asbestos containing materials (ACMs) to be present within the shallow ground as a result of the demolition and refurbishment works undertaken on the original site buildings, which were constructed circa 1970. However, the majority of the Foundry Lane site is surfaced in hardstanding comprising tarmac or concrete.

The potential for contamination to be present due to current activities (open space) at the **Reclamation site** is considered to be low (although the mound itself comprises contaminated material that has leached out into the water courses in the past). The Reclamation site consists of an engineered mound comprised predominantly of galligu chemical waste together with other known industrial chemical wastes. However, between 1995 and 1999 the mound was re-graded, capped and landscaped into stable slopes. No activities are currently undertaken on the mound, which is currently fenced off with gated access.

The area to the north of the Reclamation mound, which lies adjacent to the main Widnes railway line comprises unsurfaced/unprotected land, which is currently utilised for container storage comprising a mixture of large, loaded/empty demountable gas/liquid/powder containers. Again, these containers are likely to be internally banded and are not filled or emptied on site, only stored.

At the **West Bank Dock site** the potential for contamination to be present as a result of current on site activities is considered to be moderate. Although the majority of the site comprises warehousing activities, other activities such as solid/liquid packing together with liquid blending

are also undertaken. Potential areas of concern noted on the West Bank Dock site include the following:

- the bulk storage of lube oil for the liquid packing operations, which involves the re-packing of lube oil from bulk storage into small containers for the consumer domestic market. The bulk oil storage facility (tank farm) associated with this activity comprises a number of vertical and horizontal ASTs, some of which are operational, but the majority of which are currently redundant as a result of the reduction in operations over the last eighteen months. The tanks were generally noted to be in a relatively poor condition, with inadequate or damaged secondary containment, all of which were located in an area where housekeeping was noted to be very poor. Potential contaminants may include hydrocarbons as a result of any uncontrolled loss of oil, accidental spills or leaks, which is considered possible given that visual evidence of contamination was noted in the form of significant staining along the bund walls. Also there was significant staining on the concrete hardstanding, which was noted to be cracked in places. The use of the filling machines could also lead to possible hydrocarbon contamination of the ground as a result of accidental spills and leaks. The powder packing activity is not considered to pose a significant ground contamination risk;
- the storage of uncontained drums of unknown composition, located within the area of the tank farm and the area in the south-western corner of the site (which also comprises the emergency exit route for the Tessenderlo COMAH site);
- the liquid blending facility, which involves the mixing and blending of various chemical substances including n-propyl bromide, dioxolane, cyclohexene oxide, butylene oxide and dimethyl carbonate and the subsequent re-packing of the product into 205 litre drummed containers. However, there is no designated drum storage area comprising secondary containment. Therefore, there is a potential for accidental spillages to occur or leaks to go unnoticed, which may give rise to ground contamination, although the drums were located on tarmac/concrete hardstanding and no visual contamination in the form of staining, was noted;
- in addition to the tank farm, there are five operational above ground storage tanks located on the West Bank Dock site; three of which are unbunded and used for gas oil heating and waste oil. The remaining two ASTs, which comprise secondary containment,

albeit inadequate, are used for vehicle refuelling, one of which serves fork lift trucks, whilst the other is a large derv tank for HGV refuelling.

All of the ASTs were sited on hardstanding comprising either tarmac or concrete, however, significant staining was observed of the bund wall of AST, which comprises fuel for the fork lift trucks and some evidence of staining was observed on the bund wall of the derv tank. Furthermore, an underground supply line from the AST lead to a dispensing pump and as with all underground lines, the possibility of accidental leaks going undetected cannot be ruled out. Therefore, there is a potential for localised hydrocarbon contamination to have occurred within the shallow soils;

- there are a number of redundant ASTs located around the site, which have all previously been used for the storage either of diesel, gas oil, nitromethane, anti freeze or waste oil. Five of the redundant AST's, which were previously used for the bulk storage of anti freeze are currently sited on rough ground in the southern area of the West Bank Dock site;
- the potential for asbestos containing materials (ACMs) to be present within the shallow made ground as a result of the demolition of Unit 1, the original site building, prior to the construction of the new Unit 1 in 2002/2003;
- there is a maintenance workshop located within the south-eastern section of the site, where low level, HGV maintenance and repair work undertaken. The workshop area comprises a maintenance pit internally and an inspection pit internally and also involves the storage and use of ubiquitous contaminative materials such as fuels, oils, degreasers, and solvents, the use of which may have resulted in the possibility of localised ground contamination. However, garaging activities have only been operational in this section of the site for approximately twelve months, since AHC (Warehousing) Ltd acquired the land; and
- the southern section of the site comprises unsurfaced/unprotected land, which is utilised for lorry/trailer parking. Therefore, there is the potential for localised hydrocarbon contamination to have occurred as a result of the possible infiltration of oils/fuels from the surface into the shallow soils.

Considering the INNOVIS Ditton site overall, the potential for contamination to be present as a result of present site activities is considered to be low to moderate.

Surrounding Area

The surrounding land use is typical of a heavy industrial location, with large chemical complexes interspersed with more recent industrial and commercial development and various waste sites. The likelihood of significant contamination being present from former activities in the surrounding area is known to be high with areas like the golf course to the north and HEDCO landfill to the south being notable in this regard (notwithstanding the widespread presence of galligu across this area generally).

The current on site activities and the potential areas of concern are presented in *Figure 14.2*

Summary of Potential for Contamination from Historical Activities

The site has been under industrial usage from at least the 1890s to the present day. The earlier maps indicate that the Foundry Lane site comprised a Cement works, which occupied the site until circa 1920, when a Tar works and a Manure works were developed. These works were subsequently replaced in the late 1950s by a Timber yard, which occupied the site until recent times. The potential for historical contamination to be present on this part of the site is considered to be moderate to high. The presence of the Cement works may have led to contaminants such as arsenic, lead, chromium and sulphur being present on the site, together with hydrocarbons, polyaromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). The Tar works provides the potential for contamination from various metals, cyanides, sulphates, phenol and PAHs. The Manure works was likely to produce contaminating materials such as metals, arsenic, cyanide, sulphate, various hydrocarbons and PCBs. The presence of a timber yard may have led to compounds such as white spirit, creosote, metal based (copper, chrome, arsenic) preservatives and pesticides being used on site. These compounds could lead to contamination from metals, boron, sulphate, various hydrocarbons and PAHs.

At the West Bank Dock site, a Satinite works together with a Saw mill and a Pottery works were developed during the early 1900s, which subsequently occupied the site until circa 1970. The Satinite works and the Saw mill appeared to have ceased their operations, which led to the redevelopment of the site during the 1980s into a transport depot. The potential for historical contamination to be present on this part of the site is considered to be moderate to high. The Satinite works produced calcium sulphate for use in the paper, construction and fertiliser industry. Potential contaminants generally associated with this process would include, for example,

various metals, sulphate, hydrocarbons, PAHs and PCBs, some of these contaminants together with sulphur are also indicative of pottery works. The Saw mill could potentially have generated contaminants such as metals, boron, arsenic, sulphate, phenols, and PAHs. The site's use as warehousing in recent years is not considered significantly contaminative, however, activities on site also include liquid/solid packing and liquid blending, these activities do involve the storage of oils and therefore, there is a potential for hydrocarbon and PAH contamination to have occurred through possible leaks and spills.

From the early 1900s until circa 1920, a small chemical works with associated tanks appeared to have occupied the northern section of the Reclamation site. From circa 1920, the ground level of the site appeared elevated. This elevation is likely to have been caused by the deposition of the galligu contamination, a by product of the *Le Blanc* process (manufacture of sodium carbonate), which is also known to contain other industrial contaminants, such as heavy metals, asbestos and hydrocarbons, for example.

Railway lines have serviced the site and surrounding area since the mid 1800s. A variety of contaminants can be attributed to railway activities including metal species such as arsenic, cadmium and copper together with polyaromatic hydrocarbons, oils and fuels.

Published Geology

According to the British Geological Survey Solid and Drift Map for Runcorn (Sheet 97, scale 1:50,000), the site is directly underlain by recent Marine and Estuarine Alluvium (the River Mersey is tidal within this area). This is further underlain by the Upper Mottled Sandstone of the Triassic Sherwood Sandstone Group at depths ranging from 12m bgl to over 35m bgl. The Sherwood Sandstone Group is underlain by Permian sandstones and further underlain by the Carboniferous Coal Measures to depth.

Estuarine alluvial deposits commonly comprise soft dark grey clays, silts and occasionally sands, which may be organic and contain shelly material. The Sherwood sandstone group comprises sandstones which are typically red in colour, occasionally mottled with yellow and white patches. The fine grained sandstone bedrock is variably weathered and is encountered in varying forms of compaction from loose sand to hard rock. The BGS map (Sheet 97; Runcorn) for the area is presented in *Figure 14.4*.

Site Investigation Methodology

WGL commissioned ENVIRON to undertake a site wide comprehensive site investigation to support the design of the development proposals and provide a more comprehensive characterisation of the site for the EIA.

Sampling locations were positioned to provide a representative spatial assessment of the ground conditions, to target identified areas of potential contamination (e.g. current storage tanks) and to provide geotechnical information. The field investigation comprised the following:

- the drilling of twelve boreholes by cable percussion/rotary drilling methods;
- the drilling of sixteen shallow window sample holes by hydraulic sampling equipment;
- the excavation of twenty three trial pits using a machine excavator;
- the excavation of two spoil mounds using a machine excavator;
- field examination and sampling of soil and groundwater;
- chemical analysis of selected soils, surface water and groundwater samples for a range of contaminants, which are likely to be associated with current and historical activities on the site;
- submission of selected soil samples for geotechnical testing; and
- monitoring for land gases.

Investigation Findings

Visual and olfactory field evidence of potential contamination was noted during the investigation at a number of locations. In general, occasional to frequent gravel size fragments of brick, concrete, cinder, coal and inclusions of metal slag were found throughout the made ground across the site, along with discrete granular ashy layers or chemical waste material.

In addition to this, occasional locations were noted to have hydrocarbon odours and/or visual evidence of hydrocarbon contamination (oily stains) within the made ground. Hydrogen sulphide odours were noted, generally within the chemical waste (galligu) material together with unidentifiable odours noted within the alluvial deposits.

Chemical testing of the soil and groundwater has revealed that the site is contaminated to varying degrees and that this is impacting upon groundwater. The investigation findings are summarised below for the key species of concern.

Metals

Metal contamination of the shallow made ground soil was recorded in several locations across the site. Lead was recorded at levels significantly above the CLEA soil guideline value (SGV) of 750 mg/kg in five locations, four of which were located on the West Bank Dock site (WS12, BH31, BH43 and BH51) and one located on the southern section of the reclamation mound (TP18). The locations of BH31 and BH51 also detected elevated arsenic levels together with the locations of WS7 (West Bank Dock site) and TP20 (south of reclamation site) above the CLEA SGV of 500 mg/kg. However, three of the four samples only recorded moderately elevated arsenic concentrations, but the sample obtained from TP20 recorded a significantly elevated level of 21,000 mg/kg. These elevated levels of lead and arsenic were generally recorded in samples recovered from the galligu chemical waste or ash fill material.

Lead and arsenic are general contaminants associated with a number of industrial activities, one of which being chemical manufacturing. Elevated levels of these metals are generally associated with the presence of ash, which is widespread in industrial areas. Furthermore, the galligu chemical waste is also known to contain numerous industrial contaminants, including heavy metals. Lead has also been used as part of the glazing process within the pottery industry, which has also been a former industrial site usage.

Generally, these metals are considered to be relatively immobile, especially as soil conditions are neutral to alkaline. Furthermore, leachability testing concludes that the metals within the made ground are not in a readily soluble and thus leachable form.

Metals were detected within the groundwater, the majority of which being low, however, slightly elevated concentrations of arsenic (BH14, BH34, BH9, BH31), cadmium (WS6, BH23), lead (WS4) and mercury (BH43) were recorded. Generally, the elevated metal levels were recorded within

the perched groundwater, with the exception of a cadmium concentration detected in BH23 and two arsenic concentrations detected in BH9 and BH31, which were detected within the natural, deeper groundwater.

Total Petroleum Hydrocarbons

Shallow soil samples obtained from WS6 and TP10 recorded elevated hydrocarbons (TPH) above the 1,000 mg/kg target value commonly applied by the Environment Agency, (this equates to the special waste threshold limit for oil contaminated site arisings). WS6 was located on the West Bank Dock site, adjacent to the vertical storage tanks, within the tank farm area. The tanks were poorly bunded and surface staining was noted around the base of the bund (which comprised breeze block) and on the concrete hardstanding, which was noted to be cracked in places and to generally be in a poor state of repair. The drainage system did not appear to be functioning properly i.e. oily water present on the surface. Field evidence of hydrocarbon contamination was noted in both the soil profile, in the form of a hydrocarbon odour and the perched water, which was discoloured and comprised a significant oily sheen. This location also recorded significantly elevated hydrocarbons in the perched water, which were identified by the laboratory as being consistent with diesel and lubricating oil.

TP10 was situated on the area of land located to the north of the Reclamation site. This area is currently unsurfaced and has numerous vehicle movements. Storage of the demountable tanks/containers, which can contain chemicals in liquid, gaseous or powdered form are currently stored on this unsurfaced area. No visual or olfactory evidence of contamination was noted during the excavation of this trial pit location.

TPH was also detected at elevated levels within the groundwater of BH12, BH43 and TP16. TP16 was located on the southern area of the reclamation mound and during the excavation, the soil arising was noted to contain a clay layer comprising black streaking (noted between the depths of 0.4-1.3 m) over galligu chemical waste. No hydrocarbon odours were noted within the soil arising and no hydrocarbon sheens were noted on the perched water sample.

BH43 was located within the former transport yard, which was once also occupied by Amazon Gas. No field evidence, generally associated with TPH contamination, was noted within the soil arising and only trace chemical concentrations were recorded within the soils, however, a slight oily sheen was noted during the purging and sampling of the perched water.

BH12 was located on the foundry Lane site and during the excavation of this borehole no visual or olfactory evidence of contamination was noted within the soil profile, nor was any evidence of contamination noted during the purging and sampling of the groundwater. The groundwater within BH12 is representative of the lower water body, as the borehole was installed in order to capture the groundwater encountered in the drift/solid geology transition zone. Therefore, as TPH contamination has been detected in this water body, there is a possibility that the underlying Triassic Sandstone Aquifer may have been impacted. This could not be ascertained as drilling into the sandstone bedrock in order to determine the presence/absence and the relative magnitude of soil/groundwater contamination was not deemed necessary at this initial stage of the investigation. Drilling into the sandstone bedrock can generate a conduit, by which contamination from the shallower soils/groundwater impacts the underlying major aquifer, hence this was avoided in preference to obtaining shallower data.

TPH contamination is not considered to be widespread. Elevated TPH concentrations in the soil/groundwater have not been identified at nearby locations the investigation results are indicative of localised hotspots rather than widespread contamination of the site by hydrocarbons.

Polyaromatic Hydrocarbons (PAHs)

Generally, PAHs were not detected at elevated levels within the soils, although four samples analysed, did record elevated levels of total PAH in excess of the Dutch I value (sum of 10) (40 mg/kg), which has been used for comparison in the absence of CLEA SGV. Total PAH includes the analysis of the sixteen most common PAH's rather than the ten compounds as referenced in the Dutch I guideline. Therefore, PAH levels are not considered to represent significant contamination in the context of this site.

Generally, PAH contamination within the groundwater is not considered significant, as the majority of the recovered groundwater samples detected individual PAHs below their respective analytical detection limits. However, the perched water recovered from TP16 (located in the southern section of the mound) and BH34 (situated adjacent to an above ground, diesel, storage tank, located on the West Bank Dock site) together with the natural groundwater within the Fluvio-glacial Sands and Gravels horizon recovered from BH23 (area to the north of the reclamation site) did record elevated concentrations of some of the individual PAH compounds.

Seven of the individual compounds, namely fluoranthene, benzo (a) anthracene, chrysene, benzo (k) fluoranthene, benzo (a) pyrene, indeno (1,2,3-cd) pyrene and benzo (g,h,i) perylene were detected at elevated levels within the perched water in TP16. However, only one compound, benzo (a) pyrene, was detected at an elevated concentration within BH34 and two compounds, indeno (1,2,3-cd) pyrene and benzo (g,h,i) perylene within BH23.

Ash can be a source of PAH's, and was encountered within the made ground horizon. This can be attributed to the coal/coke residues from historical chemical activities at the site and in the immediate surrounding area or PAH contamination may also have resulted from the former timber treatment yards located on site and in the immediate surrounding area.

The elevated PAHs in the groundwater appear to be indicative of localised hotspots rather than site wide contamination, however, in the context of the site's environmental setting these levels are not considered to be significant.

Asbestos

Asbestos presence within the ground was only identified to one exploratory location, TP5 located on the unsurfaced area in the southern section of the West Bank Dock site. Here amosite (brown asbestos) was detected as 'significant' in a sample recovered from the made ground horizon at a depth of 0.6-1.0 m. This is indicative of an isolated hotspot as no other exploratory locations recorded the presence of asbestos. However, given the historic landfilling, which is known to have been undertaken on the site, the presence of other asbestos containing materials present on the site cannot be ruled out.

The presence of isolated fragments of asbestos within the made ground does not represent a significant risk to site occupiers under the current or future site usage, however, it does represent a potential risk through inhalation during any excavation works, if such material is disturbed in significant quantities. It is not expected that this will be the case, but appropriate PPE and site health and safety procedures, as well as vigilance by experienced field scientists during the excavation works will ensure this potential issue is well managed.

Sulphide

Soil samples obtained from the galligu chemical waste recorded significantly elevated sulphide concentrations above the 250 mg/kg Environment Agency disposal guideline value, which has been used for comparison in the absence of set guideline criteria. Sulphide levels within the

galligu chemical waste ranged between 790 mg/kg and 6,800 mg/kg, compared with the concentrations recovered from other compositions of made ground (silt, ash and slag) and the underlying natural strata, which ranged between 50 mg/kg and 150 mg/kg, all of which below the Environment Agency's waste disposal guidance. One sample, which recorded a significantly elevated concentration, was however, recovered from the natural alluvial deposits, but was noted to be odorous.

Of the eight samples, which recorded elevated sulphide, three were detected in the trial pit locations of TP15, TP16 and TP23 (located on the southern section of the reclamation mound), two of which (TP15 and TP23), were noted as having hydrogen sulphide odours. The remaining samples were obtained from the locations of BH14 and BH23, situated on the unsurfaced area to the north of the reclamation mound and BH31, BH55 and BH43, which were all located within the central and southern areas of the West Bank Dock site. The sample recovered from BH43 comprised odorous, alluvial deposits, which was overlain by galligu chemical waste.

Galligu waste arising from the *Le Blanc* process is known to be rich in sulphur compounds. These levels are significant and considered to represent widespread contamination of the site, where galligu chemical waste has been deposited.

Sulphide analysis was undertaken on all of the groundwater samples, eleven of which did not detect levels of sulphide. However, concentrations of sulphide were recorded in the remaining four samples, two of which, comprised perched water within BH14 and BH43, with the other two samples comprising perched water from the excavated trial pit locations of TP16 and TP23.

Although sulphide contamination was noted within the shallow soils, comprising galligu, the groundwater does not appear to have been significantly impacted. Sulphide was detected in the groundwater at significant concentrations only in locations of BH43 (7,300 µg/l), BH14 (140,000 µg/l) and TP23 (200,000). These locations were in Made Ground.

Sulphate

Significantly elevated sulphate levels were recorded on-site within both the soils, with concentrations ranging from 0.02g/l to 2.2 g/l and groundwater, with concentrations ranging from 68 mg/l to 6,380 mg/l. There are currently no set criteria for this contaminant within soils, however, all fifteen groundwater samples analysed, recorded sulphate in excess of the UK DWQ

guideline value (250 µg/l), with the highest levels generally recorded within the perched water. The galligu is the most obvious source of these elevated sulphate levels.

Whilst elevated sulphate levels are of limited significance in environmental terms, in the UK, sulphates in soil and groundwater are the most common chemical agents likely to cause concrete deterioration. In accordance with BRE Special Digest 1:2000, the classification system for sulphate concentrations in soil are based on the Design Sulphate Class. Generally, water soluble sulphate concentrations within the made ground ranged between 1.2 and 2.3 g/l (with the exception of BH8, BH9 and BH11 which were less than 1.2 g/l) and therefore would tentatively be given a DS-2 classification, however the water soluble sulphate concentrations within the deeper natural soils were generally below 1.2 g/l, which would subsequently result in a DS-1 classification. However, this would need to be assessed by a structural engineer during the construction phase.

VOCs

VOC's were not detected at elevated levels within the soils or groundwater. Individual compounds were detected within both the soils and groundwater but are considered trace. One soil sample recovered from the made ground (2.5-3.0 m) of BH34 recorded a benzene concentration of 2.2 mg/kg, which slightly exceeds the Dutch I value and although benzene was detected within the groundwater sample recovered from the made ground horizon, the concentration is considered trace and an isolated hotspot.

Major Ions

The analysis of major ions was undertaken on a variety of soils together with the groundwater within the boreholes, which represented the various water bodies. There are no set guideline criteria for major ions in soils, however, the maximum concentrations were generally detected within samples recovered from the made ground horizon. Significant levels of the individual ions were detected within the groundwater beneath the site and were generally found within the shallow perched water, where the maximum concentrations of nitrate, potassium, calcium and alkalinity were recorded. The maximum concentrations of chloride, ammonia, sodium and magnesium were detected in the natural groundwater within the alluvial and glacial clay deposits. Given the significant levels of the individual ions, it could indicate that these chemicals are leaching out of the soils and into the groundwater, but these may also be a result of saline intrusions.

Conclusions

The site investigation revealed that the nature and level of contaminants identified at the site although substantial are not considered to pose a significant health risk to current occupants (i.e. industrial end-use). The soil contamination identified does, however, represent an ongoing source of groundwater contamination and furthermore, the areas of unsurfaced ground increases the leaching potential of any soluble contaminants from the unsaturated into the saturated zone. This will be significantly reduced as a direct result of the proposed redevelopment, as the majority of the site will become hardstanding with pockets of controlled drained landscaped areas. It is clear that groundwater quality is being locally impacted, although this does not appear to be site wide. Given the site setting and hydrogeological conditions and the substantial off-site contamination sources that exist, on-site groundwater remediation is very unlikely to have noticeable effects.

In terms of the proposed planned redevelopment of the site, some remedial works in relation to soils will be required prior to the building construction phase. The following recommendations are made with respect to additional works and issues to be addressed prior to redevelopment (and assume an industrial/commercial end use):

- Prior to the redevelopment of the site, there is a significant amount of material currently being stored on site which will require off site disposal. This includes all waste drums, which are of unknown composition, waste scrap metal and the numerous, redundant storage tanks, which will be decommissioned prior to disposal;
- the above ground oil/diesel storage tanks, which are currently in-situ, both on the Foundry Lane and West Bank Dock site will subsequently be emptied, decommissioned and removed prior to the redevelopment works commencing. This will be undertaken by an appropriately qualified contractor and a visual assessment will be made of the local ground conditions upon their removal i.e. evidence of surface staining. It is clear from the soil and groundwater samples obtained from WS6, located adjacent to the tank farm area, that localised hydrocarbon contamination has taken place and therefore an allowance will be made for soil sampling and testing of the excavation, and potentially for the removal of contaminated soil;

- prior to the construction phase, (upon site clearance), further investigation will be undertaken in those areas that were previously inaccessible, most notably within, for example, the bulk oil storage facility area within the West Bank Dock site;
- there are potential asbestos-containing materials present within some of the buildings on site. An asbestos survey has been undertaken at the site, which will aid in the assessment of asbestos removal costs and plan for any asbestos removal work prior to the demolition of the buildings;
- quantitative risk assessment will be undertaken to define site specific target values for soils for those parameters identified as being of concern i.e. TPH, PAHs, arsenic, lead etc. This will enable an assessment of remediation requirements to be carried out;
- once site specific target values have been defined, further investigatory works are likely to be required to further delineate areas of contamination identified as requiring remediation. At this stage a detailed remediation plan will be drawn up for agreement with the appropriate regulatory authority (LA/EA);
- Where future areas of landscaping are proposed as part of the planned redevelopment, it is likely that a clean 'break layer' of top-soil will be required to a thickness of at least 0.5m on top of the current ground levels, which will subsequently protect the vegetation from potentially phytotoxic effects of contaminants such as copper and zinc and to protect humans that may be exposed via landscape maintenance activities;
- a gas monitoring programme will be developed in order to further assess the gas regime at the site. BH15 located on the Foundry Lane site was the only borehole which recorded slightly elevated levels of methane, although this was recorded within the natural alluvial deposits, rather than the fill material and may be a result of the degradation of natural organic material, which may be present within the glacial clay.

Remedial Options

Remedial Plans will be submitted with the aim of remediation at this site to reduce calculated risks from the identified impacts to potential receptors to levels acceptable to the Environment Agency (EA) and the Local Authority Environmental Health Department (EHD), such that the

property is no longer considered to be impacted under the Contaminated Land Regulations 2000 or present a significant risk to the development.

Initial results from the qualitative risk assessment indicate that removal of the most heavily contaminated material together with treatment of the source areas is, in ENVIRON's opinion, likely to be acceptable to the Environment Agency (EA) and the Local Authority Environmental Health Department (EHD). If lesser degrees of removal are undertaken, these may also require some form of containment and or stabilisation at the site boundary to mitigate the potential for off-site migration. This is currently being evaluated with remediation contractors for inclusion within the overall development.

3.10 SUSTAINABILITY

It is relevant to examine, in broad terms, aspects related to the overall sustainability of the development, particularly in view of Government policies on the issue.

Since the 1992 Earth Summit in Rio de Janeiro, sustainability has become a high profile issue for national governments around the world. In the past decade, national, regional and local planning policy in Britain has been re-written to make the present generation aware that it needs to act responsibly in terms of resource management and land use to avoid compromising the prospects of future generations.

It is recognised that the extent of these impacts is dependent on the principles and design of a development and that they can be minimised through adoption of sustainable design.

This section of the ES reviews the various aspects of sustainability incorporated in the proposals. Whilst some of these aspects have already been set out in other contexts in other parts of the document, this section demonstrates the overall approach taken to ensure a highly sustainable development.

The proposed development can be considered on several levels:

- relationship to planning policies on sustainability;
- public transport and use of the car; and

- development, design, procurement of materials and construction principles.

Overall, the proposals provide a broad range of sustainable development measures, most notably those that relate to freight transport and access, which take full advantage of the excellent links to the local rail and road network.

Conclusions

The current use of the site does not accord with sustainability principles as it comprises ad-hoc development implemented over a number of years and associated ad-hoc construction materials, transport arrangements and wastes management. Also many areas of the site are unused or poorly utilised when they could be made inclusive to an economically viable and productive use of a large brownfield site.

The new buildings will achieve high standards of environmental design as part of a sustainability agenda for the whole of the site. The design of individual buildings is respectful of orientation, materials specification and energy management strategy, so as to demonstrate responsible environmental design principles.

As part of the Tenants Environmental Charter, companies will be encouraged to follow the waste hierarchy, aimed at reducing landfill disposal as much as possible with this being the final option in the event of no other reasonable solution being available. Furthermore the Tenants Charter will actively encourage the use of sustainable travel as identified in the Green Travel Plan.

The development will be assessed and certified against the BREEAM sustainability appraisal criteria or similar Sustainability Appraisal schemes in due course. The intention is to achieve “very good” sustainability credentials for the site.

3.11 TRAFFIC AND TRANSPORT

ADL Traffic Engineering have been appointed to prepare a Transport Assessment Section of the EIS to accompany the planning application for the proposed rail freight depot and associated warehousing at Ditton. This Chapter of the report will provide an assessment of the existing

situation on the local road network, the likely increase in traffic on the network as a result of the proposed development and the impact in terms of any additional queues and delays.

ADL have undertaken discussions and meetings have occurred with Halton Borough Council (HBC) with regard to the transportation aspects of the proposal. A preliminary Scope of Study has been submitted to HBC

Existing Road Network

The road network in the vicinity of the site falls into four distinct categories:

- Private
- Local roads
- Country primary route
- Motorway network

The site is accessed via a number of private roads which were included within the assessment. All of these private roads are currently accessed via the roundabout junction at Desoto Road/MacDermott Road and are in generally a poor condition.

The local non primary road network, consists of the following roads:

- MacDermott Road
- Desoto Road
- Ditton Road
- Hale Road

MacDermott Road and Desoto Road links the private industrial roads to the local and strategic road network. These roads are generally in poor condition.

The county primary routes are:

- A533 Queensway
- A562 Ashley Road

These roads have been subject to recent improvements and are generally in a good condition.

Access to the motorway network is via the A562 Queensway and A5300 to junction 6 of the M62 (to the northwest) or the A557 and Junction 7 of the M62 (to the northeast).

Traffic Surveys

Various Traffic Flows and Capacity analysis has been undertaken by ADL and incorporating information supplied by HBC and other consultants. The traffic flows have been provided by W. S. Atkins. Peak hour turning counts have been provided for at the following junctions:

- Desoto Road/MacDermott Road
- Desoto Road/Hutchinson Street
- A535 Queensway/Ditton Road Roundabout
- A562 Ashley Road West/Moor Lane Roundabout
- Hale Road/Foundry Lane
- Hale Road/Pickerings Road
- Hale Road/Ditton Road

The peak hours for the purpose of the analysis in *Section 16.4.6* of this report are taken to be 08:00 – 09:00 hours and 17:00 – 18:00 hours. These are the same hours used in the capacity assessment submitted for the permitted scheme.

The surveyed traffic flows have been factored to 2008 and 2018 for a year of opening and 15 years design growth. The factor used are based on NRTF (National Road Traffic Forecast) as given in the study undertaken by WS Atkins for the UDP Inquiry.

Mitigation

It has been demonstrated that the proposal can be accommodated within the existing road network without the need for off site junction improvements.

In any event 'predict and provide' is no longer considered to be an appropriate means to address traffic growth. The proposal does however include a travel plan, details of which are given in *ES Section 15.4.6*. The proposal would also provide a contribution towards a package of improvements to the local transport facilities to enhance the accessibility of the site (subject to a S106 Agreement). Details of possible improvements are outlined in *ES Section 15.4*.

Rail Capacity

The Network Rail Regional Freight Manager responsible for new traffic to and from the Liverpool area has advised that up to 3 trains per day could be accommodated on the network without any problems. Hence the estimated volume of new rail-freight traffic may be said to be acceptable to Network Rail.

Travel Plan

The Government wants to help raise awareness of the impacts of travel decisions and promote the widespread use of travel plans amongst businesses, schools, hospitals and other organisations. Local authorities are expected to consider setting local targets for the adoption of travel plans by local businesses and other organisations and to set an example by adopting their own plans. Their relevance to planning lies in the delivery of sustainable transport objectives:

- Reductions in car usage (particularly single occupancy journeys) and increased use of public transport, walking and cycling;

- Reduced traffic speeds and improved road safety and personal security particularly for pedestrians and cyclists; and
- More environmentally friendly delivery and freight movements, including home delivery services.

The Government considers that travel plans should be submitted alongside planning applications, which are likely to have significant transport implications, including those which are likely to be significant generators of employment. In order to comply with this requirement a Framework Travel Plan has been included as *ES Section 15.4.6*.

Conclusions

In order to determine the traffic likely to be associated with rail based warehousing ADL commissioned surveys at the existing warehousing development on the Foundry Lane Estate. This is rail based distribution which provides suitable local trip rates for the proposed development. This has also been compared to data in TRICS 2007, a widely accepted database.

The analysis has been undertaken for the periods 08:00 – 09:00 hours and 17:00 – 18:00 hours which are the same hours used for the permitted development based upon 2008 and 2018 for a year of opening and 10 years design growth. The analysis demonstrates that all of these junctions will operate within capacity in a year of opening and that there is no significant difference between the proposed scheme and that already permitted. Therefore, there is no requirement for improvement to off site junctions arising from the proposal.

The additional traffic on Junction 7 of the M62 is not expected to be significantly affected.

Overall, whilst traffic may increase over that presently experienced accessing the site, it will be more efficiently managed and there will be a wider benefit in terms of improved rail – road logistics and warehousing.

3.12 WATER QUALITY AND HYDROLOGY

In preparing this part of the ES on water quality, hydrology, drainage and flood risk the Environment Agency has been consulted in terms of their requirements for the flood risk and

drainage, the extent of available information on flood risk affecting the proposed development site. Their views were also sought on the likely mechanisms of flooding, the run-off implications of the proposed development and any control measures they consider would be acceptable.

The following methodology was employed:

- Baseline data collection and review of existing information including the collection of available published and unpublished information on flooding, examination of local watercourses and identification of any potential sources of flooding of the site. The topographical survey and drainage surveys commissioned by DSL were reviewed to confirm the drainage catchments and location of outfalls. Data collection included obtaining discharge consents, water quality and pollution incident details from the Environment Agency.
- A site visit was undertaken to consider the location of the development in relation to potential sources of flooding. This allowed the integrity of existing flood defences to be examined, their state of maintenance and performance to be assessed, the location of any drainage outfalls from the existing site and any structures that may influence local hydraulics to be determined.
- On the basis of the defined catchment(s) of the site the design storm runoff was calculated using rainfall data from the Flood Estimation Handbook (FEH) and standard available methods; the Rational Method or the Wallingford procedure.
- The Environment Agency's Flood Plain Maps suggests the area lies within the flood risk zone although much of the area is protected by the natural lie of the land. However these maps are indicative only and assume no flood defences are present. It will be necessary to define the 100 year and 200 year flood level for the Mersey. It is understood HBC also require the 1000 year flood levels to be calculated. This was based on calculations of River Mersey tidal flood levels using available data, literature estimates and the Spatial Revised Joint Probability Method developed by the Proudman Oceanographic Lab. These allow the 100, 200 and 1000 flood risk levels to be identified.

This section of the ES report therefore includes an assessment of flood defences, details the level and depth of extreme flood events, information on local watercourses and

hydraulics, speed and routes of flooding, volume of runoff likely to be generated, volume of displaced water and any requirement for compensatory storage, climate change, impact on fluvial or coastal morphology, access and escape routes etc.

In addition to the flood risk assessment, water quality issues were considered. This involved an assessment of the current quality of the watercourses (including water sampling and analysis) and an appraisal of the likely influence of the current site upon Steward's and Ditton Brooks and how this influence may change under the development proposals.

Water Features

A walk over site visit has allowed identification of all major watercourse, water bodies and structures that could influence local hydrology and hydraulics, and as potential sources of flooding as required by PPS25. One watercourse crosses the site, and two are immediately adjacent;

- Steward's Brook runs along the southern boundary of the Reclamation site and is controlled by a tidal flap upstream of the development site. This brook also runs adjacent to the western boundary of West Bank Dock site (ie bisects the development site);
- Ditton Brook runs along the western boundary of the Foundry Lane site and is tidal along this reach where it runs in a 20m wide channel; and
- Marsh Brook runs along the eastern margin of the West Bank Dock site to the east of Desoto Road.

These channels receive ad-hoc discharges from the on-site drainage system and all three watercourses discharge into the Mersey estuary.

The Environment Agency's Flood Plain Map for Ditton (*Figure 17.3*) suggests that a large part of the Foundry Lane site, and a small part of the West Bank site, may be affected by tidal flooding whilst the Reclamation site is above these flood levels. However the Agency's flood plain maps assume no flood defences are present and this may be considered unrealistic as with tidal defences and a flood wall on the Foundry Lane site the defined area of tidal flooding may be

unlikely to occur. A more precise definition of the 200 year tidal flood level is therefore required and can be compared to the level of the existing flood defences to confirm whether these are likely to be overtopped and hence whether the proposed development is acceptable in terms of flood risk. This is described in *ES Section 17.4*.

The Flood Risk Assessment shows that the redeveloped site will not be prone to flooding and finished floor levels will be well above the conservatively predicted flood levels.

Site Drainage

In terms of site drainage the Foundry Lane site is covered with hard standing or limestone chippings. The hard standing drains to Ditton Brook and is thought to be in poor condition and with no interceptor, which may be a requirement given the nature of the material stored and vehicle movements across the site. A significant part of the site is covered by limestone chippings, particularly the areas used for car parking and outdoor storage. The DSL survey reveals the northern part of the site is drained by a 100mm to 300mm piped network, which is partially collapsed in places. The middle part of the site includes a 100 to 225mm network and the southern site a 150 to 750mm network. All three systems drain to the Ditton Brook and are thought to be in a poor condition.

The Reclamation Site was used for the large scale disposal of wastes up to the late 1990's including galligu and other waste materials. The County Council undertook remediation of the site by installing marginal sheet piling along Steward's and Ditton Brook and the installation of a 1m thick clay cap, overlain by 1.5m of sub soil at the centre of the site and 0.4m to 1.0m in other areas, with 18,000 trees planted. Surface water drains have been installed in the clay cap of the Reclamation site and discharge directly to Ditton Brook via the culverted channel between the site and Foundry Lane.

The West Bank Dock Site includes 27 buildings (as surveyed by Atkins in 2000 and updated by ENVIRON 2004) and other structures including gas oil, oil, and fuel storage tanks. The majority of site is covered with hard standing although this is in poor condition in the north eastern part of the site. The site drainage systems include two outfalls to Steward's Brook and one to Marsh Brook which were unable to be located.

Water Quality Classification

Both Ditton and Steward's brooks have been classified by the Environment Agency under the General Quality Assessment (GQA) scheme as water quality Grade E, i.e. of poor water quality, although the water quality is highly variable and is dependant on the location of the biological and chemical sampling points. Marsh Brook lies to the east of the West Bank Dock sites and is unclassified.

There have been four pollution incidents to controlled waters associated with the study site, the details of which are summarised in *Table 17.3.7*. Two of these were minor incidents were on Ditton Brook and related to rubble/litter or chemicals. The two incidents on Steward's Brook were due to leachate from the Reclamation site; one minor and one significant, although there have been no reported pollution incidents since July 1996. The Reclamation site has been remediated at this time which may explain why there have no recorded pollution incidents since 1996.

Surface Water Sampling

Sampling of the surface water courses was undertaken by ENVIRON on Steward's Brook (which flows through the site) and Ditton Brook (forming the western boundary) in November 2004. The sampling points were selected to provide a 'snap shot' of the conditions encountered on site and were restricted to accessible and safe locations due to the nature of the site, the watercourses and therefore appropriate health and safety measures were employed.

The sampling methodology comprised using a dedicated plastic bailer with string for each sampling point and then decanted into clean sterile glass jars, appropriate for the type of analysis intended.

Specifically the sample locations were as follows:

- Sample 1 – Ditton Brook - Bridge at Foundry Lane;
- Sample 2 – Confluence of Ditton Brook, Steward's Brook and the mouth of the River Mersey;
- Sample 3 – Steward's Brook - located approximately half way along the mound; and
- Sample 4 – Steward's Brook – located upstream at the northern boundary of the site.

Conclusions of Surface Water Sampling

The sampling of Ditton Brook on the site's western boundary and Steward's Brook, which flows through the site has indicated that several chemical species exceed the EQS limits for Coastal and Estuarine waters, particularly Sample 4 obtained upstream in Steward's Brook. Concentrations were noted to be reduced downstream and generally lower concentrations were recorded within Ditton Brook.

The source of the elevated concentrations with respect to the various guidelines [EQS, DWQ and Dutch I] is believed to be the contaminative surrounding land use and particularly, historical deposition of galligu in the area and the HEDCO landfill site which forms Steward's Brooks eastern boundary in part. Notably, the site upstream of Steward's Brook (Golf Course) is currently undergoing remediation due to elevated metal species within the shallow ground, and measures are being undertaken with respect to contaminated discharges to the surface water course. It is also anticipated that there will be an active leachate management and control system on the HEDCO site in the future.

It is also recognised that although the golf course and HEDCO site are likely to be the main contributors to contamination of Steward's Brook, there may be some infiltration and leaching of contaminants from the development site that is adding to the pollution loading.

Re-alignment of Steward's Brook

The development proposal includes the re-alignment of Steward's Brook into Marsh Brook to enable the development to proceed and make optimum use of the site. There are a number of advantages to this proposed approach to the diversion of Steward's Brook as follows:

- To compensate for the culverted section of Steward's Brook along the first section of the new channel, the new open course of Steward's Brook that extends from it will be approximately 370 m in length. This is around 120 m longer than the current open section of Steward's Brook it replaces so even with the culverted initial section, there will be a net increase of the open length of the Brook on the site compared to the situation that exists now or which was previously granted approval;
- The provision of a temporary extension of this culvert into the open remaining section of the old Steward's Brook allows the flow of Steward's Brook to continue unhindered by the

construction works whilst the new channel and Marsh Brook is properly designed, constructed and en-mained. This enables the development (including the new channels) to proceed on programme;

- The new course of Steward's Brook (whichever route it took) will pass at substantial depth through contaminated soils and groundwater that will not be treated (stabilised) as part of the development works so remains as a pollution source. The sealed sections that will form the new channel will break any pollutant linkage between the residual contaminants in the surrounding ground and Steward's Brook and thus will protect the water quality of Steward's Brook from further deterioration as currently occurs (or could occur with earth banks);
- The site levels will be increased as part of the overall cut and fill balance. Given this, mimicking the current trapezoidal brook sections across new areas of the site, with an additional allowance of an 8m buffer zone will translate to a very large land-take effectively making the project untenable. This will not be the case with steeper sided lined linear channel sections as now proposed which allows the same volume and hydraulic flow but is structurally more robust and takes up less land (although there will still be options for some landscaping enhancement);
- The additional depth of the new channel (due to the increased site levels) will provide sufficient additional cross sectional area for the channel section compared to the wider but shallower trapezoidal section of the former Steward's Brook course. As such there will be no net loss in flow capacity or volumetric storage capacity between the existing situation and the new situation;
- The en-maining of Marsh Brook as part of the proposed diversion works allows an opportunity and provides resources to clean-up Marsh Brook, which has received polluting inputs for many decades (now ceased), and enhance the value of this watercourse;
- The diversion of Steward's Brook away from the HEDCO landfill reduces the prospect of releases of contaminated leachate worsening the water quality in the Brook and removes an odour nuisance (caused by the mixing of chemicals already in the Brook with those in the leachate issuing from the HEDCO landfill).

- The re-engineering of Steward's Brook to provide a new channel may allow opportunities for the creation of bed roughness and cascades to enhance aeration of the water flowing through Steward's Brook and improve its quality before discharge into the River Mersey.

Therefore, overall, there is a net environmental benefit to this approach that compensates for the relatively short section of culverting that will be necessary to facilitate this development and in the absence of any ability to culvert the existing watercourse in its original alignment. The precise details of the newly constructed channel are still being developed and will be furnished to the EA for approval imminently.

Conclusions

There are no suitable attenuation (water retention) techniques for this site as the use of infiltration trenches, french drains or permeable pavements are impractical due to contaminated ground beneath the site, and there is insufficient land space for ponds, basins or wetlands. However, as the site is close to the River Mersey it is considered that the additional storm runoff would not increase flooding problems to other adjacent sites and there is an environmental benefit in reducing infiltration and potential mobilisation of contaminants.

- The proposed development site lies adjacent to three tidal watercourses that drain to the River Mersey; Ditton Brook, Steward's Brook and Marsh Brook. Overtopping of the flood defences of these watercourses forms the major potential source of flooding of the site.
- Most of the site therefore lies above the 200 year 2050 estimated water level and suitable protection is provided by the existing flood defence wall. Overtopping of this wall could occur if wave heights are greater than 200 mm, or more extreme events occur by 2050, hence it is recommended that where possible all finished floor levels include a minimum freeboard of 600 mm above the 2050 200 year tide levels, i.e. at 8.1m OD. The existing flood wall and natural lie of the land therefore provide a measure of flood defence to an appropriate standard although regular inspections and maintenance of the flood wall are recommended. The site finished levels will be above this flood risk level and thus the site is unlikely to be subjected to flooding.
- There will be no additional displaced water and hence no change in the flooding potential for adjacent sites and no requirement for compensatory storage.

- There is considered to be no potential impact of the development on fluvial morphology nor on the longer-term stability and sustainability.
- The diversion of Steward's Brook will remove the linkage between site (soil and groundwater) contaminants and the water within the brook so will reduce its pollution loading. Furthermore, using the new and old courses of Steward's Brook to discharge clean surface water will help to dilute contaminants already within the water (from the golf course) and lessen the impact on the River Mersey.

Overall therefore it is considered that the development will have a beneficial impact on the aquatic environment.

3.13 WASTE MANAGEMENT

Wastes are an inevitable aspect of any business activity. These are evident with the current site operations and also will be with the redeveloped site, but there will be two aspects to waste management associated with the redevelopment. Firstly one off wastes will be generated during the construction phase (and in particular the excavated soils and gullage associated with site preparation). Secondly, once the site is developed and operational there will be routine wastes associated with the business activities of the tenants.

There is a great deal of regulatory and financial pressure to manage wastes effectively and avoid landfill disposal where possible. WGL has considered this in the context of the proposed development and assessed the waste characteristics of the current site use and the proposed development in order to try and evaluate potential impacts and identify options for sustainable waste management.

Baseline Conditions

The current site activities generate a wide range of waste materials both Special Wastes (potentially hazardous) and non-Special Wastes, although the latter predominates with the main Special Waste of note being waste oil. At present the storage and management of these materials is ad-hoc with AHC having its own waste disposal arrangements the tenants having separate arrangements. Waste currently identified on site comprises waste oil, packaging waste and general waste generated as a result of various operations undertaken at the site (see

Section 2 for Existing Site Description). No formal site wide waste management plan is in place at present and skips into which waste is placed are positioned on site such that they cannot be attributed to any particular site tenants or activities.

Insofar as AHC's waste management is concerned, the following arrangements exist:

- General wastes are not segregated;
- Where possible cardboard waste is segregated and bailed and some polythene wastes, both of which are sent for recycling;
- Scrap Metal is generally segregated for recycling although an element of metallic waste does enter the general waste stream;
- Waste Oils are barrelled or kept in a tank and periodically sent for oil recovery via OSS Ltd, although some oily wastes (rags for example) are also disposed of into the general waste skips on occasions. The annual disposal of oil (by AHC) typically amounts to less than 2000 litres;
- There are no site wide recycling, segregation or recovery initiatives and no overall waste management philosophy or site procedures. AHC do, however, keep records (Duty of Care Waste Transfer Notes and Special Waste Consignment Notes) for their own waste arisings;
- Wood waste (pallets) are periodically burned; and;
- With the exception of small quantities of rubble and contractor waste from minor civils works construction related wastes are not a feature of the current site operations.

A more notable waste feature of the site is the fact that much of the site is made up from chemical waste (gullage) associated with many decades of the chemical (and particularly alkali and soaps industry) in the area. There are also waste products in the ground from other activities. These materials, however, are seldom disturbed by site activities and do not constitute a routine waste stream. A fuller description of these buried materials and their implications for the development is provided in *Section 14 – Soils, Geology and Land Contamination*.

Construction Phase Wastes	Operational Phase Wastes
Building demolition rubble comprising, brick, glass, timber, concrete.	Waste oils and chemicals from certain businesses and site support activities (e.g. fork lift maintenance).
Roofing materials comprising asbestos cement sheet.	Paper, cardboard and plastic wastes from business activities.
Excavated soil (ash, clay, topsoil, galligu and potentially contaminated sub-soil) associated with cut and fill, foundation excavations and trenching for services.	Spoiled and damaged goods from storage warehouses.
Spoil from piling operations (especially augured piles)	Soils and possible contamination from minor earthworks (sewer repair, trenching, post boring, etc).
Waste oils, chemicals and potentially hazardous materials from buildings clearance.	Trade effluent from vehicle washing and other business related discharges.
Scrap metal and redundant plant and equipment.	Scrap metal and redundant plant and equipment.
Vegetation from site stripping.	Waste vegetation from routine maintenance of landscaped areas.
Japanese Knotweed contaminated soil.	Sanitary effluent from occupied premises.
Waste paper, plastic, cardboard and wood from delivery of construction materials and site activities during the works.	Wood waste from unused/damaged pallets.
Redundant unused construction materials.	Construction/demolition wastes from periodic contractor activities.
Collected groundwater and rainwater.	Waste oil/water mixtures and sediment from interceptor systems.

Table 1 - Predicted Waste Types

As referred to in *ES Section 14*, once the proposals have received planning consent a subsequent round of investigation will be undertaken and further risk assessments performed in order to define a detailed remediation strategy and materials management strategy. This will be communicated to and agreed with the regulatory authorities prior to such works commencing on site.

Wastewater Generation and Management

In addition to solid wastes, the development will also generate waste waters. As with most aspects of the Development, Construction and Operational Phases need to be considered separately. During the Construction Phase, the principal wastewaters will be the sanitary waters for Site Workers and Occupants (which will utilise the current sanitary facilities and foul-water systems) and more notably, "waste" waters arising from de-watering of excavations. This may in some places be contaminated. During the operational lifetime of the Development, de-watering should not be necessary, however, there will be a requirement for sanitary systems and discharge arrangements for each of the proposed units.

Conclusions

The development provides a good opportunity to stabilise very large volumes of chemical waste (galigu) that were previously deposited on the site and to make beneficial use of this treated material as construction fill.

Clearly although the surface waters on or close to the site are known to be contaminated, it will not be acceptable to simply discharge waste waters to these bodies and on site waste water management will be required.

During the construction phase, the existing sanitary facilities will be used where possible but these will need to be supplemented with temporary portable toilet units at strategic locations as the works progress. These units will be emptied frequently under a maintenance contract with the supplier who will tanker away the waste.

The waters arising from excavations will in all cases be sampled and analysed to enable their contamination status to be assessed. Based upon the results of this a number of options are available for the management of this water is considered and will be undertaken in accordance with the current legislation and environmental best practice.

Given that the proposed tenants will be national freight and logistic companies or the storage and logistic arms of large retail organisations, it is highly likely that they will be obligated under the *Producer Responsibility (Packaging Waste) Regulations 1999*, requiring individual waste generators to recover and/or recycle packaging waste generated as a result of their activities.

The majority of the tenants' wastes will fall in to this category. It is considered highly likely therefore that individual tenants' waste management arrangements will have been arranged nationally and contracted to national waste/packaging recycling organisations. As such, it will not be possible to have a centralised waste management agreement and associated contract for the entire site. Tenants will be therefore be responsible for the storage and subsequent off-site disposal of all their own waste materials, but in order to ensure adequate standards of waste management at the site tenants will be required to subscribe to a site wide Waste Management Policy that will be set out in the tenants handbook.

Once the site is operational, given the absence of access to a foul sewer, it will be necessary for each unit to have a small bespoke sewage treatment plant (package plant) that will treat the sanitary waste to a sufficient standard to allow discharge of the treated wastewater to the nearby water courses. The project is not yet at a stage where the detailed design or capacity of these plants can be established, but there will be full consultation in this with the EA to ensure the plants are acceptable. It is envisaged that there will be at least one and perhaps several discharge consents applied for to allow the discharge to the water courses.

4.0 CONCLUSIONS

This section provides a tabulated overview of the key aspects of the baseline environmental conditions and the mitigated environmental impacts of the proposed development. Importantly this section identifies the relative magnitude and significance of the predicted impacts and an overall impact assessment of the proposed development is included in the final subsection. It is important to note that impacts can be positive as well as negative.

The criteria used in this assessment are as follows:

- **Major Positive** ●●● or **Major Negative effect** ●●● – where the development would cause a significant improvement (or deterioration) to the existing environment;
- **Moderate Positive** ●● or **Moderate Negative effect** ●● – where the development would cause a noticeable improvement (or deterioration) to the existing environment;
- **Minor Positive** ● or **Minor Negative effect** ● – where the development would cause a barely perceptible improvement (or deterioration) to the existing environment; and
- **Insignificant** ● – no discernible improvement or deterioration to the existing environment.

The impact assessment also implicitly includes consideration of whether or not the impacts are permanent, temporary, direct or indirect.

4.1 SUMMARY OF THE DEVELOPMENT

The 42 ha site comprises three principal areas; the Foundry Lane Estate to the west, the Reclamation Site (or "The Mound") in the centre and the Mathieson Road Site (sometimes known as the West Bank Dock Estate) on the eastern part of the development area. The Foundry Lane and Mathieson Road sites are currently occupied by industrial units whilst the Reclamation Site is vegetated and planted with trees.

The intention of the proposed development is to provide a high quality inter-modal freight facility which involves the demolition of a number of old, redundant and possibly unsafe buildings on this part of the West Bank Dock Estate and the construction of a number of new, purpose built warehouse facilities.

The development will generate a substantial number of new jobs and bring about a substantial physical improvement to a large, currently underused site that has significant improvement potential.

The proposed development will involve substantial physical alterations to the site levels, watercourses, buildings and infrastructure in order to realise the new proposals and this in turn has the potential to give rise to a range of negative environmental impacts. New developments can also lead to positive impacts and frequently the development involves a balance between both negative and positive impacts.

The table in the following pages at the rear of this section presents each of the aspects of the development where potential impacts were predicted during the Scoping Exercise and subsequently assessed during this EIA. The table provides an overview of the following aspects of each technical area assessed:

- Baseline environmental conditions;
- Predicted environmental impacts for both the construction phase and operational phase;
- Identification of the relative magnitude of the impact for both the construction and operational phases;
- Identification of whether the predicted impact is positive or negative or whether there is no predicted impact.

It should be noted that in considering the impacts of the proposed development the predictions are based upon a comparison of the conditions that would prevail if the development does not proceed (i.e. the ongoing status of the baseline conditions) against those that will prevail if the development does proceed as described.

4.2 OVERALL CONCLUSION

The development proposals have been assessed in relation to their potential to impact upon the environmental conditions that currently prevail on the site and in the surrounding area. Implicit in this assessment has been the need to understand the environmental sensitivity of the area around the proposal site. The key aspects of the environment that have been considered are illustrated in the figure at the rear of this report and summarised in the table.

The environmental impacts of the construction phase of the project are typically minor and negative and are largely a function of the inevitable disruption caused by a major infrastructure project. The long lasting/permanent impacts associated with the development are either neutral, positive or in some cases major positive impacts. In terms of specifics in addition to the obvious developmental improvements and employment opportunities therein, the following concluding points are pertinent with regard to environmental impact:

- The development will involve substantial construction works that will generate noise and disturb contaminated site soils and may intrude in to the shallow groundwater regime. The potentially negative aspects of these works will be controlled and minimised via a construction management plan that will implicitly involve environmental protection/pollution prevention measures. This will be agreed with the regulatory authorities;
- The construction works will generate a substantial quantity of waste materials and particularly contaminated soils and gullage. Where possible these will be treated on site (with the appropriate authorisations) and re-used. This will stabilise these materials and reduce their leaching potential and avoid the need for importing materials with the attendant transport implications;
- The new development will incorporate an improved drainage system and a greater area of hardstanding, each of that will reduce infiltration and contaminant leaching potential and lessen the incidence of rainwater mixing with contaminated soils. This will have the significant benefit of improving the quality of water discharges from the site;
- Whilst the development will generate greater traffic movements than occur at present, it also facilitates much greater efficiency of goods transport in the area by optimising road and rail freight transfer.

The overall environmental impact of the proposed development post-mitigation is considered to be beneficial. The majority of the negative environmental impacts assessed during the EIA have been removed through the design of appropriate mitigation measures and those that remain are low to moderate in impact and associated with the temporary construction phase. As such they are transient in nature and generally short lived. There are no long term residual negative impacts associated with the proposed development.