PROPOSED STRATEGIC HOUSING DEVELOPMENT 'THE CONNOLLY QUARTER': ENVIRONMENTAL SITE ASSESSMENT AND GENERIC QUANTITATIVE RISK ASSESSMENT

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

OXLEY HOLDINGS LIMITED

PROJECT NO. B909

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Environmental Site Assessment and Generic Quantitative Risk Assessment

Connolly Station Car Park, Dublin 1

for

Oxley Holdings Limited.

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NOTICE

This document represents the findings from an Environmental Site Assessment (ESA) and Generic Quantitative Risk Assessment (GQRA) conducted at the above referenced site. Best practice was followed at all times and within the limitations stated. This document has been produced by O'Connor Sutton Cronin & Associates for its client Oxley Holdings Limited. It may not be used for any purpose other than that specified by any other person without the written permission of the authors.

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EXECUTIVE SUMMARY

The site for assessment is the Connolly station car park, bordered by Seville Place and Oriel Hall to the north; Sheriff Street Lower to the south; Oriel Street Upper to the east; and Connolly Station (Protected Structure) to the west, and is located in Dublin 1. O'Connor Sutton Cronin & Associates Ltd. (OCSC) were appointed by Oxley Holdings Limited (the Client) who is planning to apply for planning permission to re-develop the site for mixed use development (residential and commercial landuse) to include a basement carpark and ancillary site development proposals. There are 2No. protected structures (11No. Arches and an office building) within the site which will be retained and integrated within the new development. A survey carried out in 2018 by Murphy surveys to map existing services and the topography of the site, show there are 11No. arches along Sheriff Street Lower, that 6No. of these arches extend circa 35m into the site, and 5No. arches extend circa 17.5m into the site.

The site is c. 2.88 hectares in area and the historical Ordnance Survey 1888-1913 mapshow that the site was formerly used as a Goods Shed. The 1888-1913 map also shows an oil tank located near the intersection of Oriel Street Upper with Sheriff Street Lower. Current on-site activities of concern are the 2No. railway tracks serving Connolly station depot and the on-site fuel tank located along the boundary with Oriel Street Upper.

Under the supervision of Buro Happold (BH), Glover Site Investigations Ltd. undertook a preliminary site investigation during July to September 2008 that included the progression of 12No. windowless sample boreholes and 7No. cable percussion boreholes (with 3No. rotary core borehole follow on). The original Ground Investigation report was not made available to OCSC at the time of writing this report and therefore the geology and hydrogeology have been inferred from the Buro Happold interpretative report which was made available to OCSC and which have been relied upon as true and accurate. Fourteen (14No.) boreholes were converted to groundwater and/or gas monitoring wells. The environmental monitoring undertaken at the site included the collection of 40No. soil samples and 25No. groundwater samples, which were submitted to the laboratory for analysis. Geology of the site was proven to be a circa 7.2m thick layer of Made Ground overlying a glacial till layer comprising of Gravel embedded among or between a layer of Sandy Gravelly Clay (Dublin Boulder Clay). Rock head was not encountered throughout the site investigation even though the 3No. rotary core boreholes progressed to a maximum depth of 42.3m below ground level. The site investigation carried did not identify any Dense Non-Aqueous Phase Liquid (DNAPL) and/or Light Non-Aqueous Phase Liquid (LNAPL) present beneath the site. Asbestos fibres were not detected in the 35No. soil samples screened for asbestos.

A Generic Quantitative Risk Assessment (GQRA) was completed using the available results to assess the risk to future users (Residential without plant uptake, Public Open Space and Commercial). A number of locations exceeded the Generic Assessment Criteria (GAC) for residential, public open space and commercial receptors for contaminants particularly lead, and PAHs (residential and commercial).

The Buro Happold interpretative report contains 40No. analyses of samples taken from 17No. locations during site investigations. Of those 17No. locations, 2No. locations are significantly outside the site. The list of parameters analysed were not consistent across the 40No. samples. Of these 40No. samples, 15No. samples from 10No. locations within the site were subjected to leaching tests. Again the list of leachate parameters tested for were not consistent across the 15No. samples.

The number of sampling locations, consistency of analysed parameters, and depth of sampling are such that any assessment for soil waste management based on them should only be considered indicative. Consequently the assessment made on this data is considered not to be

fully representative of the site. Further site investigations and sample analyses will be required to provide a robust assessment in line with industry standard operating procedures.

The waste soil assessment made on this limited data set, indicates that the upper part of the soil is

- Potentially predominantly non-hazardous, with a hotspot hazardous nature resultant of lead and copper content. There is not sufficient data to exclude the potential for TPH hotspots, however it is considered probably unlikely.
- Probably unlikely to be acceptable at an inert soil disposal or recovery facility. It is expected that excepting the potential for heavy metal hotspots the soil would generally be acceptable at a non-hazardous landfill.

All soil samples analysed were from shallow depths with the deepest sample being from 6.5mbGL. Development plans show that the current site elevation ranges between 7.5-8.0mOD; ground floor of the development will be at 1mOD which is the same level as the Sherriff Street Lower. The basement floor level will be -2.585mOD and its footprint is shown in Figure 1.3. The proposed plans indicate that there will be a 10m dig depth across certain sections of the site, hence the removal of all Made Ground.

During the basement construction, and after the Made Ground has been excavated, it is possible that water ingress will occur as the dig progresses into the glacial till layer; therefore, a discharge licence will likely be required to enable discharge of water to sewer to keep the excavation dry. Excavation and disposal will also likely be used as part of the design measures and will remove a large volume of contaminated material including the more shallow material. However, the final remedial strategy will only be determined once the deeper soils which will be in contact with the basement, have been fully characterised, and further information on the hydrogeological regime and geological profile has been evaluated.

It is recommended that:

- Additional site investigations and monitoring is completed for waste classification purposes to classify the soils beneath the site which will be excavated as part of the development;
- Sampling of the deeper soils which are within the glacial till and within which the basement will be founded in order to assess if any risk is present from this layer from a human health or environmental perspective;
- Additional gas and groundwater monitoring should be carried out; and
- Decommissioning of the oil tank currently present on-site prior to re-development of the site.

1. INTRODUCTION

1.1. Project Contractual Basis & Parties Involved

This report has been prepared by O'Connor Sutton Cronin & Associates Ltd. (OCSC) at the request of their Client Oxley Holdings Limited. The project brief and terms were set out in OCSC proposal dated 6th July 2018.

The site for assessment is an area incorporating Connolly station car park and some warehouse buildings located to the east side of the intersection of Oriel Street Upper with Seville Place, Dublin 1. It is proposed that the site will be developed for mixed use incorporating commercial and residential use. The Regulating Authority for the site is Dublin City Council (DCC).

The report was completed by Ahmed Thamer, Environmental Engineer with OCSC. Assistance was provided by Ross Begg, Graduate Environmental Consultant with OCSC. The report was reviewed by Eleanor Burke who is the OCSC Environmental Division Manager. The Project Director is Tony Horan CEng, FIEI, Chartered Engineer and Managing Director of OCSC.

Other documents relevant to this report are:

- Geotechnical & Geo-environmental interpretative report: Contaminated Land Generic Quantitative Risk Assessment - A report by Buro Happold Limited for Córas Iompair Éireann (CIE) (2008).

1.2. Background Information

The site for assessment is bounded by Seville Place and Oriel Hall to the north; Sheriff Street Lower to the south; Oriel Street Upper to the east; and Connolly Station (Protected Structure) to the west, Dublin 1 (see Figure 1.1). The site currently comprises of the existing CIE car park, CIE Group buildings, Rolling stock maintenance shed, and part of existing railway lines / sidings.

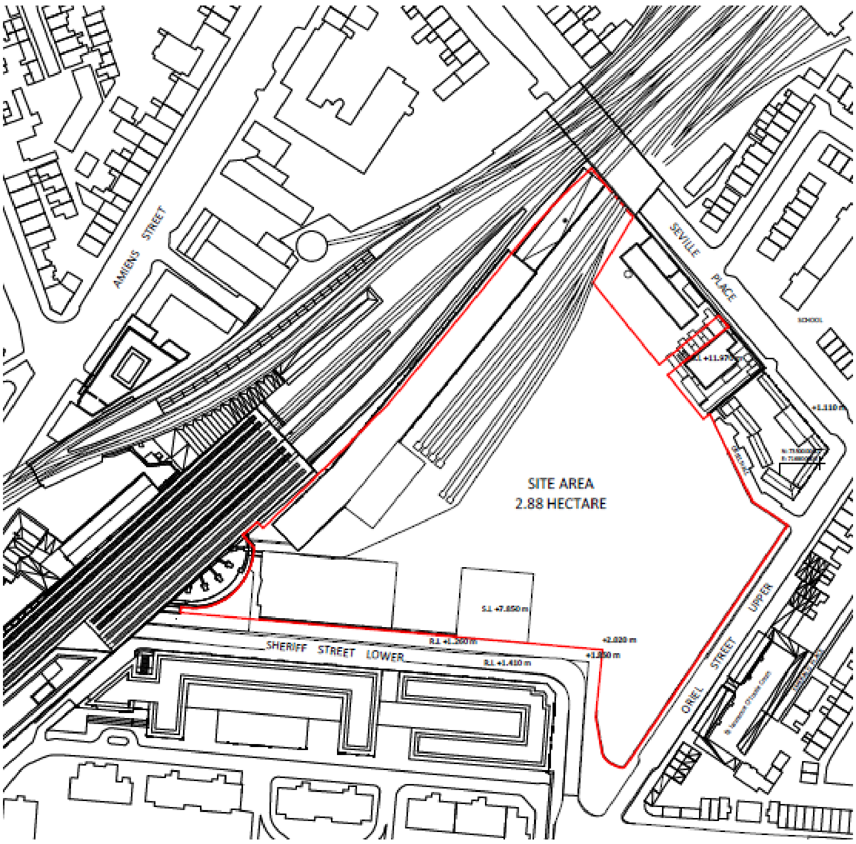

Figure 1.1: Site Location and approximate site boundary

Figure 1.2: Aerial Image of the site (Source: GoogleMaps)

1.3. Proposed Development

At the time of writing this report, OCSC understand that Oxley Holdings Ltd. intend to apply to An Bord Pleanála for permission for a Strategic Housing Development at this site (c. 2.88 hectares) to the rear of Connolly Station, Sherriff Street Lower, Dublin 1, Eircode D01 V6V6.

The development will consist of;

- the demolition of 4 no. structures with a combined gross floor area of 3,028sq.m;
- the construction of 741 no. Build to Rent (BTR) residential units in 8 no. apartment blocks ranging in height from 4 storeys to 23 storeys with lower height buildings located adjacent to the northeast and east site boundaries, with a cumulative gross floor area of 68,535sq.m comprising;
- Block B1 (maximum building height 54.917m, total gross internal floor area 11,260sq.m, Apartment Mix: Studio: 25, 1-bed: 37, 2-bed: 51);
- Block B2 (maximum building height 54.917m, total gross internal floor area 10,831sq.m, Apartment Mix: Studio: 20, 1-bed: 35, 2-bed: 51);
- Block B3 (maximum building height 51.767m, total gross internal floor area 9,766sq.m, Apartment Mix: Studio: 22, 1-bed: 60, 2-bed: 27, 3-Bed: 1);
- Block C1 (maximum building height 79,450m, total gross internal floor area 12,705sq.m, Apartment Mix: Studio: 84, 1-bed: 40, 2-bed: 41);
- Block C2 (maximum building height 39,615 m, total gross internal floor area 4,890 sq.m, Apartment Mix: Studio: 9, 1-bed: 33, 2-bed: 3, 3-Bed: 4);
- Block C3 (maximum building height 39,650 m, total gross internal floor area 6,775sq.m, Apartment Mix: Studio: 40, 1-bed: 18, 2-bed: 23);
- Block D1 (maximum building height 53,392 m, total gross internal floor area 8,418 sq.m, Apartment Mix: Studio: 10, 1-bed: 25, 2-bed: 44, 3-Bed: 1);
- Block D2 (maximum building height 30,950 m, total gross internal floor area 3,890 sq.m, Apartment Mix: Studio: 18, 1-bed: 8, 2-bed: 11);
- residential support amenities including 1 no. gyms, a resident's lounge, work areas, meeting rooms, dining rooms, recreational areas with a combined GFA of 1,444 sq.m;

- change of use from club house to pedestrian passageway of the existing vault (137sq.m GFA) fronting Seville Place, a Protected Structure (RPS No. 130);
- a basement of 7,253.4 sq.m with vehicular access from Oriel Street Upper incorporating residents' car parking (58 no. spaces), residents cycle parking (640 no. spaces) 7 no. plant rooms (combined 2,228sq.m), waste management facilities (393 sq.m)
- 766 no. covered cycle parking spaces for residents and visitors, concierge office (233 sq.m) and waste management facilities (126 sq.m);
- 'other uses' including 10 no. units providing retail, commercial, and community use with a combined GFA of 3,142 sq.m;
- A total of 18,562 sq.m of hard and soft landscaping comprising both public, communal and private open space located throughout the development;
- A service and emergency vehicle only access ramp from the Oriel Street Upper site entrance to serve CIE's transport needs at Connolly Station;
- Enabling works of a non-material nature to safeguard the existing vaults (Protected Structures - RPS No. 130) that form part of the subject site fronting Sherriff Street Lower, Oriel Street Upper, and Seville Place during the construction phase;
- All associated ancillary development works including drainage, 6 no. electricity substations, pedestrian access; and
- Works to the Masonry wall fronting Oriel Street and the Vaults fronting Seville Place (both a Protected Structure) consisting of the creation of a new vehicular and pedestrian entrance.

The site is currently higher than the surrounding Sheriff Street Lower by about 7m and it is proposed that the ground floor of the development will be at approximately the same level as the street level at +1.850mOD with the finished floor level of the basement at circa -2.585mOD. The basement will occupy approximately 30% of the site footprint, see section 2.21. The basement and the buildings will be formed and supported using a secant piled wall and piles of 900mm diameter which will extend to the top of rock which is located at depth (greater than 41metres below ground level). It also planned that Irish Rail will divert the 2No. railway tracks currently within the site boundary and move them further north prior to the redevelopment of the site. The overall development layout plan is still under discussion/ study by the design team.

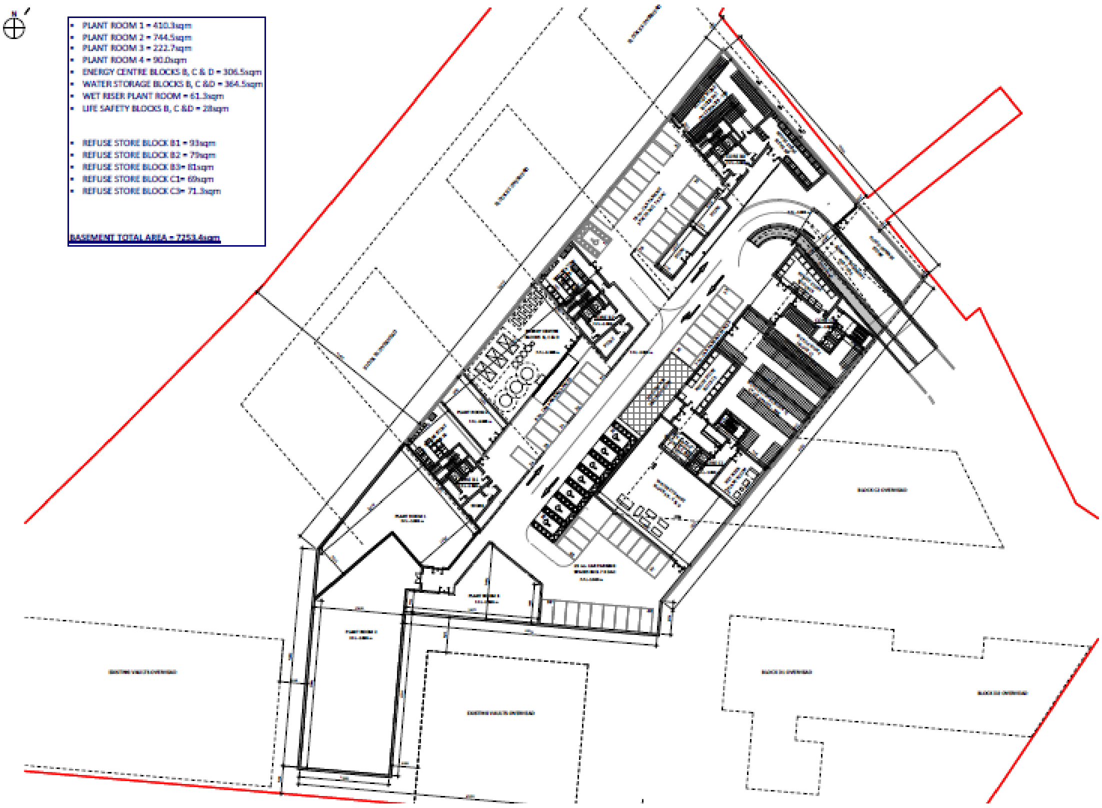

Figure 1.3: Basement footprint proposed

1.4. Previous Reports

Buro Happold (BH) undertook a Phase II site investigation in 2008 which included the installation of a number of intrusive site investigation locations. Key conclusions from the report included:

- The site's proven geology is Made Ground. This Made Ground compromises of a mixture of clay, sand and gravel containing cobbles and occasional boulders along with pieces of glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery. This made ground is located over a layer of glacial till which is composed of sandy GRAVEL embedded among or between a layer of sandy gravelly CLAY. There is a discontinuous layer of sandy SILT with sea shells in the southern end of the site towards Sherriff Street Lower, bedrock was not encountered;
- Significant ground gas concentrations of Carbon Dioxide (CO_2) and Methane (CH_4) were recorded across the site, albeit at low flow rates (<1 l/h). In accordance to BS8485:2015, the site would be categorized into 'Characteristic Situation 2' (CS2);
- Significant Dense Non-Aqueous Phase Liquid (DNAPL) or Light Non-Aqueous Phase Liquid (LNAPL) contamination was not encountered during the site investigation. Hydrocarbon odours were encountered in WS11 at a depth of 2mbGL, however no visual/olfactory evidence of contamination was recorded at any other exploratory hole locations;
- Metals concentration in the soils across the site were elevated, particularly Lead, being above the GAC limit for residential without plant uptake for about 60% of the soil samples analysed;
- No asbestos was detected in the soil samples taken from all exploratory hole locations. An asbestos survey had not been undertaken to investigate the potential for asbestos to be present in the above ground structures on-site;

- Groundwater was observed to be within the GRAVEL layer of the glacial till and the water table was found to be relatively flat and at circa 0mOD;
- Laboratory analysis of the groundwater beneath the site found it to be impacted by petroleum hydrocarbons and PAHs. In addition, chloride, sulphate and ammoniacal nitrogen concentrations were also relatively elevated;
- The report concluded that the significant amount of soils to be excavated as part of basement formation, the incorporation of gas protection measures according to 'CS2' of BS8485 and the implementation of an Environmental Management Plan will reduce the risk to construction workers and future site users to an 'acceptable' low risk;
- The report also recommended further investigation and monitoring of groundwater regime before and after development to provide evidence in support of natural attenuation occurring on site.

1.5. Project Objectives

The overall project objectives include:

- Provide environmental information on the site focusing on its environmental setting and past site activities including a review of all up to date mapping ;
- Assess any obvious environmental liabilities;
- Assess current soil and groundwater quality at the project site in terms of contamination and to inform the Client of any risk posed by contamination if present in the context of the proposed future use – commercial and residential use;
- Formulate initial Conceptual Site model;
- Undertake a generic quantitative risk assessment (GQRA) using up to date Generic Assessment Criteria (GAC); and
- Make recommendations for any further assessments/site investigations, if required.

1.6. Methodology and Approach

The methodology and approach for the proposed work will follow:

- BS 10175:2011+A1:2013, Investigation of potentially contaminated sites, Code of Practice;
- EPA, 2015, Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous;
- EPA 2013, Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites;
- EPA 2007, Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites;
- EA, 2015, Guidance on the classification and assessment of waste, Technical Guidance WM3;
- EA, 2004, Model Procedures for the Management of Land Contamination (CLR11);
- The LQM/CIEH S4ULs for Human Health Risk Assessment (2015);
- SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination CL:AIRE (2014);
- EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment (2010);

- 2010 European Communities Environmental Objectives (Groundwater) Regulations (Statutory Instrument No. 9 of 2010);
- 2016 European Communities Environmental Objectives (Groundwater) (Amendment) Regulations (Statutory Instrument No. 366 of 2016);
- EPA (2003) Towards Setting Guideline Values for the Protection of Groundwater in Ireland (2003);
- Environmental Liability Regulations (S.I. 547 of 2008);
- Environment Agency (2000) Guidance on the Assessment and Monitoring of Natural Attenuation of Contaminants in Groundwater;
- Environment Agency (2004) Model Procedures for the Management of Land Contamination. Contaminated Land Report 11;
- FRTR (2009) Remediation Technologies Screening Matrix and Reference Guide Version 4.0; and
- US EPA (2004) How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites: A Guide for Corrective Action Plan Reviewers, EPA 510-R-04-002.
- List of Waste & Determining if Waste is Hazardous or Non-Hazardous (EPA, 2015) and European Waste Catalogue (Commission Decision 2014/955/EU);
- European Waste Framework Directive (2008/98/EC);
- Guidance on the classification and assessment of waste, Technical Guidance WM3 v1.1 (EA et al, 2018);
- S.I. 233 of 2015 EU (Properties of Waste which Render it Hazardous) Regulation;
- Landfill Directive 1999/31/EC (2003/33/EC);
- Waste Management Act 1996 (as amended);
- S.I. 126/2011 – European Community (Waste Directive) Regulations;
- Classification, Labelling & Packaging Regulations EC/1272/2008;

The proposed end-use defines the level of environmental risk assessment required and in this instance, the development will consist of the redevelopment of the site to provide a mixed commercial, residential, community and leisure development.

1.7. Scope of Works

To meet the project objectives the following scope of works were completed:

- Undertake and present a historical site and area review, primarily referring to old Ordnance Survey Maps but utilising other sources as appropriate and readily available including previous site investigations and data available;
- Review third party interpretative report and identify if any gap(s) exists;
- Present a discussion of the current site status and key environmental influences around the site;
- Present a discussion of the general soil and groundwater conditions within the topographical and area context;
- Evaluate the results spatially to determine whether any subsurface pathways exists at the site and evaluate the distribution of contamination encountered, if any;

- Evaluate the results against Generic Quantitative Risk Assessment (GQRA) criteria as a first screen to evaluate if the concentrations on site present a risk to future site users (human health) or the environment; and

Based on the results of the above assessment the requirement for further detailed site investigation or more site specific Detailed Quantitative Risk Assessment (DQRA) will be discussed.

1.8. Limitations

This Environmental Site Assessment (ESA) and Generic Quantitative Risk Assessment Report (GQRA) has been prepared for the sole use of Oxley Holdings Limited ("the Client"). No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by OCSC. This Report is confidential and may not be disclosed by the Client nor relied upon by any other party without the prior and express written agreement of OCSC.

This assessment is based on a review of available historical information, environmental records, consultations, relevant information and reports from third parties. All information received has been taken in good faith as being true and representative.

This report has been prepared in line with best industry standards. The methodology adopted and the sources of information used by OCSC in providing its services are outlined in this Report. The assessment undertaken by OCSC is based on the Buro Happold Report (2008). The scope of this Report and the services are accordingly factually limited by these circumstances.

OCSC disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to OCSC's attention after the date of the Report.

The conclusions presented in this report represent OCSC's best professional judgement based on review of the relevant information available at the time of writing. The opinions and conclusions presented are valid only to the extent that the information provided was accurate and complete.

2. ENVIRONMENTAL SITE SETTING

2.1. Site Location

The site is located within the Connolly Station carpark which is near the International Financial Services Centre (IFSC) in the Dublin Docklands. The site and surrounding area has an industrial past and has a number of known contamination issues. The site is located between Seville Place and Sheriff Street Lower. In 2008, Córas Iompair Éireann (CIÉ), initiated a study to investigate the potential to redevelop Connolly Station car park to include retail, residential and commercial properties together with community green space and a transport interchange. It was also proposed to retain the existing railway arches.

The regional site location is illustrated on Figure 2.1.

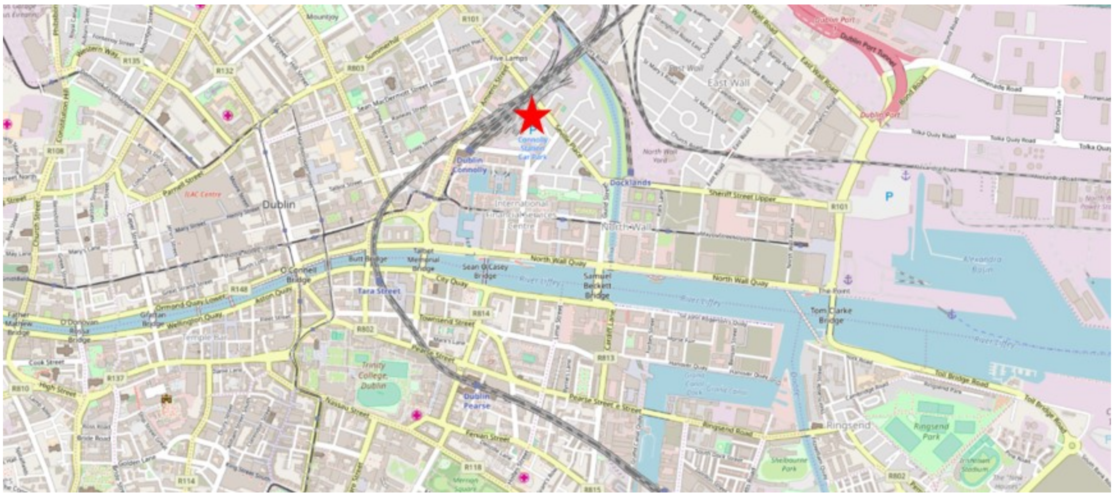

Figure 2.1 Regional Site Location

The site is located about 340m north of the of the River Liffey and 215m to the West of the Royal Canal. It is 2.88 hectares (ha) in area. The Ordnance Survey of Ireland (OSI) Easting Northing Coordinates for the site are 716812, 735003.

2.2. Surrounding Land Use

The site's surrounding area is urban in nature. The site is bordered by Seville Place and Oriel Hall to the north; Sheriff Street Lower to the south; Oriel Street Upper to the east; and Connolly Station (Protected Structure) to the west, Dublin 1. Refer to Figure 1.2 in Section 1 for an aerial photograph of the site. The adjacent land uses are listed in Table 2.1.

Table 2.1 – Adjacent Land Uses

BOUNDARY	LAND USE
North	Residential properties and the Royal Canal.
South	Custom House Harbour apartments building, and the Harbourmaster place mixed used development further South.
East	Residential properties, St Laurence O'Toole's Catholic Church and the Royal Canal further East.
West	Connolly station railway lines, platforms and building, residential buildings and a Top Service station, Fáilte Ireland Headquarters along Amiens Street.

2.3. Site History

An understanding of the site history was gained by undertaking a review of the following primary sources including:

- a review of available extracts of historical Ordnance Survey of Ireland (OSI) maps;
- National Monuments Service (NMS) viewer;
- a review of information held by the Environmental Protection Agency (EPA) EnVision online Mapping;
- aerial images available of the site (OSI, Google and Bing);
- the Geological Survey of Ireland (GSI) online map tool;
- the National Parks and Wildlife Service online map tool; and
- Information provided by the client including:
    - Geotechnical & Geoenvironmental Interpretative Report, 023956 Connolly Station, Dublin – Burro Happold (Revision 01, October 2008)

2.4. Site Development

Aerial images of the site from 1995 and 2000 show the site layout as it is today. Currently, the site consists of a CIE car park, CIE Group buildings, Rolling stock maintenance shed, and part of existing railway lines / sidings.

The 6" historical map (1837-1842) shows the site to be occupied by agricultural lands/pastures.

Development of the area surrounding the site continued throughout the 1800s and then around 1847 the Drogheda Railway Terminus was built (known today as 'Connolly Station'). Railway lines, goods sheds, warehouses and an oil tank shown occupying the site on the 25'' OSI maps 1888-1913. Around the early 1980's the site was developed as a car park for the Connolly station. The area surrounding the site is known for its industrial heritage such as vinegar works, coal yards, tobacco factories, railway depots, chemical works, timber yards, cattle yards and goods sheds'.

Figure 2.2. Approximate Location of the proposed development on 1837-1842 6 Inch OS Map (Source: Ordnance Survey Ireland)

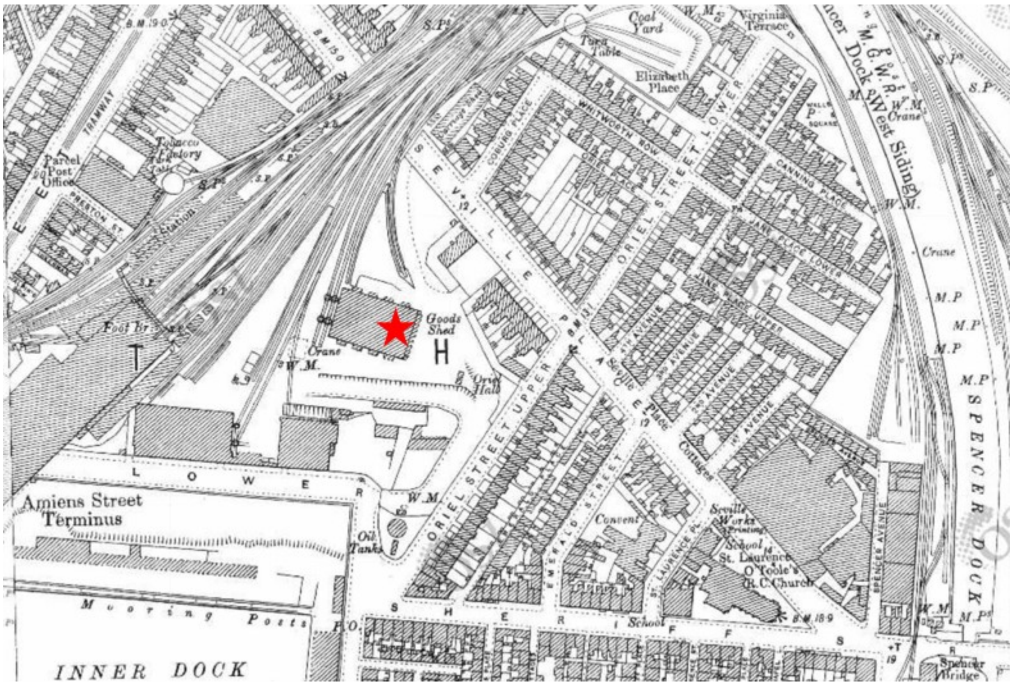

Figure 2.3. Approximate Location of the proposed development on 1888-1913 25 Inch OS Map (Source: Ordnance Survey Ireland)

2.5. Site Physical Setting

Information regarding the site topography, hydrology, geology, hydrogeology and ecology of the area has been obtained from records held by the Geological Survey of Ireland (GSI), Environmental Protection Agency (EPA) Envision online mapping tool, Ordnance Survey of Ireland (OSI), Water Framework Directive Maps and National Parks and Wildlife Service (NPWS) databases.

2.5.1. Topography

The regional topography of the area is urban and generally flat but the site itself can be described as an area of raised land running alongside the elevated railway tracks . The site generally slopes north-south from an average of 8mOD at the Seville Place boundary to 6mOD at the centre of the site, before rising again to 8mOD in the southern portion of the site bordering Sheriff Street Lower. The site also slopes west-east from 8mOD bordering Connolly Station to 2.5mOD at the Oriel Street Upper boundary.

It is also important to note, the southern boundary with Sheriff Street Lower drops suddenly from 8mOD to 1mOD at the road surface below. In the north-eastern portion of the site, the elevation of the car park drops significantly at the boundary with Oriel Hall from 6.5mOD to 1mOD at the road surface. Similarly, at the northern boundary with Seville Place, the elevation at boundary wall drops from 8mOD to 1mOD at the road surface below.

2.5.2. Area of Geological Interest

The Geological Survey of Ireland (GSI) online mapping service was consulted regarding areas of geological interest in the area of the site. The nearest area of geological heritage is the 'General Post Office (GPO)' on O'Connell Street which is located approximately 1.1km west of the site. The reason for this listing is 'The sole use of three classic Irish marble types is a good example of building stone use'. Given the distance to the building and its nature it is considered to be outside of the zone of influence of the proposed development.

2.5.3. Unconsolidated Geology

Teagasc Topsoils and Subsoils

The topsoil and subsoil beneath the site has been classified into one main category, made ground. This is as expected given the urban nature of the area.

The site surrounds also consists of made ground. Refer to Figure 2.4 from the GSI online mapping for further information.

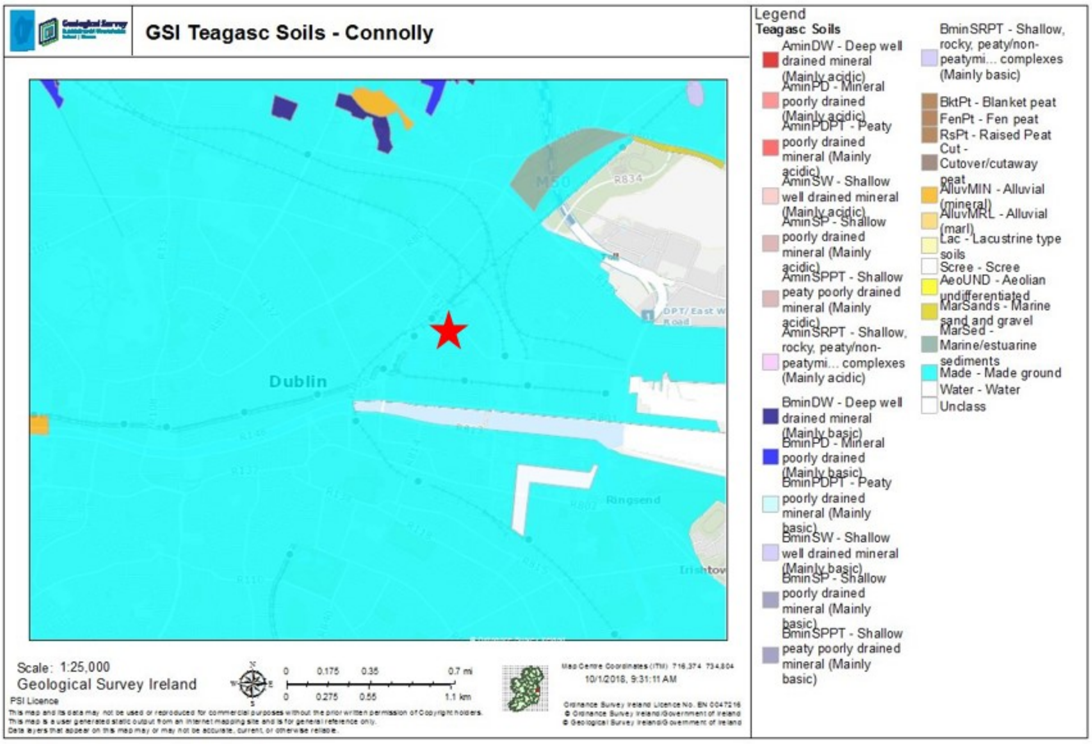

Figure 2.4 Teagasc Topsoils and Subsoils

2.5.4. Geology

The bedrock beneath the site and the greater surrounding area consists of Dinantian Upper Impure Limestones (DUIL) which is described as 'Dark grey to black Limestone and Shale'. This is colloquially known as Calp Limestone and is known to contain areas of mudstone and occasionally pyrites. The local geology mapped by the GSI is illustrated on Figure 2.5.

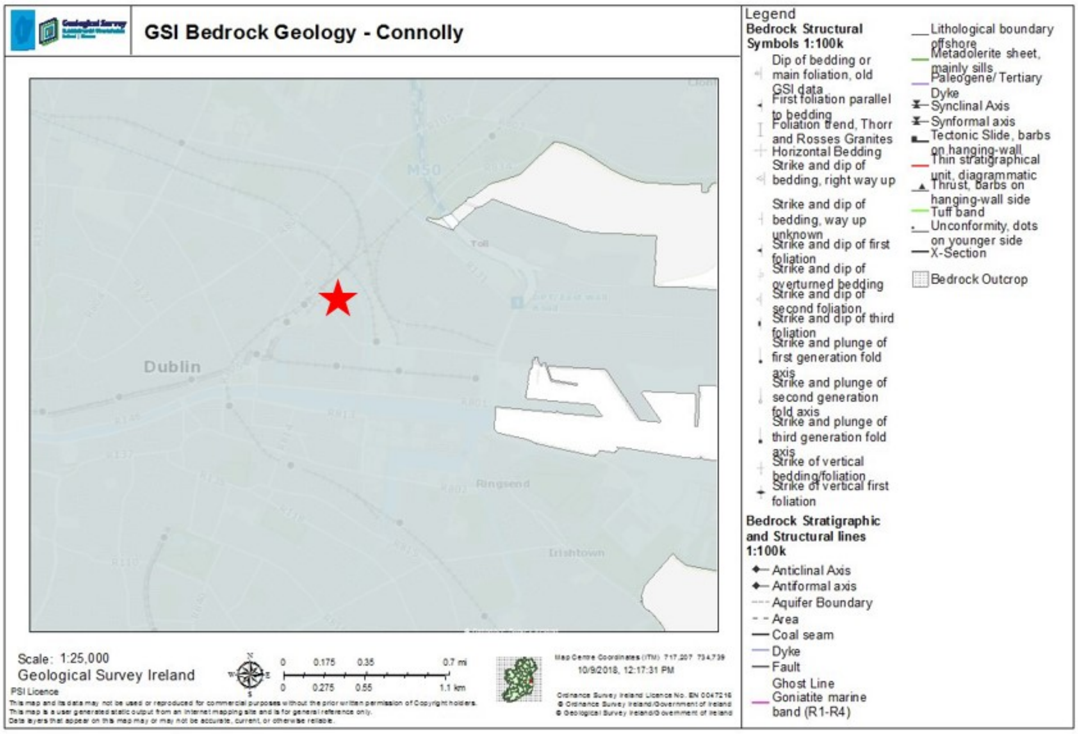

Figure 2.5 Geology

2.5.5. Aquifers

The GSI provides a methodology for aquifer classification based on resource value (Regionally Important, Locally Important and Poor) and vulnerability (Extreme, High, Moderate or Low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils). The aquifer beneath the site is a bedrock aquifer which is described as a Locally Important aquifer (LI) which is moderately productive in local zones only (Refer to Figure 2.6). The aquifer covers an area of 1309km^2 and covers the City of Dublin and surrounding area. There is no gravel aquifer mapped in Dublin City Centre however there are known gravel deposits in the area particularly in the docklands. These have not been designated as aquifers given their urban and coastal nature which make them generally unsuitable for potable use. They are however likely to contain significant volumes of water.

The limestone is part of the Dublin Urban Ground Water Body (GWB) which is described as poorly productive. The GWB covers an area of 837km^2 over the Dublin area and towards Kildare. The GSI Summary Characteristics of the Dublin GWB identify that the permeability of these rock units are likely to be low (1-10m^2/d).

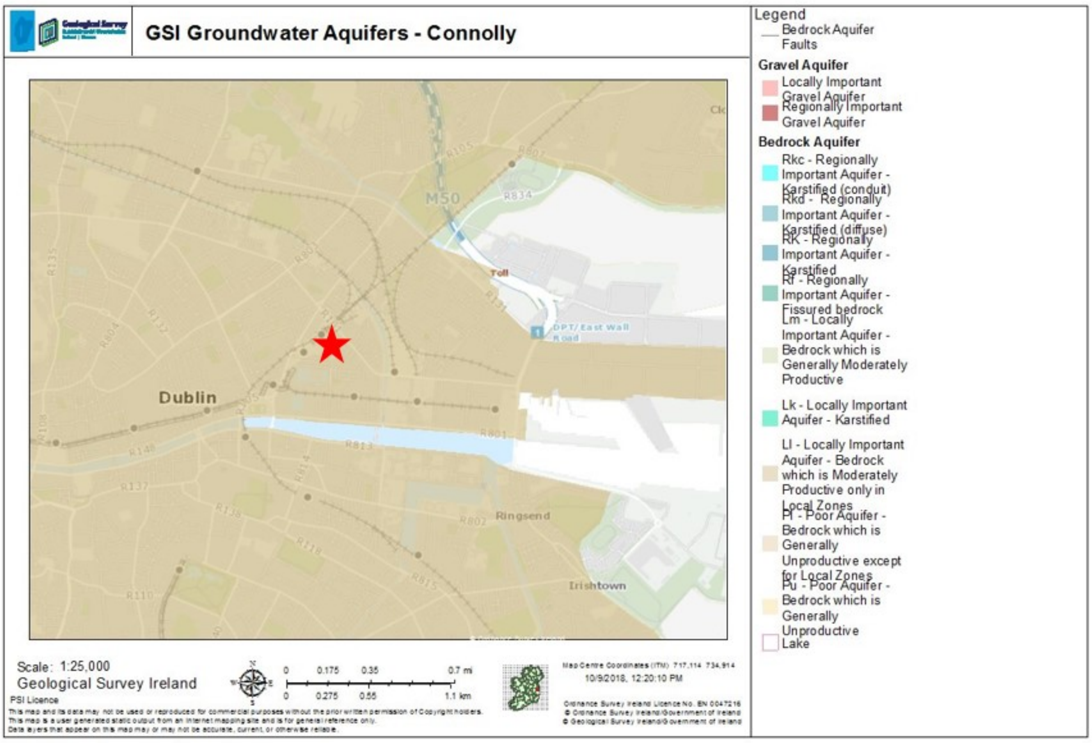

Figure 2.6 Aquifers

2.5.6. Aquifer Vulnerability

The groundwater vulnerability beneath the proposed site is Low; refer to Figure 2.7 (GSI, 2016). Vulnerability ratings are related to a function of overburden thickness and permeability which might offer a degree of protection and/or attenuation to the underlying aquifer from surface activities and pollution. Bedrock was not encountered in the previous site investigation even though 3No. Rotary core boreholes extended to a depth between 39.5 and 42.3mbGL; which suggest a thick layer of overburden exists below the site.

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Multidisciplinary Consulting Engineers

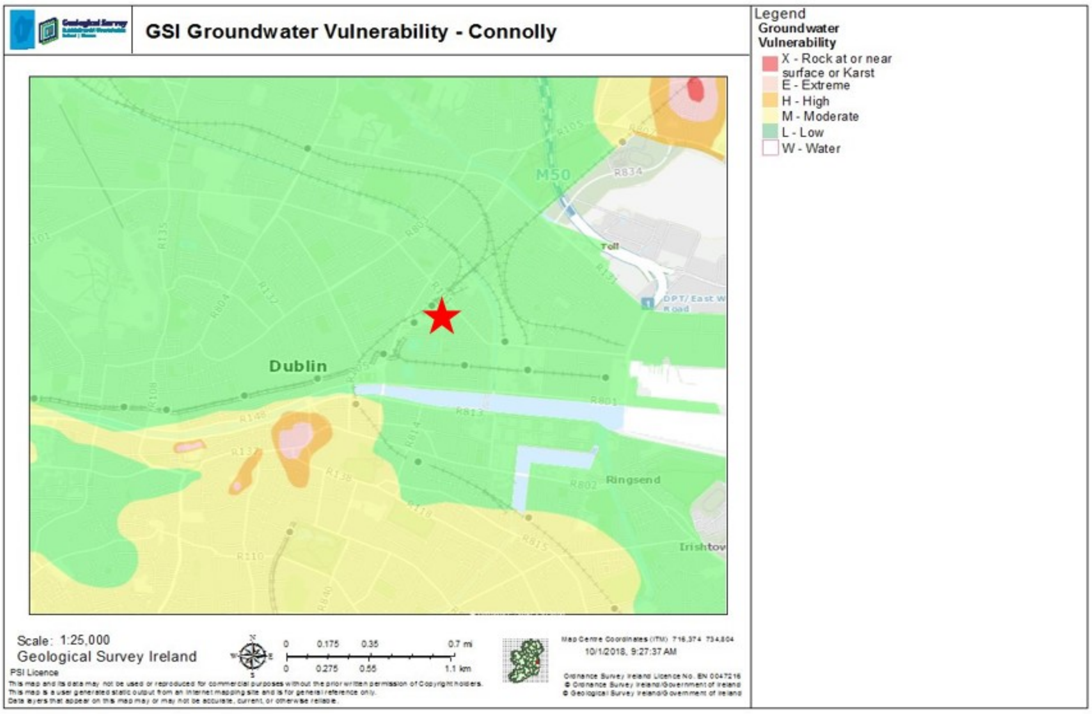

Figure 2.7 Aquifer Vulnerability

There were no karst features identified adjacent to the site.

2.5.7.Groundwater Status

An assessment carried out under the Water Framework Directive 2010-2015 groundwater body (EPA, 2018) has concluded that the groundwater within the bedrock aquifer is presently of "Good status". The objective is to protect the "Good status" by recognizing that the quality of the groundwater is at risk due to point and diffuse sources of pollution.

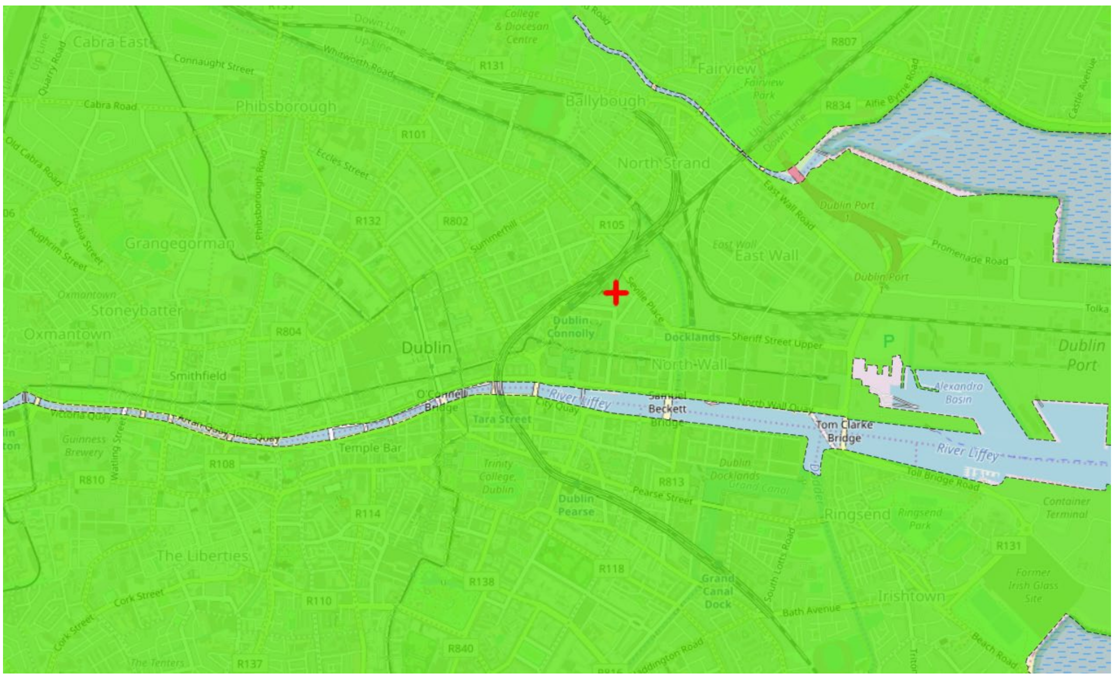

Figure 2.8 WFD Status 2010-2015

The Groundwater Bodies risk status is 'Not At Risk' assigned to the Dublin bedrock aquifer (see Figure 2.9).

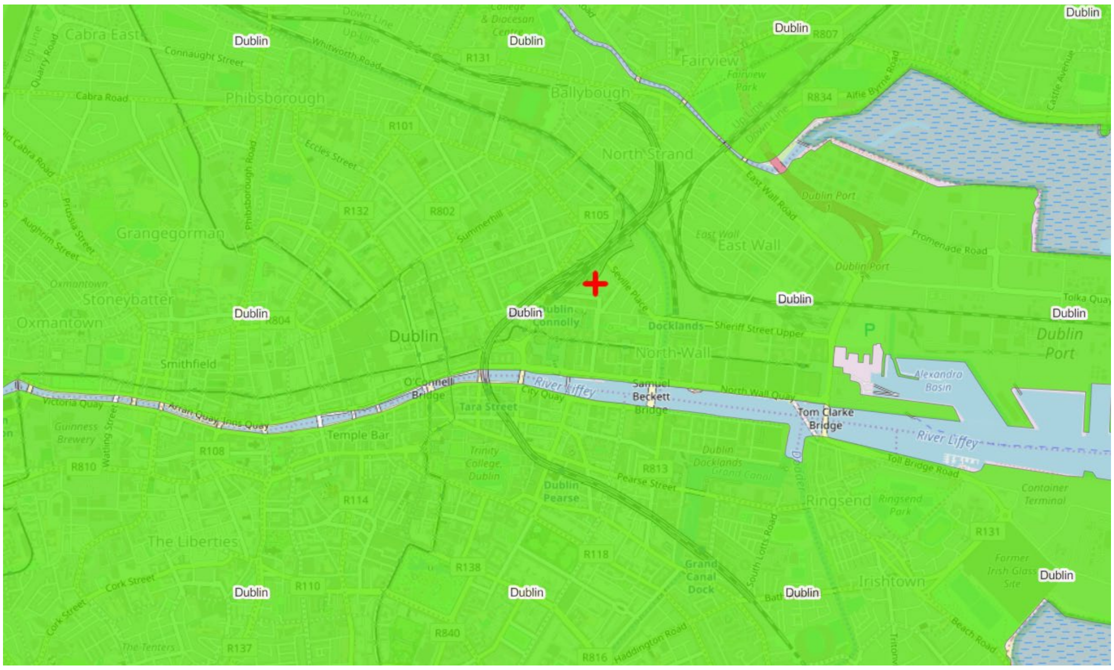

Figure 2.9 Ground Waterbodies Risk Status

2.5.8. Groundwater Recharge

Diffuse recharge generally occurs via rainfall percolating through the subsoil being higher in areas where subsoil is thinner and/or more permeable. The proportion of the effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope. On this site only a small percentage of recharge will occur due to a significant percentage of hardstanding and building coverage on site.

The GSI's groundwater recharge model parameters for the site are summarised in Table 2.2. Figure 2.10 contains a drawing from the GSI indicating the recharge zone.

Table 2.2 GSI Groundwater Recharge Parameters

Groundwater Recharge Parameters	
Average Recharge (mm/yr):	60
Hydrogeological Setting:	4m
Hydrogeological Setting Description:	Made ground
Soil Drainage:	MADE
Subsoil Type:	Made
Subsoil Description:	Made ground
Subsoil Permeability:	L
Subsoil Permeability Description:	Low
GW Vulnerability:	L
GW Vulnerability Description:	Low
Aquifer Category:	LI

Groundwater Recharge Parameters	
Aquifer Category Description:	Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
Recharge Coefficient (%):	20
Maximum Recharge Capacity (mm/yr):	200
Effective Rainfall (mm/yr):	302

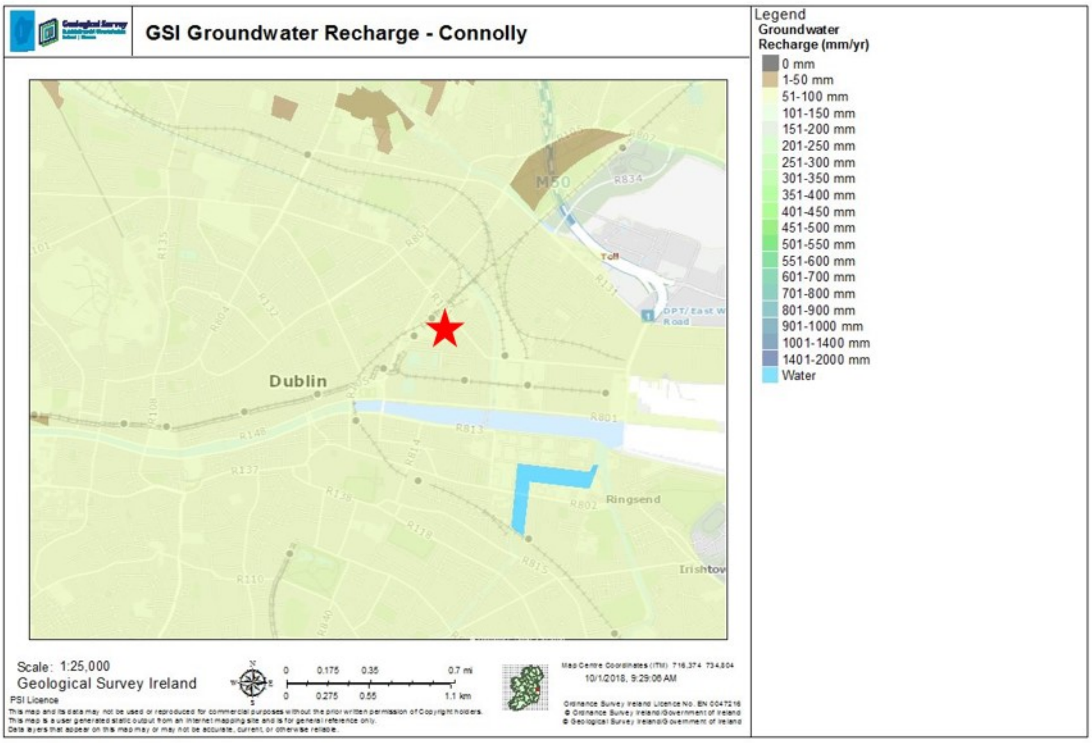

Figure 2.10 Groundwater Recharge

2.5.9.Wells & Springs

A search of the GSI groundwater well database was conducted to identify registered wells in the surrounding area. None of the wells identified had any drilling details, or depth to water. The 2No. wells identified to the East of the site are noted to be 50mm in diameter and hence are assumed to be an SI Geotechnical/Groundwater monitoring wells. The well (GSI Name: 2923SEW012) which is located around Parnell Street to the west of the site on located at E315950, N235050, was drilled in 1899 and has a total depth of 137mbGL. It was also noted to have a yield of 163.6m^3/day and a depth to rock of 9.1mbGL. Mapped wells and springs in the general vicinity of the site identified by the GSI are illustrated on Figure 2.11.

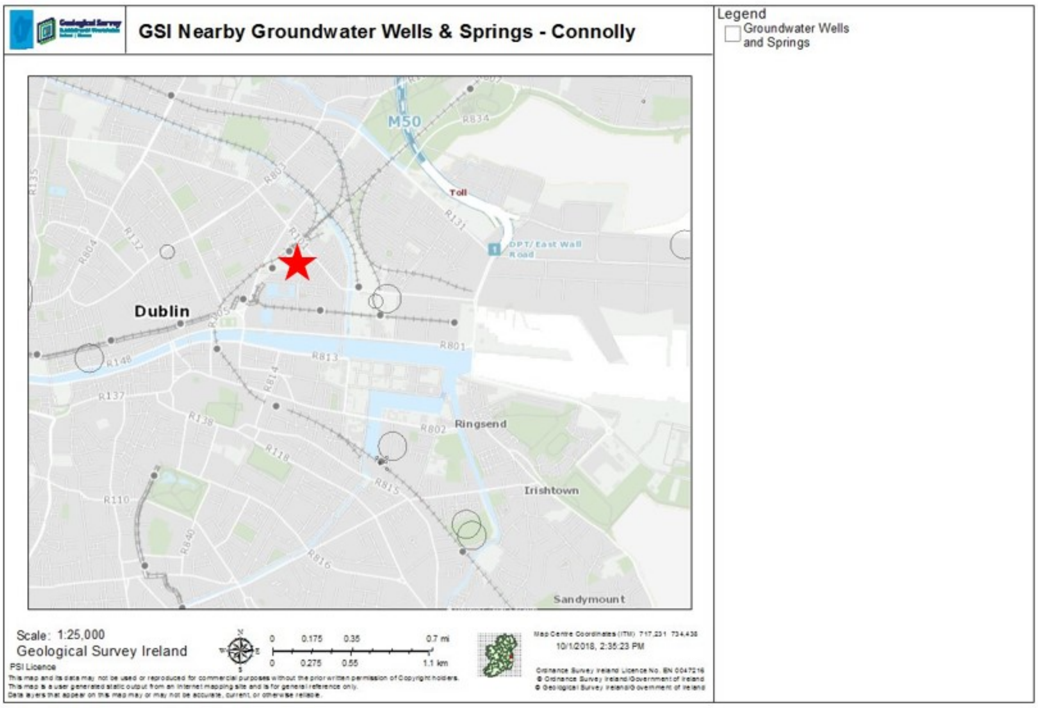

Figure 2.11 Wells and Springs

The GSI (1999) also provides a framework for the protection of groundwater source zones (e.g. areas of contribution to water supply bores). There are no reported source protection zones (SPZs) within a 2km radius of the proposed site.

Based on a review of available information local groundwater flow is expected to the South/Southeast.

2.5.10. Hydrology

There are no surface water features within the site.

The largest adjacent surface water feature, the River Liffey, is a transitional water body given it is tidally influenced. Based on the most recent water quality information 2010-2015 (EPA, 2018) the water body south of the site, Liffey Estuary Lower, has been designated as unpolluted, however further upstream it has been designated as eutrophic (refer to Figure 2.12).

Under the Water Framework Directive the River Liffey has been designated as 'Good' status for transitional waters (Figure 2.14) whereas the Liffey Estuary Upper has been designated as 'Moderate'. Additionally, both the Liffey Estuaries Lower and Upper have been identified as 'at risk of not achieving good Status' under the WFD Risk Score (Figure 2.14).

The North Dock Harbour is also located immediately to the south of the site linked with Georges Dock which is in turn connected to the River Liffey. Both docks are sealed from the Liffey by a historical lock located to the north of Scherzers Bridge on Custom House Quay.

Figure 2.12 Surface Water Quality (EPA, 2018)

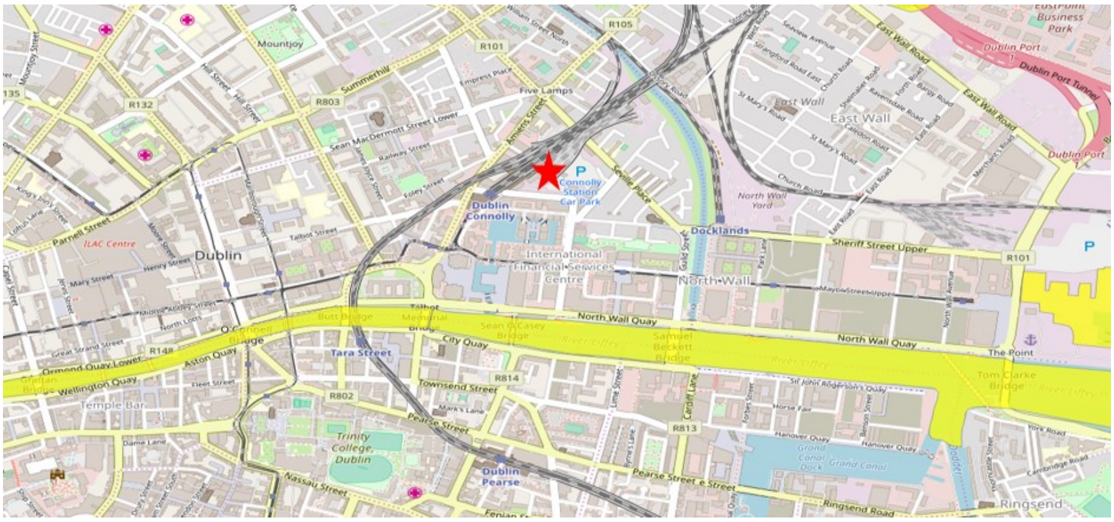

Figure 2.13 WFD Status (EPA, 2018)

Figure 2.14 WFD Risk Scores (EPA, 2018)

2.5.11. Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) between one and five per cent of the homes in this 10km grid square are estimated to be above the Reference Level of 200 Bq/m^3. The Building Regulations in Ireland only require radon protection to be installed in areas of high radon risk (10% to 30% of homes exceed reference level). Refer to Figure 2.15.

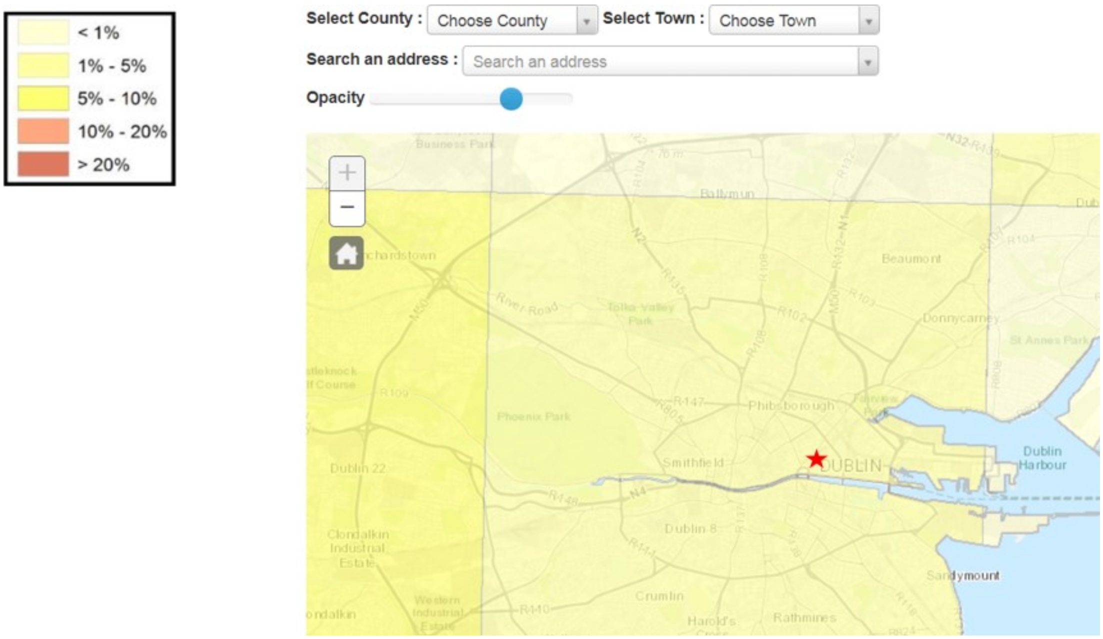

Figure 2.15 Radon Map (EPA, 2018)

2.5.12. Designated Area of Conservation

The nearest designated area of conservation is the South Dublin Bay and River Tolka Special Area of Conservation (SAC) Site Code 000210 and Special Protection Area (SPA) Site code 004024 located approximately 1.5km east of the site (NPWS, 2018).

Figure 2.16 NPWS Designated Area (Source: NPWS MapViewer)

2.5.13. Nearby Site Investigations

The site is located in a well investigated area in Dublin City of which the Geological Survey of Ireland (GSI) have compiled a database from site investigations previously carried out in Ireland. Figure 2.17 identifies the site investigation locations with the vicinity of the site. For the Connolly station site, the most relevant GSI reports for nearby investigations include R856, R2489, and R3464 which are attached in the appendices. A slight discrepancy exists between the findings of the intrusive works undertaken at the site and the nearby site investigations completed. The nearby site investigations show that the geology consists of Made Ground overlaying Gravels which are underlain by Boulder Clay. Whereas, the Buro Happold report states that the site's geology is comprised of Made Ground underlain by a layer of glacial tills (gravels embedded among or between the Boulder Clay layer). This discrepancy exists due to the fact that the site investigation boreholes carried out in 2008 by Buro Happold extended to deeper depths than the other nearby boreholes, hence, the nearby boreholes didn't encounter the deeper gravel layers encountered on the Connolly Station car park site.

The nearby site investigation undertaken just to the south-west of the site consisted of 2No. cable percussion boreholes which were carried out prior to the development of the apartment block on the intersection of Oriel Street Upper with Sheriff Street Lower. These 2No. boreholes had a maximum depth of 5mbGL and indicated that the site was underlain by a layer of 'Made Ground Fill' of 1m thickness overlaying a 1.2m layer of 'Soft Black very Silty CLAY' which is lying over a 2.8m thick layer of 'Fine to Coarse sandy GRAVEL'. Bedrock was not encountered during these works.

Site investigation records from the Custom House Harbour apartment blocks, located to the south of the site, show that the site was underlain by about 2.5m thick layer of 'Made Ground FILL' followed by a layer 3.5m thick of 'Fine to Coarse Sandy GRAVEL' which is overlying a 'very hard to stiff black gravelly silty CLAY' layer which is about 3.5m thick. The site investigation at the Custom House Harbour site consisted of 6No. cable percussion boreholes advancing to a maximum depth of 10mbGL; bedrock was not encountered during the works.

Finally, a site investigation consisting of 6No. cable percussion boreholes within the Connolly Station development which might have been from the LUAS station investigation, shows the site to be underlain by an average of 2m thick layer of 'Made Ground' over a layer of 'Fine to Coarse sandy GRAVEL' which had an average of 10m thickness. In 4No. out of 6No. boreholes, a layer of 'Fine to Coarse SAND' was encountered sandwiched between the GRAVEL layers. The 'SAND' layer had an average thickness of 3m when it was encountered. Bedrock was not encountered during the works.

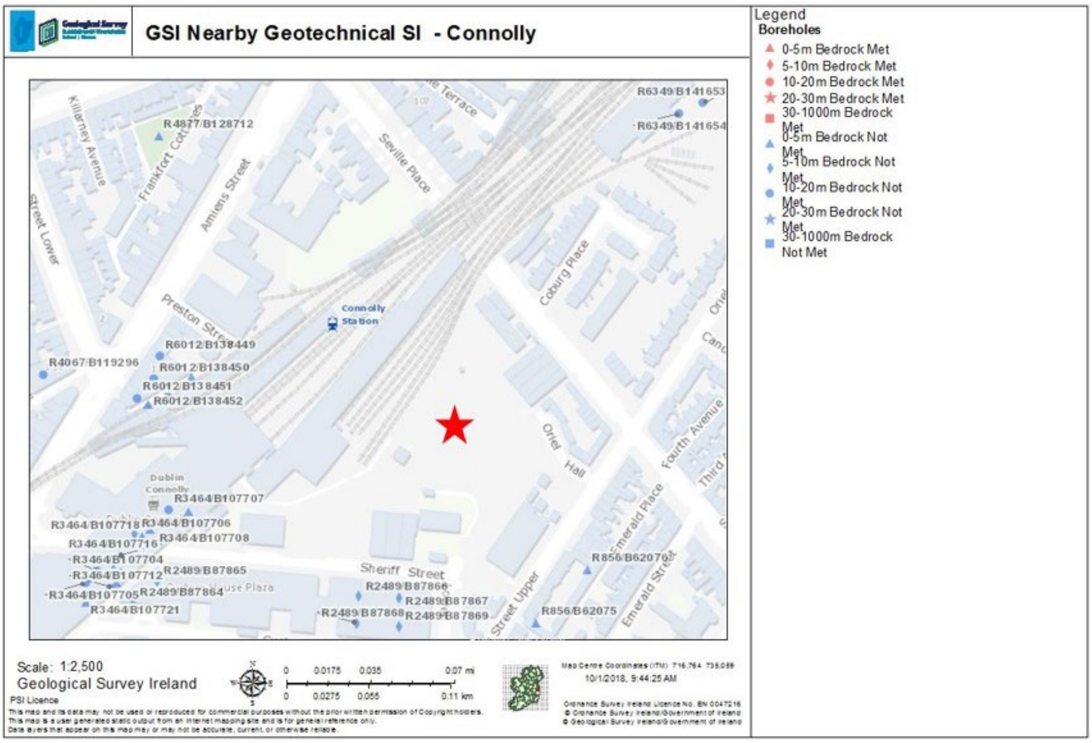

Figure 2.17 nearby Site Investigations (Source: GSI Geotechnical Viewer)

2.5.14. Summary of the Physical Site Setting

Summary of the site physical setting are outlined in Table 2.3.

Table 2.3 Summary Site Setting

FEATURE	DETAILS & COMMENTS
Topography	Urban
Geology	**Topsoil and Subsoil:** Made ground.
	Solid Geology: According to GSI data, the bedrock geology beneath the site is underlain by Dinantian Upper Impure Limestones.
Hydrogeology	**Aquifer Classification:** The bedrock aquifer underlying the site is classified as a Locally Important Aquifer (LI) which is moderately productive in local zones only.
	Vulnerability & Recharge: The vulnerability has been classified as Low. The average recharge has been modelled at 60 mm/year.
	Groundwater Flow: The regional groundwater flow direction can be expected to be to the southeast/ east.

	Well Search: There were no Source Protection Zones identified and therefore the assumption is that there are no public supply wells within a 2km zone. A number of probable geotechnical site investigation boreholes were recorded within the general vicinity of the site, near IFSC and Spencer Dock, however none of these provided any detail on depth to bedrock or water level. GSI maps also identify a high yielding borehole located on Parnell Street just 900m to the west of the site; the borehole was drilled in 1899 and its usage is not known.
Hydrology	**Surface Water Courses:** There are no surface water features on site. The nearest surface water features are the River Liffey located south of the site, the Royal Canal located to the east of the site and north, and Georges Docks immediately to the south.
Designated sites	The nearest designated site is the South Dublin Bay and Tolka River SAC (Site Code 000210) and SPA (Site Code 004024) located approximately 1.5km east of the site.

2.6. Site Walkover

A site walkover have not been carried out by OCSC at the time of writing this report as the purpose of this report is to revise the previous work completed up to current standards.

2.6.1.External Infrastructure

The majority of the site is under hardstanding which comprised of a tarmac covered surface car park. The site is bounded by an elevated stone wall with an access gate from Sheriff Street Lower.

2.6.2.Oil/Liquid Storage Infrastructure

There are visible oil storage tanks infrastructure on site, a minimum of 1 No. oil tanks can be seen currently on site from Google Earth images, the location of the historical oil tank is also shown in Figure 2.18 below. The latest 2018 Google maps aerial viewer shows the oil tank to be still present. It is recommended that the oil tank is to be decommissioned prior to re-development of the site.

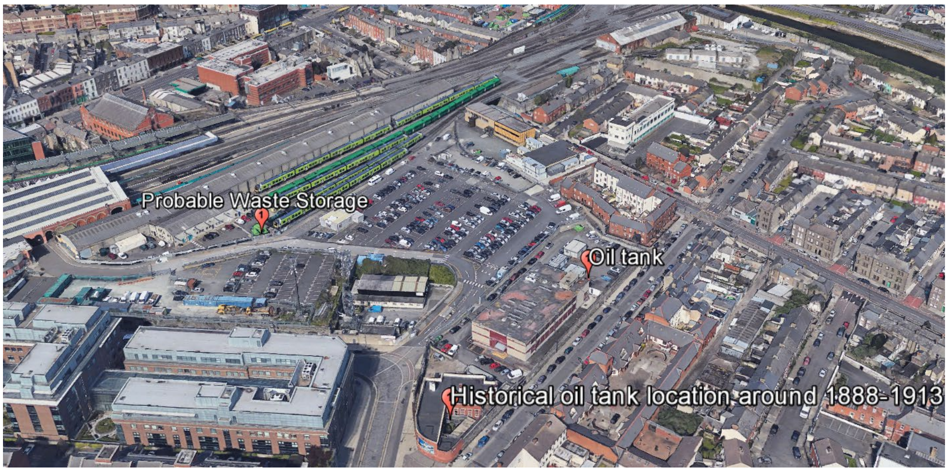

Figure 2.18 Potential areas of concern/contamination (Source: GoogleEarth)

2.6.3. Asbestos

An asbestos survey was not available for review and should be completed prior to the commencement of any demolition works.

2.7. Protected structures

National Monuments Service (NMS) maps show that there are 2No. protected structures within the site boundary as shown in Figure 2.19 below; below are the descriptions:

- Arches

The 11No. railway arches consisting of Calp limestone walls and piers built in 1840 are categorised as an Architectural Technical structure of special interest enhancing the industrial character of the streetscape as part of the Connolly Station. A recent survey showed that 6No. of the arches extend circa 35m into the site and 5No. extend circa 17.5m into the site.

- Office

The former Great Northern Railways office located between Sheriff Street Upper and Oriel Street Lower built in 1915 is deemed as an Architectural structure of special interest due to use of classical devices such as stone cornicing and symmetry.

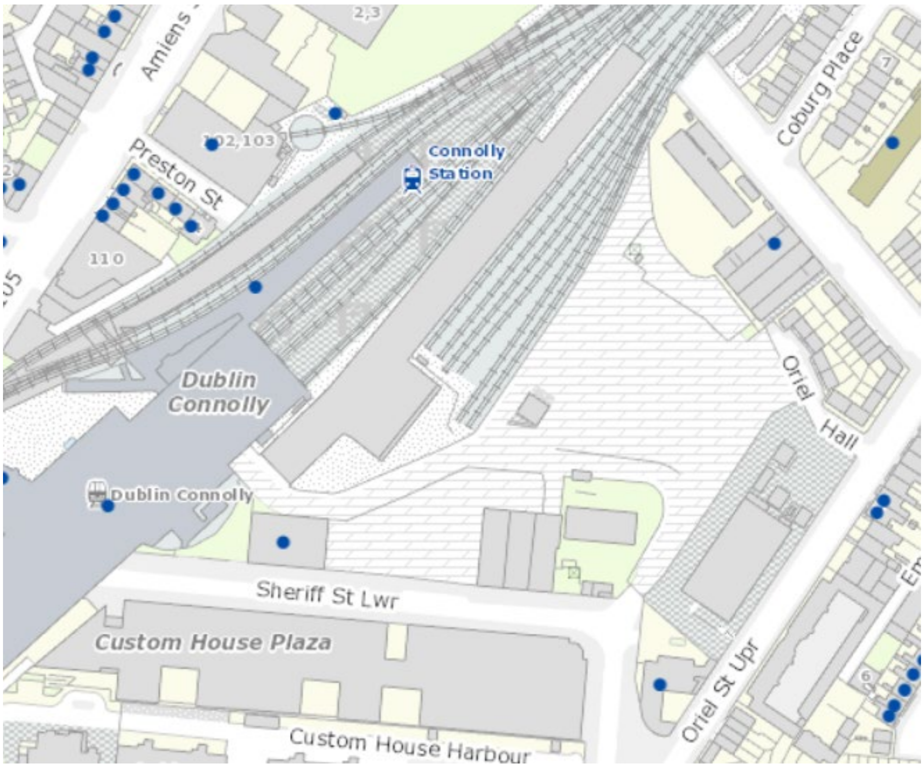

Figure 2.19 Protected structures within and surrounding site's boundary

3. PRELIMINARY CONCEPTUAL SITE MODEL

3.1. Risk Assessment Methodology

Currently there is no specific legislation addressing contaminated land in Ireland and therefore this report has been prepared considering the most relevant guidance published by the Irish Environmental Protection Agency (EPA) and the UK Environment Agency (EA) guidance as referenced in Section 1.6. Both authorities advocate a risk-based assessment when dealing with contaminated land and groundwater issues and this is considered best practice as well as being a requirement under the Environmental Liability Regulations (S.I. 547 of 2008).

A critical element of the risk assessment process is the establishment of a Conceptual Site Model (CSM) for the site. A CSM describes the potential sources of contamination at a site, the migration pathways it may follow and the receptors it could impact. If a complete source-pathway-receptor scenario existss then there is a potential pollutant linkage that needs to be characterised and assessed (via formal risk assessment). All three elements need to be present for a viable risk to exist (e.g. if a source and receptor exist but no pathway is present then there is no pollutant linkage and hence no risk). The CSM is updated and refined as more information becomes available.

3.2. Contamination Sources

Following the Phase I review the areas of concern which are considered as potential pollutant sources are summarised in Table 3.1:

Table 3.1 Potential Areas of Concern

AREA/ ASPECT	DETAILS & COMMENTS	SIZE/ MAGNITUDE	POTENTIAL FUTURE RISK
Made Ground	Any contaminants within the material used to fill the site historically.	Unknown	Low
Previous site use – Goods shed.	Any contaminants within the material associated with the past site use.	Small - medium	Low
Present site use – railway tracks and oil tanks.	There are 2No. railway tracks within the site boundary and there is a possibility that contaminants have seeped through the ballast material below the tracks and infiltrated into the Made Ground and subsequently to the gravels. There is also the potential for spills from oil tanks to have occurred.	Medium-large	Low
Offsite contaminant sources	Activities associated with offsite sources, in particular coal yards, bonded stores, goods shed, railway lines and depots in the vicinity of the site.	Medium-large	Low

NOTE: future risk assumes design/remedial measures are completed prior to development.

3.3. Outline Conceptual Site Model

Based on the preliminary assessment, several possible pollution linkages were identified for the site (Refer Table 3.2).

Table 3.2 Preliminary Conceptual Site Model

SOURCE	PATHWAY	RECEPTOR	POTENTIAL POLLUTANT LINKAGE Y/N
Environmental			
Migration of contamination from adjacent properties such as historic timber treatment, coal yards and in particular the adjacent railway lines and depots.	Migration of contaminants from made ground and soils	Groundwater in the Gravel and/or bedrock aquifer	Y
Potential historical on-site spills - Potential contamination within shallow subsoil materials from historic activities (railway lines, oil tanks and associated maintenance yards) and from unknown source of material which could have been contaminated during original filling.			Y
			Y
Potential contamination within groundwater	Migration of contaminants in the subsoil & bedrock aquifer and/or also via discharge to sewer	Potential surface watercourses (River Liffey) via groundwater baseflow and sewers if discharge to sewer occur during basement excavation.	Y
Human Health			
Migration of contamination from adjacent properties such as coal yards, timber yards, and in particular the adjacent railway lines and depots.	Vapour migration to indoor and outdoor air	Onsite Residents and Commercial Future Users.	Y
Potential historical on-site spills - Potential contamination within shallow subsoil materials from historic activities (Coal Yard, Tobacco Factory) and from unknown source of material which could have been contaminated during original filling.			

Migration of contamination from adjacent properties such as historic coal yards, tobacco factories, railway lines, and railway depots.	Inhalation/ dermal contact/ ingestion of soils/ dusts	Onsite Residents and Commercial Future Users.	Y
Potential historical on-site spills - Potential contamination within shallow subsoil materials from historic activities (Coal Yards, Railway Depots and Lines) and from unknown source of material which could have been contaminated during original filling.			
Potential contamination within groundwater	Migration of contaminants in the bedrock aquifer	Groundwater users.	Y

Note: Generic risk assessments do not assess risks to construction workers who are managed under the Safety and Welfare at Work Regulations.

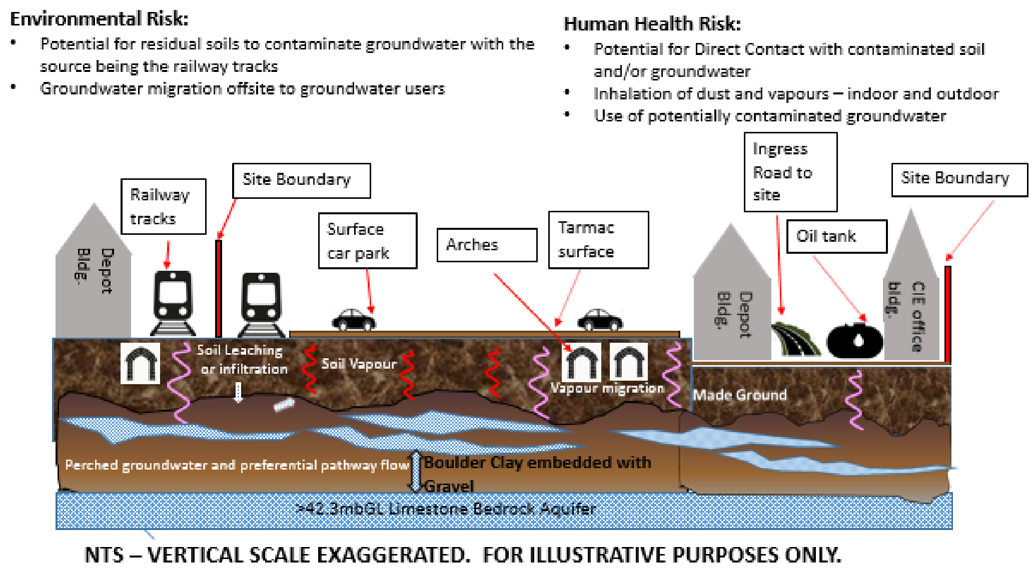

Figure 3.1 Preliminary Conceptual Site Model

4. SITE INVESTIGATION - METHODOLOGY

4.1. Buro Happold – Preliminary Investigation (2008)

Burro Happold undertook a preliminary site investigation of the Connolly Station car park site between July and September 2008. All of the intrusive investigation works were carried out by Glover. The intrusive investigation completed included the following:

- Drilling of 12No. windowless sample boreholes:
  - WS1-WS12
- Drilling of 7No. cable percussion boreholes:
  - BH01-BH07
- Drilling of 3No. rotary core follow on borehole to prove bedrock.
- Convert 14No. boreholes as gas and/or groundwater monitoring wells:
  - BH01, BH02, BH03, BH04, BH05, BH06, BH07, WS3, WS6, WS9, WS10, WS12.
- Sampling and analysis of soil from the boreholes.
- Sampling and analysis of water from the boreholes.

4.2. Laboratory Analysis – Soil

Forty (40No.) soil samples were collected in total and submitted to ALcontrol Geochem Laboratories, a UKAS accredited laboratory. From these 40No. of soil samples, 38No. were tested for metals, 15No. for TPHs, 32No. for PAHs, 9No. for PCBs, 35No. for Organics and 35No. for Inorganics. Only 5No. of samples were sufficiently tested to be deemed as a comprehensive analysis as outlined in Table 4.1 below which further outlines the analytical suites used;

Table 4.1 Soil Analytical Suites

Analytical Suite	No. of Samples tested
Full Suite*	5
Metals, TPHs, PAHs, Organics & Inorganics	7
Metals, PAHs, Organics & Inorganics	17
Metals, PAHs, PCBs, Organics & Inorganics	2
Metals, Organics & Inorganics	3
Metals, PCBs, Organics & Inorganics	1
TPHs	2
Metals, TPHs, Organics & Inorganics	1
Metals	2

*= Metals, TPHs, PAHs, PCBs, Organics & Inorganics

An Asbestos screen was performed for all samples with the exception of WS11 (0.50), BH3 (1.0) and BH4(5.0-5.3 & 6.0 -6.3). Leachability testing was also performed 20No. soil samples.

Samples were collected from surface level with the shallowest sample collected from a depth of 0-0.5 meters below ground level (mbGL) to a maximum depth of 7.2mbGL.

4.3. Laboratory Analysis – Water

Groundwater was sampled from nine locations (BH1-BH7, WS7 and WS11) on two to three occasions between 29th August 2008 and 17th September 2008. An interface probe was used to monitor groundwater levels as well as light and dense non-aqueous phase liquid (LNAPL & DNAPL). No LNAPL or DNAPL was detected in any of the sampling locations during the monitoring period.

As described in the Buro Happold report, during groundwater sampling hydrocarbon odours were recorded in water purged from WS11, BH03 and BH02 and a slight hydrocarbon odour was noted in purged water from BH06 and WS7. In addition, a slight hydrocarbon sheen was observed on water purged from WS11, BH02, BH06 and BH03. Foam was also observed on BH03. Purged groundwater from all boreholes, except from BH02, was high in suspended solids. No information was provided on the purging or sampling methods used, sample interval, whether field parameters were recorded or the volume purged from each well prior to sampling.

Twenty five (25No.) groundwater samples were collected and submitted to ALcontrol Geochem Laboratories, a UKAS accredited laboratory.

Table 4.2 Groundwater Analytical Suites

Analytical Suite	No. of Samples tested
Full Suite*	2
Metals, TPHs, PAHs, Organics & Inorganics	23
Metals	1

*= Metals, TPHs, PAHs, PCBs, Organics & Inorganics

The 1No. sample tested for just metals in Table 4.2 was a retest due to laboratory contamination. A further breakdown of chemical analysis is outlined below;

- Heavy metals (antimony, arsenic, boron, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, hexavalent chromium);
- Volatile Organic Compounds (VOCs) including tentative identified compounds (TICs);
- Semi-VOCs (sVOCs);
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG);
- Speciated Polychlorinated biphenyl (PCBs);
- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) and Methyl-Tert-Butyl-Ether (MTBE);
- Phenols;
- Sulphates, chloride, ammoniacal nitrogen as N, total alkalinity as $CaCO_3$,
- Free cyanides;
- BOD, COD, pH, Total Organic Carbon, Total Dissolved Solids and Total Suspended Solids;
- Total Cations and Total Anions.

4.4. Groundwater Level Monitoring

Groundwater levels were measured on seven occasions during the investigation by Glovers (2008). Levels were also measured on four occasions during post ground investigation monitoring undertaken by ALcontrol Dublin. From these observations, it is stated by Buro

Happold report that the groundwater table is located within the gravel layers of the Glacial Till at approx. 2.5m below the existing road level (Malin Head 0 mOD). The report also states that the groundwater table is relatively flat across the site.

BH01, BH02 and BH03 were subject to falling head tests which indicated that the permeability of the gravel layer ranged from $2.3x10^{-5}$ – 1.1×10^{-6} m/s while the boulder clay recorded a permeability of 4.0×10^{-6} m/s. The monitoring data was not available to OCSC for review at the time of writing this report.

5. SITE INVESTIGATION – FINDINGS

5.1. Conditions Encountered – Geology

The geology of the site from the intrusive investigation can be summarised to be as follows:

- Made Ground comprising of '*a mixture of clay, sand and gravel containing cobbles and occasional boulders along with pieces of glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery*'. The Made Ground varied in thickness from 0.1m to 7.2m. The thickness of Made Ground is expected given that the site is higher than Sheriff Street Lower by at least 5m. Standard Penetration Test (SPT) N value ranged between 3 to 24 in this layer;
- A discontinuous layer of Estuarine Deposit layer comprising of '*grey gravelly sandy SILT with sea shells*' was encountered in 5No. locations mainly located in the lower half of the site towards the Sheriff Street Lower side. The thickness of this layer varied between 0.5 and 3.2m when it was encountered, No SPT N values were taken in this layer;
- In addition, a layer up to 1.9m thick of dark grey/black sandy silt with fibres and an organic odour below the Made Ground in WS03 and BH02. Hydrocarbon odours were noted within this strata in WS11 at depth of circa 2mbGL; the odour did not extend to the underlying glacial till layer;
- A glacial till layer of '*Dense dark grey sandy GRAVEL*' embedded among or between a frequent layer of '*firm to stiff brown/dark grey sandy gravelly CLAY with occasional cobbles* (Boulder Clay)' was encountered across the site. The layer of the GRAVEL ranged in thickness between 1.7 and 17m while the layer of the sandy gravelly CLAY ranged between 0.6 to 7m. The total thickness of this layer has not been proven but it extended to a maximum investigation depth of 42.3mbGL. SPT N values ranged between 22 to 68 for the GRAVEL layer and from 12 to 48 for the CLAY layer;
- Bedrock was not encountered throughout the SI, the bedrock geology is expected to be *LIMESTONE*.

6. GENERIC QUANTITATIVE RISK ASSESSMENT

6.1. Generic Assessment Criteria

A risk-based approach has been adopted for the assessment of data obtained from the Burro Happold Geotechnical & Geoenvironmental Interpretive Report. In order to assess the human health and environmental risks posed by potential contaminants within the underlying soils and groundwater, a comparison of the laboratory analytical results for soil and groundwater samples using Generic Assessment Criteria (GAC) was carried out.

Constituent concentrations in soil and groundwater at the site were deemed 'potentially significant' where they exceeded the generic values. These generic values are used for initial assessment of contaminant concentrations for the purpose of providing an initial indication of impacts at a site. Comparison with GACs is a means of evaluating the compounds that could proceed to a more detailed assessment. It should be noted that generic exceedances are not an indication of the requirement for remediation and instead are indicative of the need for further assessment or Detailed Quantitative Risk Assessment (DQRA).

Additionally, where further risk assessment is considered necessary, use of more site-specific information in the assessment can often lead to the conclusion that the observed concentrations are present at levels which represent an acceptable level of risk, considering the actual or proposed end use of a site (although each site assessment has to be considered on an individual basis).

The risk to construction workers is not considered under the CLEA methodology. It is assumed that health and safety guidelines will be adhered to and appropriate health and safety planning/assessments will be undertaken in advance of any on-site works.

6.2. Soil Screening Criteria

The soil analytical data was compared with a set of standard GAC for Residential Use without Plant Uptake in addition to Commercial/Industrial Land Use – The LQM/CIEH S4ULs for Human Health Risk Assessment (2015) in addition to the SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination CL:AIRE (2014) and the EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment (2010). The reason that two different scenarios are used is to put the concentrations observed into context given that the site will be used for both residential and commercial landuse.

The use of standard residential without plant uptake GACs to assess residential risk in this scenario is conservative given that these are apartments with no gardens and additionally the receptors have the added protection of an underground basement, however as an initial generic assessment this will allow the screening out of significant contaminants of concern.

In general GACs are conservative screening criteria protective of human health. If the concentrations are below the GAC, then the risks to human health are considered negligible. If the concentrations are above the GAC, a potential risk to human health is identified and further assessment is required. The GACs are consistent with the principles of human health protection in Irish EPA, UK DEFRA and UK Environment Agency guidance.

The active exposure pathways considered under the commercial/industrial scenario are:

- Ingestion of soil and dust;
- Dermal contact with soils and dust;
- Inhalation of dusts; and
- Inhalation of vapours (indoor and outdoor air).

6.3. Groundwater Screening Criteria

In terms of protected waters (i.e. the underlying groundwater and nearby surface waters), there is the potential for contaminated soils (if present) to impact these via leaching. However, estimated soil GACs using a partitioning equation result in theoretical values that are likely to be very conservative. Greater reliance is therefore placed on measured groundwater contaminant results to assess the potential risks to waters (surface and ground) in the vicinity of the site.

Groundwater data has been compared with the overall threshold value range identified in the 2016 European Communities Environmental Objectives (Groundwater) Regulations (Statutory Instrument No 366 of 2016). In the event that there is no overall threshold value range identified for a parameter and where one is available as an Interim Guideline Values (IGV) published by the Environmental Protection Agency in the Guidance Document titled 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' (2003) an IGV has been provided instead.

It is noted that the comparison of groundwater analytical results with the Groundwater Regulations is not representative of actual risk and is used as a guide to the potential risks posed. Contaminant concentrations below the GACs are considered not to warrant further risk assessment. However, concentrations above the generic screening criteria may require further consideration through either qualitative or quantitative assessment.

To determine the vapour risk from groundwater, the newly published Society of Brownfield Risk Assessment – Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater February 2017 were used to assess potential risks from volatile compounds in on site groundwater.

6.4. Soil Assessment

The soil analytical results are presented in Table 1 along with the GAC values. During the SI works, a total of 40No. of soil samples were obtained from the window samples and boreholes. From the 40No. samples, 26No. samples were determined to display GAC exceedances. GAC exceedances consisted mostly of PAHs but also some metals. PAH exceedances included Benzo(a)pyrene, Dibenzo(ah)anthracene, Benzo(a)anthracene and Naphthalene. GAC exceedances for the metals were in the form of Arsenic, Lead and one incidence of Mercury.

6.4.1. Total Petroleum Hydrocarbons, BTEX and MTBE

No samples exceeded the Residential, Public Open Space or Commercial GAC values for TPH, BTEX or MTBE.

6.4.2. Polycyclic Aromatic Hydrocarbons

Trace concentrations of some PAH compounds were reported for a number of samples across the site primarily associated with the upper made ground.

The analytical results for PAHs were below the Residential and Public Open Space GACs protective of human health in all of samples with the exception of:

- Benzo(a)pyrene (Public Open Space GAC 5.7mg/kg) in 2No. samples including WS9 (1.0m) at 7.209mg/kg and BH06 (2.0m) at 16.122mg/kg. Both values also exceeded the residential GAC (3.2mg/kg) along with WS9 (0.5m) at 4.355mg/kg.

- Dibenzo(ah)anthracene (Public GAC 0.58mg/kg) in 6No. samples including WS1 (1.0m) 3.2mg/kg, WS2 (1.0m) 1.239mg/kg, WS3 (0.5m & 4.0m) 0.836mg/kg & 1.081mg/kg, WS9 (0.5m) 2.137mg/kg and BH04 (1.0m) 0.678mg/kg. The above samples also exceeded the residential GAC along with 8No. samples including WS12 (0.5m) 0.317mg/kg, WS1 (5.0m) 0.525mg/kg, WS2 (3.0m) 0.483mg/kg, WS8 (2.0m)

0.36mg/kg, WS11 (2.0m) 0.363mg/kg, BH03 (0.5m), BH05 (2.0m) 0.348mg/kg and BH06 (1.0m) 0.455mg/kg. Note that 2No. samples including WS9 (1.0m) 3.874mg/kg and BH06 (2.0m) 10.344mg/kg also exceeded the Commercial GAC (3.6mg/kg).

- Benzo(a)anthracene (Resi GAC 2.3mg/kg) in 1No. sample from BH06 (2.0m) 21.06mg/kg. The sample did not exceed the Commercial GAC.

- Naphthalene (Resi GAC 2.3mg/kg) in 1No. sample from BH06 (2.0m) 5.377mg/kg. The sample did not exceed the Commercial GAC.

6.4.3.Metals

The analytical results for metals in samples were below the Residential and Public Open Space GACs protective of human health with the exception of:

- Arsenic in 2No. samples including WS1 (5.0m) 124mg/kg and WS2 (5.0m) 150mg/kg exceeded the Public Open Space GAC of 79mg/kg. Both of these samples also exceeded the Residential GAC of 40mg/kg along with WS2 (3.0m) 71mg/kg. The samples did not exceed the Commercial GAC of 640mg/kg.

- Lead (Public GAC 630mg/kg) in 11No. samples including WS1 (1.0m & 5.0m) 650mg/kg & 1402mg/kg, WS2 (3.0m & 5.0m) 972mg/kg & 1425mg/kg, WS3 (0.5m) 821mg/kg, WS5 (0.5m & 2.0m) 829mg/kg & 2263mg/kg, WS7 (3.0m) 739mg/kg, WS8 (2.0m) 1118mg/kg, WS12 (1.0m) 937mg/kg and BH06 (2.0m) 1187mg/kg. These samples also exceeded the Residential GAC (310mg/kg) in addition to 11No. of other samples including WS1 (3.0m) 365mg/kg, WS2 (1.0m) 408mg/kg, WS6 (1.0m) 606mg/kg, WS12 (0.5m) 481mg/kg, BH01 (2.0m) 362mg/kg, BH03 (0.5m) 466mg/kg, BH04 (1.0m, 5.0-5.3m & 6.0-6.3m) 392mg/kg, 430mg/kg & 480mg/kg, BH05 (2.0m) 602mg/kg and BH06 (1.0m) 439mg/kg. All samples did not exceed the Commercial GAC of 2,300mg/kg.

- Mercury in 2No. samples exceeded the Residential GAC (56mg/kg) including WS1 (5.0m) 308mg/kg and WS2 (5.0m) 320mg/kg. Both of these samples also exceeded the Public Open Space GAC (16mg/kg) in addition to WS7 (3.0m) 16mg/kg.

6.4.4.PCBs

No samples tested positive for PCBs above the laboratory limits of detection.

6.5. Groundwater Assessment

The risk to groundwater has been assessed from soil leachate values and their direct comparison to Groundwater Threshold Values and, in their absence, to IGV values. The groundwater analytical results for the site are presented in Table 3 along with Environmental GAC values, while results are compared to the SoBRA Human health GAC values in Table 4.

A total of 25No. groundwater samples were collected with GAC exceedances reported for 24No. samples. As stated in the original Buro Happold report, highly elevated concentrations of Chromium, Lead, Nickel and Zinc were recorded for BH04 on the 04/09/2008 which were suspected to have been cross contamination/lab error. Further laboratory analysis confirmed the contamination. Chromium results which had original displayed a concentration of 126 µg/l, reduced to 6 µg/l upon retesting. Therefore no further comment will be given on the heavy metal contaminant levels in the sample from BH04 taken on the 04/09/2008 as it is stated in the Buro Happold report that laboratory contamination was confirmed.

In terms of the 23No. remaining samples displaying GAC exceedances, exceedances consisted of Metals, PAHs, TPH, BTEX, MTBE and some indicator parameter such as Chloride, Sulphate, Total Hardness and Ammoniacal Nitrogen.

In terms of the Society of Brownfield Risk Assessment (SoBRA) which was set up to develop a methodology for assessing chronic risk to human health via inhalation of groundwater-derived vapours and also to derive generic assessment criteria (GAC) for selected contaminants. From the analytical results, 7No. samples were noted for exceedances for Aliphatics and 3No. samples for Aromatics.

6.5.1.LNAPL & DNAPL Samples

No visual, olfactory, or interface probe evidence of the presence of LNAPL or DNAPL during the investigation and/or sampling.

6.5.2.TPH, BTEX and MTBE

Groundwater samples were submitted to the laboratory for a suite of analysis to determine if there was widespread contamination within the groundwater beneath the site. In that context, total petroleum hydrocarbons (criteria working group carbon banding), BTEX and MTBE (an additive in petrol) was scheduled for all samples. Detected TPH concentrations were consistently elevated in BH02 and WS11. Concentrations ranged from 15,148.8-41,193µg/l which exceeded the EPA Interim value (IGV) and Groundwater regulations. TPH concentrations were occasionally elevated in BH03 (29/08/2008 & 10/09/2008), BH04 (29/08/2008), BH05 (29/08/2008 &10/09/2008, BH06 (10/09/2008), BH07 (29/08/2008) and WS7 (29/08/2008). Concentrations ranged from 112-48,320µg/l on the dates noted above, during which concentrations exceeded the EPA IGV and Groundwater regulations. TPH concentrations were consistently reported below the laboratory MDL only for BH01.

VOC analytical results for the groundwater samples were below the EPA IGV and Groundwater regulations with the exception of samples from WS11 which produced exceedances for the following:

- MTBE in 2No. samples on the 04/09/2008 (14µg/l) and 10/09/2008 (17µg/l) exceeding only the Groundwater regulation threshold (14µg/l);
- Benzene in 1No. sample on the 04/09/2008 (31µg/l) exceeding both the Groundwater regulation (0.75µg/l) and EPA IGV (1µg/l);
- Toluene in 1No. sample on the 29/09/2008 (19µg/l) exceeding the EPA IGV (10µg/l) threshold only;
- Ethylbenzene in 3No. samples on the 29/08/2008 (211µg/l), 04/09/2008 (13µg/l) and 10/09/2008 (15µg/l) exceeding the EPA IGV (10µg/l);
- Xylene in 3No. samples on the 29/08/2008 (527µg/l), 04/09/2008 (35µg/l) and 10/09/2008 (23µg/l) exceeding the EPA IGV (10µg/l).

SoBRA 2017 GACs

No exceedances were noted in any of the samples with the exception of BH03 and WS11. Aliphatic exceedances were noted which included the following:

- C6-C8 in 1No. sample from WS11 (04/09/2008 – 1,927µg/l);

- C8-C10 consistently in 3No. samples from WS11 across each of three sampling dates with concentrations of 948.8µg/l, 1,649.6µg/l and 315.6µg/l);

- C10-C12 consistently in 3No. samples from WS11 across each of the three sampling rounds with concentrations of 1,272.8µg/l, 1,403.2µg/l and 344.4µg/l.

Some significant exceedances in Aromatics were also noted which included the following;

- EC12-EC16 in 1No. sample from BH03 (29/08/2008 – 48,320µg/l);

- EC8-EC10 in 2No. samples from WS11 (29/08/2008 – 2161.2µg/l & 04/09/2008 – 2,522.4µg/l).

6.5.3.PAHs

All PAHs were below the laboratory MDL in BH01. The PAH analytical results for the remaining groundwater samples did not exceed the EPA IGV or Groundwater regulations with the exception of:

- Fluoranthene in 4No. samples exceeding the EPA IGV (1µg/l) including BH02 (10/09/2008 – 2.407µg/l), BH03 (10/09/2008 – 1.135µg/l), BH06 (17/09/2018 – 1.318µg/l) and WS11 (29/08/2008 – 1.792µg/l);

- Benzo(bk)fluoranthene in 3No. samples exceeding the EPA IGV (0.5µg/l) including BH02 (10/09/2008 – 2.07µg/l), BH03 (10/09/2008 – 0.903µg/l) and WS11 (29/08/2008 – 0.551µg/l);

- Benzo(a)pyrene in 6No. samples including BH02 (10/09/2008 – 0.714µg/l), BH03 (10/09/2008 – 0.453µg/l), BH05 (29/08/2008 – 0.015µg/l), BH06 (17/09/2008 – 0.148µg/l), WS7 (29/08/2008 – 0.053µg/l) and WS11 (29/08/2008 – 0.206µg/l). All the samples mentioned exceeded the Groundwater regulation value of 0.0075µg/l and EPA IGV of 0.01µg/l;

- Indeno(123cd)pyrene in 4No. samples exceeding the EPA IGV (0.05µg/l) including BH02 (10/09/2008 – 0.204µg/l), BH03 (10/09/2008 – 0.252µg/l), BH06 (17/09/2008 – 0.069µg/l) and WS11 (29/08/2008 – 0.117µg/l);

- Benzo(ghi)perylene in 5No. samples exceeding the EPA IGV (0.05µg/l) including BH02 (10/09/2008 – 0.248µg/l), BH03 (10/09/2008 – 0.217µg/l), BH06 (17/09/2008 – 0.082µg/l), WS7 (29/08/2008 – 0.057µg/l) and WS11 (29/08/2008 – 0.128µg/l);

- Total 16 EPA PAHs in 12No. samples including BH02 (10/09/2008 – 25.399µg/l & 17/09/2008 – 6.57µg/l), BH03 (29/08/2008 – 48.871µg/l & 10/09/2008 – 15.304µg/l), BH04 (29/08/2008 – 0.208µg/l), BH05 (29/08/2008 – 0.608µg/l) and BH06 (10/09/2008 – 0.347µg/l & 17/09/2008 – 12.445µg/l), BH07 (29/08/2008 – 0.149µg/l), WS7 (29/08/2008 – 1.105µg/l) and WS11 (29/08/2008 – 17.734µg/l & 10/09/2008 (0.275µg/l). All exceedances were for the EPA IGV (0.1µg/l).

6.5.4.Metals and Indicator Parameters

Chloride was detected above the GAC interim (30mg/l) and Groundwater regulations (187.50mg/l) thresholds for BH01, BH02, BH03, BH04, BH07 and WS7 on multiple sampling dates with concentrations as high as 1,986mg/l. Similarly BH05 displayed high chloride concentrations however only exceeding the Interim GAC value. Note BH06 and WS11 did not exceed GAC thresholds for Chloride. However regardless, these high concentrations are likely naturally occurring due to the location of the site in close proximity to the tidally influenced River Liffey.

Sulphate concentrations were detected above both the GAC interim (200mg/l) and Groundwater regulations (187.50mg/l) thresholds on each round of sampling for BH01, BH02, BH005, BH07 and WS7 with concentrations ranging from 261-1,021mg/l. BH03 (29/08/2008) and BH04 (29/08/2008) similarly exceeded both GAC values however only on one sampling occasion.

With the exception of BH03 and BH04 which exceeded the Interim GAC value of 200mg/l for Total Hardness on the one of three (29/08/2008) and three of four (29/08/2008, 04/09/2008 & 10/09/2008) sampling rounds respectively, all other locations exceeded the GAC value during each of the sampling dates.

The analytical results for metals in the groundwater samples were below the EPA interim guideline values and Groundwater regulations with the exception of:

- Dissolved Arsenic (Groundwater Regs 7.5µg/l) in;
  - BH05 on the 29/08/2018 (10µg/l), 17/09/2008 (10µg/l) and 10/09/2008 (9µg/l). BH05 samples from the 29/08/2008 and 17/09/2008 also exceeded the EPA interim value.
  - BH07 on the 04/09/2008 (8µg/l) and 10/09/2008 (8µg/l).
  - WS7 – 04/09/2008 (8µg/l).

- Dissolved Zinc (Groundwater Regs 75µg/l) in;
  - BH01 – 10/09/2008 (151µg/l);
  - WS11 – 29/08/2008 (76µg/l);

  Note the sample from BH01 also exceeded the EPA interim value.

- Dissolved Lead (Groundwater Regs 7.50µg/l) in;
  - BH01 – 10/09/2008 (16µg/l);
  - BH03 – 04/09/2008 (19µg/l);
  - WS7 – 04/09/2008 (35µg/l);
  - WS11 – 04/09/2008 (62µg/l);

All of the samples above for dissolved lead also exceeded the EPA interim guideline value of 10µg/l.

Elevated levels of Ammoniacal Nitrogen were recorded during all sampling rounds for BH02, BH05, BH06, BH07, WS7 and WS11 which all exceeded the Groundwater regulations of 0.18mg/l significantly with concentrations ranging from 0.8 - 39.4mg/l. Additionally, an elevated pH value of 10.05 was determined for BH04 on the 29/09/2008.

6.5.5. Volatile Organic Carbons (VOCs, sVOCs), Phenols and PCBs

Other than BTEX no other VOCs, phenols, phthalates or sVOCs, were identified.

6.5.6. Vapours from Groundwater

The groundwater results were compared to the SoBRA GACs (2017) for residential and commercial use as a screening exercise to evaluate whether the concentrations on site present a potential risk to human health onsite and offsite. Table 6.1 outlines the SoBRA GACs for residential developments exceedances for the site. Some of these exceedances were significant but there were no exceedances of the commercial GAC.

In addition to the compounds outlined in Table 6.1, MTBE, Benzene, Toluene, Ethylbenzene, Xylene, Fluoranthene and Benzo(a)pyrene were identified in the groundwater exceeding the EPA IGV. These chemicals are sufficiently volatile and toxic and may require additional assessment to determine if they present a risk to indoor or outdoor air from volatilisation.

Table 6.1 SoBRA GAC screened values

Location ID	Date Sampled	Parameter	Concentrations (µg/l)	SoBRA Res GAC (µg/l)
WS11	04/09/2008	C6 – C8	1927	1500
	29/08/2008	C8 – C10	948	57
	04/09/2008		1649.6	
	10/09/2008		315.6	
	29/08/2008	C10 – C12	1272.8	37
	04/09/2008		1403.2	
	10/09/2008		344.4	
	29/08/2008	EC8-EC10	2161.2	1900
	04/09/2008		2522.4	
BH03	29/08/2008	EC12 – EC16	48320	39000

6.6. Ground Gas Assessment

Ground gas (Carbon Dioxide and Methane) monitoring was undertaken at 7No. locations across the site comprising of four visits at weekly intervals between 29th August and 17th of September 2008. The sampling visits were conducted during periods when atmospheric pressure ranged from 990-1019nPa. Sample locations included WS6, WS9, WS10, WS12, WS3, WS7 and WS11 with response zones ranging from made ground to estuarine deposits and boulder clay. Gas samples were collected from WS3, WS10 and WS11 on one occasion and analysed in a laboratory to confirm the readings recorded on site. Oxygen and carbon dioxide concentrations were consistent with laboratory analysis however methane concentrations for WS11 (5.7%) were slightly higher than the laboratory results (4.2%). The gas monitoring equipment used was a GA2000 gas analyser which is a certified methane analyser, recording/monitoring of Hydrogen Sulfide (H2S) and Carbon Monoxide (CO) was not carried out. The GA2000 will give accurate methane readings however only when no other hydrocarbons are present. Elevated gas levels for carbon dioxide and methane are outlined in Table 6.5.

Table 6.5 Gas monitoring results

Gas	Flow Rate (l/hr)	Atmospheric Pressure (mb)	Location ID	Response Zone Stratum	Date Sampled	Concentration (% Air)
Carbon Dioxide	0	1019	WS6	MG	17/09/2008	6.4
	0.2	1017	WS3	MG/SLT	29/08/2008	7.7
	0.2	990			04/09/2008	9.4
	0.1	999			10/09/2008	10.6
	0.2	1019			17/09/2008	10.2
	0.1	991	WS11	SLT/BC	04/09/2008	9.3
	0.2	1001			10/09/2008	5.7
	0.1	1019			17/09/2008	8.7
Methane	0	1019	WS10	MG	17/09/2008	5.6
	0.1	991	WS11	SLT/BC	04/09/2008	100
	0.2	1001			10/09/2008	1.2
	0.1	1019			17/09/2008	69.7

SLT – Silt BC – Boulder Clay MG – Made Ground

6.6.1.Possible Sources

The previous site investigations demonstrated that the Connolly site is underlain by a significant volume of made ground of up to 7.2 metres thick in places. Made ground can contain some putrescible anthropogenic materials such as cloth and wood fragments, but this is not considered to be at a level sufficient to produce volumes of ground gas that would be at risk to new buildings. There is no record of putrescible waste being deposited on the site, nor any evidence from the site investigation to indicate any significant amount of putrescible waste having been deposited in the site.

There is potential evidence of volatilisation of aliphatic hydrocarbons from the groundwater with site investigation location WS11 demonstrating elevated methane and carbon dioxide levels in conjunction with elevated levels of aliphatics and other hydrocarbons in the soil and groundwater. Hydrocarbon odours were noted during the site investigation below 2.0m at WS11 however no visual/olfactory evidence was recorded. Similarly during groundwater sampling, hydrocarbon odours were noted in water purged from WS11, BH03 and BH02 and a slight hydrocarbon sheen was noted in the purged water from WS11, BH02, BH06 and BH03.

The desk study indicated previous possible sources of hydrocarbons from fuel storage tanks onsite, chemicals/lubricants associated with train maintenance and it is also possible that an additional source of hydrocarbons may be external to the site as previous surroundings land uses have been indicted to include timber yards and fuel storage facilities such as coal yards and tobacco factories.

As noted by the authors of CIRIA C665 (2007) glacial tills with no other ground gas source can yield gas concentrations of CO_2 in the order or 5%. It is noted that the maximum recorded CO_2 during the monitoring was 10.6%. Furthermore, these authors indicate that experience has shown that where natural ground is disturbed it is common to see a fall in gas concentration with increased time from disturbing the ground. This is not the case where there is a gas producing source.

Therefore, the credible sources of CO_2 and Methane are:

- Made Ground;
- Underlain Natural Ground;
- Onsite hydrocarbon contamination of soil and groundwater;
- Migration of Carbon Dioxoide/Methane from offsite sources.

6.6.2.Possible Receptors

The receptors that have been considered during this assessment are the onsite residential receptors of the redevelopment. The proposed development best fits a type B building; i.e. private or commercial property with central building management control of any alterations to the building or its uses but limited to central building management control of the maintenance of the building, including gas protection measures. Type B buildings can consist of small to medium size rooms with passive ventilation. May be of conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels.

6.6.3.Possible Pathways

The dominant lithology on the site is gravelly clay. Pathways for gas migration through the clays are potentially via:

- Macropores such as land drains, glacial fractures, or deep root voids;
- Gravel and sand lenses and bands within the clays;
- Volatilisation of gas dissolved within groundwater.

Pathways for ingress of ground gas into buildings are:

- Services, but given that the proposed development is a new build, services can be cast into the slab and be sealed to ensure they are waterproof therefore gas migration will not be significant.
- Vertical migration through cracks in the floor slab.
- Accumulation in voids beneath floor slab.

Ground gas ingress into buildings will be prevented by risk appropriate measures built into the basement and slab design and construction methodology thus breaking the source pathway receptor linkage. The building will be supported on piled foundations, measuring approximately 900mm in diameter and extended into the Limestone bedrock, which underlies the site at depth. The piles will be constructed using bored techniques, which form an intimate skin friction and limit ground disturbance. All piles will be embedded into the pile caps / ground beams. Thus, the piles do not create voids in the soil around them nor do they increase the permeability of the soil. Therefore, they do not form preferential pathways for vapour/gas migration.

6.6.4.Ground Gas Risk

The soil data has been assessed with reference to CIRIA report C665. Consideration has therefore been given to both methane and carbon dioxide concentrations as well emission (flow) rates.

As the possibility of an offsite source of dissolved gas volatilising within the site from contaminated groundwater cannot be discounted, and as the monitoring data set is both temporally and spatial limited, as recommended by the BS8485:2015 standard, the worst case Gas Screening Value (GCV) was derived, i.e. the maximum recorded flow for any monitoring well multiplied by the maximum recorded concentration of any gas. This gives the site a characteristic GSV of 0.2 litres/hour (l/hr). As specified in Table 2 of the CIRIA C665 report, resultant from this derived GSV and because gas flow is less than <70l/hr, the site has a characteristic gas situation (CS) at a level of CS2 which is a low hazard potential.

As specified in Table 3 of the standard, the proposed development best fits a Type B characterisation, as a consequence mitigation measures put in place for the management of ground gas should as specified in Table 4, obtain a Minimum Gas Protection Score (MPGS) of 3.5. A combination of two or more of the following types of protection measures should be used to achieve that score:

- The structural barrier of the floor slab, or of the basement slab and walls if a basement is present;
- Ventilation measures; and
- Gas resistant membrane

This is a very conservative assessment, and if gas protection measures used do not meet the MPGS of 3.5 then further investigation of ground gas should be undertaken to assess the risk of the designed gas protection measures.

As part of the proposed development, a significant volume of the made ground and natural material will be excavated and removed offsite to a suitable waste facility. However the structure of the railway arches along Sheriff Street Lower will be retained. A ground gas methane reading of 5.6% was recorded in the vicinity of this area. Therefore additional consideration will have to be given to this area in relation to ground gas protection measures. Further ground gas investigation may also be required which may be in the form of a more extensive ground gas monitoring programme or DQRA.

7. REFINED CONCEPTUAL SITE MODEL (CSM)

Based on the findings of the soil and groundwater assessment i.e. the results of the GQRA, potential contamination source areas have been identified for the site. The CSM can now be refined using site specific information and the potential risk to human health can be assessed taking into account the proposed redevelopment of the site as outlined in Section 1.3.

7.1. Source – Made Ground – from previous site use or original source.

The exceedances of the GAC for metals (arsenic and lead) for residential without plant uptake were typically associated with the made ground. All samples analysed are from the top 6.5m layer of soil, based on the proposed plans discussed in Section 1.3, there will be a 10m dig within the basement footprint and hence all risk associated with the Made Ground within the basement footprint will be removed. Sampling of the soils (Natural Ground) which will be directly beneath and in contact with the basement is recommended.

Outcome: Further assessment required.

7.2. Source – Ground Gas/Vapour Risk.

Significant concentrations of ground gas were measured across the site in the 2008 sampling events. Elevated concentrations of hydrocarbons in the groundwater might pose a vapour intrusion risk to the future development. It is recommended that standpipes are to be installed and screened across the layers of soil which are to remain on-site post development, to investigate the risks associated with ground gas and/or vapour intrusion risks.

Outcome: Further assessment required.

7.3. Source – Offsite Sources

As identified in the initial CSM, migration of contamination from adjacent properties historically used as timber yards, coal yards, railway lines and associated depots is a significant concern. However as part of the design for the site, a secant pile wall is proposed for the entirety of the basement footprint.

Based on the above, the migration pathway is broken after construction as a result of the pile wall and therefore no further mitigation is required. Note. Migration pathway to the areas associated with the Arches which will remain outside of the pile wall will require additional assessment and consideration at design.

Outcome: Further assessment required.

7.4. Source – On-Site Oil Tanks

The presence of oil tank require further investigation, the tank should be decommissioned prior to redevelopment of the site, and the area surrounding its location should be investigated if additional site investigation takes place.

Outcome: Further assessment required.

7.5. Source – Groundwater

The sampling exercise in 2008 show that groundwater across the site is impacted by Polycyclic Aromatic Hydrocarbons (PAHs), BTEX, Phenols and Total Petroleum Hydrocarbons.

Based on the above, additional evaluation and assessment is required during the next phase of works.

Outcome: Further assessment required.

7.6. Refined CSM

Table 7.1 Summary Revised Conceptual Site Model

SOURCE	PATHWAY	RECEPTOR	POTENTIAL POLLUTANT LINKAGE Y/N
Environmental			
Migration of contamination from adjacent properties such as historic timber treatment, coal yards and in particular the adjacent railway lines and depots.	Migration of contaminants from natural soils	Groundwater in the Gravel and/or bedrock aquifer	N
Potential historical on-site spills - Potential contamination within deep subsoil materials from historic activities (railway lines, oil tanks and associated maintenance yards) and from unknown source of material which could have been contaminated during original filling.			Y
Potential contamination within groundwater	Migration of contaminants in the subsoil and bedrock aquifer	Potential surface watercourses (River Liffey) via groundwater baseflow.	Y
Human Health			
Migration of contamination from adjacent properties such as coal yards, timber yards, and in particular the adjacent railway lines and depots.	Vapour migration to indoor and outdoor air	Onsite Residents and Commercial Future Users.	N
Migration of contamination from adjacent properties such as historic coal yards, tobacco factories, railway lines, and railway depots.	Inhalation/ dermal contact/ ingestion of soils/ dusts	Onsite Residents and Commercial Future Users.	Y
Potential historical on-site spills - Potential contamination within deep subsoil materials from historic activities (Coal Yards, Railway Depots and Lines) and from unknown source of material which could have been contaminated during original filling.			
Potential contamination within groundwater	Migration of contaminants in the bedrock aquifer	Groundwater users.	N

Note: Generic risk assessments do not assess risks to construction workers who are managed under the Safety and Welfare at Work Regulations.

A simple pictorial illustration of the revised CSM following the design measures is included in Figure 7.1.

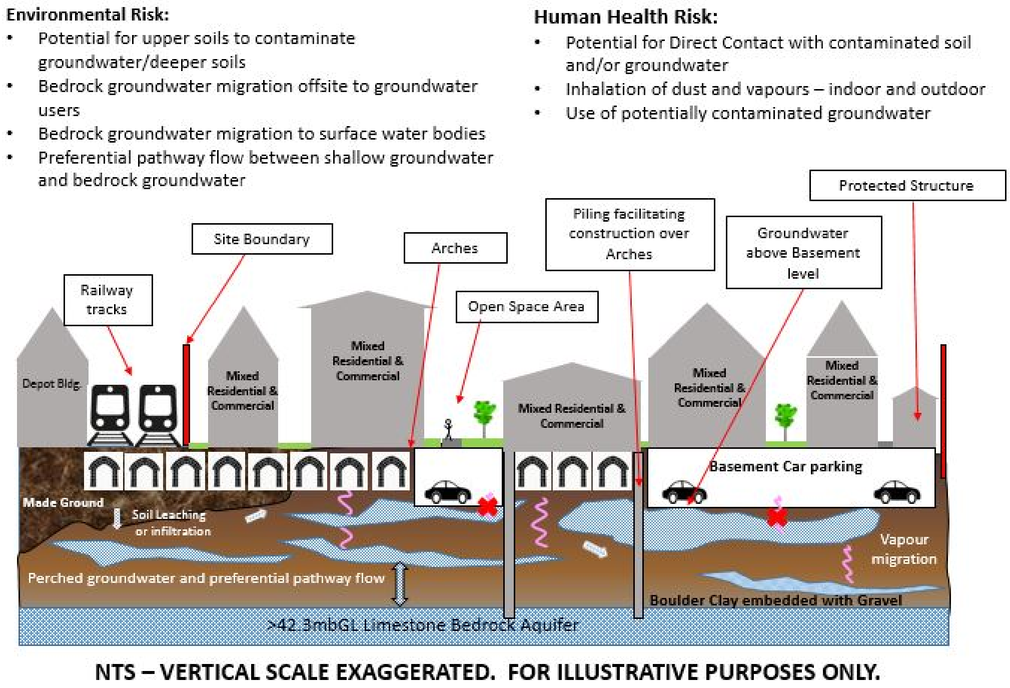

Figure 7.1 Revised Conceptual Site Model

8 WASTE SOIL CLASSIFICATION

The following classification is based on tabulated third party data. The laboratory certificates are not available to this classification. The number of sampling locations, consistency of analysed parameters, and depth of sampling are such that any assessment for soil waste management based on them should only be considered indicative. Consequently, the assessment made on this data is considered not to be fully representative of the site. Further site investigations and sample analyses will be required to provide a robust assessment in line with industry standard operating procedures.

8.1 Hazardous Waste Assessment

To comply with the European Waste Framework Directive (2008/98/EC), S.I. 233 of 2015 and S.I. 126 of 2011; a hazardous waste assessment was carried out utilising HazWasteOnline software using classification engine WM3.v1.1 (2018). The software enables the user to review the total pollutant content analysis in terms of any Hazardous Properties (as defined in the Regulations) the material may have. The material is assessed against an array of hazardous property thresholds as prescribed in the relevant Regulations and Guidance (Section 1.6).

Of the analyses for the 40 No. samples presented only one sample is assessed as being Hazardous; specifically:

- 0No. (zero) samples have been assessed for total metal soil concentrations for Antinomy Barium, Molybdenum;
- 37 No. samples were assessed for other metal species of which only one sample from 2mbGL in WS5 was hazardous for Lead and Copper;
- 35No. samples were assessed for PAHs of which all were analysed to contain Non hazardous concentrations;
- 15No samples were assessed for TPH(C6-C40) of which 11No.samples had concentrations greater than the limit of detection. As there was no free draining liquid waste reported to be within the soil, and as the concentration in all samples was so low, all these 15No.samples are assessed as containing Non-hazardous concentrations of TPH;
- 19No samples were assessed for BTEXs of which 2No.samples had concentrations greater than the limit of detection. As there was no free draining liquid waste reported to be within the soil, and as the concentration in all samples was so low, all these 19No.samples are assessed as containing Non-hazardous concentrations of BTEXs;
- 19No samples were assessed for PCBs of which no samples reported concentrations above limit of detection. All these 19No.samples are assessed as containing Non-hazardous concentrations of PCBs;

8.2 Waste Acceptance Criteria Assessment

20No. samples were subjected to a leaching test. The leaching results and a selection of total pollutant content results have been compared with the thresholds for acceptance of waste at inert, non-hazardous and hazardous facilities as prescribed in the Landfill Directive. An additional category was included which is based on the integrated Material Solutions Hollywood waste acceptance criteria which are the same as the inert criteria with the exception of total PAHs (100mg/l). The classification categories are outlined in Table 8.1

Table 8.1 Classification Categories

WASTE CATEGORY	TITLE	CLASSIFICATION CATEGORY	POTENTIAL OUTLET
Category A	Inert Waste Criteria	Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results found to be non-hazardous using the HazWasteOnline application.	Reuse or recovery subject to Planning and/or Waste Permissions. Inert Landfills e.g. Murphy Gormanston, Roadstone Huntstown. If material constitutes MADE ground acceptance needs to be confirmed in advance with landfill.
Category B	Inert (IMS Acceptance Criteria)	MEHL Acceptance Criteria as laid out in their Waste Licence W0129-02. Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) **with the exception of PAHs (Total 17 <100mg/kg)**. Results found to be non-hazardous using the HazWasteOnline application.	Disposal at Integrated Materials Solutions Naul Facility.
Category C1	Non-Haz Criteria	Analytical results greater than Category A criteria but less than non-hazardous waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) **no limit for TOC**. Results found to be non-hazardous using the HazWasteOnline application.	Disposal/Recovery at licensed Landfill (Ballynagran, Knockharley, Drehid). Material can be sent for recovery as engineering material rather than disposed of (no landfill tax).
Category C2	**Non-Haz Criteria but with trace asbestos**	Results as per C1 but with trace asbestos	Material will need to be disposed of at a licensed landfill if trace asbestos confirmed. If asbestos level is quantifiable then it may have to be disposed in N. Ireland.
Category D	Hazardous	Analytical results found to be hazardous using the HazWasteOnline application.	None in Ireland (export).

NOTE: HazWasteOnline accessed through http://www.hazwasteonline.com. Application developed by One Touch Data Limited based on Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP) and the latest UK Environment Agency guidance, WM3 v1.1 (2018). The EPA have stated that the HazWasteOnline tool is acceptable for the classification of wastes in Ireland and they have a licence for the application to review results if required.
NOTE: Where material is sent for RECOVERY it does not incur the landfill tax (currently €75/tonne)
NOTE: While waste soil is classified based on the EU Council Decision 2003/33/EC, waste acceptance criteria may vary at each potential Waste Receiver site and further assessment and consultation may be required with the proposed Waste Receiver to confirm suitability for disposal. In terms of permitted sites, further assessment in terms of potential impact to the environment may be required or inert waste comprising made ground may not be acceptable. The Regulations also allow Waste Receivers to agree increased specific limits (e.g. TOC, sulphates) following Risk Assessment, agreement with the EPA and notification of the EC.

The assessment for each sample is contained in the Waste Classification Table which is attached in Table 6 at the end of this report.

While OCSC provide an opinion on which potential Waste Receivers may accept any particular type of material, it is up to the individual Waste Receivers whether they can accept the material (based on results, site acceptance criteria, void space, percentage of non-natural materials within made ground etc).

8.3 Waste Codes

The code for soil and stone material as per the List of Waste is:

- 17 05 04 soil and stone other than those mentioned in 17 05 03

For made ground there is often a portion of the material which is not soil and stone (e.g. brick fragments, concrete, clinker, timber etc). There is no guidance available on what proportion of other materials is acceptable when classifying a single waste stream although a standard industry guideline of 5% maximum visible contamination with other waste types is often employed. Some facilities have specific limits in their licence (e.g. for non-greenfield sites soil and stone to have <2% contamination with non-natural materials). Therefore it is required to confirm the acceptable levels of contamination of non-natural materials with the Waste Receiver in advance of exporting material to site.

The code for soil and stone which has been classified as hazardous is:

- 17 05 03* soil and stones containing hazardous substances

There are no hazardous waste landfills in Ireland; however, there is one facility licensed to treat hazardous material (Enva Portlaoise). All hazardous material which cannot be treated at Enva is exported to an appropriately permitted facility in the EU via a Waste Broker or direct under Transfrontier Shipment (TFS).

8.4 Summary of Waste Classification to Date

Table 8.2 summarises the waste assessment carried out on site investigation samples (i.e. from boreholes and window samples). Note not all of the 20No. samples were tested for the same parameters.

Table 8.2 Waste Classification Results

	A Inert	B Inert (MEHL)	C1 Non-Haz	C2 Non-Haz w/ trace asbestos	D Hazardous
No. of samples	0	0	19	0	1

Of the 19 No. samples classifiable as C1 – Non-Hazardous:

- 11No. of 17No. samples showed Total Organic carbon concentration in excess of the Inert limit;
- 10No. of 18No. samples showed PAH (sum of 6) in excess of the Inert limit;
- 5No. of 20No. samples showed dissolved Antinomy in excess of the Inert limit;
- 5No. of 20No. samples showed dissolved Selenium in excess of the Inert limit;
- 2No. of 16No. samples showed dissolved Fluoride in excess of the Inert limit;
- 3No. of 16No. samples showed dissolved Sulphate in excess of the Inert limit;
- 3No. of 16No. samples showed Total Dissolved Solids in excess of the Inert limit;
- 3No. of 20No. samples showed dissolved Arsenic in excess of the Inert limit;
- 2No. of 20No. samples showed dissolved Chromium in excess of the Inert limit;
- 3No. of 20No. samples showed dissolved Molybdenum in excess of the Inert limit;
- 3No. of 20No. samples showed dissolved Nickel in excess of the Inert limit;
- 1No. of 16No. samples showed dissolved Chloride in excess of the Inert limit.

The waste soil assessment made on this limited data set, indicates that the upper part of the soil is probably unlikely to be acceptable at an inert soil disposal or recovery facility. It is expected that excepting the potential for heavy metal hotspots the soil would generally be acceptable at a non-hazardous landfill. The HazWasteOnline Assessment is attached in Appendix C.

8.5 Asbestos

Of the 40No. samples, 35No. samples were subjected to Asbestos screening. 0No. (zero) samples of those 35No. samples contained detectable asbestos fibres.

8.6 Dig Plans

Only a limited and incomplete set of samples were collected for Waste Acceptance Criteria (WAC) during the 2008 investigation. There is an insufficient sampling density available to create a Dig Plan for the Site. It is strongly recommended that additional site works are undertaken post planning to facilitate the most cost-effective disposal of material and facilitate their acceptance to a licenced waste facility.

It should be noted that the Dig Plans indicate waste soil classifications to enable excavations and assume that the analytical sample results for the key components from that cell are representative for the entire volume of the cell. This is an accepted industry practice and the Contractor will also be informed of the Watching Brief and Discovery Strategy (contained in the Construction Demolition Waste Management Plan (CDWMP) in the event of any unexpected visual or olfactory contamination hot-spots being encountered.

8.7 Contractor Requirements regarding Waste Soil & Groundwater Management

The management of waste soils, hazardous materials and groundwater during construction must comply with all relevant environmental and waste regulations (see Section 1.6 for a non-exhaustive list).

A Soil and Groundwater Management Plan should submitted with the planning applications for the site. This report outlines requirements and recommendations regarding the management of Soil and Groundwater during the construction phase. The designated Contractors will be required to adopt and amend these plans in advance of works starting on site.

The following section outlines requirements and recommendations which the Contractor is required to implement regarding the management of waste soil throughout the project.

8.7.1 Watching Brief

It is possible that unknown isolated hotspot areas which could contain potential contamination (either physical such as waste, underground storage tanks, asbestos or chemical such as hydrocarbons) could be present on site.

Should the contractor encounter any ground conditions which differ from those outlined in this report and/or the ground investigation reports they should suspend works in that area and notify the Client or their representative.

The contractor is required to ensure that no cross-contamination and/or mixing of materials of different waste categories occurs on site.

8.7.2 Hazardous Cells

There are no hazardous cells identified by the site investigations. Should however it become evident for any reason that contamination is or suspected to be present in the soil then the contractor should suspend works in that area, notify the Client or their representative, and request that the dig plans be revised including if appropriate further site investigation.

8.7.3 Export from Site

All excavated soil and wastes requiring export from the site, for recovery or disposal offsite, shall require waste classification. Waste classification shall be carried out by a suitability qualified and experienced person via sampling and analysis following best industry practice and relevant legislation including:

- List of Waste & Determining if Waste is Hazardous or Non-Hazardous (EPA, 2015);
- European Waste Framework Directive (2008/98/EC);

- Guidance on the classification and assessment of waste, Technical Guidance WM3 (EA et al, 2015);
- EU Council Decision 2003/33/EC and 1999/31/EC (2002);
- European Union (Properties of Waste which render it Hazardous) Regulations 2015 – S.I. 233 of 2015; and
- EC Classification, Labelling & Packaging Regulations (No. 1272/2008).

Written confirmation shall be obtained from the proposed Receiver (either under an Article 27 Declaration or Waste Permission) in advance of materials being removed from site. All Waste Receivers and Waste Hauliers shall hold valid and appropriate permissions and shall be preapproved by the Client or their Representative.

Where material is to be exported out of the State it shall be carried out with the agreement of the TFS office in DCC and in accordance with all relevant legislation including:

- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations, 1988 (S.I. No. 248 of 1988);
- The Basel Convention; and
- European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011).

Where material is awaiting classification and/or acceptance by a Waste Receiver it shall either be; left in-situ or; excavated and stockpiled in an appropriate manner, which means, as a minimum, that:

- A temporary storage area shall be designated;
- All stockpiles to be assigned an identifier number;
- Excavation and stockpile formation shall be carried out in a controlled manner to ensure cross-contamination is avoided;
- Non-hazardous and hazardous soil shall be stockpiled only on hard-standing or high-grade plastic to prevent leaching and cross contamination of underlying soils; and
- Stockpiles shall be covered with high-grade plastic sheeting to avoid leachate and dust generation. The plastic sheeting must be adequately weighted on tied down to prevent being blown off by the wind.

Stockpile sampling shall be carried out by a competent person following a documented sampling procedure or recognised standard[1]. Once a stockpile has been sampled it is considered complete and no more material shall be added to it.

An excavation/stockpile register shall be maintained showing as a minimum the following information:

- Stockpile number;
- Origin;
- Approximate volume of material;

[1] eg. ISO 10381-8:2006 Soil quality – Sampling- Part 8: Guidance on sampling of stockpiles or WM3 Guidance

- Date of creation;
- Date of sampling;
- Description of material;
- Classification;
- Removal date and destination; and
- Photograph.

8.7.4 Monitoring Requirements

The Contractor shall ensure that all waste materials associated with the project are appropriately classified and documented and shall include in the CDWMP appropriate measures such as:

- Arrange for soil samples to be collected either prior to excavation (in situ) and/or from the stockpiles of material before disposal;
- Arrange for samples to be analysed at an accredited laboratory for an appropriate and approved suite of parameters;
- Assess the results against the appropriate criteria to classify the waste; and
- Maintain copies of all sample details, results, assessments and provide copies of same to the Client or its Representatives.

8.7.5 Documentation

Waste disposal shall be documented within a Waste Documentation System which shall be developed by the Contractor within the overall document management system for the works and shall be included in the Construction Management Plan (CMP). The documentation to be maintained in relation to wastes shall include the following:

- Details of all parties involved in the transport of material (including. Hauliers, Agents, Shipping details etc.);
- Details of the Waste Receivers including any intermediary facilities;
- Written confirmation of the acceptance and recovery/disposal of any hazardous waste consignments;
- The tonnages and Waste Code for all waste materials;
- Details of each individual consignment of waste including:
    - Docket number of consignment
    - Date and time;
    - Name of Haulier, vehicle registration and Driver;
    - Volume/weight of consignment;
    - Description of material and origin (stockpile or cell number);
    - Name of receiving facility;
    - Date and time of arrival at receiving facility; and
    - Docket/weighbridge ticket number from receiving facility;
- All Waste Transfer Forms for hazardous waste;

The Contractor shall maintain an electronic register with the aforementioned details, as well as copies of all dockets from hauliers, and receivers. The Contractor shall provide regular reports to the Client or its representative including copies of the register and dockets if required.

9 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The site currently comprises of a CIE car park, CIE Group buildings, Rolling stock maintenance shed, and part of existing railway lines / sidings. The site had been granted planning in 2012 for a mixed-use development to include commercial offices, leisure centre and residential properties overlying a basement carpark. An outline of what is proposed as part of the new planning permission is outlined in section 1.3. This new planning permission is currently undergoing feasibility study. A summary of the Environmental Site Assessment (ESA) and Generic Quantitative Risk Assessment (GQRA) findings are detailed below:

- The site is bounded by Seville Place and Oriel Hall to the north; Sheriff Street Lower to the south; Oriel Street Upper to the east; and Connolly Station (Protected Structure) to the west, Dublin 1. The River Liffey is 340m to the south of the site while the Royal Canal is 215m east.
- The site was historically infilled, and then used as a Goods Shed. An oil tank can be seen in southern portion of the site on the OSI maps (1888-1913). Adjacent historic activities include tobacco factory, coal yard, Amiens street terminus, bonded stores, and timber yards.
- Historic investigations showed the site's proven geology to be Made Ground over a layer of glacial till, the glacial till layer is composed of sandy GRAVEL embedded among or between a layer of sandy gravelly CLAY. There is a discontinuous layer of sandy SILT with sea shells in the southern end of the site towards Sherriff Street Lower and bedrock was not encountered.
- The conceptual site model identified the receptors as future residential and commercial receptors on-site and offsite human health and environmental receptors.
- The site investigation works carried out included the collection of a number of soil samples, very few samples were analyzed thoroughly to enable the characterization of the material for waste classification purposes.
- A GQRA was undertaken using residential without plant uptake to assess the risk to the residential receptors while commercial GACs were used to assess the risk to future commercial users. This is a conservative assumption given the designed presence of a basement beneath the occupied spaces. Further information will be required in order to refine the Generic Quantitative Risk Assessment (GQRA) as to whether the basement will be occupied or not in order to evaluate the risk more thoroughly.
- Soil analytical results show that the samples collected do not exceed the GAC limit for commercial except for WS9 (1m), WS12 (0.5m) and BH06 (2m), those samples had elevated Polycyclic Aromatic Hydrocarbons (PAHs). If a shallow basement (4m deep) is proposed and it is to be located within the footprint of the above SI points, then, the risk will be removed from a commercial perspective.
- Soil analytical results show that a significant number of samples exceed the GAC limit for residential without plant uptake. However, majority of those samples are from the upper 3mbGL, except for WS1 (5m), WS2 (5m) and BH04 (5-5.3 and 6-6.3m), those samples had elevated metals and/or Polycyclic Aromatic Hydrocarbons (PAHs). If a shallow basement (4m deep) is proposed and it is to be located within the footprint of the above SI points, then, the risk will be removed from a residential perspective.
- The generic prevalent contaminants in the soil across the site are elevated metals (Lead) and PAHs (Dibenzo(ah)anthracene).

- The sampling exercise show that groundwater across the site is impacted by Polycyclic Aromatic Hydrocarbons (PAHs), BTEX, Phenols and Total Petroleum Hydrocarbons, both WS11 and BH03 show concentrations above the SOBRA 2017 GACs for residential. The maximum TPHs and PAHs concentration recorded across the site was 48.32 mg/l and 48.871 µg/l respectively in BH03. The maximum BTEX and Phenols concentrations across the site were 757 µg/l and 0.18 µg/l in WS11 and BH01 respectively.
- No LNAPL (floating hydrocarbon) or DNAPL (settled/sinking hydrocarbon) layer was observed and/or sampled throughout the 2008 study.
- Significantly elevated ground gas (methane and carbon dioxide) was identified during the limited sampling undertaken in 2008. Based on the 2008 results, there is a requirement identifying remedial works for Characterisation Situation 2 (CS2).
- It is anticipated that a number of the pathways of concern such as direct contact from metals will be broken due to the basement construction i.e. the removal of some material as a result of design measures and breaking the pathway by the use of concrete however, an updated GQRA will be required following the completion of any additional site investigation to further characterize the risks associated with the development.
- The number of sampling locations, consistency of analysed parameters, and depth of sampling are such that any assessment for soil waste management based on them should only be considered indicative. Consequently the assessment made on this data is considered not to be fully representative of the site. Further site investigations and sample analyses will be required to provide a robust assessment in line with industry standard operating procedures.

  The waste soil assessment made on this limited data set, indicates that the upper part of the soil is

  - Potentially predominantly non-hazardous, with a hotspot hazardous nature resultant of lead and copper content. There is not sufficient data to exclude the potential for TPH hotspots.
  - Probably unlikely to be acceptable at an inert soil disposal or recovery facility. It is expected that excepting the potential for heavy metal hotspots the soil would generally be acceptable at a non-hazardous landfill.

9.1 Recommendations

It is recommended that the following works are completed:

- A further more robust soil waste classification exercise should be carried out in advance of any excavation works to classify the soils according to the relevant statutory requirements such as 2003/33/EC. OCSC recommend the site to be divided into 50m square grids and a borehole should be drilled in each grid, with samples taken at each 1m depth intervals across the proposed dig depth. Majority of licenced waste facilities require 1No. representative sample for each 1500-2000 tonnes to be disposed of;
- All samples for waste classification purposes should be analysed for a full suite of waste acceptance criteria parameters with an MCERTS/UKAS accredited laboratory.
- It is recommended that due to the large area of the site, the soil waste classification exercise should be carried out prior to the start of the basement excavation in order to

identify suitable licenced waste facilities to accept it, hence avoiding the need to store large soil stockpiles on site;

- It is recommended that if a car park basement is proposed, and that a secant piled wall is be used to form the basement, the depth to bedrock should be proven with the means of an additional site investigation which should/preferably coincide with the waste classification exercise in order to optimise time and/or cost associated with the works;
- Heavy metal contamination identified in the made ground, particularly in the upper layers, has the potential to create an unacceptable risk to human health, depending on the development. This needs to be assessed against the proposed development layout (such as basement depth, footprint and etc) to ensure the design breaks any source pathway receptor linkage identified, particularly in the case if some of the made ground is left on site after development;
- A Vapour Intrusion Risk Assessment (VIRA) was not completed as part of the previous assessment. A VIRA assesses risk to indoor and outdoor air from contamination on site. Given the presence of contamination in the soils and groundwater on site this should be undertaken to ensure that the appropriate mitigation measures are identified and included;
- Due to the presence of a water bearing GRAVEL layer, any dewatering scheme proposed during the basement excavation needs to take into account the elevated concentrations of PAHs, TPHs, Phenols and BTEX in the groundwater across the site. Also, these should be taken account of for the purpose of discharge licence requirements and potential onsite treatment if discharge to sewer is going to occur;
- Significantly elevated ground gas (methane and carbon dioxide) was identified during the limited sampling undertaken in 2008. Within the 2008 report there is a requirement identifying remedial works for Characterisation Situation 2 (CS2). It is recommended that additional gas monitoring is carried out and if required at that time a detailed gas risk assessment is undertaken. This detailed assessment could remove the requirement for mitigation to be incorporated into the development.

Respectfully submitted

on behalf of OCSC Multidisciplinary Consulting Engineers

AHMED THAMER AHMED
MSc MIEI EnvEng
ENVIRONMNETAL ENGINEER

Eleanor Burke

ELEANOR BURKE
MSc MIEnvSc
TECHNICAL PRINCIPAL & DIVISION MANAGER

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Figures

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Tables

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Appendix A

Buro Happold Report – 2008

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Appendix B

Nearby Site Investigation Records

Appendix C

HazWasteOnline (HWOL) assessment

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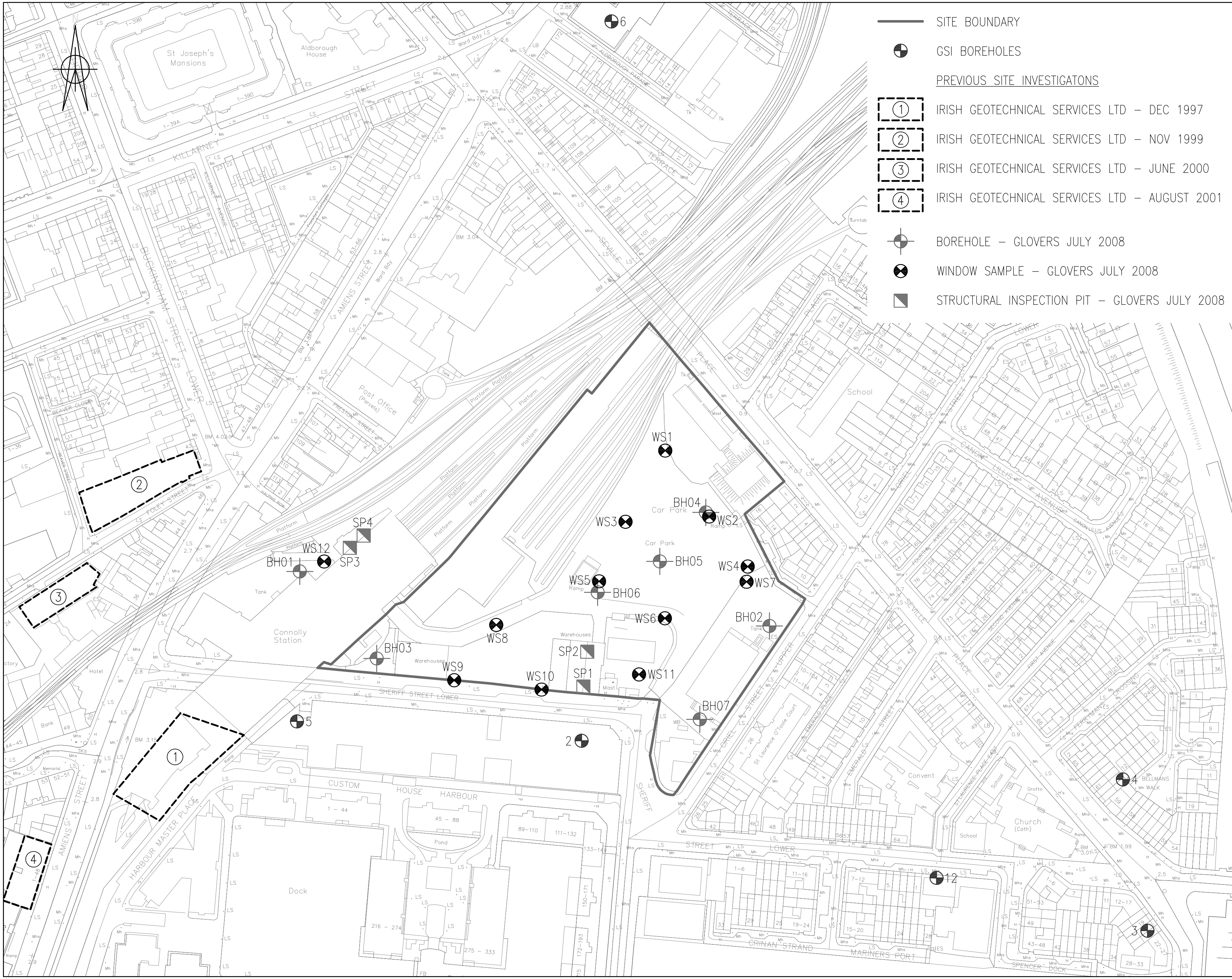
Figures



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Notes

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INFORMATION

Status of drawing

Camden Mill
Lower Bristol Road
Bath BA2 3DQ
UK
Tel: +44 (0)1225 320600
Fax: +44 (0)870 787 4148
email: 023956@burohappold.com
Web: www.burohappold.com

Buro Happold
Consulting Engineers

Architect	P&W
Project	CONNOLLY STATION, DUBLIN
Drg Title	EXPLORATORY HOLE LOCATION PLAN
Scales@A3	1:2000
Drawn by	NG
Checked by	SB
Date	OCT 2008
Job No.	023956
Drg No.	FIGURE 2
Rev	00

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Tables

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%	Method	Units	LOD	WS1			WS2			WS3		WS4	
										Sample ID		WS1			WS2			WS3		WS4	
										Depth		1.00	3.00	5.00	1.00	3.00	5.00	0.50	4.00	0.50	2.00
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
7440-38-2	Arsenic	40	40	40	79	640	640	640	TM30/PM15	mg/kg	<0.5	33.00	26.00	124.00	18.00	71.00	150.00	18.00	9.00	7.00	15.00
7440-43-9	Cadmium	85	85	85	120	190	190	190	TM30/PM15	mg/kg	<0.1	2.00	1.00	41.00	1.00	1.00	35.00	1.00	1.00	1.00	1.00
7440-47-3	Chromium								TM30/PM15	mg/kg	<0.5	32.00	44.00	41.00	32.00	23.00	44.00	22.00	25.00	34.00	18.00
7440-50-8	Copper	7,100	7,100	7,100	12,000	68,000	68,000	68,000	TM30/PM15	mg/kg	<1	95.00	134.00	222.00	136.00	238.00	292.00	113.00	13.00	47.00	134.00
7439-92-1	Lead*	310	310	310	630	2,300	2,300	2,300	TM30/PM15	mg/kg	<5	650.00	364.00	1402.00	408.00	972.00	1425.00	821.00	183.00	168.00	289.00
7439-97-6	Mercury	56	56	56	16	1,100	1,100	1,100	TM30/PM15	mg/kg	<0.1	<0.3	<0.3	308.00	<0.3	9.00	320.00	3.00	<0.3	<1	<1
7440-02-0	Nickel	180	180	180	230	980	980	980	TM30/PM15	mg/kg	<0.7	41.00	61.00	131.00	37.00	64.00	173.00	33.00	18.00	48.00	30.00
7782-49-2	Selenium	430	430	430	1,100	12,000	12,000	12,000	TM30/PM15	mg/kg	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1
JEL1045	Total Sulphate								TM50/PM29	mg/kg	<50	2200.00	980.00	8800.00	280.00	1200.00	5300.00	1000.00	1400.00	240.00	530.00
7440-42-8	Water Soluble Boron								TM74/PM32	mg/kg	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
7440-66-6	Zinc	40,000	40,000	40,000	81,000	730,000	730,000	730,000	TM30/PM15	mg/kg	<5	334.00	164.00	841.00	259.00	312.00	1124.00	256.00	79.00	207.00	124.00
	PAH MS																				
91-20-3	Naphthalene	2.3	5.6	13	4,900	190	460	1,100	TM4/PM8	mg/kg	<0.04	0.51	0.059	0.139	0.389	0.23	0.05	0.225	0.068	0.056	0.036
208-96-8	Acenaphthylene	2,900	4,600	6,000	15,000	83,000	97,000	100,000	TM4/PM8	mg/kg	<0.03	0.566	0.063	0.059	0.209	0.168	0.029	0.17	0.316	0.049	0.013
83-32-9	Acenaphthene	3,000	4,700	6,000	15,000	84,000	97,000	100,000	TM4/PM8	mg/kg	<0.05	0.545	0.045	0.048	0.818	0.054	0.036	0.156	0.051	0.037	0.016
86-73-7	Fluorene	2,800	3,800	4,500	9,900	63,000	68,000	71,000	TM4/PM8	mg/kg	<0.04	0.827	0.034	0.029	0.784	0.065	0.019	0.147	0.11	0.036	0.007
85-01-8	Phenanthrene	1,300	1,500	1,500	3,100	22,000	22,000	23,000	TM4/PM8	mg/kg	<0.03	8.748	0.596	1.047	9.251	1.006	0.457	2.073	2.835	0.339	0.221
120-12-7	Anthracene	31,000	35,000	37,000	74,000	520,000	540,000	540,000	TM4/PM8	mg/kg	<0.04	1.899	0.098	0.124	0.905	0.268	0.057	0.338	0.84	0.116	0.068
206-44-0	Fluoranthene	1,500	1,600	1,600	3,100	23,000	23,000	23,000	TM4/PM8	mg/kg	<0.03	15.473	0.669	0.508	6.391	1.087	0.3	2.56	0.41	0.564	0.234
129-00-0	Pyrene	3,700	3,800	3,800	7,400	54,000	54,000	54,000	TM4/PM8	mg/kg	<0.03	12.491	0.614	0.455	5.351	0.974	0.259	2.259	3.672	0.568	0.247
56-55-3	Benzo(a)anthracene	11	14	15	29	170	170	180	TM4/PM8	mg/kg	<0.06	7.249	0.44	0.461	2.467	0.726	0.224	1.236	2.38	0.499	0.315
218-01-9	Chrysene	30	31	32	57	350	350	350	TM4/PM8	mg/kg	<0.02	4.508	0.497	0.542	3.051	0.842	0.292	1.408	2.222	0.46	0.285
BEN-BK-FLUORAN	Benzo(bk)fluoranthene								TM4/PM8	mg/kg	<0.07	7.205	0.743	1.074	4.16	1.513	0.583	2.281	3.591	0.822	0.315
50-32-8	Benzo(a)pyrene	3.2	3.2	3.2	5.7	35	35	36	TM4/PM8	mg/kg	<0.04	3.134	0.385	0.543	2.268	0.765	0.297	1.158	2.097	0.614	0.151
193-39-5	Indeno(123cd)pyrene	45	46	46	82	500	510	510	TM4/PM8	mg/kg	<0.04	3.955	0.271	0.551	1.342	0.534	0.284	1.036	1.235	0.764	0.155
53-70-3	Dibenzo(ah)anthracene	0.31	0.32	0.32	0.58	3.5	3.6	3.6	TM4/PM8	mg/kg	<0.04	3.28	0.242	0.525	1.239	0.483	0.246	0.836	1.081	0.273	0.081
191-24-2	Benzo(ghi)perylene	360	360	360	640	3,900	4,000	4,000	TM4/PM8	mg/kg	<0.04	5.999	0.337	0.708	1.705	0.722	0.378	1.238	1.334	0.729	0.139
191-07-1	Coronene								TM4/PM8	mg/kg	<0.04	1.036	N/A	N/A	0.477	N/A	N/A	N/A	0.342	N/A	N/A
PAH_6_TOTAL	PAH 6 Total								TM4/PM8	mg/kg	<0.22	35.766	2.405	3.384	15.866	4.621	1.842	8.273	8.667	3.493	0.994
PAH_17_TOTAL	PAH 17 Total								TM4/PM8	mg/kg	<0.64	77.419	5.093	6.813	40.807	9.437	3.511	17.121	22.584	5.926	2.283
	PAHs																				
INTERPRETATION	EPH CWG Interpretation								TM5/PM16	None		Possible PAHs	N/A	N/A	Possible PAHs	N/A	N/A	N/A	Possible PAHs	N/A	N/A
MINOIL_10-40	Mineral Oil (C10-C40)								TM5/PM16	mg/kg	<30	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
	TPH CWG																				
	Aliphatics																				
GTC05C06AL	>C5-C6	42	78	160	600,000	3,200	5,900	12,000	TM36/PM12	mg/kg	<0.1	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTC06C08AL	>C6-C8	100	230	530	620,000	7,800	17,000	40,000	TM36/PM12	mg/kg	<0.1	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTC08C10AL	>C8-C10	27	65	150	13,000	2,000	4,800	11,000	TM36/PM12	mg/kg	<0.1	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTC10C12AL	>C10-C12	130	330	770	13,000	9,700	23,000	47,000	TM5/PM16	mg/kg	<0.2	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTC12C16AL	>C12-C16	1,100	2,400	4,400	13,000	59,000	82,000	90,000	TM5/PM16	mg/kg	<4	N/A	<0.1	N/A	N/A	<0.1	N/A	N/A	<0.1	15.00	N/A
GTC16C21AL	>C16-C21								TM5/PM16	mg/kg	<7	N/A	<0.1	N/A	N/A	<0.1	N/A	N/A	<0.1	62.00	N/A
GTC21C35AL	>C21-C35								TM5/PM16	mg/kg	<7	N/A	<0.1	N/A	N/A	<0.1	N/A	N/A	<0.1	311.00	N/A
GTC05C40AL	Total aliphatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	N/A	<0.1	N/A	N/A	<0.1	N/A	N/A	<0.1	389.00	N/A
	Aromatics																				
GTEC05EC07AR	>C5-EC7	370	690	1,400	56,000	26,000	46,000	86,000	TM36/PM12	mg/kg	<0.1	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTEC07EC08AR	>EC7-EC8	860	1,800	3,900	56,000	56,000	110,000	180,000	TM36/PM12	mg/kg	<0.1	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTEC08EC10AR	>EC8-EC10	47	110	270	5,000	3,500	8,100	17,000	TM36/PM12	mg/kg	<0.1	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTEC10EC12AR	>EC10-EC12	250	590	1,200	5,000	16,000	28,000	34,000	TM5/PM16	mg/kg	<0.2	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
GTEC12EC16AR	>EC12-EC16	1,800	2,300	2,500	5,000	36,000	37,000	38,000	TM5/PM16	mg/kg	<4	N/A	2.12	N/A	N/A	3.63	N/A	N/A	8.24	<0.1	N/A
GTEC16EC21AR	>EC16-EC21	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	N/A	1.95	N/A	N/A	3.62	N/A	N/A	9.42	<0.1	N/A
GTEC21EC35AR	>EC21-EC35	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	N/A	0.58	N/A	N/A	1.20	N/A	N/A	2.41	<0.1	N/A
GTEC05EC40AR	Total aromatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	N/A	4.65	N/A	N/A	8.45	N/A	N/A	20.07	<0.1	N/A
GTEC06EC10AR	>EC6-EC10								TM36/PM12	mg/kg	<0.1	271.00	N/A	N/A	60.00	N/A	N/A	N/A	111.00	N/A	N/A
1634-04-4	MTBE*							24,000	TM31/PM12	mg/kg	<0.05	N/A	<0.01	N/A	N/A	<0.01	N/A	N/A	<0.01	<0.01	N/A
71-43-2	Benzene	380	700	1,400	73,000	27,000	47,000	90,000	TM31/PM12	mg/kg	<0.05	<0.01	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	<0.01	N/A
108-88-3	Toluene	880,000	1,900,000	3,900,000	56,000,000	56,000,000	110,000,000	180,000,000	TM31/PM12	mg/kg	<0.05	<0.01	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	<0.01	N/A
100-41-4	Ethylbenzene	83,000	190,000	480,000	25,000,000	5,700,000	13,000,000	27,000,000	TM31/PM12	mg/kg	<0.05	<0.01	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	<0.01	N/A
XYLENE	Xylene	79,000	180,000	430,000	43,000,000	5,900,000	14,000,000	30,000,000	TM31/PM12	mg/kg	<0.05	<0.01	<0.01	N/A	<0.01	<0.01	N/A	N/A	<0.01	<0.01	N/A

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%	Method	Units	LOD	WS1			WS2			WS3		WS4	
										Sample ID		WS1			WS2			WS3		WS4	
										Depth		1.00	3.00	5.00	1.00	3.00	5.00	0.50	4.00	0.50	2.00
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
7012-37-5	PCB 28								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35693-99-3	PCB 52								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
37680-73-2	PCB 101								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
31508-00-6	PCB 118								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35065-28-2	PCB 138								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35065-27-1	PCB 153								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35065-29-3	PCB 180								TM17/PM8	ug/kg	<5	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
PCB_7_CON_TOTAL	Total 7 PCBs ^	1,000	1,000	1,000		1,000	1,000	1,000	TM17/PM8	ug/kg	<35	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
18540-29-9	Hexavalent Chromium	6	6	6	7.7	33	33	33	TM38/PM20	mg/kg	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
108-95-2	Phenol	750	1,300	2,300		760	1,500	3,200	TM26/PM21	mg/kg	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
MOIST_CONT_DRY	Natural Moisture Content								PM4/PM0	%	<0.1	24.60	25.20	48.30	18.50	30.90	55.60	14.30	21.00	7.80	20.50
57-12-5	Total Cyanide								TM89/PM45	mg/kg	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<1	<1
TOC	Total Organic Carbon								TM21/PM24	%	<0.02	7.60	8.30	N/A	5.40	11.20	N/A	N/A	1.70	N/A	3.60
SULPHIDE	Sulphide								TM106/PM45	mg/kg	<10	<5	<5	<5	<5	<5	<5	9.00	16.00	<5	17.00
PH	ph								TM73/PM11	pH units		8.30	8.35	7.61	8.35	8.24	7.72	8.10	7.99	8.71	8.69
	Asbestos Screening								TM65/PM42	None		No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected

Notes:

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*Indicates GAC values from SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination - Policy Companion Document published in 2014.

NAD = No Asbestos Detected. NA = Not Available.

EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment published in 2010.

+ GAC S4ULs EC >35- 44 were used in the absense of suitable for use levels for EC>35-40

^ Indicates Intervention Values taken from **DUTCH INTERVENTION 2009**

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

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Multidisciplinary Consulting Engineers

		GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%		Sample ID		WS5			WS6		WS7			WS8	WS9	
										Depth		0.50	2.00	5.00	1.00	4.00	1.00	3.00	5.00	2.00	0.50	1.00
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
CAS Number	**Test**								**Method**	**Units**	**LOD**											
7440-38-2	Arsenic	40	40	40	79	640	640	640	TM30/PM15	mg/kg	<0.5	20.00	31.00	9.00	35.00	13.00	11.00	19.00	3.00	26.00	16.00	13.00
7440-43-9	Cadmium	85	85	85	120	190	190	190	TM30/PM15	mg/kg	<0.1	<1	1.00	<1	<1	<1	2.00	1.00	1.00	1.00	1.00	1.00
7440-47-3	Chromium								TM30/PM15	mg/kg	<0.5	20.00	37.00	16.00	33.00	12.00	17.00	21.00	22.00	15.00	20.00	18.00
7440-50-8	Copper	7,100	7,100	7,100	12,000	68,000	68,000	68,000	TM30/PM15	mg/kg	<1	96.00	1179.00	10.00	66.00	22.00	31.00	89.00	19.00	544.00	55.00	77.00
7439-92-1	Lead*	310	310	310	630	2,300	2,300	2,300	TM30/PM15	mg/kg	<5	829.00	2263.00	99.00	606.00	125.00	109.00	739.00	24.00	1118.00	236.00	243.00
7439-97-6	Mercury	56	56	56	16	1,100	1,100	1,100	TM30/PM15	mg/kg	<0.1	<1	<1	<1	<1	<1	<1	16.00	<1	<0.3	<0.3	1.00
7440-02-0	Nickel	180	180	180	230	980	980	980	TM30/PM15	mg/kg	<0.7	38.00	48.00	9.00	66.00	11.00	45.00	47.00	35.00	40.00	25.00	18.00
7782-49-2	Selenium	430	430	430	1,100	12,000	12,000	12,000	TM30/PM15	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<0.5
JEL1045	Total Sulphate								TM50/PM29	mg/kg	<50	1900.00	4500.00	2000.00	370.00	1600.00	2300.00	11000.00	360.00	3000.00	3000.00	6100.00
7440-42-8	Water Soluble Boron								TM74/PM32	mg/kg	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
7440-66-6	Zinc	40,000	40,000	40,000	81,000	730,000	730,000	730,000	TM30/PM15	mg/kg	<5	120.00	296.00	42.00	142.00	59.00	96.00	122.00	70.00	419.00	116.00	115.00
	PAH MS																					
91-20-3	Naphthalene	2.3	5.6	13	4,900	190	460	1,100	TM4/PM8	mg/kg	<0.04	0.046	0.051	0.077	0.055	0.055	<1	<1	<1	0.037	0.21	0.496
208-96-8	Acenaphthylene	2,900	4,600	6,000	15,000	83,000	97,000	100,000	TM4/PM8	mg/kg	<0.03	0.044	0.013	0.021	0.024	0.013	<1	<1	<1	0.07	0.106	0.228
83-32-9	Acenaphthene	3,000	4,700	6,000	15,000	84,000	97,000	100,000	TM4/PM8	mg/kg	<0.05	0.029	0.031	0.045	0.035	0.035	<1	<1	<1	0.034	1.23	2.203
86-73-7	Fluorene	2,800	3,800	4,500	9,900	63,000	68,000	71,000	TM4/PM8	mg/kg	<0.04	0.04	0.018	0.122	0.024	0.077	<1	<1	<1	0.049	0.662	1.621
85-01-8	Phenanthrene	1,300	1,500	1,500	3,100	22,000	22,000	23,000	TM4/PM8	mg/kg	<0.03	0.68	0.326	0.554	0.327	0.363	<1	<1	<1	0.352	7.987	20.568
120-12-7	Anthracene	31,000	35,000	37,000	74,000	520,000	540,000	540,000	TM4/PM8	mg/kg	<0.04	0.175	0.093	0.248	0.09	0.131	<1	<1	<1	0.086	1.073	2.39
206-44-0	Fluoranthene	1,500	1,600	1,600	3,100	23,000	23,000	23,000	TM4/PM8	mg/kg	<0.03	1.136	0.41	0.553	0.281	0.454	<1	<1	<1	0.179	9.923	20.578
129-00-0	Pyrene	3,700	3,800	3,800	7,400	54,000	54,000	54,000	TM4/PM8	mg/kg	<0.03	0.801	0.364	0.411	0.251	0.318	<1	<1	<1	0.19	9.612	18.2
56-55-3	Benzo(a)anthracene	11	14	15	29	170	170	180	TM4/PM8	mg/kg	<0.06	0.257	0.182	0.154	0.503	0.298	<1	<1	<1	0.191	4.413	8.172
218-01-9	Chrysene	30	31	32	57	350	350	350	TM4/PM8	mg/kg	<0.02	0.569	0.399	0.375	0.34	0.186	<1	<1	<1	0.229	5.104	8.739
BEN-BK-FLUORAN	Benzo(bk)fluoranthene								TM4/PM8	mg/kg	<0.07	0.751	0.796	0.339	0.535	0.218	<1	<1	<1	0.498	7.529	12.56
50-32-8	Benzo(a)pyrene	3.2	3.2	3.2	5.7	35	35	36	TM4/PM8	mg/kg	<0.04	0.428	0.406	0.213	0.277	0.124	<1	<1	<1	0.311	4.355	7.209
193-39-5	Indeno(123cd)pyrene	45	46	46	82	500	510	510	TM4/PM8	mg/kg	<0.04	0.278	0.434	0.122	0.272	0.077	<1	<1	<1	0.297	2.67	4.377
53-70-3	Dibenzo(ah)anthracene	0.31	0.32	0.32	0.58	3.5	3.6	3.6	TM4/PM8	mg/kg	<0.04	0.16	0.22	0.091	0.186	0.04	<1	<1	<1	0.36	2.137	3.874
191-24-2	Benzo(ghi)perylene	360	360	360	640	3,900	4,000	4,000	TM4/PM8	mg/kg	<0.04	0.279	0.429	0.127	0.247	0.079	<1	<1	<1	0.548	3.446	5.605
191-07-1	Coronene								TM4/PM8	mg/kg	<0.04	N/A	0.196	N/A	N/A	0.04	N/A	N/A	N/A	0.198	N/A	N/A
PAH_6_TOTAL	PAH 6 Total								TM4/PM8	mg/kg	<0.22	2.872	2.475	1.354	1.612	0.952	<1	<1	<1	1.833	27.923	50.329
PAH_17_TOTAL	PAH 17 Total								TM4/PM8	mg/kg	<0.64	5.673	4.368	3.452	3.447	2.508	N/A	n/A	N/A	3.629	60.457	116.82
	PAHs																					
INTERPRETATION	EPH CWG Interpretation								TM5/PM16	None		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Possible natural occuring products	N/A	N/A
MINOIL_10-40	Mineral Oil (C10-C40)								TM5/PM16	mg/kg	<30	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
	TPH CWG																					
	Aliphatics																					
GTC05C06AL	>C5-C6	42	78	160	600,000	3,200	5,900	12,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC06C08AL	>C6-C8	100	230	530	620,000	7,800	17,000	40,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC08C10AL	>C8-C10	27	65	150	13,000	2,000	4,800	11,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC10C12AL	>C10-C12	130	330	770	13,000	9,700	23,000	47,000	TM5/PM16	mg/kg	<0.2	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC12C16AL	>C12-C16	1,100	2,400	4,400	13,000	59,000	82,000	90,000	TM5/PM16	mg/kg	<4	N/A	N/A	N/A	N/A	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
GTC16C21AL	>C16-C21								TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
GTC21C35AL	>C21-C35								TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
GTC05C40AL	Total aliphatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	N/A	N/A	N/A	N/A	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
	Aromatics																					
GTEC05EC07AR	>C5-EC7	370	690	1,400	56,000	26,000	46,000	86,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC07EC08AR	>EC7-EC8	860	1,800	3,900	56,000	56,000	110,000	180,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC08EC10AR	>EC8-EC10	47	110	270	5,000	3,500	8,100	17,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC10EC12AR	>EC10-EC12	250	590	1,200	5,000	16,000	28,000	34,000	TM5/PM16	mg/kg	<0.2	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC12EC16AR	>EC12-EC16	1,800	2,300	2,500	5,000	36,000	37,000	38,000	TM5/PM16	mg/kg	<4	N/A	N/A	N/A	N/A	1.40	N/A	<0.1	N/A	0.99	N/A	N/A
GTEC16EC21AR	>EC16-EC21	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	0.80	N/A	<0.1	N/A	1.22	N/A	N/A
GTEC21EC35AR	>EC21-EC35	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	0.12	N/A	<0.1	N/A	0.91	N/A	N/A
GTEC05EC40AR	Total aromatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	N/A	N/A	N/A	N/A	2.00	N/A	<0.1	N/A	3.11	N/A	N/A
GTEC06EC10AR	>EC6-EC10								TM36/PM12	mg/kg	<0.1	N/A	<1	N/A	N/A	49.00	N/A	N/A	N/A	108.00	N/A	N/A
1634-04-4	MTBE*							24,000	TM31/PM12	mg/kg	<0.05	N/A	N/A	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
71-43-2	Benzene	380	700	1,400	73,000	27,000	47,000	90,000	TM31/PM12	mg/kg	<0.05	N/A	<0.01	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
108-88-3	Toluene	880,000	1,900,000	3,900,000	56,000,000	56,000,000	110,000,000	180,000,000	TM31/PM12	mg/kg	<0.05	N/A	<0.01	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
100-41-4	Ethylbenzene	83,000	190,000	480,000	25,000,000	5,700,000	13,000,000	27,000,000	TM31/PM12	mg/kg	<0.05	N/A	<0.01	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
XYLENE	Xylene	79,000	180,000	430,000	43,000,000	5,900,000	14,000,000	30,000,000	TM31/PM12	mg/kg	<0.05	N/A	<0.01	N/A	N/A	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%	Method	Units	LOD	WS5			WS6		WS7			WS8	WS9	
										Depth		0.50	2.00	5.00	1.00	4.00	1.00	3.00	5.00	2.00	0.50	1.00
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
7012-37-5	PCB 28								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35693-99-3	PCB 52								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
37680-73-2	PCB 101								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
31508-00-6	PCB 118								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35065-28-2	PCB 138								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35065-27-1	PCB 153								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
35065-29-3	PCB 180								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
PCB_7_CON_TOTAL	Total 7 PCBs ^	1,000	1,000	1,000		1,000	1,000	1,000	TM17/PM8	ug/kg	<35	N/A	<1	N/A	N/A	<1	N/A	N/A	N/A	<1	N/A	N/A
18540-29-9	Hexavalent Chromium	6	6	6	7.7	33	33	33	TM38/PM20	mg/kg	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
108-95-2	Phenol	750	1,300	2,300		760	1,500	3,200	TM26/PM21	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	N/A	N/A
MOIST_CONT_DRY	Natural Moisture Content								PM4/PM0	%	<0.1	15.10	23.10	19.70	33.50	21.00	10.90	22.50	13.80	25.20	20.30	20.50
57-12-5	Total Cyanide								TM89/PM45	mg/kg	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2.5	<2.5	<2.5
TOC	Total Organic Carbon								TM21/PM24	%	<0.02	N/A	5.30	N/A	7.50	1.60	N/A	N/A	N/A	8.30	N/A	N/A
SULPHIDE	Sulphide								TM106/PM45	mg/kg	<10	10.00	35.00	541.00	8.00	47.00	<5	<5	11.00	<5	<5	<5
PH	ph								TM73/PM11	pH units		8.51	8.32	8.41	8.66	8.04	8.13	7.71	8.65	8.32	8.04	8.16
	Asbestos Screening								TM65/PM42	None		No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected

Notes:

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*Indicates GAC values from SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination - Policy Companion Document published in 2014

NAD = No Asbestos Detected. NA = Not Available.

EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment published in 2010.

+ GAC S4ULs EC >35- 44 were used in the absense of suitable for use levels for EC>35-40

^ Indicates Intervention Values taken from **DUTCH INTERVENTION 2009**

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%	Method	Units	LOD	WS11			WS12		BH1	BH3		
										Sample ID		WS11			WS12		BH1	BH3		
										Depth		0.50	2.00	3.00	0.50	1.00	2.00	2.0	0.50	1.00
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
7440-38-2	Arsenic	40	40	40	79	640	640	640	TM30/PM15	mg/kg	<0.5	N/A	7.00	3.00	27.00	27.00	11.00	8.00	30.00	N/A
7440-43-9	Cadmium	85	85	85	120	190	190	190	TM30/PM15	mg/kg	<0.1	N/A	<1	2.00	1.00	1.00	<0.5	<0.5	<0.5	N/A
7440-47-3	Chromium								TM30/PM15	mg/kg	<0.5	N/A	11.00	32.00	22.00	19.00	10.00	16.00	16.00	N/A
7440-50-8	Copper	7,100	7,100	7,100	12,000	68,000	68,000	68,000	TM30/PM15	mg/kg	<1	N/A	14.00	26.00	306.00	610.00	28.00	7.00	91.00	N/A
7439-92-1	Lead*	310	310	310	630	2,300	2,300	2,300	TM30/PM15	mg/kg	<5	N/A	77.00	25.00	481.00	937.00	362.00	30.00	466.00	N/A
7439-97-6	Mercury	56	56	56	16	1,100	1,100	1,100	TM30/PM15	mg/kg	<0.1	N/A	<1	<1	<0.3	<0.3	<0.3	<0.3	<0.3	N/A
7440-02-0	Nickel	180	180	180	230	980	980	980	TM30/PM15	mg/kg	<0.7	N/A	9.00	51.00	60.00	38.00	14.00	16.00	46.00	N/A
7782-49-2	Selenium	430	430	430	1,100	12,000	12,000	12,000	TM30/PM15	mg/kg	<1	N/A	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	N/A
JEL1045	Total Sulphate								TM50/PM29	mg/kg	<50	N/A	790.00	210.00	1600.00	2300.00	1500.00	560.00	1800.00	N/A
7440-42-8	Water Soluble Boron								TM74/PM32	mg/kg	<0.1	N/A	<1	<1	<1	<1	<1	<1	<1	N/A
7440-66-6	Zinc	40,000	40,000	40,000	81,000	730,000	730,000	730,000	TM30/PM15	mg/kg	<5	N/A	45.00	105.00	233.00	228.00	62.00	59.00	98.00	N/A
	PAH MS																			
91-20-3	Naphthalene	2.3	5.6	13	4,900	190	460	1,100	TM4/PM8	mg/kg	<0.04	N/A	0.351	N/A	0.056	0.047	0.075	<1	0.077	0.007
208-96-8	Acenaphthylene	2,900	4,600	6,000	15,000	83,000	97,000	100,000	TM4/PM8	mg/kg	<0.03	N/A	0.206	N/A	0.08	0.026	0.019	<1	0.065	0.003
83-32-9	Acenaphthene	3,000	4,700	6,000	15,000	84,000	97,000	100,000	TM4/PM8	mg/kg	<0.05	N/A	0.337	N/A	0.068	0.083	0.066	<1	0.038	0.019
86-73-7	Fluorene	2,800	3,800	4,500	9,900	63,000	68,000	71,000	TM4/PM8	mg/kg	<0.04	N/A	0.721	N/A	0.062	0.041	0.105	<1	0.045	0.002
85-01-8	Phenanthrene	1,300	1,500	1,500	3,100	22,000	22,000	23,000	TM4/PM8	mg/kg	<0.03	N/A	2.456	N/A	0.02	0.503	0.559	<1	0.618	0.052
120-12-7	Anthracene	31,000	35,000	37,000	74,000	520,000	540,000	540,000	TM4/PM8	mg/kg	<0.04	N/A	0.65	N/A	0.149	0.141	0.179	<1	0.251	0.012
206-44-0	Fluoranthene	1,500	1,600	1,600	3,100	23,000	23,000	23,000	TM4/PM8	mg/kg	<0.03	N/A	2.634	N/A	0.505	0.566	0.393	<1	0.76	0.032
129-00-0	Pyrene	3,700	3,800	3,800	7,400	54,000	54,000	54,000	TM4/PM8	mg/kg	<0.03	N/A	2.395	N/A	0.36	0.52	0.298	<1	0.764	0.027
56-55-3	Benzo(a)anthracene	11	14	15	29	170	170	180	TM4/PM8	mg/kg	<0.06	N/A	2.016	N/A	0.457	0.537	0.179	<1	0.247	0.032
218-01-9	Chrysene	30	31	32	57	350	350	350	TM4/PM8	mg/kg	<0.02	N/A	1.52	N/A	0.604	0.555	0.147	<1	0.624	0.036
BEN-BK-FLUORAN	Benzo(bk)fluoranthene								TM4/PM8	mg/kg	<0.07	N/A	1.538	N/A	1.007	0.537	0.181	<1	0.937	0.036
50-32-8	Benzo(a)pyrene	3.2	3.2	3.2	5.7	35	35	36	TM4/PM8	mg/kg	<0.04	N/A	0.828	N/A	0.544	0.385	0.135	<1	0.46	0.007
193-39-5	Indeno(123cd)pyrene	45	46	46	82	500	510	510	TM4/PM8	mg/kg	<0.04	N/A	0.539	N/A	0.387	0.179	0.061	<1	0.381	0.014
53-70-3	Dibenzo(ah)anthracene	0.31	0.32	0.32	0.58	3.5	3.6	3.6	TM4/PM8	mg/kg	<0.04	N/A	0.363	N/A	0.317	0.116	0.051	<1	0.398	0.006
191-24-2	Benzo(ghi)perylene	360	360	360	640	3,900	4,000	4,000	TM4/PM8	mg/kg	<0.04	N/A	0.535	N/A	0.537	0.218	0.095	<1	0.701	0.022
191-07-1	Coronene								TM4/PM8	mg/kg	<0.04	N/A	0.205	N/A	N/A	N/A	N/A	N/A	N/A	0.008
PAH_6_TOTAL	PAH 6 Total								TM4/PM8	mg/kg	<0.22	N/A	6.074	N/A	2.98	1.885	0.865	<1	3.239	0.111
PAH_17_TOTAL	PAH 17 Total								TM4/PM8	mg/kg	<0.64	N/A	17.294	N/A	5.153	4.454	2.543	N/A	6.366	0.315
	PAHs																			
INTERPRETATION	EPH CWG Interpretation								TM5/PM16	None		N/A	Possible highly degraded Diesel	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MINOIL_10-40	Mineral Oil (C10-C40)								TM5/PM16	mg/kg	<30	N/A	217.00	N/A	N/A	N/A	N/A	N/A	N/A	<1
	TPH CWG																			
	Aliphatics																			
GTC05C06AL	>C5-C6	42	78	160	600,000	3,200	5,900	12,000	TM36/PM12	mg/kg	<0.1	<0.01	1.00	0.30	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC06C08AL	>C6-C8	100	230	530	620,000	7,800	17,000	40,000	TM36/PM12	mg/kg	<0.1	<0.01	6.00	3.00	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC08C10AL	>C8-C10	27	65	150	13,000	2,000	4,800	11,000	TM36/PM12	mg/kg	<0.1	<0.01	4.00	3.00	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC10C12AL	>C10-C12	130	330	770	13,000	9,700	23,000	47,000	TM5/PM16	mg/kg	<0.2	<0.01	7.00	8.00	N/A	<0.01	N/A	<0.01	N/A	N/A
GTC12C16AL	>C12-C16	1,100	2,400	4,400	13,000	59,000	82,000	90,000	TM5/PM16	mg/kg	<4	<0.1	194.00	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
GTC16C21AL	>C16-C21								TM5/PM16	mg/kg	<7	<0.1	301.00	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
GTC21C35AL	>C21-C35								TM5/PM16	mg/kg	<7	<0.1	88.00	<0.1	N/A	<0.1	N/A	<0.1	N/A	N/A
GTC05C40AL	Total aliphatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	<0.1	601.00	14.00	N/A	<0.1	N/A	<0.1	N/A	N/A
	Aromatics																			
GTEC05EC07AR	>C5-EC7	370	690	1,400	56,000	26,000	46,000	86,000	TM36/PM12	mg/kg	<0.1	<0.01	0.02	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC07EC08AR	>EC7-EC8	860	1,800	3,900	56,000	56,000	110,000	180,000	TM36/PM12	mg/kg	<0.1	<0.01	0.10	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC08EC10AR	>EC8-EC10	47	110	270	5,000	3,500	8,100	17,000	TM36/PM12	mg/kg	<0.1	<0.01	6.38	4.00	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC10EC12AR	>EC10-EC12	250	590	1,200	5,000	16,000	28,000	34,000	TM5/PM16	mg/kg	<0.2	<0.01	11.00	12.00	N/A	<0.01	N/A	<0.01	N/A	N/A
GTEC12EC16AR	>EC12-EC16	1,800	2,300	2,500	5,000	36,000	37,000	38,000	TM5/PM16	mg/kg	<4	286.00	9.40	<0.1	N/A	1.88	N/A	<0.1	N/A	N/A
GTEC16EC21AR	>EC16-EC21	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	73.00	5.60	<0.1	N/A	1.81	N/A	<0.1	N/A	N/A
GTEC21EC35AR	>EC21-EC35	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	37.00	0,9	<0.1	N/A	0.33	N/A	<0.1	N/A	N/A
GTEC05EC40AR	Total aromatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	396.00	33.00	17.00	N/A	4.02	N/A	<0.1	N/A	N/A
GTEC06EC10AR	>EC6-EC10								TM36/PM12	mg/kg	<0.1	N/A	1086.00	N/A	N/A	N/A	N/A	N/A	N/A	<1
1634-04-4	MTBE*							24,000	TM31/PM12	mg/kg	<0.05	<0.01	0.14	<0.01	N/A	<0.01	N/A	<0.01	N/A	N/A
71-43-2	Benzene	380	700	1,400	73,000	27,000	47,000	90,000	TM31/PM12	mg/kg	<0.05	<0.01	0.02	<0.01	N/A	<0.01	N/A	<0.01	N/A	<0.01
108-88-3	Toluene	880,000	1,900,000	3,900,000	56,000,000	56,000,000	110,000,000	180,000,000	TM31/PM12	mg/kg	<0.05	<0.01	0.10	<0.01	N/A	<0.01	N/A	<0.01	N/A	<0.01
100-41-4	Ethylbenzene	83,000	190,000	480,000	25,000,000	5,700,000	13,000,000	27,000,000	TM31/PM12	mg/kg	<0.05	<0.01	0.04	0.02	N/A	<0.01	N/A	<0.01	N/A	<0.01
XYLENE	Xylene	79,000	180,000	430,000	43,000,000	5,900,000	14,000,000	30,000,000	TM31/PM12	mg/kg	<0.05	<0.01	0.17	0.05	N/A	<0.01	N/A	<0.01	N/A	<0.01

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%	Method	Units	LOD	WS11			WS12		BH1	BH3		
										Sample ID		WS11			WS12		BH1	BH3		
										Depth		0.50	2.00	3.00	0.50	1.00	2.00	2.0	0.50	1.00
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
7012-37-5	PCB 28								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
35693-99-3	PCB 52								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
37680-73-2	PCB 101								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
31508-00-6	PCB 118								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
35065-28-2	PCB 138								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
35065-27-1	PCB 153								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
35065-29-3	PCB 180								TM17/PM8	ug/kg	<5	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
PCB_7_CON_TOTAL	Total 7 PCBs ^	1,000	1,000	1,000		1,000	1,000	1,000	TM17/PM8	ug/kg	<35	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	<1
18540-29-9	Hexavalent Chromium	6	6	6	7.7	33	33	33	TM38/PM20	mg/kg	<0.01	N/A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N/A
108-95-2	Phenol	750	1,300	2,300		760	1,500	3,200	TM26/PM21	mg/kg	<0.01	N/A	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MOIST_CONT_DRY	Natural Moisture Content								PM4/PM0	%	<0.1	8.20	23.80	10.70	21.70	14.00	33.30	23.50	24.30	24.40
57-12-5	Total Cyanide								TM89/PM45	mg/kg	<0.5	N/A	<1	<1	<2.5	<2.5	<1	<1	<1	N/A
TOC	Total Organic Carbon								TM21/PM24	%	<0.02	N/A	2.20	N/A	N/A	N/A	N/A	1.50	N/A	1.10
SULPHIDE	Sulphide								TM106/PM45	mg/kg	<10	N/A	189.00	12.00	<5	8.00	93.00	<5	6.00	N/A
PH	ph								TM73/PM11	pH units		N/A	8.67	8.70	8.21	8.01	8.63	8.93	8.98	N/A
	Asbestos Screening								TM65/PM42	None		N/A	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	N/A

Notes:

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*Indicates GAC values from SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination - Policy Companion Document published in 2014

NAD = No Asbestos Detected. NA = Not Available.

EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment published in 2010.

+ GAC S4ULs EC >35- 44 were used in the absense of suitable for use levels for EC>35-40

^ Indicates Intervention Values taken from **DUTCH INTERVENTION 2009**

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

		GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%		Sample ID		BH4				BH5	BH6		BH7		
										Depth		1.00	5.0-5.3	6.0-6.3	7.20	2.00	1.00	2.00	0.5	3	6.50
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
CAS Number	**Test**								**Method**	**Units**	**LOD**										
7440-38-2	Arsenic	40	40	40	79	640	640	640	TM30/PM15	mg/kg	<0.5	26.00	18.00	22.00	17.00	15.00	15.00	27.00	27.00	N/A	8.00
7440-43-9	Cadmium	85	85	85	120	190	190	190	TM30/PM15	mg/kg	<0.1	1.00	1.00	1.00	1.00	<0.5	1.00	1.00	<1	N/A	1.00
7440-47-3	Chromium								TM30/PM15	mg/kg	<0.5	28.00	14.00	17.00	16.00	30.00	15.00	20.00	23.00	N/A	17.00
7440-50-8	Copper	7,100	7,100	7,100	12,000	68,000	68,000	68,000	TM30/PM15	mg/kg	<1	237.00	270.00	250.00	42.00	145.00	42.00	99.00	29.00	N/A	18.00
7439-92-1	Lead*	310	310	310	630	2,300	2,300	2,300	TM30/PM15	mg/kg	<5	392.00	430.00	480.00	222.00	602.00	439.00	1187.00	183.00	N/A	22.00
7439-97-6	Mercury	56	56	56	16	1,100	1,100	1,100	TM30/PM15	mg/kg	<0.1	<0.3	1.50	2.10	<0.3	<0.3	<0.3	5.00	<1	N/A	<1
7440-02-0	Nickel	180	180	180	230	980	980	980	TM30/PM15	mg/kg	<0.7	40.00	29.00	40.00	26.00	29.00	18.00	35.00	16.00	N/A	28.00
7782-49-2	Selenium	430	430	430	1,100	12,000	12,000	12,000	TM30/PM15	mg/kg	<1	<0.5	<3	<3	<0.5	<0.5	<0.5	<0.5	<1	N/A	<1
JEL1045	Total Sulphate								TM50/PM29	mg/kg	<50	2000.00	N/A	N/A	1500.00	5800.00	500.00	1700.00	1000.00	N/A	620.00
7440-42-8	Water Soluble Boron								TM74/PM32	mg/kg	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
7440-66-6	Zinc	40,000	40,000	40,000	81,000	730,000	730,000	730,000	TM30/PM15	mg/kg	<5	153.00	260.00	240.00	95.00	103.00	91.00	139.00	118.00	N/A	72.00
	PAH MS																				
91-20-3	Naphthalene	2.3	5.6	13	4,900	190	460	1,100	TM4/PM8	mg/kg	<0.04	0.072	N/A	N/A	0.039	0.074	0.108	5.377	0.002	N/A	<1
208-96-8	Acenaphthylene	2,900	4,600	6,000	15,000	83,000	97,000	100,000	TM4/PM8	mg/kg	<0.03	0.101	N/A	N/A	0.009	0.044	0.201	2.351	0.004	N/A	<1
83-32-9	Acenaphthene	3,000	4,700	6,000	15,000	84,000	97,000	100,000	TM4/PM8	mg/kg	<0.05	0.054	N/A	N/A	0.027	0.03	0.079	0.994	0.016	N/A	<1
86-73-7	Fluorene	2,800	3,800	4,500	9,900	63,000	68,000	71,000	TM4/PM8	mg/kg	<0.04	0.068	N/A	N/A	0.025	0.021	0.118	3.38	0.001	N/A	<1
85-01-8	Phenanthrene	1,300	1,500	1,500	3,100	22,000	22,000	23,000	TM4/PM8	mg/kg	<0.03	1.062	N/A	N/A	0.34	0.49	1.969	27.765	0.005	N/A	<1
120-12-7	Anthracene	31,000	35,000	37,000	74,000	520,000	540,000	540,000	TM4/PM8	mg/kg	<0.04	0.26	N/A	N/A	0.033	0.19	0.699	10.691	0.002	N/A	<1
206-44-0	Fluoranthene	1,500	1,600	1,600	3,100	23,000	23,000	23,000	TM4/PM8	mg/kg	<0.03	1.407	N/A	N/A	0.113	0.879	3.233	34.308	0.078	N/A	<1
129-00-0	Pyrene	3,700	3,800	3,800	7,400	54,000	54,000	54,000	TM4/PM8	mg/kg	<0.03	1.379	N/A	N/A	0.092	0.941	2.372	28.495	0.153	N/A	<1
56-55-3	Benzo(a)anthracene	11	14	15	29	170	170	180	TM4/PM8	mg/kg	<0.06	0.86	N/A	N/A	0.117	1.257	3.324	21.106	0.08	N/A	<1
218-01-9	Chrysene	30	31	32	57	350	350	350	TM4/PM8	mg/kg	<0.02	0.932	N/A	N/A	0.171	0.826	1.387	16.33	0.061	N/A	<1
BEN-BK-FLUORAN	Benzo(bk)fluoranthene								TM4/PM8	mg/kg	<0.07	1.808	N/A	N/A	0.193	1.417	1.963	28.064	0.085	N/A	<1
50-32-8	Benzo(a)pyrene	3.2	3.2	3.2	5.7	35	35	36	TM4/PM8	mg/kg	<0.04	1.039	N/A	N/A	0.078	0.816	1.366	16.122	0.047	N/A	<1
193-39-5	Indeno(123cd)pyrene	45	46	46	82	500	510	510	TM4/PM8	mg/kg	<0.04	0.896	N/A	N/A	0.071	0.501	0.781	10.079	0.058	N/A	<1
53-70-3	Dibenzo(ah)anthracene	0.31	0.32	0.32	0.58	3.5	3.6	3.6	TM4/PM8	mg/kg	<0.04	0.678	N/A	N/A	0.086	0.348	0.455	10.344	0.021	N/A	<1
191-24-2	Benzo(ghi)perylene	360	360	360	640	3,900	4,000	4,000	TM4/PM8	mg/kg	<0.04	1.117	N/A	N/A	0.137	0.678	0.857	10.027	0.062	N/A	<1
191-07-1	Coronene								TM4/PM8	mg/kg	<0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
PAH_6_TOTAL	PAH 6 Total								TM4/PM8	mg/kg	<0.22	6.267	N/A	N/A	0.592	4.291	8.2	98.6	0.33	N/A	<1.6
PAH_17_TOTAL	PAH 17 Total								TM4/PM8	mg/kg	<0.64	11.733	N/A	N/A	1.531	8.512	18.912	225.433	0.675	N/A	<1
	PAHs																				
INTERPRETATION	EPH CWG Interpretation								TM5/PM16	None		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MINOIL_10-40	Mineral Oil (C10-C40)								TM5/PM16	mg/kg	<30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
	TPH CWG																				
	Aliphatics																				
GTC05C06AL	>C5-C6	42	78	160	600,000	3,200	5,900	12,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTC06C08AL	>C6-C8	100	230	530	620,000	7,800	17,000	40,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTC08C10AL	>C8-C10	27	65	150	13,000	2,000	4,800	11,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTC10C12AL	>C10-C12	130	330	770	13,000	9,700	23,000	47,000	TM5/PM16	mg/kg	<0.2	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTC12C16AL	>C12-C16	1,100	2,400	4,400	13,000	59,000	82,000	90,000	TM5/PM16	mg/kg	<4	N/A	N/A	N/A	N/A	<0.1	N/A	N/A	N/A	<0.1	N/A
GTC16C21AL	>C16-C21								TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	<0.1	N/A	N/A	N/A	<0.1	N/A
GTC21C35AL	>C21-C35								TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	<0.1	N/A	N/A	N/A	<0.1	N/A
GTC05C40AL	Total aliphatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	N/A	N/A	N/A	N/A	<0.1	N/A	N/A	N/A	<0.1	N/A
	Aromatics																				
GTEC05EC07AR	>C5-EC7	370	690	1,400	56,000	26,000	46,000	86,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTEC07EC08AR	>EC7-EC8	860	1,800	3,900	56,000	56,000	110,000	180,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTEC08EC10AR	>EC8-EC10	47	110	270	5,000	3,500	8,100	17,000	TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTEC10EC12AR	>EC10-EC12	250	590	1,200	5,000	16,000	28,000	34,000	TM5/PM16	mg/kg	<0.2	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
GTEC12EC16AR	>EC12-EC16	1,800	2,300	2,500	5,000	36,000	37,000	38,000	TM5/PM16	mg/kg	<4	N/A	N/A	N/A	N/A	2.60	N/A	N/A	N/A	<0.1	N/A
GTEC16EC21AR	>EC16-EC21	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	4.00	N/A	N/A	N/A	<0.1	N/A
GTEC21EC35AR	>EC21-EC35	1,900	1,900	1,900	3,800	28,000	28,000	28,000	TM5/PM16	mg/kg	<7	N/A	N/A	N/A	N/A	1.00	N/A	N/A	N/A	<0.1	N/A
GTEC05EC40AR	Total aromatics C5-40								TM5/TM36/PM12/PM16	mg/kg	<26	N/A	N/A	N/A	N/A	7.60	N/A	N/A	N/A	<0.1	N/A
GTEC06EC10AR	>EC6-EC10								TM36/PM12	mg/kg	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
1634-04-4	MTBE*							24,000	TM31/PM12	mg/kg	<0.05	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	N/A
71-43-2	Benzene	380	700	1,400	73,000	27,000	47,000	90,000	TM31/PM12	mg/kg	<0.05	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	<0.01
108-88-3	Toluene	880,000	1,900,000	3,900,000	56,000,000	56,000,000	110,000,000	180,000,000	TM31/PM12	mg/kg	<0.05	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	<0.01
100-41-4	Ethylbenzene	83,000	190,000	480,000	25,000,000	5,700,000	13,000,000	27,000,000	TM31/PM12	mg/kg	<0.05	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	<0.01
XYLENE	Xylene	79,000	180,000	430,000	43,000,000	5,900,000	14,000,000	30,000,000	TM31/PM12	mg/kg	<0.05	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	N/A	<0.01	<0.01

Table 1: Soil Analytical Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	GAC S4UL Residential without plant uptake End Use 1%	GAC S4UL Residential without plant uptake End Use 2.5%	GAC S4UL Residential without plant uptake End Use 6%	GAC S4UL Public Open Space Residential 6% SOM	GAC S4UL commercial End Use 1%	GAC S4UL Commercial End Use 2.5%	GAC S4UL Commercial End Use 6%	Method	Units	LOD	Sample ID: BH4				BH5	BH6		BH7		
										Depth		1.00	5.0-5.3	6.0-6.3	7.20	2.00	1.00	2.00	0.5	3	6.50
										Sample Type		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
7012-37-5	PCB 28								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
35693-99-3	PCB 52								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
37680-73-2	PCB 101								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
31508-00-6	PCB 118								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
35065-28-2	PCB 138								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
35065-27-1	PCB 153								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
35065-29-3	PCB 180								TM17/PM8	ug/kg	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
PCB_7_CON_TOTAL	Total 7 PCBs ^	1,000	1,000	1,000		1,000	1,000	1,000	TM17/PM8	ug/kg	<35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1
18540-29-9	Hexavalent Chromium	6	6	6	7.7	33	33	33	TM38/PM20	mg/kg	<0.01	<0.1	N/A	N/A	<0.1	<0.1	<0.1	<0.1	<0.1	N/A	<0.1
108-95-2	Phenol	750	1,300	2,300		760	1,500	3,200	TM26/PM21	mg/kg	<0.01	N/A	N/A	N/A	N/A	<0.01	N/A	N/A	<0.01	N/A	<0.01
MOIST_CONT_DRY	Natural Moisture Content								PM4/PM0	%	<0.1	9.50	N/A	N/A	40.90	23.20	15.00	27.20	3.90	17.80	7.80
57-12-5	Total Cyanide								TM89/PM45	mg/kg	<0.5	<2.5	N/A	N/A	<2.5	N/A	<2.5	<2.5	<1	N/A	<1
TOC	Total Organic Carbon								TM21/PM24	%	<0.02	7.60	N/A	N/A	N/A	3.10	N/A	N/A	N/A	N/A	0.50
SULPHIDE	Sulphide								TM106/PM45	mg/kg	<10	7.00	N/A	N/A	35.00	<5	17.00	<5	24.00	N/A	16.00
PH	ph								TM73/PM11	pH units		8.49	N/A	N/A	7.84	8.13	8.45	8.38	9.21	N/A	8.67
	Asbestos Screening								TM65/PM42	None		No Fibres Detected	N/A	N/A	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	N/A	No Fibres Detected

Notes:

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*Indicates GAC values from SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination - Policy Companion Document published in 2014

NAD = No Asbestos Detected. NA = Not Available.

EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment published in 2010.

+ GAC S4ULs EC >35- 44 were used in the absense of suitable for use levels for EC>35-40

^ Indicates Intervention Values taken from **DUTCH INTERVENTION 2009**

Table 2: Soil Samples SVOCs and VOC Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

								Sample ID			WS6	WS11	WS6	WS11	BH5
								Depth			4	3	4	3	2
								Sample Type			Soil	Soil	Soil	Soil	Soil
								Sampled Date			Unknown	Unknown	Unknown	Unknown	Unknown
CAS Number	**Test**	**GAC S4UL Residential without plant uptake End Use 1%**	**GAC S4UL Residential without plant uptake End Use 2.5%**	**GAC S4UL Residential without plant uptake End Use 6%**	**GAC S4UL commercial End Use 1%**	**GAC S4UL Commercial End Use 2.5%**	**GAC S4UL Commercial End Use 6%**	**Method**	**Units**	**LOD**					
	Total Organic Carbon							TM21/PM24	%	<0.02	1.6	-	1.6	-	3.1
	Soil Organic Matter								%	<0.02	0.928	-	0.928	-	1.798
	SVOC MS														
	Phenols														
95-57-8	2-Chlorophenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
95-48-7	2-Methylphenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
88-75-5	2-Nitrophenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
120-83-2	2,4-Dichlorophenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
105-67-9	2,4-Dimethylphenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
95-95-4	2,4,5-Trichlorophenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
88-06-2	2,4,6-Trichlorophenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
59-50-7	4-Chloro-3-methylphenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
106-44-5	4-Methylphenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
100-02-7	4-Nitrophenol							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Sum of Mono to Tetra Chlorophenols	94,000	150,000	210,000	3,500,000	4,000,000	4,300,000								
87-86-5	Pentachlorophenol	27,000	29,000	31,000	400,000	400,000	400,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
108-95-2	Phenol	750,000	1,300,000	2,300,000	760,000	1,500,000	3,200,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Phthalates														
117-81-7	Bis(2-ethylhexyl) phthalate							TM16/PM8	ug/kg	<100	<100	1663	-	-	-
85-68-7	Butylbenzyl phthalate							TM16/PM8	ug/kg	<100	<100	<100	-	-	-
84-74-2	Di-n-butyl phthalate	450,000	450,000	450,000	15,000,000	15,000,000	15,000,000	TM16/PM8	ug/kg	<100	<100	<100	-	-	-
117-84-0	Di-n-Octyl phthalate	3,400,000	3,400,000	3,400,000	89,000,000	89,000,000	89,000,000	TM16/PM8	ug/kg	<100	<100	<100	-	-	-
84-66-2	Diethyl phthalate	1,800,000	3,500,000	6,300,000	150,000,000	220,000,000	290,000,000	TM16/PM8	ug/kg	<100	<100	<100	-	-	-
131-11-3	Dimethyl phthalate							TM16/PM8	ug/kg	<100	<100	<100	-	-	-
	Other SVOCs														
95-50-1	1,2-Dichlorobenzene	24,000	57,000	130,000	2,000,000	4,800,000	11,000,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
120-82-1	1,2,4-Trichlorobenzene	2,600	6,400	15,000	220,000	530,000	1,300,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
541-73-1	1,3-Dichlorobenzene	440	1,100	2,500	30,000	73,000	170,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
106-46-7	1,4-Dichlorobenzene	61,000	150,000	350,000	4,400,000	10,000,000	25,000,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
88-74-4	2-Nitroaniline							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
121-14-2	2,4-Dinitrotoluene	170,000	170,000	170,000	3,700,000	3,700,000	3,800,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
606-20-2	2,6-Dinitrotoluene	78,000	84,000	87,000	1,900,000	1,900,000	1,900,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
99-09-2	3-Nitroaniline							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
101-55-3	4-Bromophenylphenylether							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
106-47-8	4-Chloroaniline							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
7005-72-3	4-Chlorophenylphenylether							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
100-01-6	4-Nitroaniline							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
103-33-3	Azobenzene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
111-91-1	Bis(2-chloroethoxy)methane							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
111-44-4	Bis(2-chloroethyl)ether							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
86-74-8	Carbazole							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
132-64-9	Dibenzofuran							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
118-74-1	Hexachlorobenzene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-

Table 2: Soil Samples SVOCs and VOC Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

								Sample ID			WS6	WS11	WS6	WS11	BH5
								Depth			4	3	4	3	2
								Sample Type			Soil	Soil	Soil	Soil	Soil
								Sampled Date			Unknown	Unknown	Unknown	Unknown	Unknown
87-68-3	Hexachlorobutadiene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
77-47-4	Hexachlorocyclopentadiene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
67-72-1	Hexachloroethane	220	540	1,300	22,000	53,000	120,000	TM16/PM8	ug/kg	<10	<100	<100	-	-	-
78-59-1	Isophorone							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
621-64-7	N-nitrosodi-n-propylamine							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
98-95-3	Nitrobenzene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
321-60-8	Surrogate Recovery 2-Fluorobiphenyl							TM16/PM8	%	<0					
1718-51-0	Surrogate Recovery p-Terphenyl-d14							TM16/PM8	%	<0					
	Naphthalene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Acenaphthylene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Acenaphthene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Fluorene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Phenanthrene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Anthracene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Fluoranthrene							TM16/PM8	ug/kg	<10	163	185	-	-	-
	Pyrene							TM16/PM8	ug/kg	<10	130	153	-	-	-
	Benzo(a)anthracene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Chrysene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Benzo(b)fluoranthene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Benzo(k)fluoranthrene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Benzo(a)pyrene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Indeno(1,2,3-cd)pyrene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Dibenzo(a,h)anthracene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	Benzo(ghi)perylene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	2-Chloronaphthalene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	2-Methylnaphthalene							TM16/PM8	ug/kg	<10	<100	<100	-	-	-
	VOC MS														
75-71-8	Dichlorodifluoromethane							TM15/PM10	ug/kg	<2	-	-	<2	<2	<2
1634-04-4	Methyl Tertiary Butyl Ether	73,000	120,000	220,000	7,900,00	13,000,000	24,000,000	TM15/PM10	ug/kg	<2	-	-	<3	<3	<3
74-87-3	Chloromethane	8.5	9.9	13	1,000	1,200	1,600	TM15/PM10	ug/kg	<3	-	-	<3	<3	<3
75-01-4	Vinyl Chloride	0.77	1	1.5	59	77	120	TM15_A/PM10	ug/kg	<2	-	-	<3	<3	<3
74-83-9	Bromomethane						120,000	TM15/PM10	ug/kg	<1	-	-	<5	<5	<5
75-00-3	Chloroethane	8,400	11,000	18,000	960,000	1,300,000	2,100,000	TM15/PM10	ug/kg	<2	-	-	<2.5	<2.5	<2.5
75-69-4	Trichlorofluoromethane							TM15/PM10	ug/kg	<2	-	-	<1.5	<1.5	<1.5
75-35-4	1,1-Dichloroethene (1,1 DCE)	230	410	820	26,000	46,000	92,000	TM15/PM10	ug/kg	<6	-	-	<2	<2	<2
75-09-2	Dichloromethane (DCM)	2,100	2,800	4,500	270,000	360,000	560,000	TM15/PM10	ug/kg	<30	-	-	<4	<4	<4
156-60-5	trans-1-2-Dichloroethene							TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
75-34-3	1,1-Dichloroethane	2,500	4,100	7,700	280,000	450,000	850,000	TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
156-59-2	cis-1-2-Dichloroethene	120	200	390	14,000	24,000	47,000	TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
594-20-7	2,2-Dichloropropane							TM15/PM10	ug/kg	<4	-	-	<3	<3	<3
74-97-5	Bromochloromethane							TM15/PM10	ug/kg	<3	-	-	<6	<6	<6
67-66-3	Chloroform	1,200	2,100	4,200	99,000	170,000	350,000	TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
71-55-6	1,1,1-Trichloroethane	9,000	18,000	40,000	660,000	1,300,000	3,000,000	TM15/PM10	ug/kg	<3	-	-	<1.5	<1.5	<1.5
563-58-6	1,1-Dichloropropene							TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
56-23-5	Carbon tetrachloride							TM15/PM10	ug/kg	<4	-	-	<1	<1	<1
107-06-2	1,2-Dichloroethane	9.2	13	23	670	970	1,700	TM15/PM10	ug/kg	<4	-	-	<5	<5	<5
71-43-2	Benzene	380	700	1,400	27,000	47,000	90,000	TM15/PM10	ug/kg	<3	-	-	<2	<2	<2

Table 2: Soil Samples SVOCs and VOC Results - Site Investigation 2008

Connolly Station Car Park, Dublin 1

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

								Sample ID			WS6	WS11	WS6	WS11	BH5
								Depth			4	3	4	3	2
								Sample Type			Soil	Soil	Soil	Soil	Soil
								Sampled Date			Unknown	Unknown	Unknown	Unknown	Unknown
79-01-6	Trichloroethene (TCE)	17	36	80	1,200	2,600	5,700	TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
78-87-5	1,2-Dichloropropane	24	42	85	3,300	5,900	12,000	TM15/PM10	ug/kg	<6	-	-	<3	<3	<3
74-95-3	Dibromomethane							TM15/PM10	ug/kg	<3	-	-	<8	<8	<8
75-27-4	Bromodichloromethane							TM15/PM10	ug/kg	<3	-	-	<3	<3	<3
10061-01-5	cis-1-3-Dichloropropene							TM15/PM10	ug/kg	<4	-	-	<3.5	<3.5	<3.5
108-88-3	Toluene	880,000	1,900,000	3,900,000	56,000,000	110,000,000	180,000,000	TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
10061-02-6	trans-1-3-Dichloropropene							TM15/PM10	ug/kg	<3	-	-	<4	<4	<4
79-00-5	1,1,2-Trichloroethane	880	1,800	3,900	94,000	190,000	400,000	TM15/PM10	ug/kg	<3	-	-	<4.5	<4.5	<4.5
127-18-4	Tetrachloroethene (PCE)	180	400	920	19,000	42,000	95,000	TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
142-28-9	1,3-Dichloropropane							TM15/PM10	ug/kg	<3	-	-	<5	<5	<5
124-48-1	Dibromochloromethane							TM15/PM10	ug/kg	<3	-	-	<4	<4	<4
106-93-4	1,2-Dibromoethane							TM15/PM10	ug/kg	<3	-	-	<5	<5	<5
108-90-7	Chlorobenzene	460	1,000	2,400	56,000	130,000	290,000	TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
630-20-6	1,1,1,2-Tetrachloroethane	1,500	3,500	8,200	110,000	250,000	560,000	TM15/PM10	ug/kg	<3	-	-	<2	<2	<2
100-41-4	Ethylbenzene	83,000	190,000	480,000	5,700,000	13,000,000	33,000,000	TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
P_M_XYLENE	p/m-Xylene	161,000	370,000	880,000	12,100,000	28,000,000	61,000,000	TM15/PM10	ug/kg	<5	-	-	<2	18	<2
95-47-6	o-Xylene	88,000	210,000	480,000	6,600,000	15,000,000	33,000,000	TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
100-42-5	Styrene	35,000	78,000	170,000	3,300,000	6,500,000	11,000,000	TM15_A/PM10	ug/kg	<3	-	-	<1	<1	<1
75-25-2	Bromoform	5,200	11,000	23,000	760,000	1,500,000	3,100,000	TM15/PM10	ug/kg	<3	-	-	<7	<7	<7
98-82-8	Isopropylbenzene	12,000	28,000	67,000	1,400,000	3,300,000	7,700,000	TM15/PM10	ug/kg	<3	-	-	<1	5	<1
79-34-5	1,1,2,2-Tetrachloroethane	3,900	8,000	17,000	270,000	550,000	1,100,000	TM15/PM10	ug/kg	<3	-	-	<8	<8	<8
108-86-1	Bromobenzene	910	2,100	4,900	97,000	220,000	520,000	TM15/PM10	ug/kg	<2	-	-	<2	<2	<2
96-18-4	1,2,3-Trichloropropane							TM15/PM10	ug/kg	<4	-	-	<8	<8	<8
103-65-1	Propylbenzene	40,000	97,000	230,000	4,100,000	9,700,000	21,000,000	TM15/PM10	ug/kg	<4	-	-	<1	10	<1
95-49-8	2-Chlorotoluene							TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
108-67-8	1,3,5-Trimethylbenzene							TM15/PM10	ug/kg	<3	-	-	<1	11	<1
106-43-4	4-Chlorotoluene							TM15/PM10	ug/kg	<3	-	-	<1	<1	<1
98-06-6	tert-Butylbenzene							TM15/PM10	ug/kg	<5	-	-	<1	<1	<1
95-63-6	1,2,4-Trimethylbenzene	410	990	2,300	42,000	99,000	220,000	TM15/PM10	ug/kg	<6	-	-	<1	71	<1
135-98-8	sec-Butylbenzene							TM15/PM10	ug/kg	<4	-	-	<1	3	<1
99-87-6	4-Isopropyltoluene							TM15/PM10	ug/kg	<4	-	-	<1	<1	<1
541-73-1	1,3-Dichlorobenzene	440	1,100	2,500	30,000	73,000	170,000	TM15/PM10	ug/kg	<4	-	-	<1	<1	<1
106-46-7	1,4-Dichlorobenzene	61,000	150,000	350,000	4,400,000	10,000,000	25,000,000	TM15/PM10	ug/kg	<4	-	-	<3	<3	<3
104-51-8	n-Butylbenzene							TM15/PM10	ug/kg	<4	-	-	<2	<2	<2
95-50-1	1,2-Dichlorobenzene	24,000	57,000	130,000	2,000,000	4,800,000	11,000,000	TM15/PM10	ug/kg	<4	-	-	<2	<2	<2
96-12-8	1,2-Dibromo-3-chloropropane							TM15/PM10	ug/kg	<4	-	-	<13	<13	<13
120-82-1	1,2,4-Trichlorobenzene	2,600	6,400	15,000	220,000	530,000	1,300,000	TM15/PM10	ug/kg	<7	-	-	<3	<3	<3
87-68-3	Hexachlorobutadiene	320	780	1,800	31,000	66,000	120,000	TM15/PM10	ug/kg	<4	-	-	<2	<2	<2
91-20-3	Naphthalene	2,300	5,600	13,000	190,000	460,000	1,100,000	TM15/PM10	ug/kg	<27	-	-	<4	<4	<4
87-61-6	1,2,3-Trichlorobenzene	1,500	3,700	8,800	102,000	250,000	590,000	TM15/PM10	ug/kg	<7	-	-	<2.5	<2.5	<2.5

Notes:
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EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment published in 2010.
- = Not tested

Table 3: Groundwater Environmental Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

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					Sample ID		BH1			BH2		BH3			BH4				BH5			BH6		BH7			WS7			WS11		
					Depth		Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
					Sample Type		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
					Sampled Date		04/09/2008	10/09/2008	17/09/2008	10/09/2008	17/09/2008	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	04/09/2008	10/09/2008	29/08/2008	10/09/2008	17/09/2008	10/09/2008	17/09/2008	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	10/09/2008
CAS Number	**Test**	**Groundwater Regulations**	**EPA Interim Guideline Values**	**Method**	**Units**	**LOD**																										
		2016	2003																													
7440-36-0	Dissolved Antimony			TM30/PM14	ug/l	<2	1	<1	2	<1	3	3	1	<1	5	<1	N/A	<1	3	3	4	<1	<1	<1	<1	1	11	21	20	<1	3	2
7440-38-2	Dissolved Arsenic	7.50	10	TM30/PM14	ug/l	<2.5	1	<1	2	2	3	3	<1	<1	5	2	N/A	<1	10	9	10	2	3	5	8	8	3	8	1	2	6	4
7440-43-9	Dissolved Cadmium		5	TM30/PM14	ug/l	<0.5	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	0.5	<0.4	<0.4	0.5	N/A	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.6	1.3	1.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
7440-47-3	Total Dissolved Chromium	37.50	30	TM30/PM14	ug/l	<1.5	<1	1	<1	<1	1	4	3	<1	2	126	6	1	13	1	1	<1	<1	7	2	3	7	1	<1	9	<1	<1
7440-50-8	Dissolved Copper		30	TM30/PM14	ug/l	<7	2	3	1	3	2	3	7	4	5	15	N/A	5	4	5	5	<1	2	8	8	4	5	9	5	4	9	1
7439-92-1	Dissolved Lead	7.50	10	TM30/PM14	ug/l	<5	1	16	<1	<1	<1	<1	19	1	2	34	N/A	1	2	4	<1	<1	3	<1	4	1	2	35	2	6	62	2
7439-97-6	Dissolved Mercury	0.75	1	TM30/PM14	ug/l	<1	N/A	<0.05	<0.05	<0.05	<0.05	0.08	N/A	<0.05	0.05	N/A	N/A	0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	N/A	0.06	<0.05	N/A	<0.05	<0.05	N/A	<0.05
7440-02-0	Dissolved Nickel		20	TM30/PM14	ug/l	<2	6	6	4	7	4	5	7	2	4	68	N/A	2	17	17	19	7	10	14	13	13	10	10	8	8	15	12
7782-49-2	Dissolved Selenium			TM30/PM14	ug/l	<3	12	8	11	3	10	16	<1	3	8	2	N/A	<1	<1	<1	2	<1	<1	31	28	27	1	10	<1	<1	<1	2
7440-66-6	Dissolved Zinc	75.00	100	TM30/PM14	ug/l	<3	21	151	<1	32	<1	32	45	22	34	104	N/A	18	57	55	32	27	27	35	25	17	34	36	23	76	72	15
VOCTIC	**VOC TICs**			TM15/PM10	None																											
1634-04-4	Methyl Tertiary Butyl Ether	10.00	30	TM15/PM10	ug/l	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	14	17
71-43-2	Benzene	0.75	1	TM15/PM10	ug/l	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	31	<0.01
108-88-3	Toluene	525.00	10	TM15/PM10	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	19	<0.01	<0.01
100-41-4	Ethylbenzene		10	TM15/PM10	ug/l	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	211	13	15
XYLENE	Xylene		10	TM15/PM10	ug/l	<2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	527	35	23
	SVOC MS																															
108-95-2	Phenol		0.5	TM16/PM30	ug/l	<1	0.02	<0.01	0.18	<0.01	0.13	N/A	0.03	<0.01	N/A	0.03	N/A	<0.01	N/A	<0.01	0.09	<0.01	0.03	N/A	<0.01	<0.01	N/A	0.02	<0.01	N/A	0.03	<0.01
	PAHs																															
91-20-3	Naphthalene		1	TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.117	0.013	0.531	<0.01	0.07	0.028	<0.01	N/A	<0.01	0.02	<0.01	<0.01	0.013	0.382	0.031	<0.01	<0.01	0.037	<0.01	<0.01	0.617	<0.01	<0.01
208-96-8	Acenaphthylene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	4.631	5.201	33.067	<0.01	3.775	0.023	<0.01	N/A	<0.01	0.011	<0.01	<0.01	0.013	1.147	<0.01	<0.01	<0.01	0.018	<0.01	<0.01	2.35	<0.01	0.018
83-32-9	Acenaphthene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	1.836	1.222	6.966	<0.01	1.099	0.022	<0.01	N/A	<0.01	0.029	<0.01	<0.01	0.038	1.693	0.011	<0.01	<0.01	0.032	<0.01	<0.01	2.996	<0.01	0.045
86-73-7	Fluorene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	2.027	0.031	1.611	<0.01	1.552	0.016	<0.01	N/A	<0.01	0.04	<0.01	<0.01	0.047	1.781	0.025	<0.01	<0.01	0.079	<0.01	<0.01	1.73	<0.01	0.045
85-01-8	Phenanthrene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	3.303	0.067	2.803	<0.01	2.106	0.034	<0.01	N/A	<0.01	0.159	<0.01	<0.01	0.088	3.062	0.04	<0.01	<0.01	0.187	<0.01	<0.01	3.956	<0.01	0.061
120-12-7	Anthracene		10,000	TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.901	0.019	2.221	<0.01	1.396	0.013	<0.01	N/A	<0.01	0.043	<0.01	<0.01	0.029	0.596	<0.01	<0.01	<0.01	0.086	<0.01	<0.01	0.48	<0.01	0.025
206-44-0	Fluoranthene		1	TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	2.407	<0.01	0.578	<0.01	1.135	0.011	<0.01	N/A	<0.01	0.083	<0.01	<0.01	0.045	1.318	<0.01	<0.01	<0.01	0.141	<0.01	<0.01	1.792	<0.01	0.037
129-00-0	Pyrene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.975	<0.01	1.094	<0.01	0.982	0.011	<0.01	N/A	<0.01	0.075	<0.01	<0.01	0.041	1.075	<0.01	<0.01	<0.01	0.117	<0.01	<0.01	1.554	<0.01	0.03
56-55-3	Benzo(a)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.867	<0.01	<0.01	<0.01	0.647	<0.01	<0.01	N/A	<0.01	0.027	<0.01	<0.01	0.013	0.43	<0.01	<0.01	<0.01	0.085	<0.01	<0.01	0.635	<0.01	<0.01
218-01-9	Chrysene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.908	<0.01	<0.01	<0.01	0.632	<0.01	<0.01	N/A	<0.01	0.026	<0.01	<0.01	0.01	0.311	<0.01	<0.01	<0.01	0.083	<0.01	<0.01	0.545	<0.01	<0.01
BEN-BK-FLUORAN	Benzo(bk)fluoranthene*		0.5	TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	2.07	<0.01	<0.01	<0.01	0.903	0.017	<0.01	N/A	<0.01	0.036	<0.01	<0.01	0.01	0.321	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.551	<0.01	<0.01
50-32-8	Benzo(a)pyrene	0.0075	0.01	TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.714	<0.01	<0.01	<0.01	0.453	<0.01	<0.01	N/A	<0.01	0.015	<0.01	<0.01	<0.01	0.148	<0.01	<0.01	<0.01	0.053	<0.01	<0.01	0.206	<0.01	<0.01
193-39-5	Indeno(123cd)pyrene		0.05	TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.204	<0.01	<0.01	<0.01	0.252	<0.01	<0.01	N/A	<0.01	0.012	<0.01	<0.01	<0.01	0.069	<0.01	<0.01	<0.01	0.041	<0.01	<0.01	0.117	<0.01	<0.01
53-70-3	Dibenzo(ah)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.19	<0.01	<0.01	<0.01	0.086	<0.01	<0.01	N/A	<0.01	0.018	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.029	<0.01	<0.01	0.077	<0.01	<0.01
191-24-2	Benzo(ghi)perylene		0.05	TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.248	<0.01	<0.01	<0.01	0.217	<0.01	<0.01	N/A	<0.01	0.014	<0.01	<0.01	<0.01	0.082	<0.01	<0.01	<0.01	0.057	<0.01	<0.01	0.128	<0.01	<0.01
	Total 16 EPA PAHs		0.1		ug/l	<1	<0.01	<0.01	<0.01	25.399	6.576	48.871	<0.01	15.304	0.208	<0.01	N/A	<0.01	0.608	<0.01	<0.01	0.347	12.445	0.149	<0.01	<0.01	1.105	<0.01	<0.01	17.734	<0.01	0.275
	TPH CWG																															
	Aliphatics																															
GTC05C06AL	>C5-C6			TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	138	1004	34
GTC06C08AL	>C6-C8			TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1453	1927	454
GTC08C10AL	>C8-C10			TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	948.8	1649.6	315.6
GTC10C12AL	>C10-C12			TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1272.8	1403.2	344.4
GTC12C16AL	>C12-C16			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	226	<0.01	<0.01	<0.01	111	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1734	103.1	1152
GTC16C21AL	>C16-C21			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	1088	<0.01	<0.01	<0.01	761	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	444	66.7	443
GTC21C35AL	>C21-C35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	15312	<0.01	<0.01	<0.01	8376	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC05C35AL	Total aliphatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	16626	<0.01	<0.01	<0.01	9248	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5990.6	6153.6	2743
	Aromatics																															
GTEC05EC07AR	>C5-EC7			TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	31	<0.01
GTEC07EC08AR	>EC7-EC8			TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	19	<0.01	<0.01
GTEC08EC10AR	>EC8-EC10			TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2161.2	2522.4	511.4
GTEC10EC12AR	>EC10-EC12			TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1909.2	2104.8	516.6
GTEC12EC16AR	>EC12-EC16			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	18080	6553	48320	<0.01	12045	130	<0.01	N/A	<0.01	445.2	<0.01	261	301	<0.01	99	<0.01	<0.01	660	<0.01	183	14858	4337	10672
GTEC16EC21AR	>EC16-EC21			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	6049	<0.01	<0.01	<0.01	2434	35	<0.01	N/A	<0.01	101	<0.01	<0.01	35	<0.01	13	<0.01	<0.01	269	<0.01	61	1848	<0.01	1131
GTEC21EC35AR	>EC21-EC35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	438	<0.01	<0.01	<0.01	303	10	<0.01	N/A	<0.01	32	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	86	<0.01	24	105	<0.01	112
GTEC05EC35AR	Total aromatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	24567	6553	48320	<0.01	14782	175	<0.01	N/A	<0.01	578.2	<0.01	261	336	<0.01	112	<0.01	<0.01	1015	<0.01	268	20900.4	8995.2	12943
GTC05C35ALAR	Total TPH C2-C40	7.50	10	TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	41193	6553	48320	<0.01	24030	175	<0.01	N/A	<0.01	578.2	<0.01	261	336	<0.01	112	<0.01	<0.01	1015	<0.01	268	26891	15148.8	15686
7012-37-5	PCB 28			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35693-99-3	PCB 52			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
37680-73-2	PCB 101			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31508-00-6	PCB 118			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-28-2	PCB 138			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-27-1	PCB 153			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-29-3	PCB 180			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCB_7_CON_TOTAL	Total 7 PCBs		0.01	TM17/PM30	ug/l	<0.7	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16984-48-8	Fluoride			TM173/PM0	mg/l	<0.3																										
14808-79-8	Sulphate as SO4	187.50	200	TM38/PM0	mg/l	<0.5	393	342	313	308	261	268	39	19	302	183	N/A	128	952	1021	976	91	89	841	1003	992	777	826	770	72	73	101
16887-00-6	Chloride	187.50	30	TM38/PM0	mg/l	<0.3	841	800	672	1,792	1,214	1,790	62	38	925	624	N/A	493	29	35	29	20	15	6475	7208	7750	15	2011	16	14	17	17
CYANIDE_FREE	Free Cyanide			TM89/PM0	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
AMM_NITROGEN_N	Ammoniacal Nitrogen as N	0.18		TM38/PM0	mg/l	<0.03	<0.2	<0.2	<0.2	36	39.4	<0.2	<0.2	<0.2	<0.2	<0.2	N/A	<0.2	8.9	9.6	8.9	17.4	0.8	2	5.3	1.5	6.8	4.9	2	3.4	4	20.6
ALK_TOT_CACO3	Total Alkalinity as CaCO3		200	TM75/PM0	mg/l	<1	472	520	508	799	701	573	162	90	610	391	N/A	281	1610	1564	1552	776	455	1986	1806	1906	1182	1337	982	450	548	748
JEL575	BOD (Settled)			TM58/PM0	mg/l	<1	<2	<2	<2	<2	<2	43	9	<2	4	2	N/A	<2	<2	93	<2	<2	<2	2	<2	<2	18	<2	<2	4	4	<2
COD	COD (Settled)			TM57/PM0	mg/l	<7	204	366	<15	178	42	73	144	593	<15	129	N/A	229	897	280	<15	402	327	72	350	660	2242	696	574	912	339	35
TOC	Total Organic Carbon			TM60/PM0	mg/l	<2	<2	<2	3	9	10	6	<2	12	6	<2	N/A	3	7	7	7	7	14	4	<2	3	7	<2	7	10	<2	7
	pH		>6.5 & <9.5		pH units		7.59	7.71	7.68	7.29	7.86	7.76	7.89	7.92	10.05	7.57	N/A	7.8	7.07	7.02	7.58	7.14	7.42	7.37	7.95	7.54	7.33	7.58	7.57	7.14	7.61	7.51

Notes:
N/A = Not Analysed/ No Analytical Results

Table 4: Groundwater Human health Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

CAS Number	Test	SoBRA 2017 Residential Development GACs	SoBRA 2017 Commercial Development GACs	Method	Units	LOD	BH1			BH2		BH3		
						Depth	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
						Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
						Sampled Date	04/09/2008	10/09/2008	17/09/2008	10/09/2008	17/09/2008	29/08/2008	04/09/2008	10/09/2008
7440-36-0	Dissolved Antimony			TM30/PM14	ug/l	<2	1	<1	2	<1	3	3	1	<1
7440-38-2	Dissolved Arsenic			TM30/PM14	ug/l	<2.5	1	<1	2	2	3	3	<1	<1
7440-43-9	Dissolved Cadmium			TM30/PM14	ug/l	<0.5	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	0.5	<0.4
7440-47-3	Total Dissolved Chromium			TM30/PM14	ug/l	<1.5	<1	1	<1	<1	1	4	3	<1
7440-50-8	Dissolved Copper			TM30/PM14	ug/l	<7	2	3	1	3	2	3	7	4
7439-92-1	Dissolved Lead			TM30/PM14	ug/l	<5	1	16	<1	<1	<1	<1	19	1
7439-97-6	Dissolved Mercury (sol)	1	95	TM30/PM14	ug/l	<1	N/A	<0.05	<0.05	<0.05	<0.05	0.08	N/A	<0.05
7440-02-0	Dissolved Nickel			TM30/PM14	ug/l	<2	6	6	4	7	4	5	7	2
7782-49-2	Dissolved Selenium			TM30/PM14	ug/l	<3	12	8	11	3	10	16	<1	3
7440-66-6	Dissolved Zinc			TM30/PM14	ug/l	<3	21	151	<1	32	<1	32	45	22
VOCTIC	**VOC TICs**			TM15/PM10	None									
1634-04-4	Methyl Tertiary Butyl Ether	83,000	7,800,000	TM15/PM10	ug/l	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
71-43-2	Benzene	210	20,000	TM15/PM10	ug/l	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
108-88-3	Toluene (sol)	230,000	21,000,000	TM15/PM10	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
100-41-4	Ethylbenzene (sol)	10,000	960,000	TM15/PM10	ug/l	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P_M_XYLENE	Xylene (sol) (m)	9,500	940,000	TM15/PM10	ug/l	<2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SVOC MS													
108-95-2	Phenol			TM16/PM30	ug/l	<1	0.02	<0.01	0.18	<0.01	0.13	N/A	0.03	<0.01
	PAHs													
91-20-3	Naphthalene	220	23,000	TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.117	0.013	0.531	<0.01	0.07
208-96-8	Acenaphthylene (sol)	220,000	20,000,000	TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	4.631	5.201	33.067	<0.01	3.775
83-32-9	Acenaphthene (sol)	170,000	15,000,000	TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	1.836	1.222	6.966	<0.01	1.099
86-73-7	Fluorene (sol)	210,000	18,000,000	TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	2.027	0.031	1.611	<0.01	1.552
85-01-8	Phenanthrene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	3.303	0.067	2.803	<0.01	2.106
120-12-7	Anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.901	0.019	2.221	<0.01	1.396
206-44-0	Fluoranthene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	2.407	<0.01	0.578	<0.01	1.135
129-00-0	Pyrene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.975	<0.01	1.094	<0.01	0.982
56-55-3	Benzo(a)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.867	<0.01	<0.01	<0.01	0.647
218-01-9	Chrysene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	1.908	<0.01	<0.01	<0.01	0.632
BEN-BK-FLUORAN	Benzo(bk)fluoranthene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	2.07	<0.01	<0.01	<0.01	0.903
50-32-8	Benzo(a)pyrene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.714	<0.01	<0.01	<0.01	0.453
193-39-5	Indeno(123cd)pyrene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.204	<0.01	<0.01	<0.01	0.252
53-70-3	Dibenzo(ah)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.19	<0.01	<0.01	<0.01	0.086
191-24-2	Benzo(ghi)perylene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.248	<0.01	<0.01	<0.01	0.217
	Total 16 EPA PAHs						<0.01	<0.01	<0.01	25.399	6.576	48.871	<0.01	15.304

Table 4: Groundwater Human health Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

						Sample ID	BH1			BH2		BH3		
						Depth	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
						Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
						Sampled Date	04/09/2008	10/09/2008	17/09/2008	10/09/2008	17/09/2008	29/08/2008	04/09/2008	10/09/2008
CAS Number	**Test**	**SoBRA 2017 Residential Development GACs**	**SoBRA 2017 Commercial Development GACs**	**Method**	**Units**	**LOD**								
	TPH CWG													
	Aliphatics													
GTC05C06AL	>C5-C6 (sol)	1,900	190,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC06C08AL	>C6-C8 (sol)	1,500	150,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC08C10AL	>C8-C10 (sol)	57	5,700	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC10C12AL	>C10-C12 (sol)	37	3,600	TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC12C16AL	>C12-C16			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	226	<0.01	<0.01	<0.01	111
GTC16C21AL	>C16-C21			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	1088	<0.01	<0.01	<0.01	761
GTC21C35AL	>C21-C35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	15312	<0.01	<0.01	<0.01	8376
GTC05C35AL	Total aliphatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	16626	<0.01	<0.01	<0.01	9248
	Aromatics													
GTEC05EC07AR	>C5-EC7 (sol)	210,000	20,000,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC07EC08AR	>EC7-EC8 (sol)	220,000	21,000,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC08EC10AR	>EC8-EC10 (sol)	1,900	190,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC10EC12AR	>EC10-EC12 (sol)	6,800	660,000	TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC12EC16AR	>EC12-EC16 (sol)	39,000	3,700,000	TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	18080	6553	48320	<0.01	12045
GTEC16EC21AR	>EC16-EC21			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	6049	<0.01	<0.01	<0.01	2434
GTEC21EC35AR	>EC21-EC35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	438	<0.01	<0.01	<0.01	303
GTEC05EC35AR	Total aromatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	24567	6553	48320	<0.01	14782
GTC05C35ALAR	Total TPH C2-C40			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	41193	6553	48320	<0.01	24030
7012-37-5	PCB 28			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
35693-99-3	PCB 52			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
37680-73-2	PCB 101			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
31508-00-6	PCB 118			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
35065-28-2	PCB 138			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
35065-27-1	PCB 153			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
35065-29-3	PCB 180			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
PCB_7_CON_TOTAL	Total 7 PCBs			TM17/PM30	ug/l	<0.7	N/A	N/A	N/A	N/A	N/A	N/A	<0.01	<0.01
16984-48-8	Fluoride			TM173/PM0	mg/l	<0.3								
14808-79-8	Sulphate as SO4			TM38/PM0	mg/l	<0.5	393	342	313	308	261	268	39	19
16887-00-6	Chloride			TM38/PM0	mg/l	<0.3	841	800	672	1792	1214	1790	62	38
CYANIDE_FREE	Free Cyanide			TM89/PM0	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AMM_NITROGEN_N	Ammoniacal Nitrogen as N			TM38/PM0	mg/l	<0.03	<0.2	<0.2	<0.2	36	39.4	<0.2	<0.2	<0.2
ALK_TOT_CACO3	Total Alkalinity as CaCO3			TM75/PM0	mg/l	<1	472	520	508	799	701	573	162	90
JEL575	BOD (Settled)			TM58/PM0	mg/l	<1	<2	<2	<2	<2	<2	43	9	<2
COD	COD (Settled)			TM57/PM0	mg/l	<7	204	366	<15	178	42	73	144	593
TOC	Total Organic Carbon			TM60/PM0	mg/l	<2	<2	<2	3	9	10	6	<2	12
PH	pH				pH units		7.59	7.71	7.68	7.29	7.86	7.76	7.89	7.92

Notes:
N/A = Not Analysed/ No Analytical Data

Table 4: Groundwater Human health Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

						Sample ID	BH4				BH5			BH6	
						Depth	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
						Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
						Sampled Date	29/08/2008	04/09/2008	04/09/2008	10/09/2008	29/08/2008	10/09/2008	17/09/2008	10/09/2008	17/09/2008
CAS Number	**Test**	**SoBRA 2017 Residential Development GACs**	**SoBRA 2017 Commercial Development GACs**	**Method**	**Units**	**LOD**									
7440-36-0	Dissolved Antimony			TM30/PM14	ug/l	<2	5	<1	N/A	<1	3	3	4	<1	<1
7440-38-2	Dissolved Arsenic			TM30/PM14	ug/l	<2.5	5	2	N/A	<1	10	9	10	2	3
7440-43-9	Dissolved Cadmium			TM30/PM14	ug/l	<0.5	<0.4	0.5	N/A	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
7440-47-3	Total Dissolved Chromium			TM30/PM14	ug/l	<1.5	2	126	6	1	13	1	1	<1	<1
7440-50-8	Dissolved Copper			TM30/PM14	ug/l	<7	5	15	N/A	5	4	5	5	<1	2
7439-92-1	Dissolved Lead			TM30/PM14	ug/l	<5	2	34	N/A	1	2	4	<1	<1	3
7439-97-6	Dissolved Mercury (sol)	1	95	TM30/PM14	ug/l	<1	0.05	N/A	N/A	0.05	<0.05	<0.05	<0.05	0.07	<0.05
7440-02-0	Dissolved Nickel			TM30/PM14	ug/l	<2	4	68	N/A	2	17	17	19	7	10
7782-49-2	Dissolved Selenium			TM30/PM14	ug/l	<3	8	2	N/A	<1	<1	<1	2	<1	<1
7440-66-6	Dissolved Zinc			TM30/PM14	ug/l	<3	34	104	N/A	18	57	55	32	27	27
VOCTIC	**VOC TICs**			TM15/PM10	None										
1634-04-4	Methyl Tertiary Butyl Ether	83,000	7,800,000	TM15/PM10	ug/l	<0.1	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
71-43-2	Benzene	210	20,000	TM15/PM10	ug/l	<0.5	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
108-88-3	Toluene (sol)	230,000	21,000,000	TM15/PM10	ug/l	<5	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
100-41-4	Ethylbenzene (sol)	10,000	960,000	TM15/PM10	ug/l	<1	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P_M_XYLENE	Xylene (sol) (m)	9,500	940,000	TM15/PM10	ug/l	<2	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SVOC MS														
108-95-2	Phenol			TM16/PM30	ug/l	<1	N/A	0.03	N/A	<0.01	N/A	<0.01	0.09	<0.01	0.03
	PAHs														
91-20-3	Naphthalene	220	23,000	TM16/PM30	ug/l	<1	0.028	<0.01	N/A	<0.01	0.02	<0.01	<0.01	0.013	0.382
208-96-8	Acenaphthylene (sol)	220,000	20,000,000	TM16/PM30	ug/l	<0.5	0.023	<0.01	N/A	<0.01	0.011	<0.01	<0.01	0.013	1.147
83-32-9	Acenaphthene (sol)	170,000	15,000,000	TM16/PM30	ug/l	<1	0.022	<0.01	N/A	<0.01	0.029	<0.01	<0.01	0.038	1.693
86-73-7	Fluorene (sol)	210,000	18,000,000	TM16/PM30	ug/l	<0.5	0.016	<0.01	N/A	<0.01	0.04	<0.01	<0.01	0.047	1.781
85-01-8	Phenanthrene			TM16/PM30	ug/l	<0.5	0.034	<0.01	N/A	<0.01	0.159	<0.01	<0.01	0.088	3.062
120-12-7	Anthracene			TM16/PM30	ug/l	<0.5	0.013	<0.01	N/A	<0.01	0.043	<0.01	<0.01	0.029	0.596
206-44-0	Fluoranthene			TM16/PM30	ug/l	<0.5	0.011	<0.01	N/A	<0.01	0.083	<0.01	<0.01	0.045	1.318
129-00-0	Pyrene			TM16/PM30	ug/l	<0.5	0.011	<0.01	N/A	<0.01	0.075	<0.01	<0.01	0.041	1.075
56-55-3	Benzo(a)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	N/A	<0.01	0.027	<0.01	<0.01	0.013	0.43
218-01-9	Chrysene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	N/A	<0.01	0.026	<0.01	<0.01	0.01	0.311
BEN-BK-FLUORAN	Benzo(bk)fluoranthene			TM16/PM30	ug/l	<1	0.017	<0.01	N/A	<0.01	0.036	<0.01	<0.01	0.01	0.321
50-32-8	Benzo(a)pyrene			TM16/PM30	ug/l	<1	<0.01	<0.01	N/A	<0.01	0.015	<0.01	<0.01	<0.01	0.148
193-39-5	Indeno(123cd)pyrene			TM16/PM30	ug/l	<1	<0.01	<0.01	N/A	<0.01	0.012	<0.01	<0.01	<0.01	0.069
53-70-3	Dibenzo(ah)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	N/A	<0.01	0.018	<0.01	<0.01	<0.01	0.03
191-24-2	Benzo(ghi)perylene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	N/A	<0.01	0.014	<0.01	<0.01	<0.01	0.082
	Total 16 EPA PAHs						0.208	<0.01	N/A	<0.01	0.608	<0.01	<0.01	0.347	12.445

Table 4: Groundwater Human health Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

					Sample ID		BH4				BH5			BH6	
					Depth		Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
					Sample Type		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
					Sampled Date		29/08/2008	04/09/2008	04/09/2008	10/09/2008	29/08/2008	10/09/2008	17/09/2008	10/09/2008	17/09/2008
CAS Number	**Test**	**SoBRA 2017 Residential Development GACs**	**SoBRA 2017 Commercial Development GACs**	**Method**	**Units**	**LOD**									
	TPH CWG														
	Aliphatics														
GTC05C06AL	>C5-C6 (sol)	1,900	190,000	TM36/PM12	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC06C08AL	>C6-C8 (sol)	1,500	150,000	TM36/PM12	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC08C10AL	>C8-C10 (sol)	57	5,700	TM36/PM12	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC10C12AL	>C10-C12 (sol)	37	3,600	TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC12C16AL	>C12-C16			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC16C21AL	>C16-C21			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC21C35AL	>C21-C35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC05C35AL	Total aliphatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Aromatics														
GTEC05EC07AR	>C5-EC7 (sol)	210,000	20,000,000	TM36/PM12	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC07EC08AR	>EC7-EC8 (sol)	220,000	21,000,000	TM36/PM12	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC08EC10AR	>EC8-EC10 (sol)	1,900	190,000	TM36/PM12	ug/l	<10	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC10EC12AR	>EC10-EC12 (sol)	6,800	660,000	TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTEC12EC16AR	>EC12-EC16 (sol)	39,000	3,700,000	TM5/PM16/PM30	ug/l	<10	130	<0.01	N/A	<0.01	445.2	<0.01	261	301	<0.01
GTEC16EC21AR	>EC16-EC21			TM5/PM16/PM30	ug/l	<10	35	<0.01	N/A	<0.01	101	<0.01	<0.01	35	<0.01
GTEC21EC35AR	>EC21-EC35			TM5/PM16/PM30	ug/l	<10	10	<0.01	N/A	<0.01	32	<0.01	<0.01	<0.01	<0.01
GTEC05EC35AR	Total aromatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	175	<0.01	N/A	<0.01	578.2	<0.01	261	336	<0.01
GTC05C35ALAR	Total TPH C2-C40			TM5/TM36/PM12/PM16/PM30	ug/l	<10	175	<0.01	N/A	<0.01	578.2	<0.01	261	336	<0.01
7012-37-5	PCB 28			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35693-99-3	PCB 52			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
37680-73-2	PCB 101			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31508-00-6	PCB 118			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-28-2	PCB 138			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-27-1	PCB 153			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-29-3	PCB 180			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCB_7_CON_TOTAL	Total 7 PCBs			TM17/PM30	ug/l	<0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16984-48-8	Fluoride			TM173/PM0	mg/l	<0.3									
14808-79-8	Sulphate as SO4			TM38/PM0	mg/l	<0.5	302	183	N/A	128	952	1021	976	91	89
16887-00-6	Chloride			TM38/PM0	mg/l	<0.3	925	624	N/A	493	29	35	29	20	15
CYANIDE_FREE	Free Cyanide			TM89/PM0	mg/l	<0.01	0.01	<0.01	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AMM_NITROGEN_N	Ammoniacal Nitrogen as N			TM38/PM0	mg/l	<0.03	<0.2	<0.2	N/A	<0.2	8.9	9.6	8.9	17.4	0.8
ALK_TOT_CACO3	Total Alkalinity as CaCO3			TM75/PM0	mg/l	<1	610	391	N/A	281	1610	1564	1552	776	455
JEL575	BOD (Settled)			TM58/PM0	mg/l	<1	4	2	N/A	<2	<2	93	<2	<2	<2
COD	COD (Settled)			TM57/PM0	mg/l	<7	<15	129	N/A	229	897	280	<15	402	327
TOC	Total Organic Carbon			TM60/PM0	mg/l	<2	6	<2	N/A	3	7	7	7	7	14
PH	pH				pH units		10.05	7.57	N/A	7.8	7.07	7.02	7.58	7.14	7.42

Notes:
N/A = Not Analysed/ No Analytical Data

Table 4: Groundwater Human health Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

						Sample ID	BH7			WS7			WS11		
						Depth	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
						Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
						Sampled Date	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	10/09/2008
CAS Number	**Test**	**SoBRA 2017 Residential Development GACs**	**SoBRA 2017 Commercial Development GACs**	**Method**	**Units**	**LOD**									
7440-36-0	Dissolved Antimony			TM30/PM14	ug/l	<2	<1	<1	1	11	21	20	<1	3	2
7440-38-2	Dissolved Arsenic			TM30/PM14	ug/l	<2.5	5	8	8	3	8	1	2	6	4
7440-43-9	Dissolved Cadmium			TM30/PM14	ug/l	<0.5	1.6	1.3	1.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
7440-47-3	Total Dissolved Chromium			TM30/PM14	ug/l	<1.5	7	2	3	7	1	<1	9	<1	<1
7440-50-8	Dissolved Copper			TM30/PM14	ug/l	<7	8	8	4	5	9	5	4	9	1
7439-92-1	Dissolved Lead			TM30/PM14	ug/l	<5	<1	4	1	2	35	2	6	62	2
7439-97-6	Dissolved Mercury (sol)	1	95	TM30/PM14	ug/l	<1	<0.05	N/A	0.06	<0.05	N/A	<0.05	<0.05	N/A	<0.05
7440-02-0	Dissolved Nickel			TM30/PM14	ug/l	<2	14	13	13	10	10	8	8	15	12
7782-49-2	Dissolved Selenium			TM30/PM14	ug/l	<3	31	28	27	1	10	<1	<1	<1	2
7440-66-6	Dissolved Zinc			TM30/PM14	ug/l	<3	35	25	17	34	36	23	76	72	15
VOCTIC	**VOC TICs**			TM15/PM10	None										
1634-04-4	Methyl Tertiary Butyl Ether	83,000	7,800,000	TM15/PM10	ug/l	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	14	17
71-43-2	Benzene	210	20,000	TM15/PM10	ug/l	<0.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	31	<0.01
108-88-3	Toluene (sol)	230,000	21,000,000	TM15/PM10	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	19	<0.01	<0.01
100-41-4	Ethylbenzene (sol)	10,000	960,000	TM15/PM10	ug/l	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	211	13	15
P_M_XYLENE	Xylene (sol) (m)	9,500	940,000	TM15/PM10	ug/l	<2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	527	35	23
	SVOC MS														
108-95-2	Phenol			TM16/PM30	ug/l	<1	N/A	<0.01	<0.01	N/A	0.02	<0.01	N/A	0.03	<0.01
	PAHs														
91-20-3	Naphthalene	220	23,000	TM16/PM30	ug/l	<1	0.031	<0.01	<0.01	0.037	<0.01	<0.01	0.617	<0.01	<0.01
208-96-8	Acenaphthylene (sol)	220,000	20,000,000	TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.018	<0.01	<0.01	2.35	<0.01	0.018
83-32-9	Acenaphthene (sol)	170,000	15,000,000	TM16/PM30	ug/l	<1	0.011	<0.01	<0.01	0.032	<0.01	<0.01	2.996	<0.01	0.045
86-73-7	Fluorene (sol)	210,000	18,000,000	TM16/PM30	ug/l	<0.5	0.025	<0.01	<0.01	0.079	<0.01	<0.01	1.73	<0.01	0.045
85-01-8	Phenanthrene			TM16/PM30	ug/l	<0.5	0.04	<0.01	<0.01	0.187	<0.01	<0.01	3.956	<0.01	0.061
120-12-7	Anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.086	<0.01	<0.01	0.48	<0.01	0.025
206-44-0	Fluoranthene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.141	<0.01	<0.01	1.792	<0.01	0.037
129-00-0	Pyrene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.117	<0.01	<0.01	1.554	<0.01	0.03
56-55-3	Benzo(a)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.085	<0.01	<0.01	0.635	<0.01	<0.01
218-01-9	Chrysene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.083	<0.01	<0.01	0.545	<0.01	<0.01
BEN-BK-FLUORAN	Benzo(bk)fluoranthene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.551	<0.01	<0.01
50-32-8	Benzo(a)pyrene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.053	<0.01	<0.01	0.206	<0.01	<0.01
193-39-5	Indeno(123cd)pyrene			TM16/PM30	ug/l	<1	<0.01	<0.01	<0.01	0.041	<0.01	<0.01	0.117	<0.01	<0.01
53-70-3	Dibenzo(ah)anthracene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.029	<0.01	<0.01	0.077	<0.01	<0.01
191-24-2	Benzo(ghi)perylene			TM16/PM30	ug/l	<0.5	<0.01	<0.01	<0.01	0.057	<0.01	<0.01	0.128	<0.01	<0.01
	Total 16 EPA PAHs						0.149	<0.01	<0.01	1.105	<0.01	<0.01	17.734	<0.01	0.275

Table 4: Groundwater Human health Risk Site Investigation 2008

Connolly Station Car Park, Dublin 1

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

						Sample ID	BH7			WS7			WS11		
						Depth	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
						Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
						Sampled Date	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	10/09/2008	29/08/2008	04/09/2008	10/09/2008
CAS Number	**Test**	**SoBRA 2017 Residential Development GACs**	**SoBRA 2017 Commercial Development GACs**	**Method**	**Units**	**LOD**									
	TPH CWG														
	Aliphatics														
GTC05C06AL	>C5-C6 (sol)	1,900	190,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	138	1004	34
GTC06C08AL	>C6-C8 (sol)	1,500	150,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1453	1927	454
GTC08C10AL	>C8-C10 (sol)	57	5,700	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	948.8	1649.6	315.6
GTC10C12AL	>C10-C12 (sol)	37	3,600	TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1272.8	1403.2	344.4
GTC12C16AL	>C12-C16			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1734	103.1	1152
GTC16C21AL	>C16-C21			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	444	66.7	443
GTC21C35AL	>C21-C35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GTC05C35AL	Total aliphatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5990.6	6153.6	2743
	Aromatics														
GTEC05EC07AR	>C5-EC7 (sol)	210,000	20,000,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	31	<0.01
GTEC07EC08AR	>EC7-EC8 (sol)	220,000	21,000,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	19	<0.01	<0.01
GTEC08EC10AR	>EC8-EC10 (sol)	1,900	190,000	TM36/PM12	ug/l	<10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2161.2	2522.4	511.4
GTEC10EC12AR	>EC10-EC12 (sol)	6,800	660,000	TM5/PM16/PM30	ug/l	<5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1909.2	2104.8	516.6
GTEC12EC16AR	>EC12-EC16 (sol)	39,000	3,700,000	TM5/PM16/PM30	ug/l	<10	99	<0.01	<0.01	660	<0.01	183	14858	4337	10672
GTEC16EC21AR	>EC16-EC21			TM5/PM16/PM30	ug/l	<10	13	<0.01	<0.01	269	<0.01	61	1848	<0.01	1131
GTEC21EC35AR	>EC21-EC35			TM5/PM16/PM30	ug/l	<10	<0.01	<0.01	<0.01	86	<0.01	24	105	<0.01	112
GTEC05EC35AR	Total aromatics C5-35			TM5/TM36/PM12/PM16/PM30	ug/l	<10	112	<0.01	<0.01	1015	<0.01	268	20900.4	8995.2	12943
GTC05C35ALAR	Total TPH C2-C40			TM5/TM36/PM12/PM16/PM30	ug/l	<10	112	<0.01	<0.01	1015	<0.01	268	26891	15148.8	15686
7012-37-5	PCB 28			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35693-99-3	PCB 52			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
37680-73-2	PCB 101			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31508-00-6	PCB 118			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-28-2	PCB 138			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-27-1	PCB 153			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35065-29-3	PCB 180			TM17/PM30	ug/l	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCB_7_CON_TOTAL	Total 7 PCBs			TM17/PM30	ug/l	<0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16984-48-8	Fluoride			TM173/PM0	mg/l	<0.3									
14808-79-8	Sulphate as SO4			TM38/PM0	mg/l	<0.5	841	1003	992	777	826	770	72	73	101
16887-00-6	Chloride			TM38/PM0	mg/l	<0.3	6475	7208	7750	15	2011	16	14	17	17
CYANIDE_FREE	Free Cyanide			TM89/PM0	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
AMM_NITROGEN_N	Ammoniacal Nitrogen as N			TM38/PM0	mg/l	<0.03	2	5.3	1.5	6.8	4.9	2	3.4	4	20.6
ALK_TOT_CACO3	Total Alkalinity as CaCO3			TM75/PM0	mg/l	<1	1986	1806	1906	1182	1337	982	450	548	748
JEL575	BOD (Settled)			TM58/PM0	mg/l	<1	2	<2	<2	18	<2	<2	4	4	<2
COD	COD (Settled)			TM57/PM0	mg/l	<7	72	350	660	2242	696	574	912	339	35
TOC	Total Organic Carbon			TM60/PM0	mg/l	<2	4	<2	3	7	<2	7	10	<2	7
PH	pH				pH units		7.37	7.95	7.54	7.33	7.58	7.57	7.14	7.61	7.51

Notes:
N/A = Not Analysed/ No Analytical Data

Table 5: Gas Monitoring Results
Connolly Station Car Park, Dublin 1

Borehole ID	Date	Sample Time	Response Zone stratum	Stable CH4 %	CH4% Peak	Stable CO2 %	CO2% Peak	O2 %	Bal %	H2S stable ppm	H2S peak ppm	CO stable ppm	CO peak ppm	Atmospheric Pressure mb	Relative pressure mb	Flow l/hr	Groundwater level mbGL
WS6	29/08/2008	-	MG	-	0.10	-	2.90	17.20	-	-	-	-	-	1017.00	-	0.20	-
	04/09/2008	-		-	0.10	-	5.00	13.10	-	-	-	-	-	990.00	-	0.20	-
	10/09/2008	-		-	0.10	-	3.50	14.50	-	-	-	-	-	1000.00	-	0.00	-
	17/09/2008	-		-	0.10	-	6.40	8.50	-	-	-	-	-	1019.00	-	0.00	-
WS9	29/08/2008	-	MG	-	0.10	-	1.90	18.60	-	-	-	-	-	1016.00	-	0.00	-
	04/09/2008	-		-	0.10	-	1.90	18.60	-	-	-	-	-	991.00	-	0.20	-
	10/09/2008	-		-	0.10	-	0.70	19.90	-	-	-	-	-	999.00	-	0.10	-
	17/09/2008	-		-	0.20	-	0.70	20.00	-	-	-	-	-	1019.00	-	0.10	-
WS10	29/08/2008	-	MG	-	0.10	-	0.10	20.30	-	-	-	-	-	1017.00	-	0.00	-
	04/09/2008	-		-	0.10	-	0.10	20.10	-	-	-	-	-	992.00	-	0.10	-
	10/09/2008	-		-	0.10	-	0.10	20.10	-	-	-	-	-	999.00	-	0.00	-
	17/09/2008	-		-	5.60	-	0.20	19.20	-	-	-	-	-	1019.00	-	0.00	-
WS12	04/09/2008	-	MG	-	0.40	-	1.50	19.60	-	-	-	-	-	992.00	-	0.10	-
	10/09/2008	-		-	0.10	-	1.50	19.10	-	-	-	-	-	998.00	-	0.10	-
	17/09/2008	-		-	0.10	-	1.30	19.30	-	-	-	-	-	1019.00	-	0.10	-
WS3	29/08/2008	-	MG/SLT	-	0.10	-	7.70	9.10	-	-	-	-	-	1017.00	-	0.20	-
	04/09/2008	-		-	0.10	-	9.40	7.60	-	-	-	-	-	990.00	-	0.20	-
	10/09/2008	-		-	0.10	-	10.60	7.80	-	-	-	-	-	999.00	-	0.10	-
	17/09/2008	-		-	0.10	-	10.20	7.50	-	-	-	-	-	1019.00	-	0.20	-
WS7	29/08/2008	-	MG/BC	-	0.10	-	3.00	15.70	-	-	-	-	-	1016.00	-	0.10	-
	04/09/2008	-		-	0.10	-	2.60	16.10	-	-	-	-	-	990.00	-	0.00	-
	10/09/2008	-		-	0.10	-	0.20	20.20	-	-	-	-	-	1001.00	-	0.00	-
	17/09/2008	-		-	0.10	-	2.50	16.20	-	-	-	-	-	1019.00	-	0.00	-
WS11	29/08/2008	-	SLT/BC	-	0.20	-	3.80	15.00	-	-	-	-	-	1017.00	-	0.20	-
	04/09/2008	-		-	100.00	-	9.30	0.00	-	-	-	-	-	991.00	-	0.10	-
	10/09/2008	-		-	1.20	-	5.70	10.00	-	-	-	-	-	1001.00	-	0.20	-
	17/09/2008	-		-	69.70	-	8.70	0.10	-	-	-	-	-	1019.00	-	0.10	-

MG : Made Ground SLT : Silt Clay BC : Boulder Clay
- : No data available

Table 6: Waste Soil Classification Table

B909 Connolly Station Car Park, Dublin 1

	A	B	C1	C2	D		Sample Identity	WS1	WS1	WS1	WS2	WS2	WS2	WS3	WS4	WS5	WS6	WS6	WS8	WS11	BH3	BH3	BH4	BH4	BH4	BH5	BH7
						Depth (mbGL)		1	3	5	1	3	5	4	2	2	1	4	2	2	1	2	1	5-5.3	6-6.3	2	6.5
Analyte	Inert	Inert (IMS)	Non-Haz	Non-Haz with Asbestos	Hazardous	LOD	Unit																				
HazWaste Assessment Result								Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Hazardous	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz	Non-Haz
Overall Assessment Result								B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	D Hazardous	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz	B Non-Haz
Solid Waste Analysis																											
Total Organic Carbon#	3	3	-	-	6		%	7.6	8.3		5.4	5.4	11.2	1.7	3.6	5.3	7.5	1.6	8.3	2.2	1.1	1.5	7.6	N/A	N/A	3.1	0.5
Sum of BTEX	6	6	see HWOL	see HWOL	see HWOL		mg/kg	<0.04	<0.04		<0.04	<0.04	<0.04	N/A	<0.04	<0.04	<0.04	<0.04	<0.04	0.33	<0.04	<0.04	<0.04	N/A	N/A	<0.04	<0.04
Sum of 7 PCBs#	1	1	see HWOL	see HWOL	see HWOL		mg/kg	<1	N/A		<1	N/A	N/A	<1		<1	<1	<1	<1	<1	<1	N/A	<0.001	N/A	N/A		<1
PAH Sum of 6#	2	-	see HWOL	see HWOL	see HWOL		mg/kg	35.766	2.405	3.384	15.866	4.621	1.842	8.2	0.994	2.5	1.612	0.952	1.833	6.1	0.111	<1	6.267	N/A	N/A	4.291	<1.6
PAH Sum of 17	6	100	see HWOL	see HWOL	see HWOL		mg/kg	77.419	5.093	6.812	40.825	9.437	3.513	22.756	2.283	4.368	3.447	2.508	3.629	17.294	0.315	6.366	11.733	N/A	N/A	8.512	<1
Mineral Oil Calculation	-	500	see HWOL	see HWOL	see HWOL		mg/kg	<1	N/A		<1			<1		<1		<1	<1	<1	<1						<1
CEN 10:1 Leachate																											
Dissolved Antimony (A10)	0.06	0.06	0.7	0.7	5		mg/kg	0.07	0.05	0.03	0.04	0.04	0.04	0.06	0.07	0.02	0.04	0.11	0.09	0.13	0.07	0.04	0.03	1.3	<0.075	0.01	0.04
Dissolved Arsenic (A10)	0.5	0.5	2	2	25		mg/kg	0.09	0.08	<0.01	0.1	0.12	<0.01	0.02	0.14	<0.01	0.04	0.04	0.14	0.01	2.43	1.51	0.02	0.73	0.29	<0.01	<0.01
Dissolved Barium (A10)	20	20	100	100	300		mg/kg	2.49	2.36	2.5	2.05	2.14	2.47	3.22	1.8	2.53	1.81	3	2.31	2.71	7.14	8.86	2.33	3.2	3	2.42	3.15
Dissolved Cadmium (A10)	0.04	0.04	1	1	5		mg/kg	<0.004	<0.004	0.012	<0.004	<0.004	0.007	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.022	<0.022	<0.004	<0.004
Dissolved Chromium (A10)	0.5	0.5	10	10	70		mg/kg	0.02	0.03	0.03	0.02	0.04	0.02	0.02	0.08	0.04	<0.01	<0.01	0.02	<0.01	3.74	2.15	0.04	<0.1	<0.1	<0.01	<0.01
Dissolved Copper (A10)	2	2	50	50	100		mg/kg	0.36	0.53	0.32	0.22	0.28	0.28	0.57	0.34	0.41	1.12	0.5	0.5	0.38	2.37	0.4	0.26	0.27	0.57	0.38	0.34
Dissolved Lead (A10)	0.5	0.5	10	10	50		mg/kg	<0.01	<0.01	0.07	<0.01	<0.01	0.01	<0.01	0.04	0.03	0.06	0.06	<0.01	0.03	0.05	0.03	<0.01	0.17	0.04	0.01	0.01
Dissolved Molybdenum (A10)	0.5	0.5	10	10	30		mg/kg	0.12	0.23	0.37	0.33	0.18	0.29	0.39	0.03	0.32	0.06	0.64	0.26	0.48	0.06	0.04	0.13	4.5	2.4	0.17	0.11
Dissolved Nickel (A10)	0.4	0.4	10	10	40		mg/kg	<0.01	<0.01	0.08	<0.01	<0.01	0.03	0.04	0.17	0.12	0.08	0.11	<0.01	0.13	3.75	3.39	<0.01	0.39	0.87	0.06	0.14
Dissolved Selenium (A10)	0.1	0.1	6	6	7		mg/kg	0.04	0.02	<0.01	0.04	0.02	0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.67	0.53	0.02	0.5	0.5	<0.01	0.19
Dissolved Zinc (A10)	4	4	50	50	200		mg/kg	0.15	0.17	1.33	0.04	0.11	0.96	0.85	0.17	0.44	0.28	0.39	0.09	0.73	0.83	0.49	0.07	<0.5	<0.5	0.48	0.19
Mercury Dissolved by CVAF	0.01	0.01	0.2	0.2	2		mg/kg	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.002	<0.0005	<0.0005
Phenol	1	-	-	-	-		mg/kg	<0.1	<0.1	N/A	<0.1	<0.1	N/A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N/A		<20	N/A	N/A	<0.1	<0.1
Fluoride	10	10	150	150	500		mg/kg	20	7	N/A	12	9	N/A	7	6	2	8	3	9	3	5	2	5	N/A	N/A	3	4
Chloride	800	800	15000	15000	25000		mg/kg	37	24	N/A	23	22	N/A	44	12	20	14	22	33	35	83	20	32	N/A	N/A	37	823
Sulphate	1000	1000	20000	20000	50000		mg/kg	54	108	N/A	50	110	N/A	2302	42	4278	53	409	184	721	130	241	425	N/A	N/A	4668	335
Mass of raw test portion	-	-	-	-	-		kg	N/A			N/A			N/A		N/A		N/A	N/A	N/A	N/A						N/A
Leachant Volume	-	-	-	-	-		l	N/A			N/A			N/A		N/A		N/A	N/A	N/A	N/A						N/A
Eluate Volume	-	-	-	-	-		l	N/A			N/A			N/A		N/A		N/A	N/A	N/A	N/A						N/A
Dissolved Organic Carbon	500	500	800	800	1000		mg/kg	31	<20		20	21	N/A	30	<20	<20	<20	74	35	80	<20	27	<20	N/A	N/A	<20	<20
pH	-	-	-	-	-		pH units	8.3			8.35			7.99		8.32		8.04	8.32	8.67	N/A						8.67
Total Dissolved Solids	4000	4000	60000	60000	100000		mg/kg	1040	1140	N/A	980	980	N/A	4580	940	6460	1060	1200	1400	3060	1220	1260	1260	N/A	N/A	5900	2040
Asbestos Testing																											
Asbestos Screen	-	-	-	-	-	-	None	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	N/A	NAD	NAD	N/A	N/A	NAD	NAD

NOTES:

Categories explained in OCSC Waste Categories Table
Hazardous classes subject to confirmation with waste facility
Hazardous hotspot areas are isolated and may be reduced in size following further testing
NAD = no asbestos detected
N/A = not analysed
HWOL = HazWasteOnline

HazWasteOnline accessed through http://www.hazwasteonline.com. Application developed by One Touch Data Limited based on Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP) and the latest UK Environment Agency guidance, WM3 v1.1 (2018). The EPA have stated that the HazWasteOnline tool is acceptable for the classification of wastes in Ireland and they have a licence for the application to review results if required.

While waste soil is classified based on the EU Council Decision 2003/33/EC, waste acceptance criteria may vary at each potential Waste Receiver site and further assessment and consultation may be required with the proposed Waste Receiver to confirm suitability for disposal. In terms of permitted sites, further assessment in terms of potential impact to the environment may be required or inert waste comprising made ground may not be acceptable.

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Multidisciplinary
Consulting Engineers

Appendix A
Buro Happold Report – 2008

Buro Happold

023956 Connolly Station, Dublin

Geotechnical & Geoenvironmental Interpretative Report

October 2008

Revision 01

Revision	Description	Issued by	Date	Checked
00	Draft	SB	10/10/08	KL/HM
01	Final Issue	SB	16/10/08	KL/HM

O:\023956 - Connolly Station, Dublin (Transportation)\F09 - Geotech + SI\Reports\Interpretative Report\081010 SB 023956 Geotechnical & Geoenvironmental Interpretative Report 00rev1.doc

This report has been prepared for the sole benefit, use and information of Coras Iompair Eiram (CIE) for the purposes set out in the report or instructions commissioning it. The liability of Buro Happold Limited in respect of the information contained in the report will not extend to any third party.

author	**Sarah Bear**
signature	
date	**16 October 2008**
approved	**Kenny Lyons/Hugh Mallett**
signature	
date	**16 October 2008**

Contents

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Executive Summary

General

Coras Iompair Éireann (CIE) is proposing to redevelop a 3.5ha site adjacent to Connolly Station in Dublin. On the instruction of CIE, Buro Happold has carried out a contaminated land Generic Quantitative Risk Assessment in accordance with current good practice guidance together with a geotechnical assessment as part of the overall master planning for the area. This report also presents an assessment of the waste classification of the likely arisings from proposed earthworks.

Background

The site is located adjacent to Connolly Station, Dublin at the approximate National Grid Reference E316 611 N234 866. The land has been built up above the surrounding area, sloping upwards from road level in the south-east to approximately 8m above this in the north-west and is currently occupied by the station carpark, along with various commercial/industrial buildings. The site has been previously occupied by various workshops, storage and goods sheds, sidings, railway lines, cattle pens and buildings until 1981 when the site had been fully developed into its current condition.

The current development proposal for the site consists of retail, residential and commercial properties together with community green space and a transport interchange. Existing railway arches are to be retained

Ground conditions

The geological sequence beneath the site consists of made ground (up to 7.2m thick) overlying a thin, discontinuous layer of estuarine deposits (sandy silt) overlying or inter-bedded with the upper Glacial Till (inter-layered gravelly clay and gravel deposits). Limestone underlies the site at depth but was not encountered during the investigation.

Ground chemistry

Elevated concentrations of heavy metals (principally lead and arsenic) were recorded above relevant guideline values. Occasionally elevated concentrations of other metals (cadmium, mercury, nickel) and benzo(a)pyrene were recorded. The maximum recorded concentrations of arsenic, lead, nickel and mercury were very highly elevated in occasional samples. Asbestos not detected in any of the soil samples but is potentially present in the made ground. Locally strong hydrocarbon odours were recorded in soil (at water table level) and chemical analyses identified elevated concentrations of petroleum hydrocarbons (typical of highly degraded diesel).

Water quality

The groundwater table is fairly shallow beneath the site (approximately 2.5m below existing road level) and is likely to be in hydraulic continuity with the Docks located approximately 90m south of the site. Groundwater flow appears to be reasonably flat across the site.

Heavy metal concentrations are not highly elevated in groundwater, but elevated concentrations of petroleum hydrocarbons and polyaromatic hydrocarbons were recorded in groundwater within southern and eastern portion of site. Chloride, sulphate and ammoniacal nitrogen concentrations are also relatively elevated.

Ground gas

A limited ground gas monitoring programme was undertaken which recorded elevated concentrations of methane (>5%) and carbon dioxide (>10%) but at low flow rates (<1l/hr) indicating that the suite would fall into "Characteristic Situation 2" (as defined in good practice guidance).

Risk assessment

The generic quantitative risk assessment carried out on the basis of both existing and recently acquired data indicates that there are potentially significant risks to people and the environment under the currently existing conditions.

The proposed development of the site will give rise to some temporary risks, most notably to construction workers during its development. Short-term risks to the groundwater and the Docks are likely to increase during the excavation works. This is primarily because of the potential for runoff and leaching from stockpiles, and enhanced mobilisation of contaminants in groundwater. These potential risks can be mitigated by appropriate environmental management during construction. In the long term, provided appropriate mitigation measures are constructed and the recommendations below adopted, the risks to people and the environment can all be mitigated to acceptably low levels.

Risks to the groundwater are considered to be partially mitigated by the proposed development, which will consist of the excavation of the majority of made ground and contaminated soil material. It is therefore considered likely that with this reduction in the residual source, natural attenuation processes will be occurring at rates sufficient to be protective of human health and controlled waters. Some long term monitoring may be required to demonstrate satisfactory risk reduction is occurring by such processes.

Waste management

The results of the waste assessment indicate that the majority of the soils should be considered acceptable at the KTK Landfill site. Provision should however be made for the off-shore disposal of some hazardous waste

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from the site based on visual/olfactory evidence of hydrocarbon contamination in the southern and eastern portion of the site, along with occasional exceedances of TPH and PAH for both Murphy and KTK waste acceptance criteria. It should be noted that it is the excavation contractor's responsibility, in association with the operator/owner of the receiving landfill site, to classify the materials for disposal/reuse prior to disposal.

Foundations and Sub Structure

Low rise structures (up to two storeys in height) could be supported by shallow foundations in the glacial till beneath basement slab level. For medium rise structures (up to ten storeys in height) the structure could be supported by a raft foundation. Structures greater than ten storeys in height could be supported by bored pile foundations. As the basement substructure is below ground water level, the basement and buildings will require appropriate design to resist uplift. Retaining walls will be necessary to support the basement around the site. Construction of a secant wall is proposed to form the basement. In order to maintain stability of the basement and excavation, and to provide dry working conditions for construction of the sub structure, a temporary pumped dewatering system will need to be installed to lower the ground water table. It is recommended that intrusive coring is carried out to determine the arch construction to allow a structural assessment of the arch to be made. All foundations are to be designed for an ACEC classification AC-5.

Recommendations

It is recommended that the following measures are implemented to mitigate the potential risks related to the proposed development;

- A rigorous health & safety regime (including PPE and personal hygiene) should be implemented by the construction work force;
- Construction workers should remain vigilant of ground conditions at all times and should report any suspect areas of potential contamination (especially hydrocarbon contamination);
- Stockpiling of grossly contaminated soils should be avoided if possible and where necessary, stockpiles should be covered when not in use.
- Gas protection measures (appropriate for Characteristic Situation 2) should be incorporated into all new buildings where excavation of all made ground has not been undertaken;
- Further investigation and monitoring of the groundwater regime should be carried out during and post construction in order to provide evidence of natural attenuation of hydrocarbon contamination;
- All foundations are to be designed for an ACEC classification AC-5.
- Further liaison with Dublin City Council as to disposal options for water during temporary works;
- Further intrusive investigation to determine stability of the existing railway arches;
- Pump testing to determine site specific hydraulic conductivities for dewatering works design.

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1 Introduction

Coras Iompair Éireann (CIE) is proposing to redevelop a 3.5ha site adjacent to Connolly Station in Dublin. On the instruction of CIE, Buro Happold has carried out a contaminated land Generic Quantitative Risk Assessment (GQRA) and geotechnical assessment as part of the overall master planning for the area.

1.1 Scope

This report presents a summary of the current ground investigation information and makes recommendations based on both geotechnical and geoenvironmental findings. It also presents an assessment of the likely waste classification of arisings from the proposed excavation works. This report has been prepared in general accordance with CLR11 – 'Model Procedures for the Management of Land Contamination', Environment Agency (UK), September 2004 (ref 1). The Irish Environmental Protection Agency (IEPA) and Dublin City Council have generally adopted the UK Model Procedures as good practice guidance appropriate for Ireland.

The objectives of this report are:

- To assess the potential for significant risks to both human and environmental receptors from contaminants identified within the made and natural ground during construction and for the finished site development;
- To identify key areas of geotechnical risk with respect to ground conditions;
- To determine the likely waste classes for excavated material; and
- To determine the need for and scope of any remediation.

1.2 Existing Information and Reporting

The following should be read in conjunction with this report:

- Buro Happold Ground Engineering 'Site Appraisal Report' Connolly Station, Dublin job: 023956, March 2008.

1.3 Limitations

The ground investigations carried out to date have been undertaken in general accordance with good practice guidance, relevant standards and established good practice. The scope and design of the site investigation has been based upon the known history of site use, the results of previous studies and investigations and on the development plan. On this basis the spacing of the exploratory holes and the sampling and analysis plan for this investigation is considered to have provided a reasonable level of certainty about the ground conditions.

However it is important to recognise that contamination can be both widespread and relatively localised, depending upon its source and nature etc. No investigation, however comprehensive can be expected to determine absolutely the nature and extent of all the contamination which could be present on any site. There will always be an element of uncertainty about the ground conditions including contamination. This potential for currently undetected contamination to be present must therefore be taken into account in consideration of future development activities, in the risk assessment, in the design of the remedial strategy, the health and safety planning, the financial planning and financial risk management and in the implementation of the below ground works during construction.

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2 Proposed Development

The proposed redevelopment of Connolly Station is to include retail, residential and commercial properties together with community green space and a transport interchange. Existing railway arches are to be retained

There are currently 9 blocks proposed as part of the development varying in height from 2 to 27 storeys.

A single storey basement is to be provided throughout most of the site footprint with basements used for car parking, plant and equipment. Along Sheriff Street the basement a two storey basement is proposed. No basements are proposed beneath heritage structures.

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3 Site Description and Environmental Setting

A detailed review of the environmental setting for the site is provided in the Site Appraisal Report (Buro Happold, March 2008). A summary of this information (updated with reference to recently acquired site investigation data) is presented in the following sections.

3.1 Site Location and Topography

The site is located adjacent to Connolly Station, Dublin at the approximate National Grid Reference E316 611 N234 866 (Figure 1). It is irregular in shape covering an area of approximately 3.5 hectares. The site has been built up above the surrounding area, sloping upwards from road level in the south-east to approximately 8m above this in the north-west. The site is bounded to the south by Sheriff Street Lower, to the south-east by Oriel Street Upper, to the north-east by Seville Place and to the north-west and west by Connolly Station and associated platforms and railway lines (Figure 2). The entire site is covered mainly in hardstanding, incorporating a mixture of tarmac and concrete with a gravel cover surrounding the railway lines. The site is surrounded by a mixture of commercial/industrial and residential land use.

3.2 Current Site Use

At present, the site is occupied by Connolly Station, a rolling stock maintenance yard, various CIE Group buildings, IE building maintenance and fastrack facilities, CTC buildings and associated car parking. Disused, derelict railway arches (former goods sheds) run along Sheriff Street Lower, Seville Place and beneath Connolly Station and associated railway lines off Amiens Street.

Numerous heating oil tanks are present across the site, along with an electricity substation in the south-west corner. Activities undertaken within the locomotives maintenance building and yard to the north of the site include re-fuelling, cleaning and light servicing.

3.3 Previous Site Use

The majority of the site was open/agricultural land prior to 1838, with Connolly Station (then the Drogheda Railway Terminus) built by 1847. Various workshops, storage and goods sheds, sidings, railway lines, cattle pens and buildings occupied the site until 1981 when the site was fully developed into its current condition.

The majority of the area surrounding the site was covered by commercial and residential land uses from at least 1838. Significant surrounding historical land uses include gasometers (east of Oriel Street Upper), timber yards, tobacco, whiskey, sugar and tea stores, tobacco works, a tank, tobacco warehouse, storehouses and coal yards.

3.4 Geology, Hydrogeology and Hydrology

The geological sequence for the site, as obtained from the Geological Survey of Ireland (GSI) website (ref. 2) Geology of Dublin, Sheet 16, 1992, comprises Alluvium overlying Glacial Till (boulder clay) and Dublin Limestone (Calp). Much of the site, generally from the main car park area towards Connolly Station, is built up (up to 8m) above the surrounding ground level. It is therefore expected that a large thickness of made ground is present across this part of the site, potentially sourced from cuttings and workings during the construction of the station in the early 1840s.

Taking into account the geological map from the GSI website (ref. 4), GSI borehole records and ground observations made during the site walkover (refer Buro Happold Site Appraisal Report), the expected geology underlying the site can be summarised as indicated in Table 3.1 below.

Table 3.1. Summary of Geology and Hydrogeology

Name	Description	Thickness	Aquifer type
Made ground	Fill material, possibly reworked alluvium and glacial till materials containing demolition and railway materials.	Approx. 5-8m	Not classified (perched water likely)
Glacial Till	Sand, gravel, cobbles and boulders.	Approx. 12m	Unclassified aquifer
	Firm to stiff grey brown gravelly sandy CLAY containing limestone boulders. Becoming dark grey / black and very stiff with depth. Contains frequent lenses or layers of fluvio-glacial sands and gravels.	Typically 10-15m from previous BH investigations	Not classified (aquitard)
Calp	Dublin Limestone	Unproven	Locally Important Aquifer (LI)

Note: updated with reference to recently acquired site investigation data.

The hydrogeological system for the site and surrounding areas comprises possible perched water in the made ground, with groundwater residing within the granular glacial till deposits (sand and gravel) and the Limestone.

Groundwater present within the glacial till can be important for local supplies and is likely to supply the base flow to nearby surface waters. The direction of groundwater flow is likely to be southerly, towards the Docks

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and the River Liffey. The layer of low permeability glacial till (gravelly clay) is likely to act as an aquitard, limiting vertical migration and effectively confining the Limestone aquifer from the granular glacial till deposits.

The Limestone Aquifer has been designated as a Locally Important Aquifer (LI) and is therefore likely to be important for local supplies. The site does not lie within a Source Protection Zone (SPZ), however it does lie within a drinking water protected area (DWPA) for groundwater. The IEPA currently do not require licences for groundwater abstraction.

The nearest surface water feature is the Docks located approximately 90m south of the site. The Docks connect with the Liffey Estuary and River approximately 440m south of the site. The Liffey Estuary has been designated as a nutrient sensitive area.

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4 Ground Investigation

4.1 Site works

The ground investigation was undertaken by Glovers on behalf of Buro Happold and contamination testing was undertaken by Alcontrol Geochem, Dublin, a specialist analytical soils and groundwater laboratory. The site works took place between 8 July and 17 September 2008 and comprised the following:

- Drilling of 7 No. boreholes using cable percussion tool techniques (between 6.7 and 15.8m depth);
- Progression of 3 No. boreholes (following on from cable percussion) using rotary coring techniques (between 39.5 and 42.3m depth);
- Progression of 12 No. window sample boreholes (up to 5.0m depth);
- Installation of groundwater and gas monitoring standpipes in 14 No. boreholes
- Excavation of 4 No. structural inspection pits;
- Soil logging and sampling from all exploratory holes for geotechnical and geoenvironmental purposes;
- Geophysical trial survey above and within railway arches; and
- Groundwater and ground gas monitoring and sampling.

The locations of the exploratory holes are shown as Figure 2. Logging and soil sampling was undertaken by a Glovers engineer. The ground conditions encountered in all exploratory holes were logged in accordance with BS 5930:1999. Logs for the boreholes, window samples and structural inspection pits are provided in the Glovers Factual Report September 2008.

4.2 Geotechnical sampling

Standard penetration tests (SPT) were conducted as per BS5950 in all boreholes, with disturbed (bag) samples collected at 1m intervals.

4.3 Getoechnical laboratory testing

Geotechnical laboratory testing was scheduled by Buro Happold. Results of the geotechnical testing are included in the Glovers factual report.

The geotechnical testing schedule for soils comprised the following testing:

- Atterberg limits determination (liquid limit, plastic limit and plasticity index)
- Particle size distribution
- Chemical testing to determine total sulfate, soluble sulfate, total sulfur, and pH in accordance with BRE SD1 (ref 2)

4.4 Geoenvironmental sampling

Representative disturbed soil samples were obtained from boreholes and window samples (in plastic liners) for examination and laboratory chemical analysis. An average of four samples were collected per location. At least one of the samples was taken within the top 1.0 m of the borehole. Further samples were taken where a change in lithology was noted or where significant visual/olfactory evidence of contamination was identified.

4.5 Geoenvironmental laboratory testing

Geoenvironmental laboratory testing was scheduled by Buro Happold. All contamination analysis was undertaken by ALcontrol Geochem. Details of the specific suites of analysis for soil samples can be found in this document. Analysis was undertaken using methods approved under the MCERTS performance standard for soils where possible. The number of samples analysed for each of the analytical suites is given in Table 4-1.

The analytical data is presented in Appendix B and discussed in Sections 7 and 8.

Table 4-1 – Number of samples analysed; Suites of analysis

Suite	Soil	Groundwater
General Suite	35	25
Heavy metals only	2	-
TPHCWG	13	-
VOC	3	-
SVOC	6	-
Leachate	9	-
Murphy/KTK	9	-

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5 Ground Conditions

5.1 Geology

The ground investigation generally confirmed the geological sequence described in the published geology, however a thin layer of estuarine deposits (sandy silt) was recorded overlying or inter-bedded with the upper Glacial Till. Limestone was not encountered during the investigation.

The ground profile disclosed by the investigation is summarised in the Table 6.1 below, and is illustrated in the geological sections presented in Figure 3.

Table 6.1. Summary of site specific ground conditions

Stratum	Depth to top of stratum (mbgl)	Level of top of stratum (m OD)	Thickness (m)	General description
Made ground	GL	+1.6- -7.9	0.1-7.2	Mixture of clay, sand and gravel containing cobbles and occasional boulders
Estuarine Deposits	2.4-6.9	+4- -7.4	0.5-3.2	Grey, locally gravelly sandy silt with sea shells.
Glacial Till	0.1-7.2	+1.7- -7.2	Not proven likely to be 40m	Firm dark grey sandy gravel inter-bedded with layers of firm gravelly clay.
Calp (Limestone)	>42.5	> -38.24	Not proven	-

5.2 Made ground

Made ground across the entire site ranged from 0.1 to 7.2m thick. Much of the site, generally from the main car park area towards Connolly Station, is built up (up to 8m) above the surrounding ground level. A large thickness of made ground is therefore present across this part of the site, recorded thicknesses ranging from 3 to 7.2m. The thickness of made ground at road level was approximately 2.6m.

Made ground was recorded as a mixture of clay, sand and gravel containing cobbles and occasional small boulders along with pieces of glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery. Gravel is sub-angular to sub-rounded, fine to coarse.

Standard penetration tests (SPT) N values ranged between 3 and 24 in made ground, generally being higher in the gravel stratum, recording less than 12 in the sand and clay.

5.3 Estuarine Deposits

Estuarine deposits were encountered in borehole BH06 and window samples WS05, WS06 and WS11 in the south of the site and in WS12 in the far north. The deposits comprise grey, locally gravelly, sandy silt with sea shells. Sand is fine to coarse grained and gravel sub-rounded, fine to medium. No SPTs were taken within the Estuarine Deposits.

A layer of dark grey/black sandy silt with fibres and an organic odour (up to 1.9m thick) was recorded beneath made ground in window sample WS03 and borehole BH02.

5.4 Glacial Till

Glacial Till was encountered across the entire site, comprising dense dark grey sandy gravel interbedded with frequent layers of firm to stiff brown/dark grey sandy gravelly clay with cobbles. Gravel is sub-angular to sub-rounded, fine to coarse.

The thickness of Glacial Till was not proven, recorded down to at least 42.3m below ground level (-36.24mOD). Layers of gravelly clay within the Glacial Till ranged between 0.6 to 7m thick. SPT N values ranged from 12 to 48 within the boulder clay with the higher N-values likely to be attributed to the presence of cobbles and boulders within this stratum or an underlying gravel layer.

The gravel deposits ranged in thickness from 1.7 to 17m, with SPTs ranging from 22 to 68. with SPT's generally increasing with depth.

5.5 Limestone

Limestone was not encountered during the investigation.

5.6 Visual/Olfactory Evidence of Contamination

Hydrocarbon odours were recorded within the Estuarine Deposits in window sample WS11 at approximately 2.0m below ground level (bgl). No odour was recorded in the underlying gravelly clay (Glacial Till). No visual/olfactory evidence was recorded at any of the other exploratory hole locations.

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5.7 Groundwater

Groundwater levels were measured on seven occasions during the recent investigation by Glovers (refer Glovers Factual Report September 2008) and on four occasions during the post ground investigation (GI) monitoring undertaken by ALcontrol Dublin. From observations made in the field and the monitoring data, it appears that the groundwater table is located within the gravel layers of the Glacial Till at approximately 2.5m below existing road level (0 OD Marlin Head). From monitoring data collected to date, groundwater flow is relatively flat across the site (refer Figure 3).

Falling head tests were carried out by Glovers in three boreholes (BH01, BH02 and BH03) during the field works. The permeability of the gravel layers ranged from 2.3×10^{-5} - 1.1×10^{-6}m/s while the boulder clay recorded a permeability of 4.0×10^{-6} m/s.

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6 Geotechnical Assessment

6.1 Foundations

General

The proposed development involves the construction of 9 structures varying in height form 2 to 27 storeys. A single level basement is proposed over most of the site foot print. For the foundation assessment it has been assumed that made ground has been removed as part of the basement works with formation level within the natural soils beneath the site.

Shallow Foundations

Low rise structures up to say 2 storeys in height could be supported by shallow foundations in the natural glacial sands and gravels beneath basement slab level. An allowable bearing capacity of 150KPa can be adopted for preliminary design.

Raft Foundations

For medium rise structures up to say 10 storeys in height, the structure could be supported by a raft foundation at basement level founded within the natural glacial sands and gravels. Raft thicknesses varying from 600mm to 1000mm are likely to be required to evenly distribute column loads through the raft.

Pile Foundations

For structures greater than 10 storeys in height, the structure can be supported by pile foundations. Due to the nature of the ground and location of existing structures, a bored replacement pile is considered to be a suitable piling method for the development.

Assuming piles carry load in shaft friction, the following pile diameters and lengths may be adopted for preliminary design.

Bored Pile Diameter	Length	Safe Working Load
600mm	20m	1500KN
750mm	20m	1800KN
900mm	20m	2200KN

6.2 Buoyancy

As the basement substructure is below ground water level, the basement and buildings will require to be designed to resist uplift. For a single level basement 5m below ground level, assuming water is at or near existing ground level, an uplift pressure of 50kPa can develop beneath the basement slab. Assuming a minimum factor of safety against uplift of 1.4In accordance with BS8110, a downward load of 70kPa will be required to provide an adequate factor of safety against uplift.

The uplift can be resisted by providing bar anchors or micro piles in the basement slab. Preliminary calculations indicate 12m long, 300mm diameter micro piles installed in 3m grid could provide the required resistance against uplift. The micro piles will require to be reinforced over the full length with approximately 2% reinforcement by pile area

To control uplift pressures an under drainage system with pumping could be adopted as part of the permanent works Due to the maintenance requirements and likely licensing issues for discharging water, this option has not been considered further.

6.3 Basement Retaining Walls

Retaining walls will be required to support the basement around the site. Retained heights vary from 12m adjacent to the existing railway sidings at Connolly to station to 4m. To maximise space within the basement and provide an open working area for construction it is proposed to construct embedded retaining walls to form the basement. To control water seepage into the basement and limit noise and vibration during construction, it is recommended that a secant piled wall system is adopted for the basement works.

Preliminary calculations indicate that a 900mm diameter secant wall up to15m long will be required to support the 4m deep single level basement excavation. For the 12m high retaining wall supporting the existing railway, a 1500mm diameter secant wall tied back with 3 rows anchors will be required to support the excavation and limit movements of the adjacent railway infrastructure.

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6.4 Dewatering during Construction

In order to maintain stability of the basement excavation and provide dry working conditions for construction of the sub structure, a pumped dewatering system will require to be installed to lower the ground water table

There are various methods available for lowering the ground water table. The choice of method depends on the nature and permeability of the ground, the extent of the area to be dewatered and required reduction in ground water level.. Based on these factors it is considered that a well point system could be adopted to control groundwater during construction.

Wellpointing systems are among the most common methods of dewatering excavations and consist of shallow wells comprising small well screens of about 50mm diameter by about 0.5m to 1.0m long. The well screens are connected to a common header pipe where water is pumped to a discharge point. The design of the temporary dewatering system will be the responsibility of the contractor.

6.5 Railway arches

A trial geophysical survey was carried out on 3 and 5 July above the railway arches along Sheriff Street Lower to determine the presence and plan extent of hollow arches. The results from these surveys are presented in Appendix H of Glovers Factual Report (September 2008).

The results were not conclusive and the construction of the arches could not be determined. It is recommended that intrusive coring is carried out to determine the arch construction to allow a structural assessment of the arch to be made.

Four inspection pits were excavated adjacent to the existing arches to determine the geometry of the arch foundations. The trial pits are detailed in Appendix G of the contractors report. The results indicate the arches are founded on shallow brick or masonry foundations. The base of the foundations could not be proved during the ground investigation however probing at the base of each trial pit indicates the foundations to be at depths greater than 1.45m below ground level.

6.6 Buried concrete

Classification of buried concrete against sulphate attack has been carried out through the assessment of chemical test results on various strata and various levels to the current guidance BRE SD1:2005 (ref 2). In summary the soils and groundwater results for made ground give a design sulphate class of DS-4 and DS-5 respectively. The soils and groundwater results for Glacial till also give a design sulphate class of DS-4 and DS-5 respectively.

The DS-Class converts into a classification of the aggressive chemical environment for concrete (ACEC) once the pH and mobility of groundwater are taken into consideration. The characteristic pH value for both soil and groundwater has been taken as 7.1 for both made ground and for Glacial Till. For all foundations an ACEC classification of AC-5 has been determined assuming groundwater is mobile.

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7 Soil Data Assessment

7.1 Approach

The current land use of the Connolly Station site is commercial/industrial, and is likely to remain so in the future development with possible residential land use (without plant uptake). An assessment of soil contaminant concentrations in relation to the future (more conservative) condition will be carried out to assess potential risks to both current and future human receptors using the site. Due to existing topography, site redevelopment will require a significant programme of earthworks to excavate the majority of the site to approximately two stories below the existing road level. An assessment of soil contaminant concentrations in relation to the enabling works/construction phase condition will be carried out to assess potential risks to human receptors using the site, principally construction workers.

The IEPA have generally adopted the UK assessment of risk as good practice guidance appropriate for Ireland. This approach has therefore been adopted for this report. Recently (August 2008) the Environment Agency published its revised contaminated land exposure assessment technical guidance (commonly known as "CLEA") and associated CLEA software model. The new CLEA software [Version 1.03 (beta)] has been published for a three month evaluation period for comment (period ends at the end of November). Currently, work is underway to generate screening values using this new software. In the meantime, Buro Happold is continuing to use the published SGVs (ref. 3 & 4) as initial screening criteria. However, the subsequent risk assessment has recognised the current uncertainty with respect to these values.

Human health threshold values (Generic Assessment Criteria) for cyanide, benzene, xylene, naphthalene, benzo(a)pyrene and total petroleum hydrocarbon (TPH) bands in accordance with Science Report P5-080/TR3 (ref 5) have been derived using the CLEA UK (beta version) risk assessment model. Generic Assessment Criteria (GAC) for benzo(a)pyrene and naphthalene were derived using toxicological data from the TOX reports published by the Environment Agency. For TPH bands given in aliphatic and aromatic bands, toxicological values reported in the EA publication "The UK approach for evaluating human health risks from petroleum hydrocarbons in soils" have been adopted. Potentially phytotoxic metals have been assessed against Dutch Values (ref. 6) (for ecotoxic risk) in the absence of suitable generic assessment criteria.

Statistical analysis of the soil analytical results has been carried out in general accordance with the 'Guidance on Comparing Soil Contaminant Data with Critical Concentrations' (ref 7). An estimate of the true population mean has been calculated (upper confidence limit of the sample mean) for all contaminants where a sample has exceeded relevant screening criteria. The "conservative mean" contaminant concentration (US95) is then compared against the screening criteria. This approach is intended to assess the average exposure to a contaminant rather than looking at solely worst case values. Outlier testing has been carried out to indicate whether or not a data point is likely to form part of the same statistical distribution. Where a maximum concentration has been determined as an outlier (confirmed by visual/olfactory evidence or the result of an error) this concentration has not been included in the US95 calculation, but has been separately assessed.

Division relevant to receptor

The analytical data has been assessed with respect to:

- Chronic risks to human health;
- Acute risks to human health;
- Risks to flora;
- Risks to buildings/ structures; and
- Risks to controlled waters (considered in Section 8).

Division relevant to source material

The analytical data has been characterised with respect to the two different soil types encountered; (i) made ground and (ii) natural materials (including Estuarine Deposits and Glacial Till).

7.2 Chronic risks to human health

7.2.1 Made ground

A total of twenty eight samples of made ground were analysed for a suite of inorganic and organic determinands given in Table 1 of Appendix B. Determinands showing one or more exceedance of a relevant threshold value have been subjected to statistical analysis as defined above. This data is summarised in Table 7.1 below.

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Table 7.1 Made ground- Determinands showing exceedances of thresholds

Determinand	No of samples	SGV (No. of samples exceeding SGV/GAC)		Max	Min	US95 (exc. Outlier)	Outliers
		Residential without plant uptake	Commercial industrial				
Arsenic (mg/kg)	26	20 (**15**)	500 (0)	150	3	41	-
Cadmium (mg/kg)	26	30 **(2)**	1400(0)	41	<1	3	-
Lead (mg/kg)	26	450 **(15)**	750 **(9)**	2263	30	980	-
Mercury (mg/kg)	26	15 **(3)**	480 (0)	320	<1	6	-
Nickel (mg/kg)	26	75 **(2)**	5000 (0)	173	11	62	-
Benzo(a)pyrene (mg/kg)	26	1.4* **(4)**	31* (0)	7.2	<0.001	2.09	-

*Generic Assessment Criteria

The majority (54%) of samples of made ground recorded concentrations of arsenic above the SGV for residential with and without plant uptake. The US95 for arsenic was also above the SGV for residential without plant uptake by a factor of two. One third of samples recorded concentrations of lead above the commercial/industrial SGV for lead, with 58% of samples elevated above the SGV for residential without plant uptake. The US95 for lead was also elevated above the SGV for both residential and commercial/industrial landuse.

A small proportion of samples recorded concentrations of cadmium, mercury, nickel and benzo(a)pyrene above the SGV for residential without plant uptake. The US95 for all of these determinands, with the exception of benzo(a)pyrene (which exceeded the SGV by 50%), was however below the SGV for residential without plant uptake.

Slightly elevated concentrations of TPH (up to 389mg/kg) were recorded in occasional samples of made ground. TPH results depict predominantly ‘heavy end’ aromatic hydrocarbons, however occasional aliphatic hydrocarbons were also recorded. The majority of VOC and SVOC were recorded below limits of detection although occasional concentrations above detection limits were recorded.

7.2.2 Natural ground

A total of nine samples of natural materials were analysed for a suite of inorganic and organic determinands. With one exception, all samples recorded concentrations of all determinands below relevant screening values.

A single sample of natural material showed a slight exceedance of the residential without plant uptake SGV for benzo(a)pyrene (WS3 at 4.0m). The sample size (six) for benzo(a)pyrene was considered to be too small to calculate the US95.

Strong hydrocarbon odours were recorded in natural soil at the approximate water table level within WS11 (located within the building maintenance yard). Samples collected from WS11 recorded elevated TPH concentrations (up to 635mg/kg) with higher concentrations within the heavier carbon banded range. Laboratory characterisation suggests this concentration is typical of highly degraded diesel. TPH concentrations within this location reduced considerably with depth as expected due to the relatively shallow water table level (approximately 2m bgl). That is, this contamination appears to be representative of ‘smear’ at or about the zone of groundwater fluctuation.

7.3 Acute Risks to Human Health

Soil concentrations

There are no guidance values for assessing acute risk related to soil contamination. Because such risks are associated with short term exposure, consideration of maximum concentrations (and not the “average” concentration which is relevant to chronic, or long term risk) is required. Comparison of these maximum concentrations has been made with the various SGVs and other screening values which will provide a conservative benchmark for such short term risks (as the SGVs etc are based upon a long term exposure).

The maximum values recorded for some inorganic determinands are highly elevated. With the exception of lead, these maximum concentrations have been recorded in two single samples located in the northern corner of the site in the vicinity of the CTC building. The maximum recorded concentration of arsenic was approximately 7.5 times the SGV for residential without plant uptake, the maximum recorded concentration of mercury was 21 times the SGV and nickel was 2 times the SGV. The maximum recorded concentration of lead was 3 times the SGV for commercial/industrial land use and 5 times the SGV for residential landuse (without plant uptake).

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Asbestos

Asbestos screening was undertaken on twenty six samples of made ground and nine samples of natural material. Asbestos fibres were not recorded in any of the samples analysed.

7.4 Risks to Flora

Phytotoxic effects with respect to *flora* have been assessed by statistical evaluation of the datasets of the phytotoxic elements copper and zinc. Results are summarised in Table 7.2.

Table 7.2 – Phytotoxicity assessment

Material	Determinand	No of samples	Dutch Intervention Value (DIV)	Max	Min	US95 (exc. Outliers)	Outliers
Made ground	Copper (mg/kg)	28	190 **(10)**	1179	7	258	-
	Zinc (mg/kg)	28	720 **(2)**	1124	59	306	-

Over one third of the samples of made ground recorded elevated concentrations of copper above relevant thresholds. Elevated concentrations of zinc were recorded in less than 10% of samples. The US95 for copper was above the DIV, but the US95 for zinc was below.

Copper and zinc concentrations were below the relevant thresholds in natural ground.

7.5 Risks to buildings/structures

Classification of buried concrete against sulphate attack has been carried out through the assessment of chemical test results on various strata and various levels to the current guidance BRE SD1:2005 (ref 2). In summary the soils and groundwater results for made ground give a design sulphate class of DS-4 and DS-5 respectively. The soils and groundwater results for Glacial till also give a design sulphate class of DS-4 and DS-5 respectively.

The DS-Class converts into a classification of the aggressive chemical environment for concrete (ACEC) once the pH and mobility of groundwater are taken into consideration. The characteristic pH value for both soil and groundwater has been taken as 7.1 for both made ground and for Glacial Till. For all foundations an ACEC classification of AC-5 has been determined assuming groundwater is mobile.

In order to assess the risks to conventional water pipe material from made ground found onsite, contaminant concentrations have been compared against threshold values derived by Water Regulations Advisory Scheme (WRAS) (ref 8). Where soil concentrations exceed these threshold values, it is likely that special consideration of material selection will be required.

Determinands showing one or more exceedance of a WRAS material selection threshold are summarised in Table 7.3. Numerous concentrations of arsenic, lead, sulphate and pH were elevated above WRAS material selection threshold values in made ground. Arsenic and lead are classed as a toxic contaminant, whereas sulphate and pH are corrosive. Occasional concentrations of cadmium, mercury, and organic contaminants (PAH) were also elevated above WRAS material selection threshold values.

Occasional concentrations of corrosive (pH), toxic (arsenic) and organic (TPH) contaminants were recorded concentrations above WRAS material selection threshold values in natural material.

With reference to Table 3 of WRAS Information and Guidance Note: No 9-04-03 (ref 8), suitable pipe materials for organic and corrosive environments include wrapped iron or polythene/aluminium/polythene. Suitable pipe materials for toxic contaminants include metallic or plastic. The WRAS Guidance Note however recommends that the laying of water pipes across land where arsenic is identified or suspected is unacceptable without site remediation.

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8 Groundwater Assessment

8.1 Approach

For the groundwater assessment, contaminant concentrations have been compared with Irish Interim Guideline Values (ref 9). These values have been recommended by the Irish Environmental Protection Agency (IEPA) and are based upon a combination of both Drinking Water Standards (ref 10) as well as Freshwater Environmental Quality Standards derived under the requirements of the EC Dangerous Substances Directive (ref 11). It is recognised that these substances may require further review against site specific thresholds derived using quantitative risk assessment, if potentially significant risk is identified.

8.2 Risks to Controlled Waters

Potential risks to controlled waters have been assessed by examining soil leachability and groundwater data. A total of twenty one soil samples were scheduled for leachability testing. Groundwater was sampled from nine locations (BH01-BH07, WS7 and WS11) on two to three occasions between 29 August and 17 September 2008. Soil leachability and groundwater data are presented in Appendix B as Tables 2 and 3 respectively.

8.2.1 Leachability

The leachate from numerous soil samples recorded concentrations of copper and barium above Irish Interim Guideline Values (IIGV). Occasional concentrations of arsenic, chromium, nickel, fluoride and sulphate were also elevated above IIGV in leachate. Leachable metals (particularly arsenic and mercury) in samples where elevated soil concentrations were recorded were low in comparison.

8.2.2 Groundwater

8.2.2.1 Field observations

During groundwater sampling, hydrocarbon odours were recorded in water purged from WS11, BH03 and BH02 and a slight hydrocarbon odour was noted in purged water from BH06 and WS7. A slight hydrocarbon sheen was observed on water purged from WS11, BH02, BH06 and BH03. Foam was also observed on BH03. Purged groundwater from all boreholes, except from BH02, was high in suspended solids.

An interface probe was used to monitor groundwater levels as well as levels of light and dense non-aqueous phase liquids (LNAPL and DNAPL). No LNAPL or DNAPL was detected in any of the boreholes during the monitoring period.

Inorganics

Occasional concentrations of dissolved boron and lead were recorded above Irish Interim Guideline Values (IGV). Highly elevated concentrations of chromium, lead, nickel and zinc were recorded on one occasion in groundwater sampled from BH04. Concentrations of these metals were below IGV during the other two sampling rounds. Investigation undertaken by the laboratory (ALcontrol) indicated that there was a possibility that this sample was contaminated during analysis. Re-analysis for dissolved chromium confirmed sample contamination, reporting concentrations much lower than the initial results obtained. The metal concentrations from this sample have therefore not been included in this assessment.

Consistently elevated concentrations of chloride, sulphate, ammoniacal nitrogen, and total hardness were recorded above IGV. The pH recorded on one occasion in BH04 was elevated above the IGV (i.e. alkaline).

Organics

Total petroleum hydrocarbon (TPH) concentrations (up to 48.32mg/l) in groundwater sampled from BH02, BH03, BH05, WS7 and WS11 were consistently elevated above IGV. Occasional concentrations of TPH were recorded in groundwater sampled from BH04, BH06 and BH07. TPH concentrations were generally within the aromatic C_{12}-C_{35} hydrocarbon range. Occasional concentrations of TPH within the alliphatics C_{12}-C_{35} range were recorded in BH02 and BH03. The full range of hydrocarbons were recorded in groundwater sampled from WS11.

Consistently elevated concentrations of ethylbenzene and total xylenes were recorded above IGV in WS11. Occasionally elevated concentrations of benzene and toluene were also recorded above IGV at this location.

Consistently elevated concentrations of total PAH were recorded above IGV in groundwater sampled from BH02, BH03, BH06 and WS11. Occasionally elevated total PAH concentrations were recorded in groundwater sampled from BH04, BH05, BH06 and WS7. Occasional concentrations of fluoranthene, benzo(b) + benzo(k)fluroanthene, benzo(a)pyrene, indeno(123cd)pyrene and benzo(ghi)perylene were recorded in groundwater.

All organic determinands were recorded below IGVs in groundwater sampled from BH01. PCB concentrations were recorded below the laboratory detection limit in groundwater sampled from BH03 (within vicinity of electricity substation).

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9 Ground Gas Assessment

9.1 Programme

Ground gas monitoring was undertaken at four locations in made ground, two locations within made ground and natural material (alluvial deposits and boulder clay) and one location in natural material (estuarine deposits and boulder clay) across the site. This monitoring programme comprised four visits at weekly intervals between 29 August and 17 September 2008. Visits were undertaken during periods of both high and low atmospheric pressure. Gas samples were collected on one occasion and analysed in the laboratory to confirm the readings recorded on site. Table 9.1 shows a summary of the results from the monitoring.

Table 9.1 Summary of ground gas monitoring

Strata	Flow Rate (l/hr)	VOCs (ppm)	CO2 (% of samples > 5%) % v/v	CH4 (% of samples > 5%) % v/v
Made ground	0-0.2	10-272	<0.1-6.4 (0.07)	<0.1-5.6 (0.07)
Made ground and natural deposits (alluvial deposits and glacial till)	0-0.2	32.9-388	2.6-10.6 (50%)	<0.1 (0)
Natural deposits (estuarine deposits and glacial till)	0.1-0.2	95-1980	3.8-9.3 (50%)	0.2-100 (50%)

Highly elevated concentrations of methane up to 100% v/v were recorded in natural deposits (WS11) and up to 9.4% v/v carbon dioxide (WS03). This elevated concentration of methane is likely to be associated with the hydrocarbon contamination recorded in soil and groundwater within WS11 (confirmed by chemical analysis of groundwater). The second highest methane concentration recorded (not associated with hydrocarbon contamination) was 0.4% v/v (WS12). A photoionisation detector (PID) was used to provide a screen for Volatile Organic Compounds (VOCs) present in the soil gas during the monitoring period. VOC readings of up to 111ppm (WS11) were recorded.

Occasional concentrations of carbon monoxide and hydrogen sulphide were recorded throughout the monitoring period. Carbon monoxide concentrations ranged from <0.1-6ppm and hydrogen sulphide concentrations from <0.1ppm-1ppm.

Consistently low flow rates were observed, ranging from 0l/hr up to 0.2/hr. Flow rates also did not differ significantly between response zone stratum. Chemical analysis of ground gas compared to field measurements is shown in Table 9.2.

Table 9.2 Chemical analysis of ground gas compared to field results

		FIELD RESULTS					LAB RESULTS		
	Date Monitored & Sampled	Flow Rate (l/hr)	Atmos Pres (mb)	Min O2 (%) air	Max CO2 (% air)	Max CH4 (% air)	O2 (%) air	CO2 (% air)	CH4 (% air)
WS3	10/09/2008	0.1	999	7.8	10.6	<0.1	9	8	<0.05
WS10	10/09/2008	0	999	20.1	<0.1	<0.1	21	0.4	0.1
WS11	10/09/2008	0.2	1001	10	5.7	1.2	11	4.2	0.1

Oxygen and carbon dioxide concentrations recorded in the field were consistent with laboratory analysis, however methane concentrations recorded in the field (WS11) were slightly higher than those recorded in the laboratory. The GA2000 gas analyser is calibrated using certified methane mixtures and will give correct readings provided there are no other hydrocarbons present within the sample. If there are other hydrocarbons present, the methane reading will be higher (never lower) than the actual methane concentration being monitored. On this basis, and taking into consideration the significantly elevated levels of methane (up to 100%v/v) recorded in WS11 (which contains hydrocarbon impacted soil and groundwater), the elevated methane concentrations recorded in WS11 is likely to be due to elevated VOC vapours and not solely methane.

9.2 Assessment

The soil data has been assessed with reference to CIRIA report C665 (ref 12). Consideration has therefore been given to both methane and carbon dioxide concentrations as well as emission (flow) rates. The Gas Screening

Value (GSV) is defined as the product of gas concentration multiplied by flow rate. The GSV is then considered with other parameters/limiting conditions to define a Characteristic Situation. The Characteristic Situation in turn identifies the need for and scope of any necessary gas protection measures. Assessment of the ground gas results is provided in Appendix B – Table 4.

As part of the proposed development, most of the made ground across the site, and a significant volume of natural material (including that contaminated with hydrocarbons) will be excavated and removed offsite in order to facilitate development. Gas protection measures across this part of the site are therefore not required as the source will have been removed. In addition, the proposed below ground car-park is considered to provide adequate ventilation in this area. The railway arches along Sheriff Street Lower are however being retained and therefore the ground gas regime in this area (and for any buildings where no-excavation is proposed) has been assessed.

The highest concentration of methane (5.6% v/v) and the highest flow rate (0.2 l/hr) recorded within the arches along Sheriff Street Lower produce a GSV of 0.1 indicating that the ground gas regime beneath the site (under a worst case scenario) falls within Characteristic Situation 2 (Table 8.5, CIRIA Report C665). Taking into consideration the limited monitoring period, the likely maximum concentrations should further monitoring be carried out, recorded flow rates, and uncertainties in the data, gas protection measures typical of Characteristic Situation 2 are recommended within the former railway arches and any new buildings where no excavation is proposed.

Should the proposed development change elsewhere on the site, gas protection within any new buildings and services onsite needs to be seriously considered. Further ground gas monitoring and sampling should be undertaken to fully assess the ground gas regime across the site, and to verify the highly elevated methane levels recorded.

9.3 Radon

Technical Guidance document C published by the Department of the Environment (DoE) in support of the 1997 Building Regulations provides guidance on the radon protection measures required for new and existing buildings where extensions or material changes of use are planned. Box 9.1 below details the specific guidance with respect to radon protection measures required. Discussions with the National Radiological Protection Institute for Ireland (NRPI) indicate Dublin is not in a High Radon Area.

Gas protection measures typical of CS2 are considered to be sufficient to protect against the build up of radon iwithin the former railway arches and any new buildings where no basement car-park is proposed. Radon protection measures are not considered necessary within the proposed basement car-park, on the basis that this should provide adequate ventilation to prevent the build up of radon, combined with the depth to the potential source of radon (>40m below ground level).

2.10 Dwellings or other long –stay residential buildings

(a) High Radon Areas: measures should be taken to protect the building from Radon in the ground. For example, in the case of a non-complex building of normal design and construction, a fully sealed membrane of low permeability over the entire footprint of the building and a potential means of extracting Radon from the substructure such as a standby Radon sump or sumps with connecting pipework or other appropriate certified systems should be provided.

(b) Areas other than High Radon Areas: the building should be provided with a potential means of extracting Radon from the substructure should that prove necessary after construction. For example in the case of a non-complex building of normal design and construction, the provision of a standby Radon sump or sumps with connecting pipework or other appropriate certified systems should be adequate.

2.11 Other Buildings

The designer should consider the provision of measures to protect buildings against high Radon concentrations. In the absence of specific guidance, provisions similar to those in 2.10 may be adopted.

Box 9.1 Guidance on radon protection measures, page 8, Technical Guidance Document C, DoE, 2002.

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10 Contaminated Land Risk Assessment

10.1 General approach

The UK source-pathway-receptor approach to the assessment of risk from has been adopted for this report as this is considered good practice in Ireland. If one of these three elements is absent it is considered that there is no risk of harm. If, however, there is considered to be a linkage between any given source and any given target/receptor then a risk-based approach is used to assess the significance or impact of any such linkage.

Source – The contaminants that have the potential to negatively affect human health and/or the health of the environment (i.e. the hazard).

Pathway – The potential route by which a receptor may come into contact with the source.

Receptor – The specific group of human beings or aspect of the environment (e.g. controlled waters) that could be affected by the source.

Risks are defined as the probability of an event occurring combined with the severity of the consequence of that event occurring. Particularly, to assess the risk to site end users posed by any given source, the sensitivity of each receptor is considered. For example, the concentration of contamination acceptable at a site to be developed as a residential property with a garden used to grow vegetables and accessible to young children is set lower than that for a commercial site where soil is exposed in minor areas of landscaping and the only long-term users of the site are adults. Similarly, a site overlying a major aquifer supplying potable water to a large population will be considered more stringently than a site overlying an impermeable geology with only minor seepages of groundwater.

10.2 Conceptual Site Model

The potential risks posed to human health and the environment by ground contamination at this site have been evaluated using a generic quantitative risk assessment which incorporates the 'source-pathway-receptor' identification and assessment methodology in accordance with good practice guidance (ref 1). The risk assessment process therefore involves the identification of each site specific source based on both desk based and chemical information obtained from the site investigation together with identification of each relevant exposure pathway and each potential receptor. The potential risks to the receptor are then assessed by considering the potential effect of the source on the receptor as well as the likelihood of a pathway linking the two, i.e. a pollutant linkage as discussed above.

10.2.1 Potential Sources

Based on the desk based and site investigation data obtained to date, the potential sources of contamination that may reasonably affect receptors on the site are summarised in Table 10.1 below.

Table 10.1: Principal sources of contamination in existing condition and during construction

Potential Source(s)	Location	Potential Contaminants of Concern/Comments
Made ground	Site wide	Clays, sands and gravels containing glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery in some locations. Arsenic (50% samples) recorded above residential without plant uptake. Lead (30% samples) recorded above commercial/industrial SGV. The US95 values for arsenic and lead > SGV. Occasional concentrations of other metals (Cd, Hg, Ni) and benzo(a)pyrene recorded > SGV for residential without plant uptake. US95 > SGV for benzo(a)pyrene only. Maximum recorded concentrations of As, Pb, Ni and Hg very highly elevated in occasional samples. Numerous concentrations of As, Pb, sulphate and pH > WRAS material selection threshold values. Asbestos not detected, but potentially present. Leachability: Metals are not highly leachable based on the analytical results. Ground Gas: Limited monitoring programme undertaken. Maximum concentrations of methane (5.6%v/v) and carbon dioxide (10.6%v/v) recorded. Consistently low flow rates (<0.2l/hr). Gas protection measures typical of Characteristic Situation 2 recommended within arches.

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Potential Source(s)	Location	Potential Contaminants of Concern/Comments
Hydrocarbon contaminated soil	South of site	Strong hydrocarbon odours were recorded in soil at the approximate water table level within the building maintenance yard. Elevated TPH concentrations (up to 635mg/kg) recorded. Laboratory characterisation suggests this is typical of highly degraded diesel. Ground Gas: Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v) recorded in the area. Consistently low flow rates (<0.2l/hr).
Residual hydrocarbon contaminated groundwater	South to east	Very high hydrocarbon odours and a slight sheen were recorded in groundwater during sampling. Consistently elevated concentrations of TPH (up to 48mg/l) and PAH (up to 25ug/l) in groundwater within southern and eastern portion of site. TPH concentrations recorded are predominantly within C_{12}-C_{35} range. BTEX compounds elevated in groundwater sampled from WS11.

10.2.2 Proposed development – influences on sources

The proposed development involves the excavation of the majority of made ground across the site, and a large proportion of natural soil as part of the construction of a two storey basement. The only area that will not be excavated is beneath the railway arches along Sheriff Street Lower. The sources of made ground and hydrocarbon contaminated soil will therefore be considerably reduced in the final development.

10.3 Potential Receptors and Pathways

Site specific pathway receptor linkages have been identified for the site (Table 10.2) with respect to the sources outlined above, and with respect to the anticipated future uses of the site as described in Section 4.3.

Table 10.2 – Site Specific Receptors & Pathways

Receptor		Pathway
Human Health	Current site users (commercial/industrial)	Direct contact and dermal uptake, soil ingestion, gas and vapour inhalation (outdoor air)
	Enabling works and construction phase workers.	Direct contact and dermal uptake, soil and dust ingestion including asbestos fibres, gas and vapour inhalation. Migration of ground gas *via* permeable strata and accumulation in enclosed spaces.
	Site end users (commercial/industrial and residential)	Direct contact and dermal uptake, soil and dust ingestion including asbestos fibres, gas and vapour inhalation. Ingestion of contaminated water supplies. Migration of ground gas *via* permeable strata and accumulation in enclosed spaces.
	Offsite users (local residents and commercial/industrial)	Soil and dust ingestion during enabling works/construction including asbestos fibres, gas and vapour inhalation, ingestion of contaminated water supplies. Migration of ground gas *via* permeable strata and accumulation in enclosed spaces.
Controlled Waters	Docks	Leaching and migration via permeable strata. Surface runoff.
	Gravel layers within Glacial Till Limestone	Leaching and migration *via* permeable strata.
Flora		Direct contact and up-take *via* root system.
Buildings/services	On site structures (including water supply pipes)	Direct contact/ permeation of plastic pipe work by contaminants in soil and leachate. Migration of ground gas *via* permeable strata and accumulation in enclosed spaces.

10.4 Risk Assessment

The details of the Generic Quantitative Risk Assessment are presented in Appendix A – Table 1 (existing site condition), Table 2 (enabling works/construction phase condition), and Table 3 (proposed site condition) and the results/ conclusions discussed in Section 13.

It should be noted that this risk assessment has been completed without consideration of potential remedial measures however does assume use of standard site health and safety procedures and appropriate personal protective equipment (PPE) and site management practices (stockpile management, surface drainage etc). A summary of key details with respect to the existing, construction phase and proposed development conditions is provided below:

<u>Existing condition:</u> Car park and commercial uses [Appendix A - Table 1].

<u>Enabling works/construction phase</u>: Significant excavation to majority of site, de-watering and demolition of existing structures [Appendix A- Table 2]; and

<u>Proposed development:</u> Mixed use development including a two storey basement across majority of site, retail blocks, car parking and residential uses [Appendix A – Table 3].

10.4.1 Summary of risk assessment under current conditions

Risks to human health

The human receptors potentially at risk under current conditions are the people who visit/use the site (i.e. railway commuters and commercial users) together with residents of neighbouring properties. The potential risks to site users associated with ground gases are assessed as Moderate. This reflects the nature of the soil gas regime and the current absence of gas protection measures onsite. Risks to people off-site associated with ground gases are assessed as Low, taking into consideration the nature of the soil gas regime but also the level of the site above surrounding land and presence of retaining walls inhibiting ground gas migration.

The assessment of the potential risks to visitors/users of the site and adjacent site users associated with solid contamination (in both the made ground and natural materials) is assessed as Low, reflecting the recorded concentrations, limited period of exposure and limited presence of soft landscaping.

Risks to controlled waters

There are currently potential risks to groundwater related to the made ground, hydrocarbon contaminated soils and residual hydrocarbon contamination in groundwater. The risks to groundwater are range from Moderate/Low to Moderate reflecting the presence of contamination in the made ground and natural soils, the shallow depth to groundwater, the proven presence of contaminants in the groundwater and the designation of this receptor as drinking water protected area (relating to the Limestone Aquifer underlying the site at depth).

The risks to surface water (Docks) vary from Low to Moderate/Low. This reflects the discussion above regarding groundwater, but also the distance of the Docks to the site (approx 90m south) and lower sensitivity of this receptor.

10.4.2 Summary of risk assessment during development.

Risks to human health

During the development of the site, the human receptors potentially at risk are the construction workers and residents of neighbouring properties. It has been assumed that during development, the active part of the site will be secured by the contractor.

The potential risks to construction workers from soil contaminants in made ground and residual hydrocarbon contamination in groundwater are assessed as Moderate/Low. Potential risks related to ground gases are also assessed as Moderate/Low. This assessment reflects both the nature of the materials, ground gas regime and construction methods, the potential for direct contact, dust inhalation etc, but also the assumed use of standard health and safety procedures. All of these potential risks are capable of mitigation by means of an appropriately rigorous health and safety/hygiene regime.

The potential risks to adjacent site users are generally assessed as Low. However, there are potential risks greater than Low related to dust generation of made ground. These potential risks are capable of mitigation by the employment of an appropriate environmental management regime.

Risks to controlled waters.

During development there are potentially significant risks to both groundwater and the docks related to the excavated materials (made ground and contaminated natural material) and residual hydrocarbon contamination. The potential risks to groundwater are assessed as Moderate reflecting the presence of recorded contaminants in soil and groundwater, the possible temporary local increase in leachate migration due to excavations and groundwater abstraction during dewatering.

Risks to the Docks are assessed as Moderate/Low. This reflects the discussion above regarding groundwater, the potential for enhanced leaching of contaminants from stockpiles, the distance of the Docks to proposed earthworks (<90m), and the scale of the proposed earthworks.

Risks to controlled waters can be mitigated by the adoption of safe working practices such as pre-planned stockpile management; measures to control run off, leachate collection etc.

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10.4.3 Summary of risks on completion of the final development

Risk to human health

In the final development, the majority of made ground and a large proportion of natural soil across the site will be excavated and removed offsite, with the construction of a two storey basement (to an approximate maximum depth of 10m below existing ground level). Material beneath the arches along Sherriff Street Lower will remain in-situ. The majority of the source of contamination across the site (made ground and hydrocarbon contaminated soil) will therefore have been removed. The potential risks to site users and occupiers of adjacent sites from ground gas migration and accumulation have therefore been assessed as Very Low.

The entire site will be covered in hardstanding in the final development. On this basis, there is no plausible exposure pathway and thus no risks to site users and occupiers of adjacent sites from contamination present in the remaining made ground or natural soil beneath the site.

Risks to controlled waters

As discussed above, in the final development the majority of made ground and a large proportion of natural soil across the site will be excavated and removed offsite. A small proportion of material will remain beneath the arches along Sherriff Street Lower. On this basis, the majority of the source of contamination across the site (made ground and hydrocarbon contaminated soil) will have been removed. Accordingly potential risks to groundwater in the long term, from residual hydrocarbon contamination will be partly mitigated by the proposed development (i.e due to the excavation of majority of contaminated made ground and soil). However, the potential risks to groundwater have been assessed as Moderate/Low reflecting the level of contamination and the sensitivity of this receptor (drinking water protected area).

It is considered likely that natural attenuation processes on the residual contamination will be occurring at rates sufficient to be protective of human health and controlled waters. Three lines of evidence would need to be used to support natural attenuation of hydrocarbon contamination including:

- Observed reduction in contaminant concentrations down-gradient of the source;
- Documented loss of contaminant mass using chemical and geochemical data (e.g. depletion of electron acceptors and donors, and increasing metabolic by-products); and
- Microbiological laboratory data that support the occurrence of biodegradation.

At the minimum the first two lines of evidence must be obtained and ideally all three lines of evidence should be confirmed to demonstrate the occurrence of natural attenuation. It is recommended that a programme of monitoring is carried out during and post construction to provide evidence to support the occurrence of natural attenuation.

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11 Waste Management

The proposed development will require the off-site disposal of arisings from the site of approximately 67,000m^3.

In order to determine the likely waste classes, soil and leachate test results require screening against Waste Acceptance Criteria that have been derived by Irish Landfill facilities using guidance generated by the European Council decision 2003/33/EC. More specifically local landfill waste acceptance criteria are considered, namely the criteria currently used at the Murphy Concrete Manufacturing Ltd. Landfill located at Hollywood Great, the Naul, Co Dublin (waste licence reference no. W0129-01) for the acceptance of Inert waste and the waste acceptance criteria used at the KTK landfill Ltd site located in Kilcullen, Co Kildare (waste licence reference no. W082-03) for the acceptance of non-hazardous waste. The results of this assessment are shown in Appendix C and Table 1 of Appendix B. It is important to note that the acceptance criteria are subject to change and the landfill capacity at both sites is limited in accordance with their respective licences.

Based on the results for both soil and soil leachability testing, numerous samples analysed exceed the inert (Murphy) waste acceptance criteria for antimony. Occasional exceedances of inert waste acceptance criteria were also recorded for chloride, fluoride, sulphate, total dissolved solids, total PAH and TPH. Occasional concentrations of PAH (Dutch 10) and diesel range organics were recorded above hazardous waste acceptance criteria for the KTK landfill. Soil sampled from BH3 recorded elevated leachable metals (As, Cr, Mo, Ni) above inert waste acceptance criteria, and leachable arsenic and selenium above non-hazardous waste acceptance criteria (KTK). Made ground sampled at this location is not visually different from the rest of the site and would therefore be impossible to separate during excavation works. The concentrations are only marginally above KTK non-hazardous waste acceptance criteria and it is therefore recommended that discussions with the landfill are held as it is likely that this material will be accepted.

The results of this assessment indicate that the majority of the soils should be considered acceptable at the KTK Landfill site. Provision should however be made for the off-shore disposal of some hazardous waste from the site based on visual/olfactory evidence of hydrocarbon contamination in the southern and eastern portion of the site, along with occasional exceedances of TPH and PAH for both Murphy and KTK waste acceptance criteria.

Notwithstanding the above, it should be noted that it is the excavation contractor’s responsibility, in association with the operator/owner of the receiving site, to classify the materials for disposal/reuse using the test data obtained during both the recent and previous site investigations.

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12 Conclusions

12.1 Ground conditions

The geological sequence beneath the site consists of made ground (up to 7.2m thick) overlying a thin, discontinuous layer of estuarine deposits (sandy silt) overlying or inter-bedded with the upper Glacial Till (inter-layered boulder clay and gravel deposits). Limestone underlies the site at depth but was not encountered during the investigation.

Strong hydrocarbon odours were recorded in soil at the approximate water table level within the building maintenance yard in the south of the site. Elevated TPH concentrations (up to 635mg/kg) were recorded in samples anlaysed. No other visual/olfactory evidence of contamination was recorded. Metal concentrations were recorded below commercial/industrial landuse acceptance criteria with the exception of lead. Maximum recorded concentrations of metals (As, Pb, Ni and Hg) were however very highly elevated. Asbestos was not detected in any of the samples analysed, but there is potential that such material could be present within the made ground.

12.2 Controlled waters

Metals to not appear to be highly leachable based on the analytical results, and metal concentrations are not highly elevated in groundwater. Groundwater beneath the site is impacted by petroleum hydrocarbons and PAHs. Chloride, sulphate and ammoniacal nitrogen concentrations are also relatively elevated.

The groundwater table is fairly shallow beneath the site (approximately 2.5m below existing road level) and is likely to be in hydraulic continuity with the Docks located approximately 90m south of the site. The groundwater level appears to be reasonably flat across the site.

12.3 Ground gas

The ground gas regime is characterised by elevated concentrations of methane and carbon dioxide (although gas flow rates are very low). As part of the proposed development, most of the made ground across the site, and a significant volume of natural material (including that contaminated with hydrocarbons) will be excavated and removed offsite. The railway arches along Sheriff Street Lower are however being retained. Gas protection measures typical of Characteristic Situation 2 are therefore recommended within the former railway arches. Should the proposed development change, gas protection within any new buildings and services onsite will need to be re-assessed. Further ground gas monitoring and sampling should be undertaken to fully assess the ground gas regime across the site.

12.4 Risk assessment

A summary of the risk assessment for each of the three scenarios (current, during development and future use) is presented in Table 13.1 and discussed in more detail in the following text.

Table 13.1 Summary of risk assessment

Receptor	Source	Current risk	Risk during construction	Future risk
People onsite	Made ground	Low	n/a	Very Low
	Ground gas (made ground, hydrocarbon impacted soil and groundwater)	Moderate	n/a	Moderate/Low
	Hydrocarbon contaminated soil	Low	n/a	Very Low
People offsite	Made ground	Very Low	Moderate/Low	Very Low
	Ground gas (made ground, hydrocarbon impacted soil and groundwater)	Moderate /Low	Moderate/Low	Very Low
	Hydrocarbon contaminated soil	Very Low	Low	Very Low
Construction workers	Made ground	n/a	Moderate/Low	n/a
	Ground gas (made ground, hydrocarbon impacted soil and groundwater)	n/a	Moderate	n/a
	Hydrocarbon contaminated soil	n/a	Low	n/a
	Hydrocarbon contaminated groundwater	n/a	Moderate/Low	n/a
Flora	Made ground	Low	n/a	n/a
	Hydrocarbon contaminated soil	Low	n/a	n/a

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Receptor	Source	Current risk	Risk during construction	Future risk
Groundwater	Made ground	Moderate/Low	Moderate	Low
	Hydrocarbon contaminated soil	Moderate/Low	Moderate	Low
	Hydrocarbon contaminated groundwater	Moderate	Moderate	Moderate/Low
Docks	Made ground	Low	Moderate/Low	Very Low
	Hydrocarbon contaminated soil	Low	Moderate/Low	Very Low
	Hydrocarbon contaminated groundwater	Moderate/Low	Moderate/Low	Low
Buildings /services	Made ground	Moderate/Low	n/a	Low
	Hydrocarbon contaminated soil	Moderate/Low	n/a	Low

The generic quantitative risk assessment carried out on the basis of both existing and recently acquired data indicates that there are potentially significant risks to people and the environment under the currently existing conditions.

The proposed development of the site will give rise to some temporary risks, most notably to construction workers during its development. Short-term risks to the groundwater and the Docks are likely to increase during the excavation works. This is primarily because of the potential for runoff and leaching from stockpiles, and enhanced mobilisation of contaminants in groundwater. These potential risks can be mitigated by appropriate environmental management during construction. In the long term, provided appropriate mitigation measures are constructed and the recommendations in Section 14 adopted, the risks to people and the environment can all be mitigated to acceptably low levels.

Risks to the groundwater are considered to be partially mitigated by the proposed development, which will consist of the excavation of the majority of made ground and contaminated soil material. It is therefore considered likely that with this reduction in the residual source, natural attenuation processes will be occurring at rates sufficient to be protective of human health and controlled waters. Some long term monitoring may be required to demonstrate satisfactory risk reduction is occurring by such processes.

12.5 Waste management

The results of this assessment indicate that the majority of the soils should be considered acceptable at the KTK Landfill site. Provision should however be made for the off-shore disposal of some hazardous waste from the site based on visual/olfactory evidence of hydrocarbon contamination in the southern and eastern portion of the site, along with occasional exceedances of TPH and PAH for both Murphy and KTK waste acceptance criteria. It should be noted that it is the excavation contractor’s responsibility, in association with the operator/owner of the receiving landfill site, to classify the materials for disposal/reuse prior to disposal.

12.6 Foundations

Low rise structures (up to two storeys in height) could be supported by shallow foundations in the glacial till beneath basement slab level. An allowable bearing capacity of 150KPa can be adopted for preliminary design. Medium rise structures (up to ten storeys in height) could be supported by a raft foundation at basement level, founded in the glacial sands and gravels. Raft thicknesses varying from 600mm to 1000mm are likely to be required to evenly distribute column loads through the raft. For structures greater than ten storeys in height, the structure could be supported by bored pile foundations.

12.7 Buoyancy

As the basement substructure is below ground water level, the basement and buildings will need to be designed to resist uplift. The uplift can be resisted by providing bar anchors or micro piles in the basement slab.

12.8 Basement Retaining Walls

Retaining walls will be required to support the basement around the site. To maximise space within the basement and provide an open working area for construction and control seepage it is proposed to construct a secant wall to form the basement. For retained heights greater than 4m the retaining wall will require to be propped by struts or tied back with ground anchors.

12.9 Dewatering

In order to maintain stability of the basement excavation and provide dry working conditions for construction of the sub structure, a pumped dewatering system will require to be installed to lower the ground water table

12.10 Railway arches

It is recommended that intrusive coring is carried out to determine the arch construction to allow a structural assessment of the arch to be made.

12.11 Buried concrete

For all foundations an ACEC classification of AC-5 has been determined assuming groundwater is mobile

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13 Recommendations

The proposed development includes a number of measures necessary to mitigate the potential risks. In summary these comprise:

- The implementation of a rigorous health & safety regime (including PPE and personal hygiene) by the construction work force;
- Construction workers should remain vigilant of ground conditions at all times and should report any suspect areas of potential contamination (especially hydrocarbon contamination);
- Stockpiling of grossly contaminated soils should be avoided if possible and where necessary, stockpiles should be covered when not in use.
- Incorporation of gas protection measures typical of CS2 into all new buildings where no excavation has been undertaken;
- Further investigation and on-going monitoring of the groundwater regime during and post construction in order to provide evidence in support of natural attenuation.
- Further liaison with Dublin City Council as to disposal options for water during temporary works.
- Further Intrusive investigation to determine stability of the existing railway arches.
- Pump testing to allow dewatering works to be designed.

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Figures

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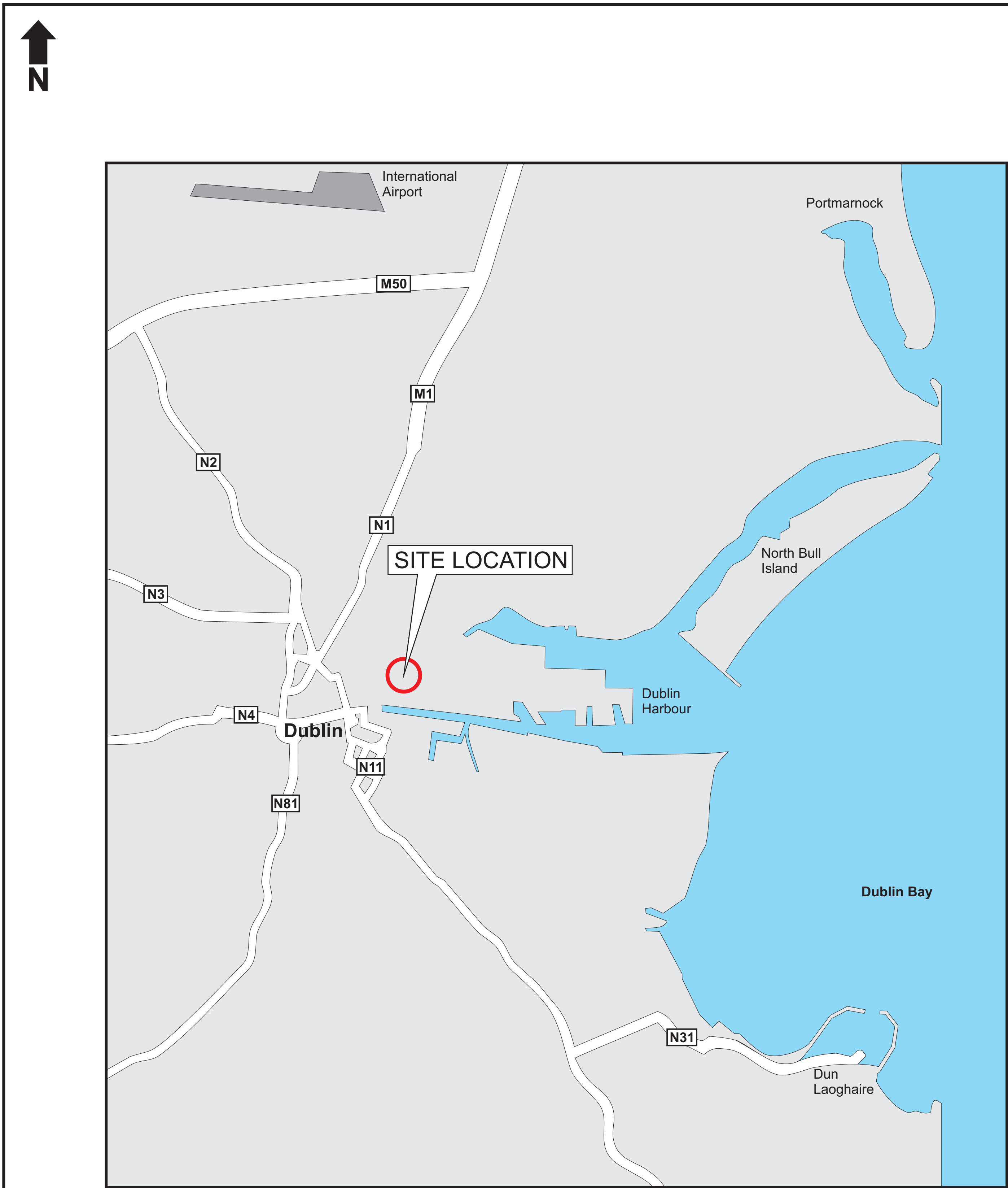

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Project: Connolly Station, Dublin

SITE LOCATION PLAN

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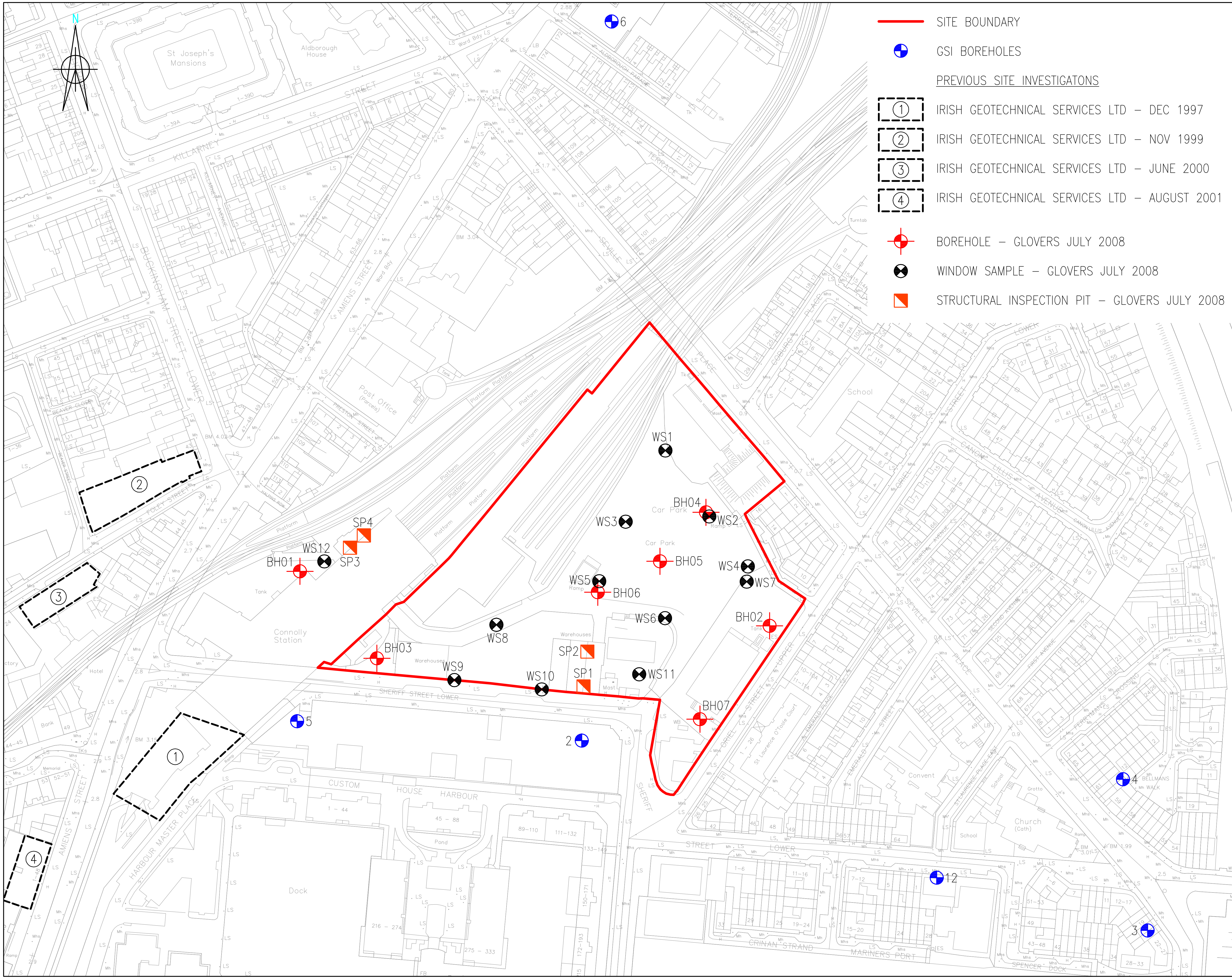

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Camden Mill
Lower Bristol Road
Bath BA2 3DQ
UK
Tel: +44 (0)1225 320600
Fax: +44 (0)870 787 4148
email: 023956@burohappold.com
Web: www.burohappold.com

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Architect	P&W
Project	CONNOLLY STATION, DUBLIN
Drg Title	EXPLORATORY HOLE LOCATION PLAN
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Drawn by	NG
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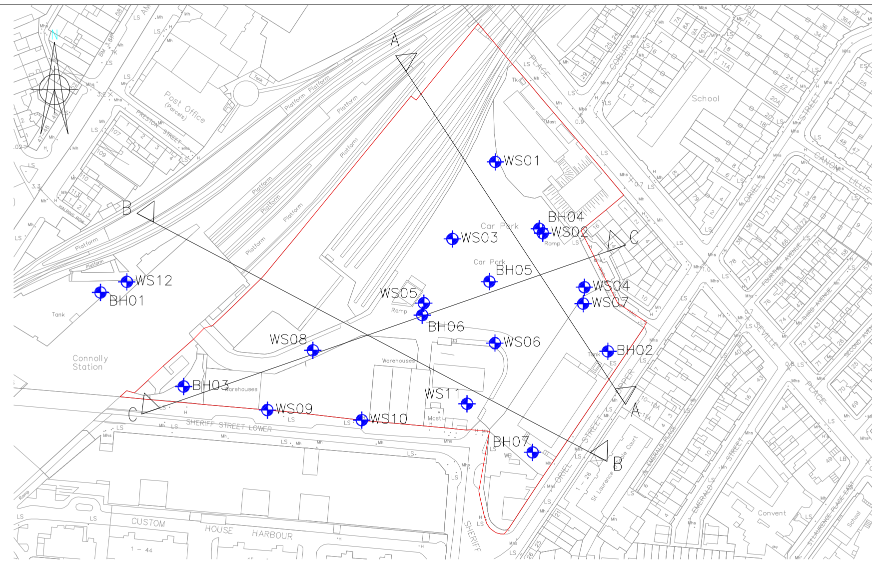
Rev	00



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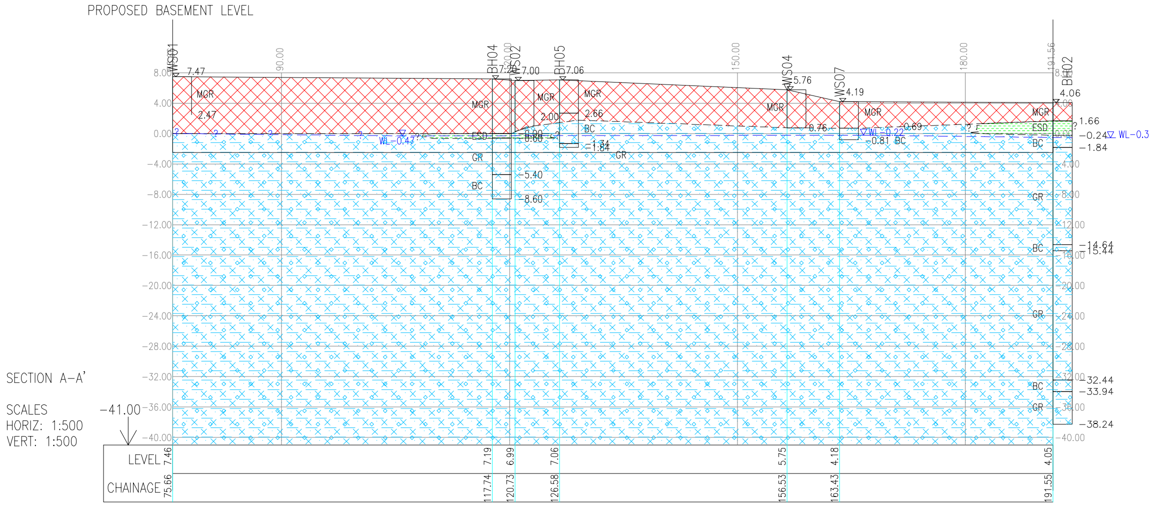

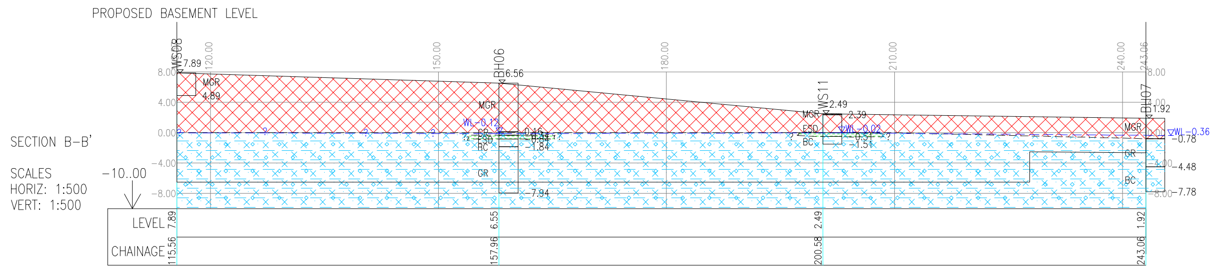

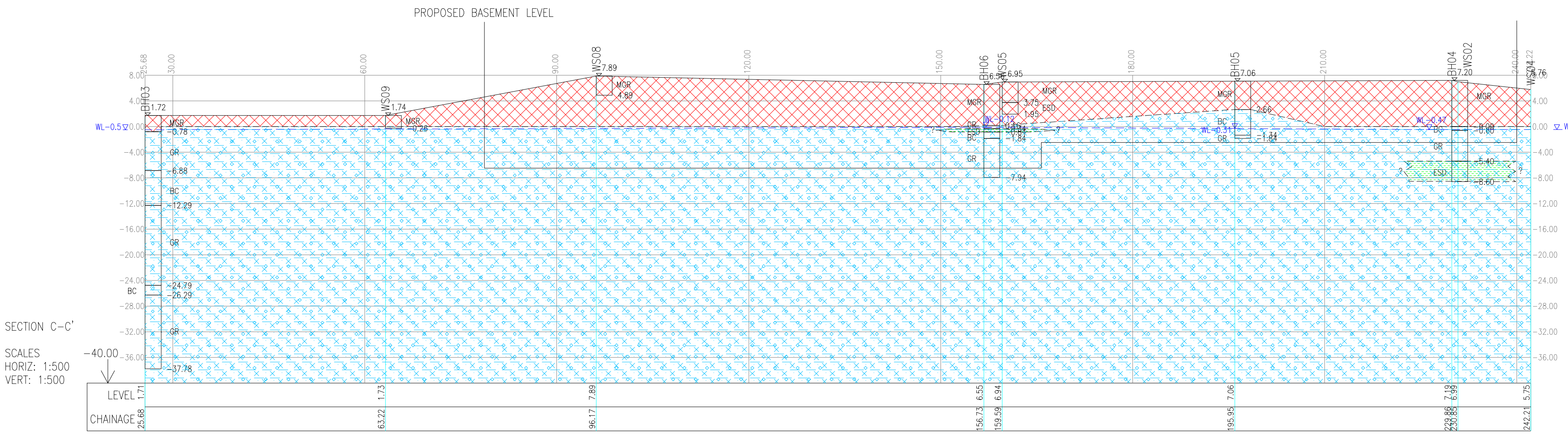

MGR MADE GROUND
ESD ESTUARINE DEPOSITS
GR GLACIAL TILL – GRAVELS
BC GLACIAL TILL – BOULDER CLAY

MADE GROUND
ESTUARINE DEPOSITS
GLACIAL TILL
GROUNDWATER
WATER LEVEL
BASEMENT LEVEL

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INFORMATION

Status of drawing

Camden Mill
Lower Bristol Road
Bath BA2 3DQ
UK
Tel: +44 (0)1225 320600
Fax: +44 (0)870 787 4148
Email: 001234@burohappold.com
Web: www.burohappold.com

Buro Happold
Consulting Engineers

Architect P&W
Project **CONNOLLY STATION, DUBLIN**
Drg Title GEOLOGICAL CROSS SECTIONS A-A', B-B' & C-C'

Scales@A1	AS SHOWN	Job No.	023956
Drawn by	NG	Drawing No.	FIGURE 3
Checked by	SB		
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Appendix A: Generic Quantitative Risk Assessment

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Table 1 Existing Condition

Source			Receptor	Pathway	Risk assessment (following CIRIA C665)			Description of source [bold text]. Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Made ground	Heavy metals, PAH, mineral oils, sulphate, pH, asbestos.	Site wide						**Clay bound gravels containing glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery.** **Arsenic (50% samples) recorded above residential without plant uptake. Lead (30% samples) recorded above commercial/industrial SGV. The US95 values for arsenic and lead > SGV. Occasional concentrations of other metals (Cd, Hg, Ni) and benzo(a)pyrene recorded > SGV for residential without plant uptake. US95 > SGV for benzo(a)pyrene only. Maximum recorded concentrations of As, Pb, Ni and Hg very highly elevated in occasional samples.** **Numerous concentrations of As, Pb, sulphate and pH > WRAS material selection threshold values.** **Asbestos not detected, but potentially present.** **Leachability: Metals are not highly leachable based on the analytical results.**
			Existing site users	Soil and dust ingestion/inhalation, dermal contact.	Medium	Unlikely	Low	Hardstanding over majority of site prevents accidental exposure. Potential for exposure in areas of soft landscape (<5%). Any such exposure therefore likely to be of short/intermittent exposure.
			Adjacent site users	Dust ingestion/inhalation	Mild	Unlikely	Very Low	Residential properties located along eastern and northern site boundary. Minimal ground disturbance in existing condition. Hardstanding over majority of site prevents soil dust generation.
			Docks	Migration via permeable strata	Mild	Low-likelihood	Low	Majority of site covered in hardstanding limiting rainwater infiltration and leaching of contaminants. Docks are approx 90m south of the site. Groundwater table approx 6-7m bgl. Groundwater gradient relatively flat across site. Hydraulic continuity with Docks likely.
			Groundwater (Glacial Till and Calp Limestone)	Migration via permeable strata	Medium	Low-likelihood	**Moderate /Low**	Majority of site covered in hardstanding limiting rainwater infiltration and leaching of contaminants. Groundwater table approx 6-7m bgl. Site lies within a drinking water protected area (DWPA) for groundwater.
			Below ground structures and services	Direct contact/permeation of water supply pipework	Medium	Low-likelihood	**Moderate /Low**	**Elevated sulphate concentrations. ACEC classification AC-5. Numerous concentrations of As, Pb, sulphate and pH > WRAS material selection threshold values.** Potential for direct contact. No record of derogation to water supply and/or evidence of structural distress to current foundations attributable to ground conditions.

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
	Copper and zinc	Landscaped area	Plants/vegetation	Root uptake	Mild	Low-likelihood	Low	**Elevated copper (30%) > DIV. Less than 10% zinc > DIV. US95 for Cu > DIV.** Majority of site covered in hardstanding. Potential for uptake in any areas of landscaping (<5%). Limited vegetation present.
	Methane, carbon dioxide	On site						**Limited monitoring programmes. Made ground and natural ground generating ground gases. Maximum recorded concentrations of methane (5.6%v/v) and carbon dioxide (10.6%v/v). Consistently low flow rates (<0.2l/hr). Characteristic Situation 2 determined [CIRIA 665]**.
			Existing site users	Gas/vapour migration and accumulation	Severe	Low-likelihood	**Moderate**	Potential for build up to hazardous concentrations in existing buildings onsite, no gas protection in existing buildings/structures. No record of incident in past.
			Adjacent site users	Gas/vapour migration and accumulation	Severe	Unlikely	**Moderate /Low**	Residential properties located on northern and eastern boundary of site. Hardstanding will encourage off-site migration. No known evidence/records/complaints of odours by offsite residents. Gas migration within Made Ground likely to be limited by retaining structures on north, west and south of site.

Source			Receptor	Pathway	Risk assessment (following CIRIA C665)			Description of source [bold text]. Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Hydrocarbon contaminated soil	TPH, PAHs	South of site						**Strong hydrocarbon odours recorded in soil at water table level within building maintenance yard. Elevated TPH concentrations (up to 635mg/kg) recorded. Laboratory classification suggests highly degraded diesel.**
			Existing site users	Soil and dust ingestion/inhalation, dermal contact.	Medium	Unlikely	Low	Hardstanding over majority of site prevents accidental exposure. Potential for exposure in areas of soft landscape (<5%). Any such exposure therefore likely to be of short/intermittent exposure.
			Adjacent site users	Dust ingestion/inhalation	Mild	Unlikely	Very Low	Residential properties located along eastern and northern site boundary. Minimal ground disturbance in existing condition. Hardstanding over majority of site prevents soil dust generation.
			Docks	Migration via permeable strata	Mild	Low-likelihood	Low	Majority of site covered in hardstanding limiting rainwater infiltration and leaching of contaminants. Docks are approx 90m south of the site. Groundwater table approx 6-7m bgl. Groundwater gradient relatively flat across site. Hydraulic continuity with Docks likely.
			Groundwater (Glacial Till and Calp Limestone)	Migration via permeable strata	Medium	Low-likelihood	**Moderate /Low**	Majority of site covered in hardstanding limiting rainwater infiltration and leaching of contaminants. Groundwater table approx 6-7m bgl. Site lies within a drinking water protected area (DWPA) for groundwater.
			Below ground services	Direct contact/permeation of water supply pipework	Medium	Low-likelihood	**Moderate /Low**	Potential for direct contact. No record of derogation to water supply attributable to ground conditions.
		Landscaped area	Plants/vegetation	Root uptake	Mild	Low-likelihood	Low	Majority of site covered in hardstanding. Potential for uptake in any areas of landscaping (<5%). Limited vegetation present.
	Methane, carbon dioxide	On site						**Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v). Methane concentration likely to be associated with VOCs. Consistently low flow rates (<0.2l/hr).**
			Existing site users	Gas/vapour migration and accumulation	Severe	Low-likelihood	**Moderate**	Potential for build up to hazardous concentrations in existing buildings onsite, however consistently low flow rates recorded over monitoring period. No record of incident in past.

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Conseque nce	Probability	Risk	
			Adjacent site users	Gas/vapour migration and accumulation	Severe	Unlikely	**Moderate /Low**	Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents.

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Hydrocarbon contaminated groundwater	TPH, PAHs	Southern and eastern portion of site						**Very high hydrocarbon odours and a slight sheen recorded in groundwater. Consistently elevated concentrations of TPH (up to 48mg/l) and PAH (up to 25ug/l) in groundwater within southern and eastern portion of site. TPH concentrations are predominantly heavy ended (C_{12}-C_{35}). BTEX compounds locally elevated in groundwater (WS11).**
			Docks	Migration via permeable strata	Medium	Low-likelihood	**Moderate /Low**	Docks are approx 90m south of the site. Groundwater table is approx 2m bgl in area of hydrocarbon contamination. Groundwater gradient relatively flat across site. Hydraulic continuity with Docks likely. No record of incident in past.
			Groundwater (Glacial Till and Calp Limestone)	Migration via permeable strata	Medium	Likely	**Moderate**	Groundwater gradient relatively flat. Site lies within a drinking water protected area (DWPA) for groundwater.
	Methane, carbon dioxide	On site						**Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v). Methane concentration likely to be associated with VOCs. Consistently low flow rates (<0.2l/hr).**
			Existing site users	Gas/vapour migration and accumulation	Severe	Low-likelihood	**Moderate**	Potential for build up to hazardous concentrations in existing buildings onsite, however consistently low flow rates recorded over monitoring period. No record of incident in past.
			Adjacent site users	Gas/vapour migration and accumulation	Severe	Unlikely	**Moderate /Low**	Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents.

Table 2 Enabling works/construction phase

Source			Receptor	Pathway	Risk assessment (following CIRIA C665)			Description of source [bold text]. Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Made ground	Heavy metals, benzo(a)pyrene, sulphate, pH.	Site wide						**Clay bound gravels containing glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery.** **Arsenic (50% samples) recorded above residential without plant uptake. Lead (30% samples) recorded above commercial/industrial SGV. The US95 values for arsenic and lead > SGV. Occasional concentrations of other metals (Cd, Hg, Ni) and benzo(a)pyrene recorded > SGV for residential without plant uptake. US95 > SGV for benzo(a)pyrene only. Maximum recorded concentrations of As, Pb, Ni and Hg very highly elevated in occasional samples.** **Numerous concentrations of As, Pb, sulphate and pH > WRAS material selection threshold values.** **Asbestos not detected, but potentially present.** **Leachability: Metals are not highly leachable based on the analytical results.**
			Enabling/ construction workforce	Soil and dust ingestion/inhalation, dermal contact.	Medium	Low-likelihood	**Moderate /Low**	Hardstanding over majority of site prevents accidental exposure. Potential for exposure during excavation/earthworks. Period of exposure relatively limited. Possibility for maximum concentrations to produce acute effects. Standard health and safety precautions likely.
			Adjacent site users	Dust ingestion/inhalation	Medium	Low-likelihood	**Moderate /Low**	Residential properties located along eastern and northern site boundary Potential for dust generation during excavation/earthworks. Scale of earthworks likely to generate large volumes of dust. Standard good construction practice to restrict dust generation likely.
			Docks	Surface runoff and groundwater transport	Mild	Likely	**Moderate /Low**	Potential for enhanced mobilisation of contaminants during earthworks and leaching of contaminants in stockpiles/areas of exposure. Docks are approx 90m south of the site down-hydraulic gradient.
			Groundwater (Glacial Till)	Migration via permeable strata	Medium	Likely	**Moderate**	Potential for enhanced mobilisation of contaminants during earthworks. Groundwater table approx 6-7m bgl. Site lies within a drinking water protected area (DWPA) for groundwater.
	Methane, carbon dioxide	On site						**Limited monitoring programmes. Made ground and natural ground generating ground gases. Maximum recorded concentrations of methane (5.6%v/v) and carbon dioxide (10.6%v/v). Consistently low flow rates (<0.2l/hr). Characteristic Situation 2 determined [CIRIA 665].**

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
			Enabling/ construction workforce	Gas/vapour migration and accumulation	Severe	Low-likelihood	**Moderate**	Potential for exposure during excavation/earthworks in any confined spaces. Standard health and safety precautions likely.
			Adjacent site users	Gas/vapour migration and accumulation	Severe	Unlikely	**Moderate /Low**	Residential properties located along eastern and northern site boundary.

Source			Receptor	Pathway	Risk assessment (following CIRIA C665)			Description of source [bold text]. Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Hydrocarbon contaminated soil	TPH, PAHs	South of site						**Strong hydrocarbon odours recorded in soil at water table level within building maintenance yard. Elevated TPH concentrations (up to 635mg/kg) recorded. Laboratory classification suggests highly degraded diesel.**
			Enabling/ construction workforce	Soil and dust ingestion/inhalation, dermal contact.	Mild	Low-likelihood	Low	Hardstanding over majority of site prevents accidental exposure. Potential for exposure during excavation/earthworks. Period of exposure relatively limited. Unlikely for maximum concentrations to produce acute effects. Standard health and safety precautions likely.
			Adjacent site users	Dust ingestion/inhalation	Mild	Low-likelihood	Low	Residential properties located along eastern and northern site boundary Potential for dust generation during excavation/earthworks. Scale of earthworks likely to generate large volumes of dust. Standard good construction practice to restrict dust generation likely.
			Docks	Surface runoff and groundwater transport	Medium	Low-likelihood	**Moderate /Low**	Potential for enhanced mobilisation of contaminants during earthworks and leaching of contaminants in stockpiles. Docks are approx 90m south of the site.
			Groundwater (Glacial Till)	Migration via permeable strata	Medium	Likely	**Moderate**	Potential for enhanced mobilisation of contaminants during earthworks. Groundwater table is relatively deep across majority of site (approx 6-7m bgl). Site lies within a drinking water protected area (DWPA) for groundwater.
	Methane, carbon dioxide	On site						**Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v). Methane concentration likely to be associated with VOCs. Consistently low flow rates (<0.2l/hr).**
			Enabling/ construction workforce	Gas/vapour migration and accumulation	Severe	Low-likelihood	**Moderate**	Potential for exposure during excavation/earthworks in any confined spaces. Standard health and safety precautions likely.
			Adjacent site users	Gas/vapour migration and accumulation	Severe	Unlikely	**Moderate /Low**	Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents.

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Hydrocarbon contaminated groundwater	TPH, PAHs	Southern and eastern portion of site						**Very high hydrocarbon odours and a slight sheen recorded in groundwater. Consistently elevated concentrations of TPH (up to 48mg/l) and PAH (up to 25ug/l) in groundwater within southern and eastern portion of site. TPH concentrations are predominantly heavy ended (C_{12}-C_{35}). BTEX compounds locally elevated in groundwater (WS11).**
			Enabling/ construction workforce	Soil and dust ingestion/inhalation, dermal contact.	Medium	Low-likelihood	**Moderate /Low**	Hardstanding over majority of site prevents accidental exposure. Potential for exposure during excavation/earthworks. Period of exposure relatively limited. Possibility for maximum concentrations to produce acute effects. Standard health and safety precautions likely.
			Groundwater (Glacial Till and Calp Limestone)	Migration via permeable strata	Medium	Likely	**Moderate**	Potential for enhanced mobilisation of contaminants during dewatering. Site lies within a drinking water protected area (DWPA) for groundwater.
			Docks	Migration via permeable strata	Medium	Low-likelihood	**Moderate /Low**	Potential for enhanced mobilisation of contaminants during construction dewatering. Docks are approx 90m south of the site. Groundwater table is relatively shallow in area of hydrocarbon contamination (approx 2m bgl). Groundwater gradient appears to be relatively flat and is expected to be in hydraulic continuity with Docks. Dewatering onsite likely reduce migration of groundwater off-site.
	Methane, carbon dioxide	On site						**Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v). Methane concentration likely to be associated with VOCs. Consistently low flow rates (<0.2l/hr).**
			Enabling/ construction workforce	Gas/vapour migration and accumulation	Severe	Low-likelihood	**Moderate**	Potential for exposure during excavation/earthworks in any confined spaces. Standard health and safety precautions likely.
			Adjacent site users	Gas/vapour migration and accumulation	Medium	Low-likelihood	**Moderate /Low**	Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents.

Table 3 Proposed development

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Made ground	Heavy metals, benzo(a)pyrene, sulphate, pH.	Railway arches along Sheriff Street Lower [made ground removed from all other parts of site)						**Clay bound gravels containing glass, brick, sea shells, ceramics, timber, rubber, concrete, ash and pottery.** **Arsenic (50% samples) recorded above residential without plant uptake. Lead (30% samples) recorded above commercial/industrial SGV. The US95 values for arsenic and lead > SGV. Occasional concentrations of other metals (Cd, Hg, Ni) and benzo(a)pyrene recorded > SGV for residential without plant uptake. US95 > SGV for benzo(a)pyrene only. Maximum recorded concentrations of As, Pb, Ni and Hg very highly elevated in occasional samples.** **Numerous concentrations of As, Pb, sulphate and pH > WRAS material selection threshold values.** **Asbestos not detected, but potentially present.** Leachability: **Metals are not highly leachable based on the analytical results.**
			Future site users	Soil and dust ingestion/inhalation, dermal contact.	Mild	Unlikely	Very Low	Potential source relatively localised. Hardstanding prevents accidental exposure.
			Adjacent site users	Dust ingestion/inhalation	Mild	Unlikely	Very Low	Potential source relatively localised. Hardstanding prevents soil dust generation.
			Docks	Migration via permeable strata	Mild	Unlikely	Very Low	Majority of made ground removed in proposed development. Hardstanding limits rainwater infiltration and leaching of contaminants. Docks are approx 90m south of the site. Groundwater table approx 2m bgl. Groundwater gradient relatively flat across site. Hydraulic continuity with Docks likely.
			Groundwater (Glacial Till and Calp Limestone)	Migration via permeable strata	Mild	Low-likelihood	Low	Majority of made ground removed in proposed development. Hardstanding limits rainwater infiltration and leaching of contaminants. Groundwater table approx 2m bgl. Site lies within a drinking water protected area (DWPA) for groundwater.
			Below ground structures and services	Direct contact/permeation of water supply pipework	Mild	Low-likelihood	Low	**Elevated sulphate concentrations. ACEC classification AC-5. Numerous concentrations of As, Pb, sulphate and pH > WRAS material selection threshold values.** Potential for direct contact beneath arches. No record of derogation to water supply and/ or evidence of structural distress to current foundations

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C665)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
								attributable to ground conditions.
	Methane, carbon dioxide	Railway arches						**Limited monitoring programmes. Made ground and natural ground generating ground gases. Maximum recorded concentrations of methane (5.6%v/v) and carbon dioxide (10.6%v/v). Consistently low flow rates (<0.2l/hr). Characteristic Situation 2 determined [CIRIA 665].**
			Existing site users	Gas/vapour migration and accumulation	Medium	Low-likelihood	**Moderate /Low**	Majority of Made Ground removed in proposed development. Potential for build up to hazardous concentrations in arches, however consistently low flow rates recorded over monitoring period.
			Adjacent site users	Gas/vapour migration and accumulation	Mild	Unlikely	Very Low	Majority of Made Ground removed in proposed development. Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents.

Source			Receptor	Pathway	Risk assessment (following CIRIA C552)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Hydrocarbon contaminated soil	TPH, PAHs	Railway arches along Sheriff Street Lower [hydrocarbon impacted soil removed from all other parts of site)						**Strong hydrocarbon odours recorded in soil at water table level within building maintenance yard. Elevated TPH concentrations (up to 635mg/kg) recorded. Laboratory classification suggests highly degraded diesel.**
			Future site users	Soil and dust ingestion/inhalation, dermal contact.	Mild	Unlikely	Very Low	Majority of hydrocarbon impacted soil removed in proposed development. Potential source relatively localised. Hardstanding prevents accidental exposure.
			Adjacent site users	Dust ingestion/inhalation	Mild	Unlikely	Very Low	Majority of hydrocarbon impacted soil removed in proposed development. Potential source relatively localised. Hardstanding prevents soil dust generation.
			Docks	Migration via permeable strata	Mild	Unlikely	Very Low	Majority of hydrocarbon impacted soil removed in proposed development. Hardstanding limits rainwater infiltration and leaching of contaminants. Docks are approx 90m south of the site. Groundwater table approx 2m bgl. Groundwater gradient relatively flat across site. Hydraulic continuity with Docks likely.
			Groundwater (Glacial Till)	Migration via permeable strata	Mild	Low-likelihood	Low	Majority of hydrocarbon impacted soil removed in proposed development. Hardstanding limits rainwater infiltration and leaching of contaminants. Groundwater table approx 2m bgl. Site lies within a drinking water protected area (DWPA) for groundwater.
			Below ground services	Direct contact/permeation of water supply pipework	Mild	Low-likelihood	Low	Majority of hydrocarbon impacted soil removed in proposed development Potential for direct contact beneath arches. No record of derogation to water supply and/ or evidence of structural distress to current foundations attributable to ground conditions.

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C552)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
	Methane, carbon dioxide	On site						**Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v). Methane concentration likely to be associated with VOCs. Consistently low flow rates (<0.2l/hr).**
			Existing site users	Gas/vapour migration and accumulation	Medium	Low-likelihood	**Moderate /Low**	Majority of hydrocarbon impacted soil removed in proposed development. Proposed development consists of a two storey basement carpark across majority of site which is considered to provide adequate ventilation. Potential for build up to hazardous concentrations in beneath arches, however consistently low flow rates recorded over monitoring period.
			Adjacent site users	Gas/vapour migration and accumulation	Mild	Unlikely	Very Low	Majority of impacted soil removed in proposed development. Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents. .

Source			Receptor	Pathway	**Risk assessment** (following CIRIA C552)			**Description of source [bold text].** Comment on hazard realisation [normal text]
Origin	Contaminants of concern	Zone affected			Consequence	Probability	Risk	
Hydrocarbon contaminated groundwater	TPH, PAHs	Southern and eastern portion of site						**Very high hydrocarbon odours and a slight sheen recorded in groundwater. Consistently elevated concentrations of TPH (up to 48mg/l) and PAH (up to 25ug/l) in groundwater within southern and eastern portion of site. TPH concentrations are predominantly heavy ended (C_{12}-C_{35}). BTEX compounds locally elevated in groundwater (WS11).**
			Docks	Migration via permeable strata	Mild	Low-likelihood	Low	Majority of residual soil source removed in proposed development. Docks are close to the site (approx. 90m S). Groundwater table is approx 2m bgl. Groundwater gradient relatively flat and is expected to be in hydraulic continuity with Docks.
			Groundwater (Glacial Till and Calp Limestone))	Migration via permeable strata	Medium	Low-likelihood	**Moderate /Low**	Majority of residual soil source removed in proposed development. Groundwater flow relatively flat across site. Site lies within a drinking water protected area (DWPA) for groundwater.
	Methane, carbon dioxide	Railway arches						**Limited monitoring programme. Maximum concentrations of methane (100%v/v) and carbon dioxide (9.3%v/v). Methane concentration likely to be associated with VOCs. Consistently low flow rates (<0.2l/hr).**
			Existing site users	Gas/vapour migration and accumulation	Medium	Low-likelihood	**Moderate /Low**	Majority of residual soil source removed in proposed development. Proposed development consists of a two storey basement carpark across majority of site which is considered to provide adequate ventilation. Potential for build up to hazardous concentrations in arches, however consistently low flow rates recorded over monitoring period. No record of incident in past.
			Adjacent site users	Gas/vapour migration and accumulation	Medium	Unlikely	Low	Majority of residual soil source removed in proposed development. Residential properties located on northern and eastern boundary of site. No known evidence/records/complaints of odours by offsite residents.

Appendix B: Laboratory Analytical Results

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Table 1- Soil Results

Sample Location		WS1			WS2			WS3		WS4		WS5			WS6		WS7			WS8	WS9	
Depth		1.00	3.00	5.00	1.00	3.00	5.00	0.50	4.00	0.50	2.00	0.50	2.00	5.00	1.00	4.00	1.00	3.00	5.00	2.00	0.50	1.00
Strata		MG	MG	MG	MG	MG	MG	MG	SS	MG	MG	MG	MG	SS	MG	MG	MG	MG	GC	MG	MG	MG
Metals																						
Arsenic	mg/kg	33.0	26.0	124.0	18.0	71.0	150.0	18.0	9.0	7	15	20	31	9	35	13	11	19	3	26.0	16.0	13.0
Cadmium	mg/kg	2.0	1.0	41.0	1.0	1.0	35.0	1.0	1.0	1	1	<1	1	<1	<1	<1	2	1	1	1.0	1.0	1.0
Chromium	mg/kg	32	44	41	32	23	44	22	25	34	18	20	37	16	33	12	17	21	22	15	20	18
Chromium VI	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	mg/kg	95	134	222	136	238	292	113	13	47	134	96	1179	10	66	22	31	89	19	544	55	77
Lead	mg/kg	650	364	1402	408	972	1425	821	183	168	289	829	2263	99	606	125	109	739	24	1118	236	243
Mercury	mg/kg	<0.3	<0.3	308.0	<0.3	9.0	320.0	3.0	<0.3	<1	<1	<1	<1	<1	<1	<1	<1	16	<1	<0.3	<0.3	1.0
Nickel	mg/kg	41	61	131	37	64	173	33	18	48	30	38	48	9	66	11	45	47	35	40	25	18
Selenium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<0.5
Zinc	mg/kg	334	164	841	259	312	1124	256	79	207	124	120	296	42	142	59	96	122	70	419	116	115
Water Soluble Boron	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Other Inorganics																						
Natural Moisture Content	%	24.6	25.2	48.3	18.5	30.9	55.6	14.3	21.0	7.8	20.5	15.1	23.1	19.7	33.5	21.0	10.9	22.5	13.8	25.2	20.3	20.5
Acid Soluble Sulphide	mg/kg	<5	<5	<5	<5	<5	<5	9	16	<5	17	10	35	541	8	47	<5	<5	11	<5	<5	<5
Total Sulphur	%	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	6.6	0.3	<0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2
Total Sulphate**	mg/kg	2200	980	8800	280	1200	5300	1000	1400	240	530	1900	4500	2000	370	1600	2300	11000	360	3000	3000	6100
Chloride	mg/kg	12	15	15	20	13	14	14	21	12	14	17	17	42	8	28	<5	13	14	119	38	40
Asbestos Screening	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected
pH	pH Units	8.30	8.35	7.61	8.35	8.24	7.72	8.10	7.99	8.71	8.69	8.51	8.32	8.41	8.66	8.04	8.13	7.71	8.65	8.32	8.04	8.16
Organics																						
Total Organic Carbon	%	7.6	8.3	-	5.4	11.2	-	-	1.7	-	3.6	-	5.3	-	7.5	1.6	-	-	-	8.3	-	-
Total Phenols	mg/kg	-	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NDP	See Attached	See Attached
Free Cyanide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thiocyanate	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Cyanide	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2.5	<2.5	<2.5
Hydrocarbons																						
Aliphatics																						
EC C5-C6	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C6-C8	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C8-C10	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C10-C12	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C12-C16	mg/kg	-	<0.1	-	-	<0.1	-	-	<0.1	15	-	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
EC>C16-C21	mg/kg	-	<0.1	-	-	<0.1	-	-	<0.1	62	-	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
EC>C21-C35	mg/kg	-	<0.1	-	-	<0.1	-	-	<0.1	311	-	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Total Aliphatics	mg/kg	-	<0.1	-	-	<0.1	-	-	<0.1	389	-	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Aromatics																						
EC C6-C7	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C7-C8	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C8-C10	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C10-C12	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
EC>C12-C16	mg/kg	-	2.12	-	-	3.625	-	-	8.236	<0.1	-	-	-	-	-	1.4	-	<0.1	-	0.987	-	-
EC>C16-C21	mg/kg	-	1.95	-	-	3.617	-	-	9.423	<0.1	-	-	-	-	-	0.8	-	<0.1	-	1.215	-	-
EC>C21-C35	mg/kg	-	0.58	-	-	1.204	-	-	2.411	<0.1	-	-	-	-	-	0.12	-	<0.1	-	0.908	-	-
Total Aromatics	mg/kg	-	4.65	-	-	8.446	-	-	20.07	<0.1	-	-	-	-	-	2	-	<0.1	-	3.11	-	-
Mineral Oil by GC	mg/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
Petrol Range Organics C5-C9	mg/kg	<0.01	-	-	<0.01	-	-	-	<0.01	-	-	-	<0.01	-	-	<0.01	-	-	-	<0.01	-	-
Petrol Range Organics C10-12	mg/kg	<0.01	-	-	<0.01	-	-	-	<0.01	-	-	-	<0.01	-	-	<0.01	-	-	-	<0.01	-	-
PRO	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
Diesel Range Organics	mg/kg	271	-	-	60	-	-	-	111	-	-	-	<1	-	-	49	-	-	-	108	-	-
DRO Interpretation		Possible PAHs	-	-	Possible PAHs	-	-	-	Possible PAHs	-	-	-	NIP	-	-	NIP	-	-	-	Possible natural occuring products	-	-
TPH	mg/kg	-	4.65	-	-	8.446	-	-	20.07	389	-	-	-	-	-	2	-	<01	-	3.11	-	-
MTBE	mg/kg	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
Benzene	mg/kg	<0.01	<0.01	-	<0.01	<0.01	-	-	<0.01	<0.01	-	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	-
Toluene	mg/kg	<0.01	<0.01	-	<0.01	<0.01	-	-	<0.01	<0.01	-	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	-
Ethylbenzene	mg/kg	<0.01	<0.01	-	<0.01	<0.01	-	-	<0.01	<0.01	-	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	-
Xylene	mg/kg	<0.01	<0.01	-	<0.01	<0.01	-	-	<0.01	<0.01	-	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	-	-
BTEX	mg/kg	<0.04	<0.04	-	<0.04	<0.04	-	-	<0.04	<0.04	-	-	<0.04	-	-	<0.04	-	<0.04	-	<0.04	-	-
PAHs																						
Naphthalene	ug/kg	510	59	139	389	230	50	225	68	56	36	46	51	77	55	55	<1	<1	<1	37	210	496
Acenaphthylene	ug/kg	566	63	59	209	168	29	170	316	49	13	44	13	21	24	13	<1	<1	<1	70	106	228
Acenaphthene	ug/kg	545	45	48	818	54	36	156	51	37	16	29	31	45	35	35	<1	<1	<1	34	1230	2203
Fluorene	ug/kg	827	34	29	784	65	19	147	110	36	7	40	18	122	24	77	<1	<1	<1	49	662	1621
Phenanthrene	ug/kg	8748	596	1047	9251	1006	457	2073	2835	339	221	660	326	554	327	363	<1	<1	<1	352	7987	20568
Anthracene	ug/kg	1899	98	124	905	268	57	338	840	116	68	175	93	248	90	131	<1	<1	<1	86	1073	2390
Fluoranthene	ug/kg	15473	669	508	6391	1087	300	2560	410	564	234	1136	410	553	281	454	<1	<1	<1	179	9923	20578
Pyrene	ug/kg	12491	614	455	5351	974	259	2259	3672	568	247	801	364	411	251	318	<1	<1	<1	190	9612	18200
Benzo(a)anthracene	ug/kg	7249	440	461	2467	726	224	1236	2380	499	315	257	182	154	503	298	<1	<1	<1	191	4413	8172
Chrysene	ug/kg	4508	497	542	3051	842	292	1408	2222	460	285	569	399	375	340	186	<1	<1	<1	229	5104	8739
Benzo(b)+Benzo(k) fluoranthene	ug/kg	7205	743	1074	4160	1513	583	2281	3591	822	315	751	796	339	535	218	<1	<1	<1	498	7529	12560
Benzo(a)pyrene	ug/kg	3134	385	543	2268	765	297	1158	2097	614	151	428	406	213	277	124	<1	<1	<1	311	4355	7209
Indeno(123cd)pyrene	ug/kg	3955	271	551	1342	534	284	1036	1235	764	155	278	434	122	272	77	<1	<1	<1	297	2670	4377
Dibenzo(ah)anthracene	ug/kg	3280	242	525	1239	483	246	836	1081	273	81	160	220	91	186	40	<1	<1	<1	360	2137	3874
Benzo(ghi)perylene	ug/kg	5999	337	708	1705	722	378	1238	1334	729	139	279	429	127	247	79	<1	<1	<1	548	3446	5605
Coronene	ug/kg	1036	-	-	477	-	-	-	342	-	-	-	196	-	-	40	-	-	-	198	-	-
Total 6 PAHs	mg/kg	31.7	-	-	15.1	-	-	-	8.2	-	-	-	2.5	-	-	<1.6	-	-	-	<1.6	-	-
Total 10 Dutch PAHs	ug/kg	60176	-	-	38725	-	-	-	17462	-	-	-	4579	-	-	1985	-	-	-	2889	-	-
Total 16 EPA PAHs	ug/kg	76389	5094	6812	40329	9436	3513	17124	22242	5926	2283	5653	4172	3452	3447	2468	<1	<1	<1	3431	60459	116821
Total 17 PAHs	ug/kg	77419	-	-	40825	-	-	-	22576	-	-	-	4368	-	-	2508	-	-	-	3629	-	-
PCBs																						
PCB Congener 28	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Congener 52	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Congener 101	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Congener 118	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Congener 153	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Congener 138	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Congener 180	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-
PCB Total of 7 Congeners	ug/kg	<1	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	<1	-	-	-	<1	-	-

Sample Location		WS11			WS12		BH1	BH3			BH4				BH 5	BH6		BH7			Residential without plant uptake[1]	Commercial/ Industrial[1]	DIV[2]	Murphy WAC[3]	KTK WAC[4]
Depth		0.50	2.00	3.00	0.50	1.00	2.00	2.0	0.50	1.00	1.00	5.0-5.3	6.0-6.3	7.20	2.00	1.00	2.00	0.50	3.00	6.50					
Strata		SS	SS	GC	MG	MG	MG	MG	MG	MG	MG	MG	MG	GC	MG	MG	MG	MG	GR	GC					
Metals																									
Arsenic	mg/kg	-	7	3	27.0	27.0	11.0	8.0	30.0	-	26.0	18	22	17.0	15.0	15.0	27.0	27	-	8	20	500			
Cadmium	mg/kg	-	<1	2	1.0	1.0	<0.5	<0.5	<0.5	-	1.0	1.0	1.0	1.0	<0.5	1.0	1.0	<1	-	1	30	1400			
Chromium	mg/kg	-	11	32	22	19	10	16	16	-	28	14	17	16	30	15	20	23	-	17	200	5000			
Chromium VI	mg/kg	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1					
Copper	mg/kg	-	14	26	306	610	28	7	91	-	237	270	250	42	145	42	99	29	-	18			190		
Lead	mg/kg	-	77	25	481	937	362	30	466	-	392	430	480	222	602	439	1187	183	-	22	450	750			
Mercury	mg/kg	-	<1	<1	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	1.5	2.1	<0.3	<0.3	<0.3	5.0	<1	-	<1	15	480			
Nickel	mg/kg	-	9	51	60	38	14	16	46	-	40	29	40	26	29	18	35	16	-	28	75	5000			
Selenium	mg/kg	-	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<3	<3	<0.5	<0.5	<0.5	<0.5	<1	-	<1	260	8000			
Zinc	mg/kg	-	45	105	233	228	62	59	98	-	153	260	240	95	103	91	139	118	-	72			720		
Water Soluble Boron	mg/kg	-	<1	<1	<1	<1	<1	<1	<1	-	<1	-	-	8	<1	<1	<1	<1	-	<1					
Other Inorganics																									
Natural Moisture Content	%	8.2	23.8	10.7	21.7	14.0	33.3	23.5	24.3	24.4	9.5	-	-	40.9	23.2	15.0	27.2	3.9	17.8	7.8					
Acid Soluble Sulphide	mg/kg	-	189	12	<5	8	93	<5	6	-	7	-	-	35	<5	17	<5	24	-	16					
Total Sulphur	%	-	0.2		<0.2	0.2	0.5	<0.2	<0.2	-	<0.2	-	-	0.3	0.3	<0.2	<0.2	<0.2	-	0.3					
Total Sulphate**	mg/kg	-	790	210	1600	2300	1500	560	1800	-	2000	-	-	1500	5800	500	1700	1000	-	620					
Chloride	mg/kg	-	22	11	41	36	76	21	15	-	33	-	-	36	33	15	11	23	-	850					
Asbestos Screening	No Fibres Detected	-	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	-	No Fibres Detected	-	-	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	No Fibres Detected	-	No Fibres Detected					
pH	pH Units	-	8.67	8.70	8.21	8.01	8.63	8.93	8.98	-	8.49	-	-	7.84	8.13	8.45	8.38	9.21	-	8.67					
Organics																									
Total Organic Carbon	%	-	2.2	-	-	-	-	1.5	-	1.1	7.6	-	-	-	3.1	-	-	-	-	0.5					
Total Phenols	mg/kg	-	<0.01	-	See Attached	See Attached	See Attached	See Attached	See Attached	-	See Attached	-	-	See Attached	<0.01	See Attached	See Attached	<0.01	-	<0.01	219000	219000			
Free Cyanide	mg/kg	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5					
Thiocyanate	mg/kg	-	<1	2	<1	<1	<1	<1	<1	-	<1	-	-	<1	<1	<1	<1	<1	-	<1					
Total Cyanide	mg/kg	-	<1	<1	<2.5	<2.5	<1	<1	<1	-	<2.5	-	-	<2.5	See Attached	<2.5	<2.5	<1	-	<1	181	13800			
Hydrocarbons																									
Aliphatics																									
EC C5-C6	mg/kg	<0.01	1	0.3	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	10.5	476			
EC>C6-C8	mg/kg	<0.01	6	3	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	26.8	>SAT			
EC>C8-C10	mg/kg	<0.01	4	3	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	73.1	157000			
EC>C10-C12	mg/kg	<0.01	7	8	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	43	157000			
EC>C12-C16	mg/kg	<0.1	194	<0.1	-	<0.1	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	<0.1	-	6790	157000			
EC>C16-C21	mg/kg	<0.1	301	<0.1	-	<0.1	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	<0.1	-					
EC>C21-C35	mg/kg	<0.1	88	<0.1	-	<0.1	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	<0.1	-					
Total Aliphatics	mg/kg	<0.1	601	14	-	<0.1	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	<0.1	-					
Aromatics																									
EC C6-C7	mg/kg	<0.01	0.02	<0.01	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-					
EC>C7-C8	mg/kg	<0.01	0.10	<0.01	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	7.3	536			
EC>C8-C10	mg/kg	<0.01	6.38	4	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	71	62800			
EC>C10-C12	mg/kg	<0.01	11	12	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	418	62800			
EC>C12-C16	mg/kg	286	9.4	<0.1	-	1.88	-	<0.1	-	-	-	-	-	-	2.6	-	-	-	<0.1	-	1920	47000			
EC>C16-C21	mg/kg	73	5.6	<0.1	-	1.808	-	<0.1	-	-	-	-	-	-	4.0	-	-	-	<0.1	-	2040	47000			
EC>C21-C35	mg/kg	37	0.9	<0.1	-	0.334	-	<0.1	-	-	-	-	-	-	1.0	-	-	-	<0.1	-					
Total Aromatics	mg/kg	396	33	17	-	4.022	-	<0.1	-	-	-	-	-	-	7.6	-	-	-	<0.1	-					
Mineral Oil by GC	mg/kg	-	217	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
Petrol Range Organics C5-C9	mg/kg	-	3.451	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	<0.01					
Petrol Range Organics C10-12	mg/kg	-	6.764	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	<0.01					
PRO	mg/kg	<0.01	36	31	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-					
Diesel Range Organics	mg/kg	-	1086	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					1000
DRO Interpretation		-	Possible highly degraded diesel	-	-	-	-	-	-	NIP	-	-	-	-	-	-	-	-	-	NIP					
TPH	mg/kg	396	635	31	-	4.022	-	<01	-	-	-	-	-	-	7.6	-	-	-	<01	-				500	
MTBE	mg/kg	<0.01	0.14	<0.01	-	<0.01	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-					
Benzene	mg/kg	<0.01	0.02	<0.01	-	<0.01	-	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	<0.01	<0.01	0.038	1.65			
Toluene	mg/kg	<0.01	0.10	<0.01	-	<0.01	-	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	<0.01	<0.01	3	150			
Ethylbenzene	mg/kg	<0.01	0.04	0.02	-	<0.01	-	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	<0.01	<0.01	16	48000			
Xylene	mg/kg	<0.01	0.17	0.05	-	<0.01	-	<0.01	-	<0.01	-	-	-	-	<0.01	-	-	-	<0.01	<0.01	7.9	341			
BTEX	mg/kg	<0.04	0.33	<0.09	-	<0.04	-	<0.04	-	<0.04	-	-	-	-	<0.04	-	-	-	<0.04	<0.04					6
PAHs																									
Naphthalene	ug/kg	-	351	-	56	47	75	<1	77	7	72	-	-	39	74	108	5377	2	-	<1	7000	290000	-		
Acenaphthylene	ug/kg	-	206	-	80	26	19	<1	65	3	101	-	-	9	44	201	2351	4	-	<1	-	-	-		
Acenaphthene	ug/kg	-	337	-	68	83	66	<1	38	19	54	-	-	27	30	79	994	16	-	<1	-	-	-		
Fluorene	ug/kg	-	721	-	62	41	105	<1	45	2	66	-	-	25	21	118	3380	1	-	<1	-	-	-		
Phenanthrene	ug/kg	-	2456	-	20	503	559	<1	618	52	1062	-	-	340	490	1969	27765	5	-	<1	-	-	-		
Anthracene	ug/kg	-	650	-	149	141	179	<1	251	12	260	-	-	33	190	699	10691	2	-	<1	-	-	-		
Fluoranthene	ug/kg	-	2634	-	505	566	393	<1	760	32	1407	-	-	113	879	3233	34308	78	-	<1	-	-	-		
Pyrene	ug/kg	-	2395	-	360	520	298	<1	764	27	1379	-	-	92	941	2372	28495	153	-	<1	-	-	-		
Benzo(a)anthracene	ug/kg	-	2016	-	457	537	179	<1	247	32	860	-	-	117	1257	3324	21106	80	-	<1	-	-	-		
Chrysene	ug/kg	-	1520	-	604	555	147	<1	624	36	932	-	-	171	826	1387	16330	61	-	<1	-	-	-		
Benzo(b)+Benzo(k) fluoranthene	ug/kg	-	1538	-	1007	537	181	<1	937	36	1808	-	-	193	1417	1963	28064	85	-	<1	-	-	-		
Benzo(a)pyrene	ug/kg	-	828	-	544	385	135	<1	460	7	1039	-	-	78	816	1366	16122	47	-	<1	1400	31000			
Indeno(123cd)pyrene	ug/kg	-	539	-	387	179	61	<1	381	14	896	-	-	71	501	781	10079	58	-	<1					
Dibenzo(ah)anthracene	ug/kg	-	363	-	317	116	51	<1	398	6	678	-	-	86	348	455	10344	21	-	<1					
Benzo(ghi)perylene	ug/kg	-	535	-	537	218	95	<1	701	22	1117	-	-	137	678	857	10027	62	-	<1					
Coronene	ug/kg	-	205	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	<1					
Total 6 PAHs	mg/kg	-	6.1	-	-	-	-	-	-	<1.6	-	-	-	-	-	-	-	-	-	<1.6					
Total 10 Dutch PAHs	ug/kg	-	13067	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	-	<1					40000
Total 16 EPA PAHs	ug/kg	-	17089	-	5154	4454	2543	<1	6366	307	11731	-	-	1530	8512	18912	225434	675	-	<1					
Total 17 PAHs	ug/kg	-	17294	-	-	-	-	-	-	315	-	-	-	-	-	-	-	-	-	<1				100,000	
PCBs																									
PCB Congener 28	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Congener 52	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Congener 101	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Congener 118	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Congener 153	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Congener 138	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Congener 180	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1					
PCB Total of 7 Congeners	ug/kg	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	<1				1000	

MG - Made Ground
SS -Sandy Silt (with sea shells)
GR - Gravel
BC -Gravelly Clay

NIP - No Identification Possible

1 - Soil Guideline Values - DEFRA & Environment Agency (2002). "The Contaminated Land Exposure Assessment Model (CLEA): Technical Basis and Algorithms". CLR10 and R&D Publication SGV1, 3, 5, 7,9 &10
2 - Dutch Guidelines - Circular on Target Values and Intervention Values for Soil Remediation, Ministry of Housing, Spatial Planning and the Environment (2000)
3- Murphy Environmental Inert Waste Acceptance Criteria
4- KTK Landfill Hazardous Waste Acceptance Criteria

Table 1 - Soil Results

Borehole Location	**WS6**	**WS11**	**BH5**
Sample Depth	4m	3m	2m
Strata	MG	GC	MG
VOCs			
Dichlorodifluoromethane	<2	<2	<2
Chloromethane	<3	<3	<3
Vinyl Chloride	<3	<3	<3
Bromomethane	<5	<5	<5
Chloroethane	<2.5	<2.5	<2.5
Trichlorofluoromethane	<1.5	<1.5	<1.5
1,1-Dichloroethene	<2	<2	<2
Carbon Disulphide	<1	<1	<1
Dichloromethane	<4	<4	<4
Tert-butyl methyl ether	<3	<3	<3
Trans-1,2-Dichoroethene	<2	<2	<2
1,1-Dichloroethane	<2	<2	<2
Cis-1,2-Dichloroethene	<2	<2	<2
2,2-Dichloropropane	<3	<3	<3
Bromochloromethane	<6	<6	<6
Chloroform	<2	<2	<2
1,1,1-Trichloroethane	<1.5	<1.5	<1.5
1,1-Dichloropropene	<2	<2	<2
Carbontetrachloride	<1	<1	<1
1,2-Dichloroethane	<5	<5	<5
Benzene	<2	<2	<2
Trichloroethene	<2	<2	<2
1,2-Dichloropropane	<3	<3	<3
Dibromomethane	<8	<8	<8
Bromodichloromethane	<3	<3	<3
Cis-1,3-Dichloropropene	<3.5	<3.5	<3.5
Toluene	<1	<1	<1
Trans-1,3-Dichloropropene	<4	<4	<4
1,1,2-Trichloroethane	<4.5	<4.5	<4.5
1,3-Dichloropropane	<5	<5	<5
Tetrachloroethene	<1	<1	<1
Dibromochloromethane	<4	<4	<4
1,2-Dibromoethane	<5	<5	<5
Chlorobenzene	<1	<1	<1
1,1,1,2-tetrachloroethane	<2	<2	<2
Ethylbenzene	<1	<1	<1
p/m-Xylene	<2	**18**	<2
o-Xylene	<1	<1	<1
Styrene	<1	<1	<1
Bromoform	<7	<7	<7
Isopropylbenzene	<1	**5**	<1
1,1,2,2-Tetrachloroethane	<8	<8	<8
1,2,3-Trichloropropane	<8	<8	<8
Bromobenzene	<2	<2	<2
Propylbenzene	<1	**10**	<1
2-Chlorotoluene	<1	<1	<1
1,3,5-Trimethylbenzene	<1	**11**	<1
4-Chlorotoluene	<1	<1	<1
Tert-Butylbenzene	<1	<1	<1
1,2,4-Trimethylbenzene	<1	**71**	<1
Sec-Butylbenzene	<1	**3**	<1
4-Isopropyltoluene	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1
1,4-Dichlorobenzene	<3	<3	<3
n-Butylbenzene	<2	<2	<2
1,2-Dichlorobenzene	<2	<2	<2
1,2-Dibromo-3-Chloropropar	<13	<13	<13
1,2,4-Trichlorobenzene	<3	<3	<3
Hexachlorobutadiene	<2	<2	<2
Naphthalene	<4	<4	<4
1,2,3-Trichlorobenzene	<2.5	<2.5	<2.5

Borehole Location	**WS6**	**WS11**
Sample Depth	4m	3m
Strata	MG	GC
SVOCs		
Phenol	<100	<100
2-Chlorophenol	<100	<100
2-Methylphenol	<100	<100
4-Methylphenol	<100	<100
2-Nitrophenol	<100	<100
4-Nitrophenol	<100	<100
2,4-Dichlorophenol	<100	<100
2,4-Dimethylphenol	<100	<100
4-Chloro-3-methylphenol	<100	<100
2,4,6-Trichlorophenol	<100	<100
2,4,5-Trichlorophenol	<100	<100
Pentachlorophenol	<100	<100
1,3-Dichlorobenzene	<100	<100
1,4-Dichlorobenzene	<100	<100
1,2-Dichlorobenzene	<100	<100
1,2,4-Trichlorobenzene	<100	<100
Nitrobenzene	<100	<100
Azobenzene	<100	<100
Hexachlorobenzene	<100	<100
Naphthalene	<100	<100
Acenaphthylene	<100	<100
Acenaphthene	<100	<100
Fluorene	<100	<100
Phenanthrene	<100	<100
Anthracene	<100	<100
Fluoranthrene	**163**	**185**
Pyrene	**130**	**153**
Benzo(a)anthracene	<100	<100
Chrysene	<100	<100
Benzo(b)fluoranthrene	<100	<100
Benzo(k)fluoranthrene	<100	<100
Benzo(a)pyrene	<100	<100
Indeno(1,2,3-cd)pyrene	<100	<100
Dibenzo(a,h)anthracene	<100	<100
Benzo(ghi)perylene	<100	<100
2-Chloronaphthalene	<100	<100
2-Methylnaphthalene	<100	<100
Carbazole	<100	<100
Isophorone	<100	<100
Dibenzofuran	<100	<100
Dimethyl phthalate	<100	<100
Diethyl phthalate	<100	<100
Di-n-butylphthalate	<100	<100
Di-n-octylphthalate	<100	<100
Bis(2-ethylhexyl)phthalate	<100	**1663**
Butylbenzylphthalate	<100	<100
4-Chloroaniline	<100	<100
2-Nitroanaline	<100	<100
3-Nitroaniline	<100	<100
4-Nitroaniline	<100	<100
2,4-Dinitrotoluene	<100	<100
2,6-Dinitrotoluene	<100	<100
Bis(2-chloroethyl)ether	<100	<100
4-Bromophenylphenylether	<100	<100
4-Chlorophenylphenylether	<100	<100
Hexachloroethane	<100	<100
Hexachlorobutadiene	<100	<100
Hexchlorocyclopentadiene	<100	<100
Bis(2-chloroethoxy)methane	<100	<100
N-nitrosodi-n-propylamine	<100	<100

All results given in ug/kg

MG - Made Ground
SS -Sandy Silt (with sea shells)
GR - Gravel
BC -Gravelly Clay

Table 2 - Leachate Results		Sample Location																				Irish Interim Guideline Value
Sample Identity		WS1			WS2			WS3	WS4	WS5	WS6		WS8	WS11	BH3		BH4			BH 5	BH7	
Depth		1.00	3.00	5.00	1.00	3.00	5.00	4.00	2.00	2.00	1.00	4.00	2.00	2.00	1.00	2.0	1.00	5.0-5.3	6.0-6.3	2.00	6.50	
Strata		MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	SS	MG	MG	MG	MG	MG	MG	GC	
Metals																						
Dissolved Mercury Low CEN 10:1 Leachate	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0001	0.0002	<0.00005	<0.00005	0.001
Total Dissolved Solids in CEN 10:1 Leachate	mg/l	104	114	-	98	98	-	458	94	646	106	120	140	306	122	126	126	-	-	590	204	1000
Total Phenols in CEN 10:1 Leachate	mg/l	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	-	-	<0.01	<0.01	0.0005
Dissolved Antimony Low CEN 10:1 Leach	mg/l	0.007	0.005	0.003	0.004	0.004	0.004	0.006	0.007	0.002	0.004	0.011	0.009	0.013	0.007	0.004	0.003	0.13	<0.0075	0.001	0.004	
Dissolved Arsenic Low CEN 10:1 Leach	mg/l	0.009	0.008	<0.001	0.01	0.012	<0.001	0.002	0.014	<0.01	0.004	0.004	0.014	0.001	0.243	0.151	0.002	0.073	0.029	<0.001	<0.001	0.01
Dissolved Barium Low CEN 10:1 Leach	mg/l	0.249	0.236	0.25	0.205	0.214	0.247	0.322	0.18	0.253	0.181	0.3	0.231	0.271	0.714	0.886	0.233	0.32	0.30	0.242	0.315	0.1
Dissolved Boron Low CEN 10:1 Leach	mg/l	-	0.082	0.132	-	0.075	0.132	-	0.021	-	0.045	0.171	-	-	-	0.027	0.067	<0.2	<0.2	0.065	-	1
Dissolved Cadmium Low CEN 10:1 Leach	mg/l	<0.0004	<0.0004	0.0012	<0.0004	<0.0004	0.0007	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0022	<0.0022	<0.0004	<0.0004	0.005
Dissolved Chromium Low CEN 10:1 Leach	mg/l	0.002	0.003	0.003	0.002	0.004	0.002	0.002	0.008	0.004	<0.001	<0.001	0.002	<0.001	0.374	0.215	0.004	<0.01	<0.01	<0.001	<0.001	0.03
Dissolved Copper Low CEN 10:1 Leach	mg/l	0.036	0.053	0.032	0.022	0.028	0.028	0.057	0.034	0.041	0.112	0.05	0.05	0.038	0.237	0.04	0.026	0.027	0.057	0.038	0.034	0.03
Dissolved Lead Low CEN 10:1 Leach	mg/l	<0.001	<0.001	0.007	<0.001	<0.001	0.001	<0.001	0.004	0.003	0.006	0.006	<0.001	0.003	0.005	0.003	<0.001	0.017	0.004	0.001	0.001	0.01
Dissolved Molybdenum Low CEN 10:1 Leach	mg/l	0.012	0.023	0.037	0.033	0.018	0.029	0.039	0.003	0.032	0.006	0.064	0.026	0.048	0.006	0.004	0.013	0.45	0.24	0.017	0.011	
Dissolved Nickel Low CEN 10:1 Leach	mg/l	<0.001	<0.001	0.008	<0.001	<0.001	0.003	0.004	0.017	0.012	0.008	0.011	<0.001	0.013	0.375	0.339	<0.001	0.039	0.087	0.006	0.014	0.02
Dissolved Selenium Low CEN 10:1 Leach	mg/l	0.004	0.002	<0.001	0.004	0.002	0.001	0.003	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.067	0.053	0.002	0.05	0.05	<0.001	0.019	
Dissolved Zinc Low CEN 10:1 Leach	mg/l	0.015	0.017	0.133	0.004	0.011	0.096	0.085	0.017	0.044	0.028	0.039	0.009	0.073	0.083	0.049	0.007	<0.05	<0.05	0.048	0.019	0.1
Other inorganics																						
Chloride in CEN 10:1 Leachate	mg/l	3.7	2.4	-	2.3	2.2	-	4.4	1.2	2	1.4	2.2	3.3	3.5	8.3	2	3.2	-	-	3.7	82.3	30
Fluoride in CEN 10:1 Leachate	mg/l	2	0.7	-	1.2	0.9	-	0.7	0.6	0.2	0.8	0.3	0.9	0.3	0.5	0.2	0.5	-	-	0.3	0.4	1
Sulphate in CEN 10:1 Leachate	mg/l	5.4	10.8	-	5	11	-	230.2	4.2	427.8	5.3	40.9	18.4	72.1	13	24.1	42.5	-	-	466.8	33.5	200
COD Filtered in CEN 10:1 Leachate	mg/l	-	<1.5	-	-	<1.5	-	-	<1.5	-	<1.5	2.3	-	-	-	5.1	<1.5	-	-	<1.5	-	
Organics																						
Dissolved Organic Carbon in CEN 10:1 Leachate	mg/l	3.1	<2.0	-	2	2.1	-	3	<2.0	<2.0	<2.0	7.4	3.5	8	<2.0	2.7	<2.0	-	-	<2.0	<2.0	

MG - Made Ground

SS -Sandy Silt (with sea shells)

GR - Gravel

BC -Gravelly Clay

Table 3 - Groundwater Results	Borehole	BH1			BH2		BH3			BH4				BH5			BH6		BH7			WS7			WS11			Irish Interim Guideline Value
	Sampling date	04-Sep-08	10-Sep-08	17-Sep-08	10-Sep-08	17-Sep-08	29-Aug-08	04-Sep-08	10-Sep-08	29-Aug-08	04-Sep-08	04-Sep-08	10-Sep-08	29-Aug-08	10-Sep-08	17-Sep-08	10-Sep-08	17-Sep-08	29-Aug-08	04-Sep-08	10-Sep-08	29-Aug-08	04-Sep-08	10-Sep-08	29-Aug-08	04-Sep-08	10-Sep-08	
Determinand	Comments				HC odour & slight sheen		High HC odour. Slight sheen on 3rd round				Sample contaminated in metals analysis	Re-analysed					Slight HC odour & slight sheen					Slight HC odour			Very high HC odour & slight sheen			
Metals																												
Dissolved Antimony Low Level	ug/l	1	<1	2	<1	3	3	1	<1	5	<1	-	<1	3	3	4	<1	<1	<1	<1	1	11	21	20	<1	3	2	
Dissolved Arsenic Low Level	ug/l	1	<1	2	2	3	3	<1	<1	5	2	-	<1	10	9	10	2	3	5	8	8	3	8	1	2	6	4	10
Dissolved Berylium Low Level	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Dissolved Boron Low Level	ug/l	150	217	194	457	381	606	17	6	161	35	-	41	1020	1028	862	308	114	1250	1010	1141	551	618	457	196	132	231	1000
Dissolved Cadmium Low Level	ug/l	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	0.5	<0.4	<0.4	0.5	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.6	1.3	1.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	5
Dissolved Chromium Low Level	ug/l	<1	1	<1	<1	1	4	3	1	2	126	6	1	13	1	1	<1	<1	7	2	3	7	1	<1	9	<1	<1	30
Dissolved Copper Low Level	ug/l	2	3	1	3	2	3	7	4	5	15	-	5	4	5	5	<1	2	8	8	4	5	9	5	4	9	1	30
Dissolved Lead Low Level	ug/l	1	16	<1	<1	<1	<1	19	1	2	34	-	1	2	4	<1	<1	3	<1	4	1	2	35	2	6	62	2	10
Dissolved Nickel Low Level	ug/l	6	6	4	7	4	5	7	2	4	68	-	2	17	17	19	7	10	14	13	13	10	10	8	8	15	12	20
Dissolved Selenium Low Level	ug/l	12	8	11	3	10	16	<1	3	8	2	-	<1	<1	<1	2	<1	<1	31	28	27	1	10	<1	<1	<1	2	
Dissolved Zinc Low Level	ug/l	21	151	<1	32	<1	32	45	22	34	104	-	18	57	55	32	27	27	35	25	17	34	36	23	76	72	15	100
Dissolved Mercury Low Level	ug/l	-	<0.05	<0.05	<0.05	<0.05	0.08	-	<0.05	0.05	-	-	0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	-	0.06	<0.05	-	<0.05	<0.05	-	<0.05	1
Other Inorganics																												
Total Hardness	mg/l	472	520	508	799	701	573	162	90	610	391	-	281	1610	1564	1552	776	455	1986	1806	1906	1182	1337	982	450	548	748	200
BOD Unfiltered	mg/l	<2	<2	<2	<2	<2	43	9	<2	4	2	-	<2	<2	93	<2	<2	<2	2	<2	<2	18	<2	<2	4	4	<2	
COD Unfiltered	mg/l	204	366	<15	178	42	73	144	593	<15	129	-	229	897	280	<15	402	327	72	350	660	2242	696	574	912	339	35	
Chloride	mg/l	841	800	672	1792	1214	1790	62	38	925	624	-	493	29	35	29	20	15	6475	7208	7750	15	2011	16	14	17	17	30
Sulphate	mg/l	393	342	313	308	261	268	39	19	302	183	-	128	952	1021	976	91	89	841	1003	992	777	826	770	72	73	101	200
Sulphide	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Free Cyanide	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01
Ammoniacal Nitrogen as N	mg/l	0.2	<0.2	<0.2	36.0	39.4	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	8.9	9.6	8.9	17.4	0.8	2.0	5.3	1.5	6.8	4.9	2.0	3.4	4.0	20.6	0.15
pH	pH Units	7.59	7.71	7.68	7.29	7.86	7.76	7.89	7.92	10.05	7.57	-	7.80	7.07	7.02	7.58	7.14	7.42	7.37	7.95	7.54	7.33	7.58	7.57	7.14	7.61	7.51	>6.5 and <9.5
Organics																												
Total Organic Carbon	mg/l	<2	<2	3	9	10	6	<2	12	6	<2	-	3	7	7	7	7	14	4	<2	3	7	<2	7	10	<2	7	
Total Phenols	mg/l	0.02	<0.01	0.18	<0.01	0.13		0.03	<0.01		0.03	-	<0.01		<0.01	0.09	<0.01	0.03		<0.01	<0.01		0.02	<0.01		0.03	<0.01	500
Hydrocarbons																												
PRO	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	7.902	10.656	2.193	
TPH	mg/l	<0.01	<0.01	<0.01	41.193	6.553	48.32	<0.01	24.03	0.175	<0.01	-	<0.01	0.5782	<0.01	0.261	0.336	<0.01	0.112	<0.01	<0.01	1.015	<0.01	0.268	26.891	15.1488	15.686	0.01
MTBE	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.014	0.017	0.03
Benzene	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.031	<0.01	0.001
Toluene	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01	0.01
Ethylbenzene	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.211	0.013	0.015	0.01
Xylene	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.527	0.035	0.023	0.01
Aliphatics																												
EC C5-C6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.138	1.004	0.034	
EC>C6-C8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.453	1.927	0.454	
EC>C8-C10	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.9488	1.6496	0.3156	
EC>C10-C12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.2728	1.4032	0.3444	
EC>C12-C16	mg/l	<0.01	<0.01	<0.01	0.226	<0.01	<0.01	<0.01	0.111	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.734	0.1031	1.152	
EC>C16-C21	mg/l	<0.01	<0.01	<0.01	1.088	<0.01	<0.01	<0.01	0.761	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.444	0.0667	0.443	
EC>C21-C35	mg/l	<0.01	<0.01	<0.01	15.312	<0.01	<0.01	<0.01	8.376	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total Aliphatics	mg/l	<0.01	<0.01	<0.01	16.626	<0.01	<0.01	<0.01	9.248	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5.9906	6.1536	2.743	
Aromatics																												
EC C6-C7	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.031	<0.01	
EC>C7-C8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01	
EC>C8-C10	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.1612	2.5224	0.5114	
EC>C10-C12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.9092	2.1048	0.5166	
EC>C12-C16	mg/l	<0.01	<0.01	<0.01	18.08	6.553	48.32	<0.01	12.045	0.13	<0.01	-	<0.01	0.4452	<0.01	0.261	0.301	<0.01	0.099	<0.01	<0.01	0.66	<0.01	0.183	14.858	4.337	10.672	
EC>C16-C21	mg/l	<0.01	<0.01	<0.01	6.049	<0.01	<0.01	<0.01	2.434	0.035	<0.01	-	<0.01	0.101	<0.01	<0.01	0.035	<0.01	0.013	<0.01	<0.01	0.269	<0.01	0.061	1.848	<0.01	1.131	
EC>C21-C35	mg/l	<0.01	<0.01	<0.01	0.438	<0.01	<0.01	<0.01	0.303	0.01	<0.01	-	<0.01	0.032	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.086	<0.01	0.024	0.105	<0.01	0.112	
Total Aromatics	mg/l	<0.01	<0.01	<0.01	24.567	6.553	48.32	<0.01	14.782	0.175	<0.01	-	<0.01	0.5782	<0.01	0.261	0.336	<0.01	0.112	<0.01	<0.01	1.015	<0.01	0.268	20.9004	8.9952	12.943	
PAHs																												
Naphthalene	ng/l	<10	<10	<10	117	13	531	<10	70	28	<10	-	<10	20	<10	<10	13	382	31	<10	<10	37	<10	<10	617	<10	<10	1000
Acenaphthylene	ng/l	<10	<10	<10	4631	5201	33067	<10	3775	23	<10	-	<10	11	<10	<10	13	1147	<10	<10	<10	18	<10	<10	2350	<10	18	
Acenaphthene	ng/l	<10	<10	<10	1836	1222	6966	<10	1099	22	<10	-	<10	29	<10	<10	38	1693	11	<10	<10	32	<10	<10	2996	<10	45	
Fluorene	ng/l	<10	<10	<10	2027	31	1611	<10	1552	16	<10	-	<10	40	<10	<10	47	1781	25	<10	<10	79	<10	<10	1730	<10	45	
Phenanthrene	ng/l	<10	<10	<10	3303	67	2803	<10	2106	34	<10	-	<10	159	<10	<10	88	3062	40	<10	<10	187	<10	<10	3956	<10	61	
Anthracene	ng/l	<10	<10	<10	1901	19	2221	<10	1396	13	<10	-	<10	43	<10	<10	29	596	<10	<10	<10	86	<10	<10	480	<10	25	10000000
Fluoranthene	ng/l	<10	<10	<10	2407	<10	578	<10	1135	11	<10	-	<10	83	<10	<10	45	1318	<10	<10	<10	141	<10	<10	1792	<10	37	1000
Pyrene	ng/l	<10	<10	<10	1975	<10	1094	<10	982	11	<10	-	<10	75	<10	<10	41	1075	<10	<10	<10	117	<10	<10	1554	<10	30	
Benzo(a)anthracene	ng/l	<10	<10	<10	1867	<10	<10	<10	647	<10	<10	-	<10	27	<10	<10	13	430	<10	<10	<10	85	<10	<10	635	<10	<10	
Chrysene	ng/l	<10	<10	<10	1908	<10	<10	<10	632	<10	<10	-	<10	26	<10	<10	10	311	<10	<10	<10	83	<10	<10	545	<10	<10	
Benzo(b)+Benzo(k) fluoranthene	ng/l	<10	<10	<10	2070	<10	<10	<10	903	17	<10	-	<10	36	<10	<10	10	321	<10	<10	<10	60	<10	<10	551	<10	<10	50*
Benzo(a)pyrene	ng/l	<10	<10	<10	714	<10	<10	<10	453	<10	<10	-	<10	15	<10	<10	<10	148	<10	<10	<10	53	<10	<10	206	<10	<10	10
Indeno(123cd)pyrene	ng/l	<10	<10	<10	204	<10	<10	<10	252	<10	<10	-	<10	12	<10	<10	<10	69	<10	<10	<10	41	<10	<10	117	<10	<10	50
Dibenzo(ah)anthracene	ng/l	<10	<10	<10	190	<10	<10	<10	86	<10	<10	-	<10	18	<10	<10	<10	30	<10	<10	<10	29	<10	<10	77	<10	<10	
Benzo(ghi)perylene	ng/l	<10	<10	<10	248	<10	<10	<10	217	<10	<10	-	<10	14	<10	<10	<10	82	<10	<10	<10	57	<10	<10	128	<10	<10	50
Total Aqueous 16 EPA PAHs	ng/l	<10	<10	<10	25399	6576	48871	<10	15304	208	<10	-	<10	608	<10	<10	347	12445	149	<10	<10	1105	<10	<10	17734	<10	275	100
PCBs																												
PCB Congener 28	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Congener 52	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Congener 101	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Congener 118	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Congener 153	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Congener 138	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Congener 180	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCB Total of 7 Congeners	ng/l	-	-	-	-	-	-	<10	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000

Notes

* IGV for benzo(k)fluroanthene taken as most conservative

Table 4: GROUND GAS ASSESSMENT	Job name:Connolly Station	Job number:023956	

NOTES:

Assessment based on guidance published in CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings.'

Information from Table 8.5 of CIRIA C665

Characteristic Situation 1 conditions

Gas screening value (CH4 or CO2) < 0.07 l/h

Typically methane < 1 % by volume

Typically carbon dioxide < 5% by volume

Characteristic Situation 2 conditions

Gas screening value (CH4 or CO2) < 0.7 l/h

Borehole air flow rate < 70 l/h

Characteristic Situation 3 conditions

Gas screening value (CH4 or CO2) < 3.5 l/h

Key for shading

Light green	CO_2 > 5% in air
Light orange	CH4 > 1 % in air
Yellow	GSV > or = 0.07 l/h
Red	GSV> or = 0.7 l/h

Approach:

Maximum concentration and flow values are used in the assessment below (minimum values for oxygen).

Where no detectable flow is recorded the instrument limit of detection is used

Where concentrations are recorded below LoD, the instrument LoD is used in the assessment (0.5%)

SITE MONITORING DATA

				Gas measurements					CO_2 analysis		CH_4 analysis		
Investigation & Year of installation	Exploratory Hole	Response zone stratum	Date Monitored/ Sampled	Flow Rate (l/hr)	Atmos Pres (mb)	Min O2 (%) air	Max CO2 (% air)	Max CH4 (% air)	CO2 as fraction	Gas screening value CO_2 (l/hr)	CH_4 as fraction	Gas screening value CH_4 (l/hr)	Characteristic Situation
Glovers 2008	WS6	MG	29-Aug-08	0.2	1017	17.2	2.9	0.1	0.029	0.006	0.001	0.000	1
			04-Sep-08	0.2	990	13.1	5	0.1	0.050	0.010	0.001	0.000	1
			10-Sep-08	0	1000	14.5	3.5	0.1	0.035	0.004	0.001	0.000	1
			17-Sep-08	0	1019	8.5	6.4	0.1	0.064	0.006	0.001	0.000	2
Glovers 2008	WS9	MG	29-Aug-08	0	1016	18.6	1.9	0.1	0.019	0.002	0.001	0.000	1
			04-Sep-08	0.2	991	18.6	1.9	0.1	0.019	0.004	0.001	0.000	1
			10-Sep-08	0.1	999	19.9	0.7	0.1	0.007	0.001	0.001	0.000	1
			17-Sep-08	0.1	1019	20	0.7	0.2	0.007	0.001	0.002	0.000	1
Glovers 2008	WS10	MG	29-Aug-08	0	1017	20.3	0.1	0.1	0.001	0.000	0.001	0.000	1
			04-Sep-08	0.1	992	20.1	0.1	0.1	0.001	0.000	0.001	0.000	1
			10-Sep-08	0	999	20.1	0.1	0.1	0.001	0.000	0.001	0.000	1
			17-Sep-08	0	1019	19.2	0.2	5.6	0.002	0.000	0.056	0.006	2
Glovers 2008	WS12	MG	04-Sep-08	0.1	992	19.6	1.5	0.4	0.015	0.002	0.004	0.000	1
			10-Sep-08	0.1	998	19.1	1.5	0.1	0.015	0.002	0.001	0.000	1
			17-Sep-08	0.1	1019	19.3	1.3	0.1	0.013	0.001	0.001	0.000	1
Glovers 2008	WS3	MG/SLT	29-Aug-08	0.2	1017	9.1	7.7	0.1	0.077	0.015	0.001	0.000	2
			04-Sep-08	0.2	990	7.6	9.4	0.1	0.094	0.019	0.001	0.000	2
			10-Sep-08	0.1	999	7.8	10.6	0.1	0.106	0.011	0.001	0.000	2
			17-Sep-08	0.2	1019	7.5	10.2	0.1	0.102	0.020	0.001	0.000	2
Glovers 2008	WS7	MG/BC	29-Aug-08	0.1	1016	15.7	3	0.1	0.030	0.003	0.001	0.000	1
			04-Sep-08	0	990	16.1	2.6	0.1	0.026	0.003	0.001	0.000	1
			10-Sep-08	0	1001	20.2	0.2	0.1	0.002	0.000	0.001	0.000	1
			17-Sep-08	0	1019	16.2	2.5	0.1	0.025	0.003	0.001	0.000	1
Glovers 2008	WS11	SLT/BC	29-Aug-08	0.2	1017	15	3.8	0.2	0.038	0.008	0.002	0.000	1
			04-Sep-08	0.1	991	0	9.3	100	0.093	0.009	1.000	0.100	2
			10-Sep-08	0.2	1001	10	5.7	1.2	0.057	0.011	0.012	0.002	2
			17-Sep-08	0.1	1019	0.1	8.7	69.7	0.087	0.009	0.697	0.070	2
				(Max)			(Max)	(Max)					
WORSE CASE CALCULATION ALL DATA				**0.2**			**10.60**	**100.00**	**0.106**	**0.021**	**1.000**	**0.200**	**2**

LABORATORY DATA

				FIELD RESULTS					LAB RESULTS			DIFFERENCE (FIELD% - LAB%)		
Investigation & Year of installation	Exploratory Hole	Response zone stratum	Date Monitored & Sampled	Flow Rate (l/hr)	Atmos Pres (mb)	Min O2 (%) air	Max CO2 (% air)	Max CH4 (% air)	O2 (%) air	CO2 (% air)	CH4 (% air)	O2 (%) air	CO2 (% air)	CH4 (% air)
Glovers 2008	WS3		10/09/2008	0.1	999	7.8	10.6	<0.1	9	8	<0.05	-1.2	2.6	0
Glovers 2008	WS10		10/09/2008	0	999	20.1	<0.1	<0.1	21	0.4	0.1	-0.9	-0.3	0
Glovers 2008	WS11		10/09/2008	0.2	1001	10	5.7	1.2	11	4.2	0.1	-1	1.5	1.1
									AVERAGE DIFFERENCE			**-1.03**	**1.27**	**0.37**

Appendix C: Waste Management

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	Sample Location																				Landfill acceptance criteria	
	WS1			WS2			WS3	WS4	WS5	WS6		WS8	WS11	BH3		BH4			BH 5	BH7	Murphy (Inert WAC)	KTK (Non-Haz WAC)
Depth	1.00	3.00	5.00	1.00	3.00	5.00	4.00	2.00	2.00	1.00	4.00	2.00	2.00	1.00	2.0	1.00	5.0-5.3	6.0-6.3	2.00	6.50		
Strata	MG	MG	MG	MG	MG	MG	SS	MG	MG	MG	MG	MG	SS	MG	MG	MG	MG	GC	MG	GC		
Leachate																						
Arsenic (as As)	0.09	0.08	<0.01	0.10	0.12	<0.01	0.02	0.14	<0.01	0.04	0.04	0.14	0.01	2.43	1.51	0.02	0.73	0.29	<0.01	<0.01	0.5	2
Barium (as Ba)	2.49	2.36	2.50	2.05	2.14	2.47	3.22	1.80	2.53	1.81	3.00	2.31	2.71	7.14	8.86	2.33	3.2	3	2.42	3.15	20	100
Boron	-	0.82	1.32	-	0.75	1.32	-	0.21	-	0.45	1.71	-	-	-	0.27	0.67	<2	<2	0.65	-		
Cadmium (as Cd)	<0.004	<0.004	0.012	<0.004	<0.004	0.007	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.022	<0.022	<0.004	<0.004	0.04	1
Total Chromium (as Cr)	0.02	0.03	0.03	0.02	0.04	0.02	0.02	0.08	0.04	<0.01	<0.01	0.02	<0.01	3.74	2.15	0.04	<0.1	<0.1	<0.01	<0.01	0.5	10
Copper (as Cu)	0.36	0.53	0.32	0.22	0.28	0.28	0.57	0.34	0.41	1.12	0.50	0.50	0.38	2.37	0.40	0.26	0.27	0.57	0.38	0.34	2	50
Mercury (as Hg)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.002	<0.0005	<0.0005	0.01	0.2
Molybdenum (as Mo)	0.12	0.23	0.37	0.33	0.18	0.29	0.39	0.03	0.32	0.06	0.64	0.26	0.48	0.06	0.04	0.13	4.5	2.4	0.17	0.11	0.5	10
Nickel (as Ni)	<0.01	<0.01	0.08	<0.01	<0.01	0.03	0.04	0.17	0.12	0.08	0.11	<0.01	0.13	3.75	3.39	<0.01	0.39	0.87	0.06	0.14	0.4	10
Lead (as Pb)	<0.01	<0.01	0.07	<0.01	<0.01	0.01	<0.01	0.04	0.03	0.06	0.06	<0.01	0.03	0.05	0.03	<0.01	0.17	0.04	0.01	0.01	0.5	10
Antimony (as Cb)	0.07	0.05	0.03	0.04	0.04	0.04	0.06	0.07	0.02	0.04	0.11	0.09	0.13	0.07	0.04	0.03	1.3	<0.075	0.01	0.04	0.06	
Selenium (as Se)	0.04	0.02	<0.01	0.04	0.02	0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.67	0.53	0.02	0.5	0.5	<0.01	0.19	0.1	0.5
Zinc (as Zn)	0.15	0.17	1.33	0.04	0.11	0.96	0.85	0.17	0.44	0.28	0.39	0.09	0.73	0.83	0.49	0.07	<0.5	<0.5	0.48	0.19	4	50
Chloride	37	24	-	23	22	-	44	12	20	14	22	33	35	83	20	32	-	-	37	823	800	15000
Fluoride	20	7	-	12	9	-	7	6	2	8	3	9	3	5	2	5	-	-	3	4	10	150
Sulphate	54	108	-	50	110	-	2302	42	4278	53	409	184	721	130	241	425	-	-	4668	335	1000	20000
Phenol index	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	See Attached	See Attached	<0.1	-	-	<0.1	<0.1	1	
Dissolved Organic Carbon (DOC)	31	<20	-	20	21	-	30	<20	<20	<20	74	35	80	<20	27	<20	-	-	<20	<20	500	800
Total Dissolved Solids (TDS)	1040	1140	-	980	980	-	4580	940	6460	1060	1200	1400	3060	1220	1260	1260	-	-	5900	2040	4000	60000
Solid																						
Total Organic Carbon (TOC)	7.6	8.3	-	5.4	11.2	-	1.7	3.6	5.3	7.5	1.6	8.3	2.2	1.1	1.5	7.6	-	-	3.1	0.5	30,000	
BTEX	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.33	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	6	
PCB (7 congeners)	<0.001	-	-	<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-	<0.001	1	
Mineral Oil (C10-C40)	<1	-	-	<1	-	-	<1	-	<1	-	<1	<1	217	-	<1	-	-	-	-	<1	500	
Total 17 PAH	77.419	-	6.812	40.825	-	3.513	22.576	-	4.368	-	2.508	3.629	17.294	0.315	-	-	-	-	-	<0.001	100	
Total PAH Dutch 10	60	-	-	38.7	-	-	17.5	-	4.6	-	2	2.9	13	0.25	-	-	-	-	-	-		40
DRO	271			60			111		<1		49	108	1086	<1						<1		1000

all results in mg/kg

MG - Made Ground
SS -Sandy Silt (with sea shells)
GR - Gravel
BC - Gravelley Clay

Sarah Bear
Buro Happold Limited
Camden Mill
Lower Bristol Road
Bath
BA2 3DQ
UK

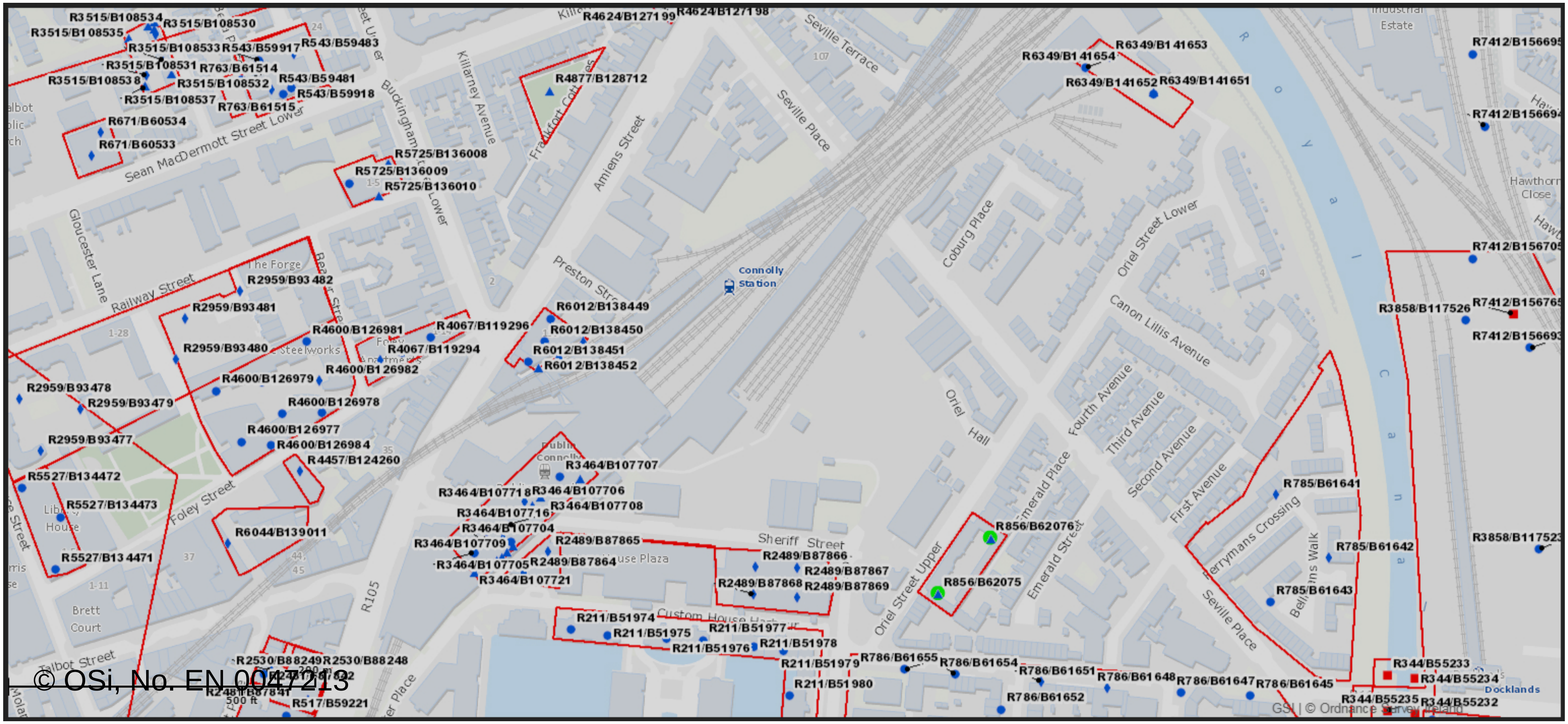
Telephone: +44 (0)1225 320600
Facsimile: +44 (0)870 787 4148

Email: sarah.bear@burohappold.com

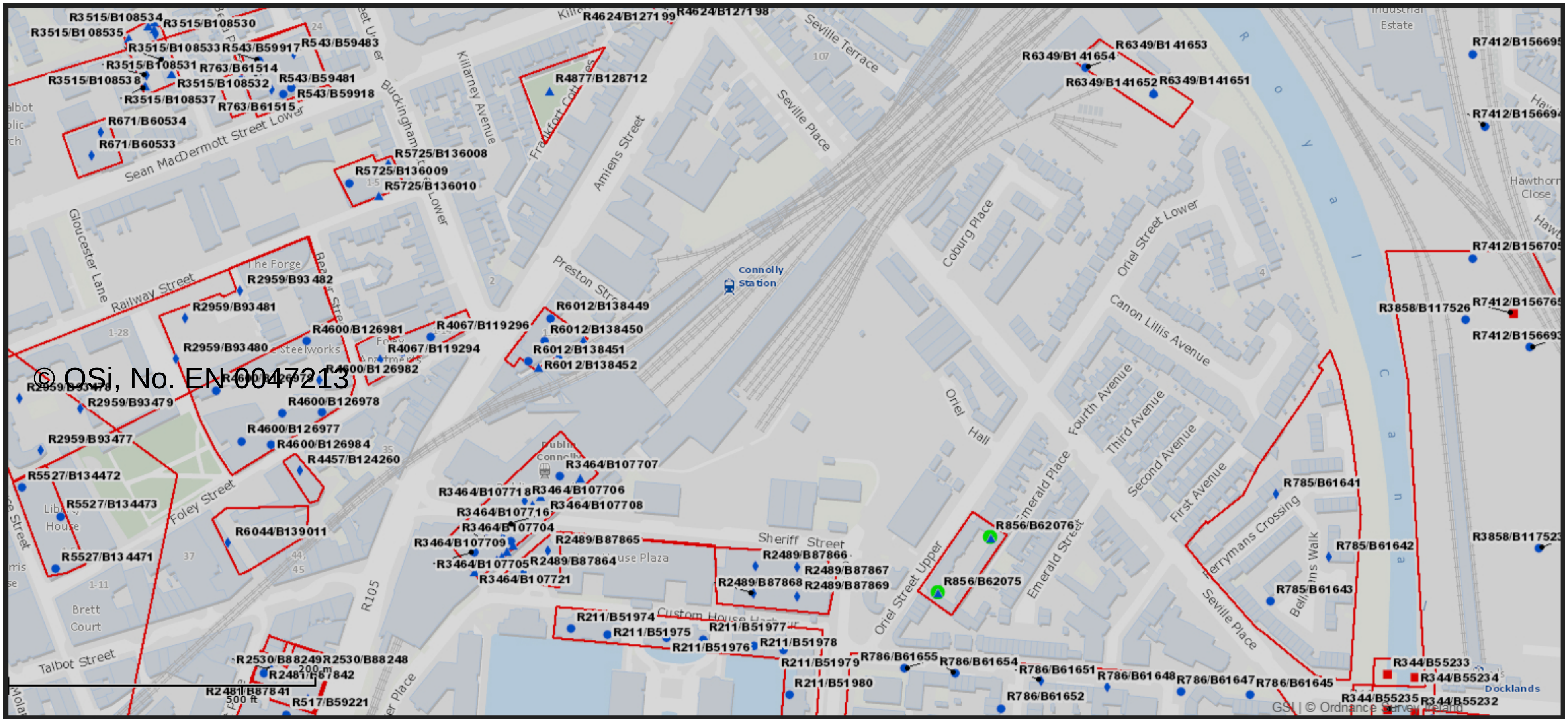
O'CONNOR | SUTTON | CRONIN

Multidisciplinary Consulting Engineers

Appendix B
Nearby Site Investigations Log



Overview Map for GSI Report 856: Apartments
Oriel Street Lower, Dublin 1.
Points Observed: 2



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R2481/B87842
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R517/B59221
Connolly Station
Sean MacDermott Street Lower
Railway Street
Gloucester Lane
Foley Street
Talbot Street
Buckingham Street Lower
Killarney Avenue
Amiens Street
Preston Street
Seville Terrace
Seville Place
Coburg Place
Oriel Street Lower
Oriel Street Upper
Oriel Hall
Canon Lillis Avenue
Fourth Avenue
Third Avenue
Second Avenue
First Avenue
Emerald Place
Emerald Street
Ferrymans Crossing
Sheriff Street
Custom House Plaza
Royal Canal
Hawthorn Close
Brett Court
The Forge
Docklands
R105
200 m
500 ft
© OSi, No. EN 0047213
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GSI REPORT 856

Apartments

Oriel Street Lower, Dublin 1.

Borehole List:

Borehole	Name	Depth	DTB	ODMALIN	Easting	Northing	Description
62075	1	4.5		1.9	316944	234856	Cable Percussion (Shell and Auger)
62076	2	5		1.9	316978	234892	Cable Percussion (Shell and Auger)

GSI REPORT 856

Apartments

LAYERS FOR BOREHOLE 62075 (Company Name: 1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
6207501	0	1				Fill - Made Ground	Fill - Made Ground
6207502	1	2	Soft	Black	Very Silty	Clay	Clay
6207503	2	4.5			Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 856

Apartments

LAYERS FOR BOREHOLE 62076 (Company Name: 2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
6207601	0	1				Fill - Made Ground	Fill - Made Ground
6207602	1	2.2	Soft	Black	Very Silty	Clay	Clay
6207603	2.2	5			Fine to Coarse	Gravel	Gravel

GSI REPORT 856

Apartments

TESTS FOR LAYER 6207501 IN BOREHOLE 62075 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
6	.5	LABSOIL	Sulphate Content - SO(3) %	0.07	%Soil
7	.5	LABSOIL	pH value	7.6	
7	.5	LABSOIL	pH value	7.6	

GSI REPORT 856

Apartments

TESTS FOR LAYER 6207502 IN BOREHOLE 62075 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1	FIELD	Standard Penetration Test	3	NBLOW
9		LABSOIL	pH value	7.5	
9		LABSOIL	pH value	7.5	

GSI REPORT 856

Apartments

TESTS FOR LAYER 6207503 IN BOREHOLE 62075 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	2	FIELD	Standard Penetration Test	34	NBLOW
3	3	FIELD	Standard Penetration Test	30	NBLOW
4	4	FIELD	Standard Penetration Test	33	NBLOW
5	4.5	FIELD	Standard Penetration Test	31	NBLOW
8		LABWATER	Sulphate content	12.2	ppw

GSI REPORT 856

Apartments

TESTS FOR LAYER 6207602 IN BOREHOLE 62076 (Company Name: 2)

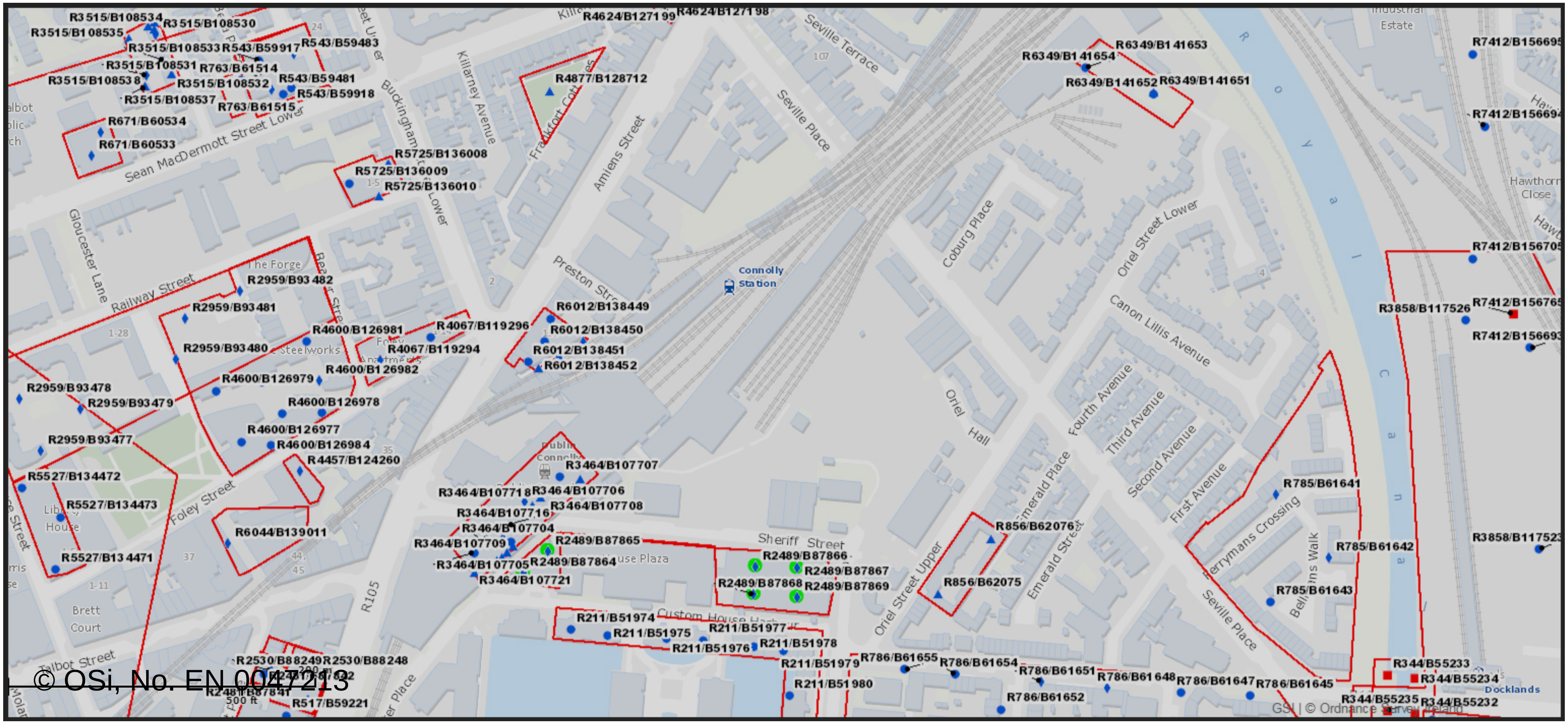
TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1	FIELD	Standard Penetration Test	5	NBLOW

GSI REPORT 856

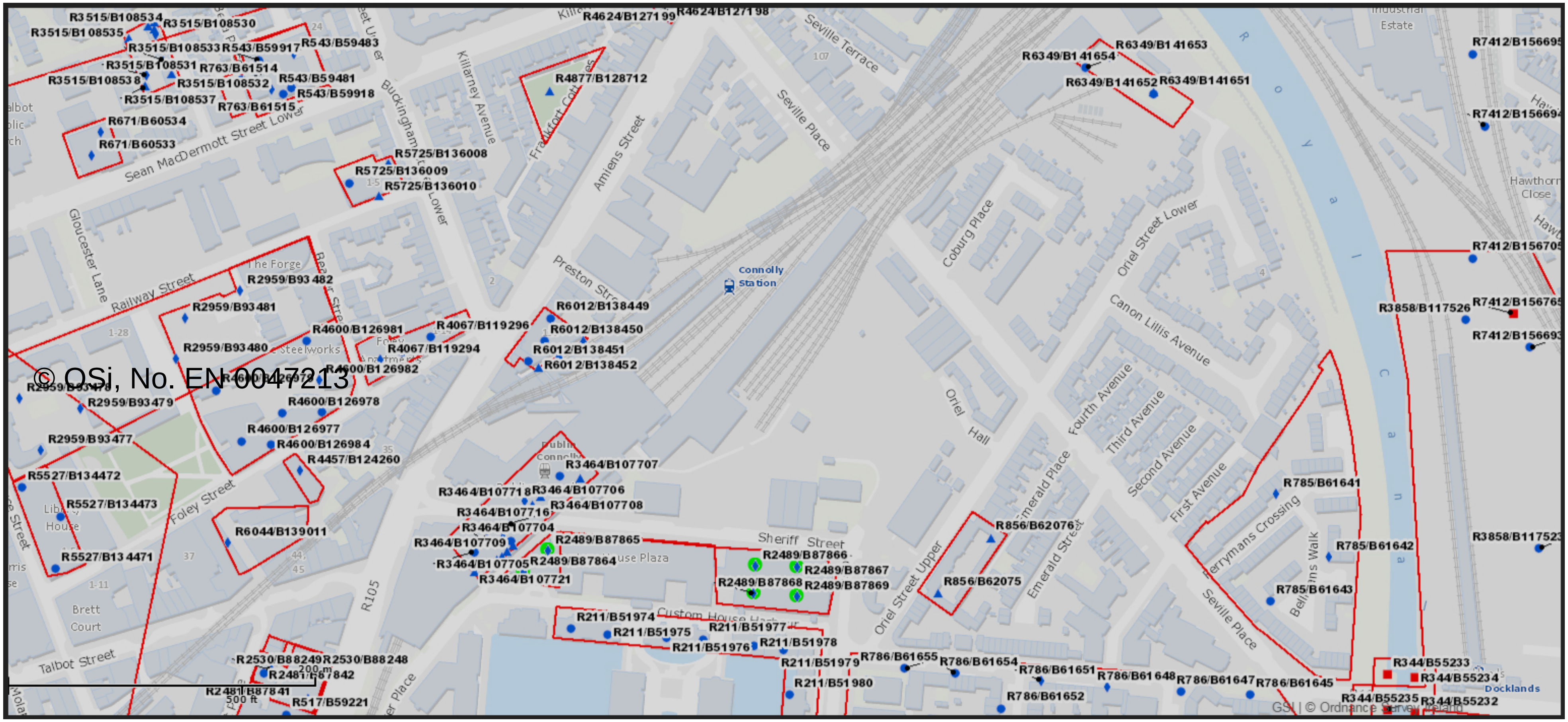
Apartments

TESTS FOR LAYER 6207603 IN BOREHOLE 62076 (Company Name: 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
3	3	FIELD	Standard Penetration Test	25	NBLOW
4	4	FIELD	Standard Penetration Test	37	NBLOW
5	5	FIELD	Standard Penetration Test	36	NBLOW



Overview Map for GSI Report 2489: New Hotel Development
Custom House Plaza, Sherriff Street, Dublin 1
Points Observed: 6



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R344/B55232
R2530/B88249
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R517/B59221
Sean MacDermott Street Lower
Gloucester Lane
Railway Street
Foley Street
Talbot Street
Buckingham Street Lower
Killarney Avenue
Frankfort Cottages
Amiens Street
Preston Street
Seville Terrace
Seville Place
Coburg Place
Oriel Street Lower
Canon Lillis Avenue
Oriel Hall
Fourth Avenue
Third Avenue
Second Avenue
First Avenue
Emerald Place
Emerald Street
Oriel Street Upper
Ferrymans Crossing
Sheriff Street
Custom House Harbour
Royal Canal
Connolly Station
The Forge
Steelworks
Brett Court
Hawthorn Close
Docklands
R105
200 m
500 ft
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GSI REPORT 2489

New Hotel Development

Custom House Plaza, Sherriff Street, Dublin 1

Borehole List:

Borehole	Name	Depth	DTB	ODMALIN	Easting	Northing	Description
87864	Borehole No. 1	9.5		3.29	316674	234870	Cable Percussion (Shell and Auger)
87865	Borehole No. 2	10		3.29	316690	234884	Cable Percussion (Shell and Auger)
87866	Borehole No. 3	9.4		3.29	316825	234874	Cable Percussion (Shell and Auger)
87867	Borehole No. 4	10		3.29	316852	234873	Cable Percussion (Shell and Auger)
87868	Borehole No. 5	8.5		3.29	316824	234856	Cable Percussion (Shell and Auger)
87869	Borehole No. 6	8		3.29	316852	234854	Cable Percussion (Shell and Auger)

GSI REPORT 2489

New Hotel Development

LAYERS FOR BOREHOLE 87864 (Company Name: Borehole No. 1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
8786401	0	.3				Fill - Made Ground	Fill - Made Ground
8786402	.3	2.2		Red Brown	Sandy Clayey	Gravel And Cobbles	Gravel And Cobbles
8786403	2.2	3.3		Grey	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786404	3.3	6.6		Grey	Fine to Coarse Sandy	Gravel	Gravel
8786405	6.6	9.5	Very Stiff to Hard	Grey Black	Very Gravelly Silty	Clay, Cobbles And Boulders	Clay, Cobbles And Boulders

GSI REPORT 2489

New Hotel Development

LAYERS FOR BOREHOLE 87865 (Company Name: Borehole No. 2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
8786501	0	.3				Fill - Made Ground	Fill - Made Ground
8786502	.3	1.8		Red Brown	Sandy Clayey	Fill - Made Ground	Fill - Made Ground
8786503	1.8	2.4	Soft	Grey Black	Silty Gravelly	Clay	Clay
8786504	2.4	4		Grey	Fine to Coarse Sandy	Clay	Clay
8786505	4	7.7		Brown	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786506	7.7	10	Very Stiff to Hard	Grey Black	Very Gravelly Silty	Clay, Cobbles And Boulders	Clay, Cobbles And Boulders

GSI REPORT 2489

New Hotel Development

LAYERS FOR BOREHOLE 87866 (Company Name: Borehole No. 3)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
8786601	0	.3				Fill - Made Ground	Fill - Made Ground
8786602	.3	2.4		Red Brown	Fine to Coarse Sandy	Fill - Made Ground	Fill - Made Ground
8786603	2.4	2.9	Soft	Grey Black	Silty Gravelly	Clay	Clay
8786604	2.9	4.4		Grey	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786605	4.4	6.2		Brown	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786606	6.2	7.7		Grey Black	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786607	7.7	9.4	Very Stiff to Hard	Grey Black	Very Gravelly Silty	Clay, Cobbles And Boulders	Clay, Cobbles And Boulders

GSI REPORT 2489

New Hotel Development

LAYERS FOR BOREHOLE 87867 (Company Name: Borehole No. 4)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
8786701	0	.3				Fill - Made Ground	Fill - Made Ground
8786702	.3	2.4		Black Brown	Fine to Coarse Sandy	Fill - Made Ground	Fill - Made Ground
8786703	2.4	3.1	Soft	Grey Brown	Silty Gravelly	Clay	Clay
8786704	3.1	4.6		Grey	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786705	4.6	8.2	Very Stiff to Hard	Grey Black	Very Gravelly Silty	Clay, Cobbles And Boulders	Clay, Cobbles And Boulders
8786706	8.2	10		Grey	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders

GSI REPORT 2489

New Hotel Development

LAYERS FOR BOREHOLE 87868 (Company Name: Borehole No. 5)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
8786801	0	.3				Fill - Made Ground	Fill - Made Ground
8786802	.3	2.2		Black Brown	Fine to Coarse Sandy	Fill - Made Ground	Fill - Made Ground
8786803	2.2	2.4	Soft	Grey Brown	Silty	Clay	Clay
8786804	2.4	4.7		Grey	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786805	4.7	8.5	Very Stiff to Hard	Grey Black	Very Gravelly Silty	Clay, Cobbles And Boulders	Clay, Cobbles And Boulders

GSI REPORT 2489

New Hotel Development

LAYERS FOR BOREHOLE 87869 (Company Name: Borehole No. 6)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
8786901	0	.4				Fill - Made Ground	Fill - Made Ground
8786902	.4	2.4		Black	Fine to Coarse Sandy	Fill - Made Ground	Fill - Made Ground
8786903	2.4	5.1		Grey	Fine to Coarse Sandy	Gravel, Cobbles And Boulders	Gravel, Cobbles And Boulders
8786904	5.1	8	Very Stiff to Hard	Grey Black	Very Gravelly Silty	Clay, Cobbles And Boulders	Clay, Cobbles And Boulders

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786402 IN BOREHOLE 87864 (Company Name: Borehole No. 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	28	NBLOW
7	1.5	LABSOIL	Sulphate Content - SO(3) %	0.12	%Soil
8	1.5	LABSOIL	pH value	8	
8	1.5	LABSOIL	pH value	8	
9	7	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	31.2	%pass
10	7	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	20.2	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786403 IN BOREHOLE 87864 (Company Name: Borehole No. 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	34	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786404 IN BOREHOLE 87864 (Company Name: Borehole No. 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
3	4.5	FIELD	Standard Penetration Test	34	NBLOW
4	6	FIELD	Standard Penetration Test	35	NBLOW
13	4	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	15	%pass
14	4	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	4.4	%pass
15	4	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	2.6	%pass
16	4	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.5	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786405 IN BOREHOLE 87864 (Company Name: Borehole No. 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
5	7.5	FIELD	Standard Penetration Test	43	NBLOW
6	9	FIELD	Standard Penetration Test	55	NBLOW
11	7	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	14	%pass
12	7	LABSOIL	Particle Size Distribution - Silt (0.06mm)	12.2	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786502 IN BOREHOLE 87865 (Company Name: Borehole No. 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	25	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786503 IN BOREHOLE 87865 (Company Name: Borehole No. 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
8	2	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	25.7	%pass
9	2	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	5.1	%pass
10	2	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	2.3	%pass
11	2	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.1	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786504 IN BOREHOLE 87865 (Company Name: Borehole No. 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	39	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786505 IN BOREHOLE 87865 (Company Name: Borehole No. 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
3	4.5	FIELD	Standard Penetration Test	39	NBLOW
4	6	FIELD	Standard Penetration Test	29	NBLOW
5	7.5	FIELD	Standard Penetration Test	52	NBLOW
12	7	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	26.4	%pass
13	7	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	12.6	%pass
14	7	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	5	%pass
15	7	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.5	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786506 IN BOREHOLE 87865 (Company Name: Borehole No. 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
6	9	FIELD	Standard Penetration Test	54	NBLOW
7	10	FIELD	Standard Penetration Test	0	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786602 IN BOREHOLE 87866 (Company Name: Borehole No. 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	27	NBLOW
8	2	LABSOIL	Sulphate Content - SO(3) %	0.08	%Soil
9	2	LABSOIL	pH value	8	
9	2	LABSOIL	pH value	8	

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786604 IN BOREHOLE 87866 (Company Name: Borehole No. 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	35	NBLOW
10	3.3	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	37.4	%pass
11	3.3	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	10.2	%pass
12	3.3	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	5.5	%pass
13	3.3	LABSOIL	Particle Size Distribution - Silt (0.06mm)	3.2	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786605 IN BOREHOLE 87866 (Company Name: Borehole No. 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
3	4.5	FIELD	Standard Penetration Test	39	NBLOW
4	6	FIELD	Standard Penetration Test	34	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786606 IN BOREHOLE 87866 (Company Name: Borehole No. 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
5	7.5	FIELD	Standard Penetration Test	41	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786607 IN BOREHOLE 87866 (Company Name: Borehole No. 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
6	9	FIELD	Standard Penetration Test	25	NBLOW
7	9.4	FIELD	Standard Penetration Test	0	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786702 IN BOREHOLE 87867 (Company Name: Borehole No. 4)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	11	NBLOW
7	1.5	LABSOIL	Sulphate Content - SO(3) %	0.14	%Soil
8	1.5	LABSOIL	pH value	8	
8	1.5	LABSOIL	pH value	8	

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786703 IN BOREHOLE 87867 (Company Name: Borehole No. 4)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	31	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786704 IN BOREHOLE 87867 (Company Name: Borehole No. 4)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
3	4.5	FIELD	Standard Penetration Test	30	NBLOW
9	4	LABWATER	Sulphate content	30	ppw
10	4	LABWATER	pH value	7.5	
10	4	LABWATER	pH value	7.5	

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786705 IN BOREHOLE 87867 (Company Name: Borehole No. 4)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
4	6	FIELD	Standard Penetration Test	48	NBLOW
5	7.5	FIELD	Standard Penetration Test	13	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786706 IN BOREHOLE 87867 (Company Name: Borehole No. 4)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
6	10	FIELD	Standard Penetration Test	0	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786802 IN BOREHOLE 87868 (Company Name: Borehole No. 5)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	17	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786804 IN BOREHOLE 87868 (Company Name: Borehole No. 5)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	16	NBLOW
3	4.5	FIELD	Standard Penetration Test	26	NBLOW
7	3	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	11.7	%pass
8	3	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	4.8	%pass
9	3	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	2.6	%pass
10	3	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2	%pass

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786805 IN BOREHOLE 87868 (Company Name: Borehole No. 5)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
4	6	FIELD	Standard Penetration Test	46	NBLOW
5	7.5	FIELD	Standard Penetration Test	47	NBLOW
6	8.5	FIELD	Standard Penetration Test	0	NBLOW
11	6	LABSOIL	Liquid Limit	25	%
12	6	LABSOIL	Plastic Limit	14	%
13	6	LABSOIL	Plasticity Index	11	%
14	6	LABSOIL	Moisture Content	9.17	%

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786902 IN BOREHOLE 87869 (Company Name: Borehole No. 6)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	16	NBLOW

GSI REPORT 2489

New Hotel Development

TESTS FOR LAYER 8786903 IN BOREHOLE 87869 (Company Name: Borehole No. 6)

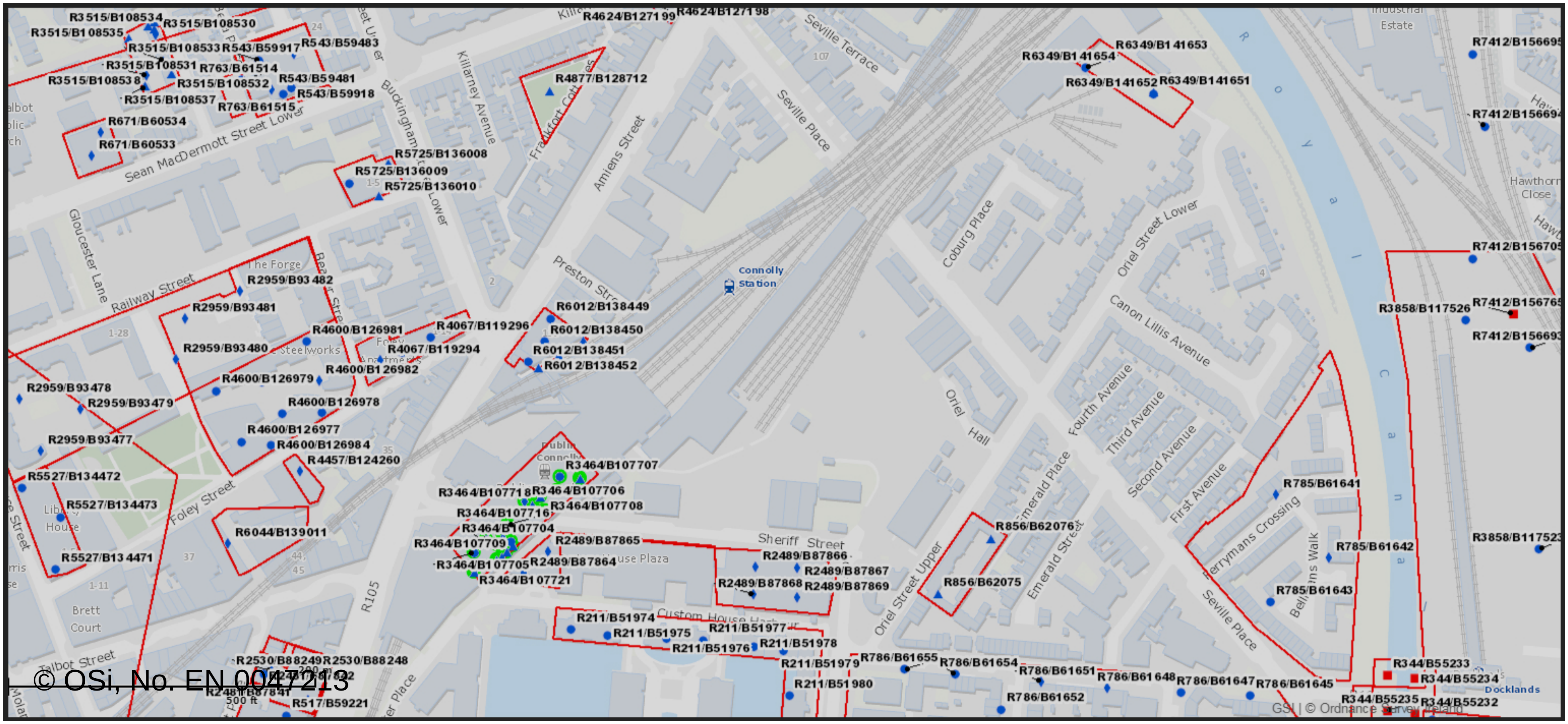
TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	26	NBLOW
3	4.5	FIELD	Standard Penetration Test	37	NBLOW

GSI REPORT 2489

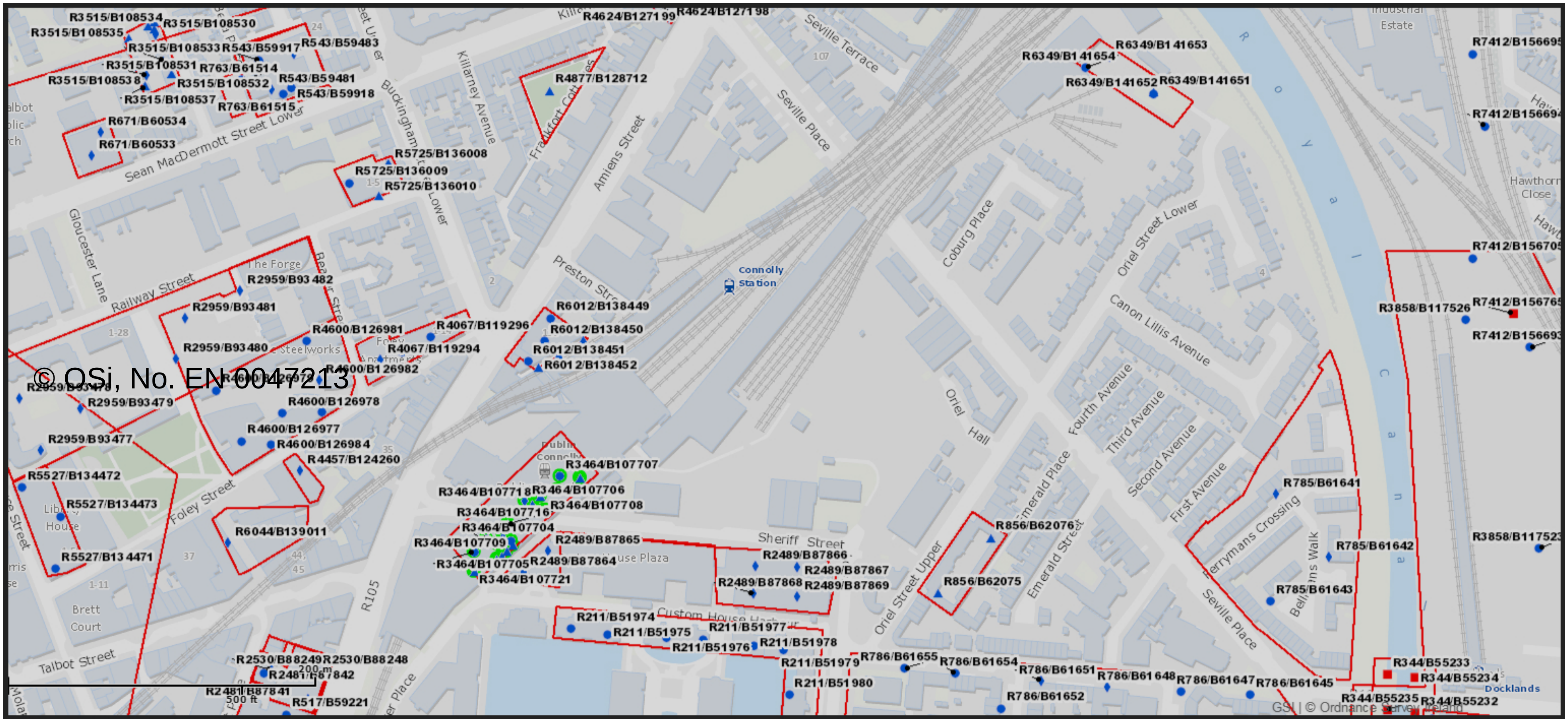
New Hotel Development

TESTS FOR LAYER 8786904 IN BOREHOLE 87869 (Company Name: Borehole No. 6)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
4	6	FIELD	Standard Penetration Test	42	NBLOW
5	7.5	FIELD	Standard Penetration Test	18	NBLOW



Overview Map for GSI Report 3464: Commercial Development
Connolly Station, Amiens Street, Dublin 1
Points Observed: 18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R3515/B108534
R3515/B108530
R3515/B108535
R3515/B108533
R543/B59917
R543/B59483
R3515/B108531
R763/B61514
R3515/B108538
R3515/B108532
R543/B59481
R543/B59918
R3515/B108537
R763/B61515
R671/B60534
R671/B60533
Sean MacDermott Street Lower
R5725/B136008
R5725/B136009
R5725/B136010
R4624/B127199
R4624/B127198
R4877/B128712
Seville Terrace
Seville Place
Amiens Street
Killarney Avenue
Buckingham Street Lower
Frankfort Cottages
R6349/B141654
R6349/B141653
R6349/B141652
R6349/B141651
R7412/B156695
R7412/B156694
Royal Canal
Industrial Estate
Hawthorn Close
Gloucester Lane
Railway Street
The Forge
R2959/B93482
R2959/B93481
R2959/B93480
R2959/B93478
R2959/B93479
R2959/B93477
R4600/B126981
R4067/B119296
R4067/B119294
R4600/B126982
R4600/B126978
R4600/B126977
R4600/B126984
R4457/B124260
Preston Street
R6012/B138449
R6012/B138450
R6012/B138451
R6012/B138452
Connolly Station
Coburg Place
Oriel Street Lower
Canon Lillis Avenue
Oriel Hall
Fourth Avenue
Third Avenue
Second Avenue
First Avenue
R7412/B156705
R3858/B117526
R7412/B156765
R7412/B156693
R5527/B134472
R5527/B134473
R5527/B134471
Foley Street
R6044/B139011
R3464/B107707
R3464/B107718
R3464/B107706
R3464/B107708
R3464/B107716
R3464/B107704
R3464/B107709
R3464/B107705
R3464/B107721
R2489/B87865
R2489/B87864
R2489/B87866
R2489/B87867
R2489/B87868
R2489/B87869
Sheriff Street
R105
Brett Court
Talbot Street
R785/B61641
R785/B61642
R785/B61643
R856/B62076
R856/B62075
Emerald Place
Emerald Street
Oriel Street Upper
Ferrymans Crossing
Seville Place
R3858/B117523
R211/B51974
R211/B51975
R211/B51976
R211/B51977
R211/B51978
R211/B51979
R211/B51980
Custom House Harbour
R786/B61655
R786/B61654
R786/B61651
R786/B61648
R786/B61647
R786/B61645
R786/B61652
R344/B55233
R344/B55234
R344/B55235
R344/B55232
Docklands
R2530/B88249
R2530/B88248
R2481/B87842
R2481/B87841
R517/B59221
200 m
500 ft
GSI | © Ordnance Survey Ireland

GSI REPORT 3464

Commercial Development

Connolly Station, Amiens Street, Dublin 1

Borehole List:

Borehole	Name	Depth	DTB	ODMALIN	Easting	Northing	Description
107704	1	11.3		1.54	316650	234891	Cable Percussion (Shell and Auger)
107705	2	12.5		1.52	316642	234883	Cable Percussion (Shell and Auger)
107706	3	10		1.64	316675	234916	Cable Percussion (Shell and Auger)
107707	4	12.5		1.9	316698	234932	Cable Percussion (Shell and Auger)
107708	5	12.4		1.51	316688	234910	Cable Percussion (Shell and Auger)
107709	6	12.5		1.55	316666	234890	Cable Percussion (Shell and Auger)
107710	RC1	2.7		1.55	316667	234887	Rotary Core Drilling
107711	RC2	2.7		1.55	316663	234883	Rotary Core Drilling
107712	RC3	3.1		1.57	316660	234880	Rotary Core Drilling
107713	RC4	5		1.57	316657	234878	Rotary Core Drilling
107714	TP1	1		1.55	316661	234893	Trial (or Observation) Pit
107715	TP2	1.4		1.55	316657	234888	Trial (or Observation) Pit
107716	TP5	1		1.55	316664	234901	Trial (or Observation) Pit
107717	TP7	1		1.7	316685	234919	Trial (or Observation) Pit
107718	TP8	1.7		1.7	316680	234914	Trial (or Observation) Pit
107719	TP9	1.7		1.8	316696	234923	Trial (or Observation) Pit
107720	TP10	1.2		1.7	316711	234931	Trial (or Observation) Pit
107721	TP11	1.6		1.39	316642	234870	Trial (or Observation) Pit

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107704 (Company Name: 1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10770401	0	1.6				Fill - Made Ground	Fill - Made Ground
10770402	1.6	3	Compact		Fine to Coarse	Gravel	Gravel
10770403	3	6	Compact	Brown	Sandy	Sand And Gravel	Sand And Gravel
10770404	6	7.1	Compact	Brown	Medium to Coarse	Sand	Sand
10770405	7.1	9	Compact		Fine to Coarse	Sand	Sand
10770406	9	11.3	Compact		Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107705 (Company Name: 2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10770501	0	1.6				Fill - Made Ground	Fill - Made Ground
10770502	1.6	2.9	Compact		Fine to Coarse	Gravel	Gravel
10770503	2.9	6.1	Compact	Brown Grey	Fine to Coarse Sandy	Gravel	Gravel
10770504	6.1	9.8	Compact	Brown Grey	Gravelly	Sand	Sand
10770505	9.8	12.5	Compact		Coarse Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107706 (Company Name: 3)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10770601	0	1.6				Fill - Made Ground	Fill - Made Ground
10770602	1.6	3.5	Compact		Fine to Coarse Sandy	Gravel	Gravel
10770603	3.5	6.6	Compact		Fine to Coarse Sandy	Gravel	Gravel
10770604	6.6	6.8		Grey	Silty	Sand	Sand
10770605	6.8	10	Compact		Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107707 (Company Name: 4)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10770701	0	1.6				Fill - Made Ground	Fill - Made Ground
10770702	1.6	12.5	Compact		Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107708 (Company Name: 5)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10770801	0	1.75				Fill - Made Ground	Fill - Made Ground
10770802	1.75	6.3	Compact		Fine to Coarse Sandy	Gravel	Gravel
10770803	6.3	7.8	Compact		Medium Gravelly	Sand	Sand
10770804	7.8	12.4	Compact		Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107709 (Company Name: 6)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10770901	0	1.7				Fill - Made Ground	Fill - Made Ground
10770902	1.7	12.5	Compact		Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107710 (Company Name: RC1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771001	0	.9				Fill - Made Ground	Fill - Made Ground
10771002	.9	1			Fine to Medium	Gravel	Gravel
10771003	1	2.2				Fill - Made Ground	Fill - Made Ground
10771004	2.2	2.7				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107711 (Company Name: RC2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771101	0	.09				Fill - Made Ground	Fill - Made Ground
10771102	.09	1.1			Sandy	Gravel	Gravel
10771103	1.1	1.3				Fill - Made Ground	Fill - Made Ground
10771104	1.3	2.7				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107712 (Company Name: RC3)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771201	0	.1				Fill - Made Ground	Fill - Made Ground
10771202	.1	1.22			Sandy	Gravel	Gravel
10771203	1.22	1.66				Fill - Made Ground	Fill - Made Ground
10771204	1.66	2.4				Fill - Made Ground	Fill - Made Ground
10771205	2.4	3.1				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107713 (Company Name: RC4)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771301	0	.09				Fill - Made Ground	Fill - Made Ground
10771302	.09	3			Sandy	Gravel	Gravel
10771303	3	5				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107714 (Company Name: TP1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771401	0	1				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107715 (Company Name: TP2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
1077150 1	0	1.4				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107716 (Company Name: TP5)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771601	0	1				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107717 (Company Name: TP7)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771701	0	.09				Fill - Made Ground	Fill - Made Ground
10771702	.09	1				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107718 (Company Name: TP8)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771801	0	.11				Fill - Made Ground	Fill - Made Ground
10771802	.11	1.5				Fill - Made Ground	Fill - Made Ground
10771803	1.5	1.7				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107719 (Company Name: TP9)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10771901	0	.2				Fill - Made Ground	Fill - Made Ground
10771902	.2	1.6				Fill - Made Ground	Fill - Made Ground
10771903	1.6	1.7			Sandy	Gravel	Gravel

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107720 (Company Name: TP10)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10772001	0	.14				Fill - Made Ground	Fill - Made Ground
10772002	.14	1.2				Fill - Made Ground	Fill - Made Ground

GSI REPORT 3464

Commercial Development

LAYERS FOR BOREHOLE 107721 (Company Name: TP11)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
10772101	0	.09				Fill - Made Ground	Fill - Made Ground
10772102	.09	1.4				Fill - Made Ground	Fill - Made Ground
10772103	1.4	1.6				Gravel	Gravel

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770401 IN BOREHOLE 107704 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.5	FIELD	Standard Penetration Test	38	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770403 IN BOREHOLE 107704 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	34	NBLOW
3	4.5	FIELD	Standard Penetration Test	34	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770404 IN BOREHOLE 107704 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
4	6	FIELD	Standard Penetration Test	30	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770405 IN BOREHOLE 107704 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
6	8	FIELD	Standard Penetration Test	28	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770406 IN BOREHOLE 107704 (Company Name: 1)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
7	9.5	FIELD	Standard Penetration Test	67	NBLOW
8	11	FIELD	Standard Penetration Test	43	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770502 IN BOREHOLE 107705 (Company Name: 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
10	2.8	LABSOIL	Particle Size Distribution - Silt (0.06mm)	4.1	%pass
11	2.8	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	7.1	%pass
12	2.8	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	15.6	%pass
13	2.8	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	26.1	%pass

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770503 IN BOREHOLE 107705 (Company Name: 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	35	NBLOW
3	4.5	FIELD	Standard Penetration Test	41	NBLOW
14	6.1	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.5	%pass
15	6.1	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	3.6	%pass
16	6.1	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	12.6	%pass
17	6.1	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	26.4	%pass

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770504 IN BOREHOLE 107705 (Company Name: 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
5	7	FIELD	Standard Penetration Test	21	NBLOW
6	8	FIELD	Standard Penetration Test	19	NBLOW
7	9	FIELD	Standard Penetration Test	34	NBLOW
18	9.8	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.7	%pass
19	9.8	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	4.2	%pass
20	9.8	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	11.5	%pass
21	9.8	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	23.8	%pass

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770505 IN BOREHOLE 107705 (Company Name: 2)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
8	10.5	FIELD	Standard Penetration Test	57	NBLOW
9	12	FIELD	Standard Penetration Test	67	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770602 IN BOREHOLE 107706 (Company Name: 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
1	1.6	FIELD	Standard Penetration Test	50	NBLOW
2	3	FIELD	Standard Penetration Test	37	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770603 IN BOREHOLE 107706 (Company Name: 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
3	4.5	FIELD	Standard Penetration Test	29	NBLOW
4	6	FIELD	Standard Penetration Test	21	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770605 IN BOREHOLE 107706 (Company Name: 3)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
5	7.5	FIELD	Standard Penetration Test	32	NBLOW
6	9	FIELD	Standard Penetration Test	37	NBLOW
7	10	FIELD	Standard Penetration Test	45	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770702 IN BOREHOLE 107707 (Company Name: 4)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	34	NBLOW
3	4.5	FIELD	Standard Penetration Test	21	NBLOW
4	6	FIELD	Standard Penetration Test	27	NBLOW
5	7.5	FIELD	Standard Penetration Test	38	NBLOW
6	9	FIELD	Standard Penetration Test	56	NBLOW
7	10.5	FIELD	Standard Penetration Test	71	NBLOW
8	1.8	LABSOIL	Particle Size Distribution - Silt (0.06mm)	3.2	%pass
9	1.8	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	5.00	%pass
10	1.8	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	10.2	%pass
11	1.8	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	37.4	%pass
12	5	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.0	%pass
13	5	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	2.2	%pass
14	5	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	4.8	%pass
15	5	LABSOIL	Particle Size Distribution - Coarse Sand (2.00mm)	11.7	%pass
16	9	LABSOIL	Particle Size Distribution - Silt (0.06mm)	2.5	%pass
17	9	LABSOIL	Particle Size Distribution - Fine Sand (0.20mm)	2.5	%pass
18	9	LABSOIL	Particle Size Distribution - Medium Sand (0.60mm)	4.4	%pass

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770802 IN BOREHOLE 107708 (Company Name: 5)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	36	NBLOW
3	4.5	FIELD	Standard Penetration Test	41	NBLOW
4	6	FIELD	Standard Penetration Test	26	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770803 IN BOREHOLE 107708 (Company Name: 5)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
5	7.5	FIELD	Standard Penetration Test	21	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770804 IN BOREHOLE 107708 (Company Name: 5)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
6	9	FIELD	Standard Penetration Test	37	NBLOW
7	10.5	FIELD	Standard Penetration Test	46	NBLOW
8	12	FIELD	Standard Penetration Test	58	NBLOW

GSI REPORT 3464

Commercial Development

TESTS FOR LAYER 10770902 IN BOREHOLE 107709 (Company Name: 6)

TEST	TOP	CLASS	DESCRIPTION	RESULT	UNITS
2	3	FIELD	Standard Penetration Test	29	NBLOW
3	4.5	FIELD	Standard Penetration Test	37	NBLOW
4	6	FIELD	Standard Penetration Test	19	NBLOW
5	7.5	FIELD	Standard Penetration Test	28	NBLOW
6	9	FIELD	Standard Penetration Test	41	NBLOW
7	10.5	FIELD	Standard Penetration Test	53	NBLOW
8	12	FIELD	Standard Penetration Test	38	NBLOW

Overview Map for GSI Report 6012: Proposed Residential/Commercial Development
Amiens Street, Dublin 1
Points Observed: 7

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GSI REPORT 6012

Proposed Residential/Commercial Development

Amiens Street, Dublin 1

Borehole List:

Borehole	Name	Depth	DTB	ODMALIN	Easting	Northing	Description
138449	BH1	13.5		3	316692	235035	Cable Percussion (Shell and Auger)
138450	BH2	14		3	316688	235020	Cable Percussion (Shell and Auger)
138451	BH3	14		3	316677	235007	Cable Percussion (Shell and Auger)
138452	TP1	.7		3	316684	235003	Trial (or Observation) Pit
138453	TP2	1.9		3	316697	235011	Trial (or Observation) Pit
138454	TP3	3.4		3	316713	235021	Trial (or Observation) Pit
138455	TP4	2.9		3			Trial (or Observation) Pit

GSI REPORT 6012

Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138449 (Company Name: BH1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13844901	0	1				Fill - Made Ground	Fill - Made Ground
13844902	1	2	Firm	Brown	Sandy Gravelly	Clay	Clay
13844903	2	4.5	Medium Dense		Coarse	Gravel	Gravel
13844904	4.5	9.5	Loose	Black	Silty	Sand	Sand
13844905	9.5	13.5	Dense		Coarse	Gravel	Gravel

GSI REPORT 6012

Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138450 (Company Name: BH2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13845001	0	1.2				Fill - Made Ground	Fill - Made Ground
13845002	1.2	3.5	Medium Dense		Coarse	Gravel	Gravel
13845003	3.5	4.5	Loose		Fine to Coarse Sandy	Gravel	Gravel
13845004	4.5	9	Loose	Brown	Silty	Sand	Sand
13845005	9	14			Coarse	Gravel	Gravel
13845006	14	14.1				Boulders	Boulders

GSI REPORT 6012

Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138451 (Company Name: BH3)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13845101	0	.2				Fill - Made Ground	Fill - Made Ground
13845102	.2	2				Fill - Made Ground	Fill - Made Ground
13845103	2	3	Firm	Brown	Sandy	Clay And Silt	Clay And Silt
13845104	3	5.5	Medium Dense		Fine to Coarse Sandy	Gravel	Gravel
13845105	5.5	7.5	Loose	Brown	Fine to Medium	Gravel	Gravel
13845106	7.5	8.5	Loose	Black	Fine to Medium	Sand	Sand
13845107	8.5	13.8		Grey	Fine to Coarse Sandy	Gravel	Gravel
13845108	13.8	14				Boulders	Boulders

GSI REPORT 6012

Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138452 (Company Name: TP1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13845201	0	.6				Fill - Made Ground	Fill - Made Ground
13845202	.6	.7				Fill - Made Ground	Fill - Made Ground

GSI REPORT 6012

Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138453 (Company Name: TP2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13845301	0	.2				Fill - Made Ground	Fill - Made Ground
13845302	.2	.9				Fill - Made Ground	Fill - Made Ground
13845303	.9	1.55				Fill - Made Ground	Fill - Made Ground
13845304	1.55	1.9	Medium Dense	Light Brown	Silty Sandy	Gravel	Gravel

GSI REPORT 6012

Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138454 (Company Name: TP3)

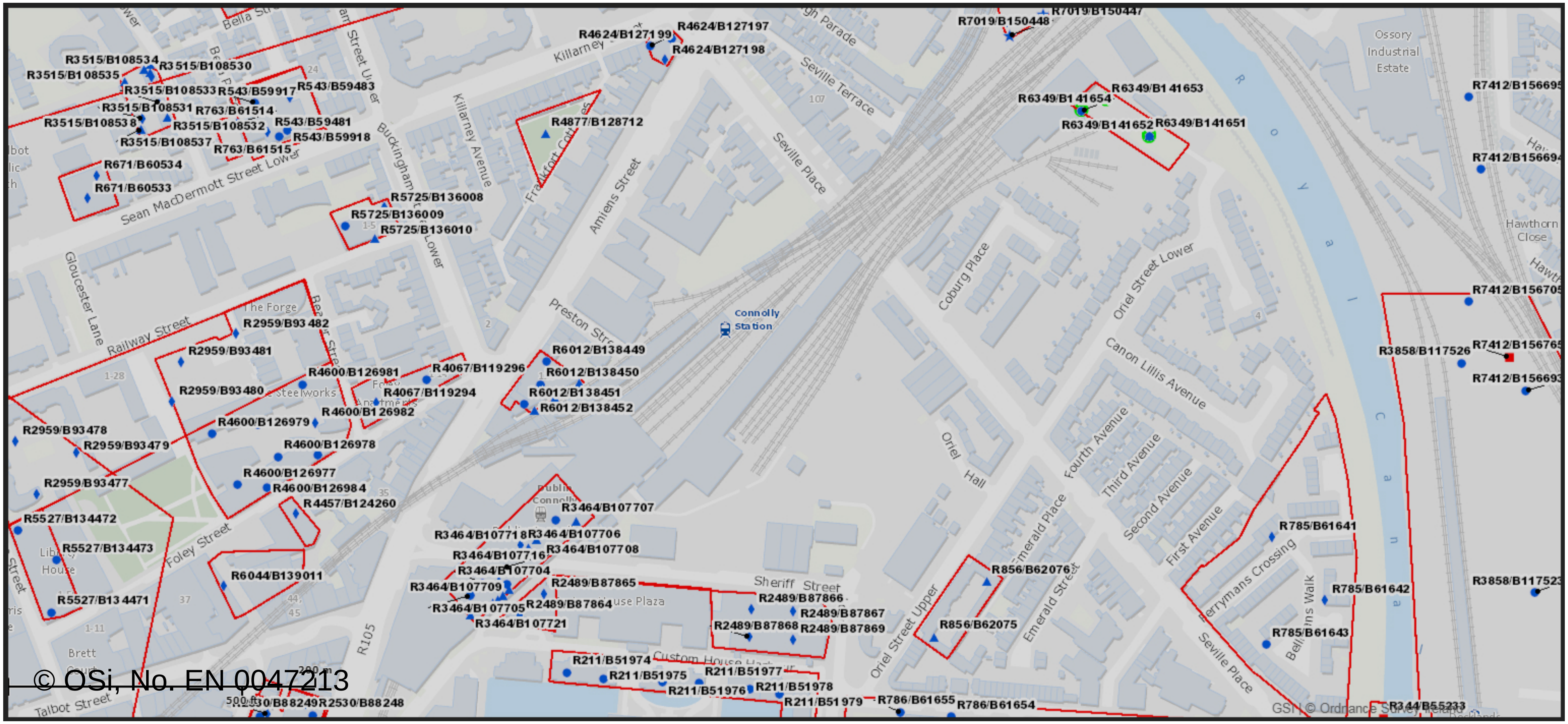
LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13845401	0	2				Fill - Made Ground	Fill - Made Ground
13845402	2	3.2				Fill - Made Ground	Fill - Made Ground
13845403	3.2	3.4		Light Brown	Slightly Silty	Gravel	Gravel

GSI REPORT 6012

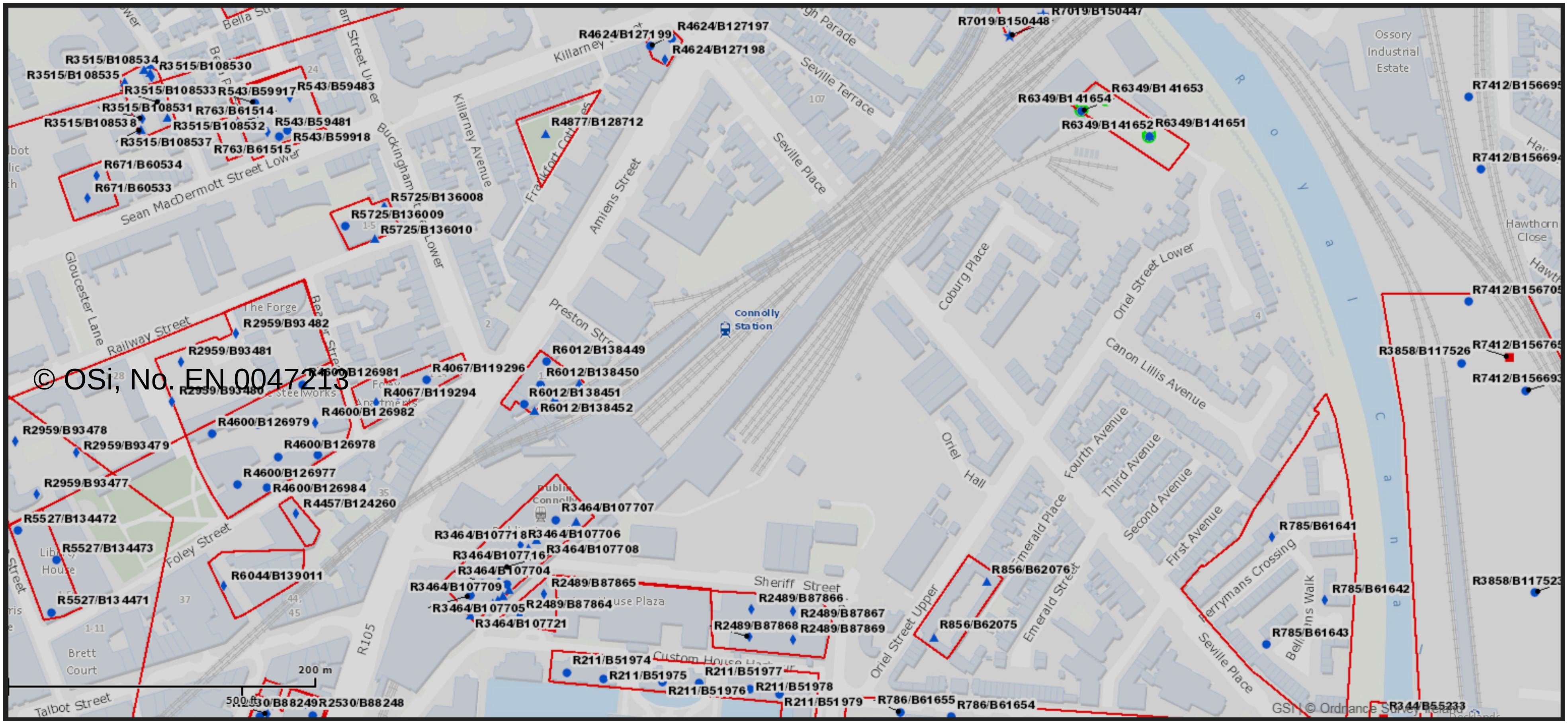
Proposed Residential/Commercial Development

LAYERS FOR BOREHOLE 138455 (Company Name: TP4)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
13845501	0	.4				Fill - Made Ground	Fill - Made Ground
13845502	.4	1.6				Fill - Made Ground	Fill - Made Ground
13845503	1.6	2.5				Fill - Made Ground	Fill - Made Ground
13845504	2.5	2.9	Firm to Soft	Light Brown	Gravelly	Silt	Silt



Overview Map for GSI Report 6349: Connolly Station Development
Connolly Station, Dublin 1, Co. Dublin
Points Observed: 4


© OSi, No. EN 0047213
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R3515/B108530
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R4877/B128712
R7019/B150447
R7019/B150448
R6349/B141653
R6349/B141654
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R6349/B141651
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R211/B51978
R211/B51979
R786/B61655
R786/B61654
R2530/B88249
R2530/B88248
R344/B55233
Connolly Station
Sean MacDermott Street Lower
Railway Street
Gloucester Lane
Buckingham Street Lower
Killarney Avenue
Amiens Street
Preston Street
Seville Place
Seville Terrace
Coburg Place
Oriel Street Lower
Canon Lillis Avenue
Oriel Hall
Fourth Avenue
Third Avenue
Second Avenue
First Avenue
Emerald Place
Emerald Street
Oriel Street Upper
Sheriff Street
Berrymans Crossing
Foley Street
Talbot Street
Brett Court
R105
Ossory Industrial Estate
Hawthorn Close
Royal Canal
The Forge
200 m
500 ft
GSI, © Ordnance Survey Ireland

GSI REPORT 6349

Connolly Station Development

Connolly Station, Dublin 1, Co. Dublin

Borehole List:

Borehole	Name	Depth	DTB	ODMALIN	Easting	Northing	Description
141651	BH1	4		6	317084	235182	Cable Percussion (Shell and Auger)
141652	BH1A	11.5		6	317084	235181	Cable Percussion (Shell and Auger)
141653	BH2	10.5		6	317056	235205	Cable Percussion (Shell and Auger)
141654	BH3	11.5		6	317040	235198	Cable Percussion (Shell and Auger)

GSI REPORT 6349

Connolly Station Development

LAYERS FOR BOREHOLE 141651 (Company Name: BH1)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
14165101	0	.8				Fill - Made Ground	Fill - Made Ground
14165102	.8	2.2				Fill - Made Ground	Fill - Made Ground
14165103	2.2	3.9				Fill - Made Ground	Fill - Made Ground
14165104	3.9	4				Boulders	Boulders

GSI REPORT 6349

Connolly Station Development

LAYERS FOR BOREHOLE 141652 (Company Name: BH1A)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
14165201	0	.9				Fill - Made Ground	Fill - Made Ground
14165202	.9	2.1				Fill - Made Ground	Fill - Made Ground
14165203	2.1	5.2				Fill - Made Ground	Fill - Made Ground
14165204	5.2	6.1				Fill - Made Ground	Fill - Made Ground
14165205	6.1	6.5		Brown	Clayey	Fill - Made Ground	Fill - Made Ground
14165206	6.5	8.1	Medium Dense		Sandy	Gravel	Gravel
14165207	8.1	11.5			Medium to Coarse	Gravel	Gravel

GSI REPORT 6349

Connolly Station Development

LAYERS FOR BOREHOLE 141653 (Company Name: BH2)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
14165301	0	.5				Fill - Made Ground	Fill - Made Ground
14165302	.5	1.1				Fill - Made Ground	Fill - Made Ground
14165303	1.1	3				Fill - Made Ground	Fill - Made Ground
14165304	3	5.5				Fill - Made Ground	Fill - Made Ground
14165305	5.5	6.2				Fill - Made Ground	Fill - Made Ground
14165306	6.2	10.5	Dense		Fine to Coarse Sandy	Gravel	Gravel

GSI REPORT 6349

Connolly Station Development

LAYERS FOR BOREHOLE 141654 (Company Name: BH3)

LAYER	TOP	BASE	STRENGTH	COLOUR	MINORLITH	MAJORLITH	INTERPRETATION
14165401	0	.1				Fill - Made Ground	Fill - Made Ground
14165402	.1	4				Fill - Made Ground	Fill - Made Ground
14165403	4	5.5				Fill - Made Ground	Fill - Made Ground
14165404	5.5	6.5				Fill - Made Ground	Fill - Made Ground
14165405	6.5	7				Fill - Made Ground	Fill - Made Ground
14165406	7	7.6				Fill - Made Ground	Fill - Made Ground
14165407	7.6	11.5	Dense		Medium to Coarse	Gravel	Gravel

O'CONNOR | SUTTON | CRONIN

Multidisciplinary Consulting Engineers

Appendix C

HazWasteOnline (HWOL) assessment

HazWasteOnline™

Waste Classification Report

62D3T-N4LXB-UGXXG

Job name

B909 GQRA review 16.11.2018

Description/Comments

Samples taken by Glovers Ltd on behalf of Buro Happold in 2008 Site Investigations. Methodology used not known, i.e. whether the samples are spot, or interval samples.

Project

B909 Connolly Station Environmental

Site

Connolly Station Car Park

Related Documents

#	Name	Description
None		

Waste Stream Template

EJEL Rilta

Classified by

Name:
Iain Williams
Date:
16 Nov 2018 14:43 GMT
Telephone:
+353 1 868 2000

Company:
OCSC
9 Prussia Street
Dublin 7

Report

Created by: Iain Williams
Created date: 16 Nov 2018 14:43 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	WS1[1m]	1.00	Non Hazardous		3
2	WS1[3m]	3.00	Non Hazardous		5
3	WS1[5m]	5.00	Non Hazardous		8
4	WS2[1m]	1.00	Non Hazardous		10
5	WS2[3m]	3.00	Non Hazardous		12
6	WS2[5m]	5.00	Non Hazardous		15
7	WS3[0.5m]	0.50	Non Hazardous		17
8	WS3[4m]	4.00	Non Hazardous		19
9	WS4[0.5m]	0.50	Non Hazardous		22
10	WS4[2m]	2.00	Non Hazardous		25
11	WS5[0.5m]	0.50	Non Hazardous		27

Classification of sample: WS1[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	**WS1[1m]**	LoW Code:	
Sample Depth:	**1.00 m**	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	**24.6%** (dry weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 24.6% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		33	mg/kg	1.32	34.968	mg/kg	0.0035 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	2	mg/kg	1.285	2.063	mg/kg	0.000161 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		95	mg/kg	1.252	95.44	mg/kg	0.00954 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		32	mg/kg	1.462	37.536	mg/kg	0.00375 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	650	mg/kg		521.669	mg/kg	0.0522 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		41	mg/kg	1.579	51.974	mg/kg	0.0052 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		334	mg/kg	3.22	863.113	mg/kg	0.0863 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.51	mg/kg		0.409	mg/kg	0.0000409 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.566	mg/kg		0.454	mg/kg	0.0000454 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		0.545	mg/kg		0.437	mg/kg	0.0000437 %	✓	
15	●	fluorene		201-695-5	86-73-7		0.827	mg/kg		0.664	mg/kg	0.0000664 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		8.748	mg/kg		7.021	mg/kg	0.000702 %	✓	
17	●	anthracene		204-371-1	120-12-7		1.899	mg/kg		1.524	mg/kg	0.000152 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		15.473	mg/kg		12.418	mg/kg	0.00124 %	✓	
19	●	pyrene		204-927-3	129-00-0		12.491	mg/kg		10.025	mg/kg	0.001 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		7.249	mg/kg		5.818	mg/kg	0.000582 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		4.508	mg/kg		3.618	mg/kg	0.000362 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		3.134	mg/kg		2.515	mg/kg	0.000252 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		3.955	mg/kg		3.174	mg/kg	0.000317 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		3.28	mg/kg		2.632	mg/kg	0.000263 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		5.999	mg/kg		4.815	mg/kg	0.000481 %	✓	
26	●	coronene		205-881-7	191-07-1		1.036	mg/kg		0.831	mg/kg	0.0000831 %	✓	
27		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		7.205	mg/kg		5.783	mg/kg	0.000578 %	✓	
28		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		7.205	mg/kg		5.783	mg/kg	0.000578 %	✓	
29		benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
30		toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
31		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
32	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
33	●	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
34	●	pH			PH		8.3	pH		8.3	pH	8.3 pH		
35	⚗	cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
											Total:	0.168 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
⚗	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS1[3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	**WS1[3m]**	LoW Code:	
Sample Depth:	**3.00 m**	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	**25.2%** (dry weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 25.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		26	mg/kg	1.32	27.419	mg/kg	0.00274 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.027	mg/kg	0.0000799 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		134	mg/kg	1.252	133.976	mg/kg	0.0134 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		44	mg/kg	1.462	51.365	mg/kg	0.00514 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	364	mg/kg		290.735	mg/kg	0.0291 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		61	mg/kg	1.579	76.956	mg/kg	0.0077 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		164	mg/kg	3.22	421.773	mg/kg	0.0422 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.059	mg/kg		0.0471	mg/kg	0.00000471 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.063	mg/kg		0.0503	mg/kg	0.00000503 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		0.045 mg/kg		0.0359 mg/kg	0.00000359 %	✓	
15	●	fluorene		201-695-5	86-73-7		0.034 mg/kg		0.0272 mg/kg	0.00000272 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		0.596 mg/kg		0.476 mg/kg	0.0000476 %	✓	
17	●	anthracene		204-371-1	120-12-7		0.098 mg/kg		0.0783 mg/kg	0.00000783 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		0.669 mg/kg		0.534 mg/kg	0.0000534 %	✓	
19	●	pyrene		204-927-3	129-00-0		0.614 mg/kg		0.49 mg/kg	0.000049 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.44 mg/kg		0.351 mg/kg	0.0000351 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.497 mg/kg		0.397 mg/kg	0.0000397 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.385 mg/kg		0.308 mg/kg	0.0000308 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		0.271 mg/kg		0.216 mg/kg	0.0000216 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.242 mg/kg		0.193 mg/kg	0.0000193 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		0.337 mg/kg		0.269 mg/kg	0.0000269 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.743 mg/kg		0.593 mg/kg	0.0000593 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.743 mg/kg		0.593 mg/kg	0.0000593 %	✓	
28		benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29		toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	●	pH			PH		8.35 pH		8.35 pH	8.35 pH		
33		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5 mg/kg	1.884	<4.71 mg/kg	<0.000471 %		<LOD
34	●	TPH (C6 to C40) petroleum group			TPH		4.65 mg/kg		3.714 mg/kg	0.000371 %	✓	
35		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
									Total:	0.102 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00037%)

Classification of sample: WS1[5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS1[5m]
Sample Depth:
5.00 m
Moisture content:
48.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 48.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		124	mg/kg	1.32	110.398	mg/kg	0.011 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	41	mg/kg	1.285	35.533	mg/kg	0.00276 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		222	mg/kg	1.252	187.387	mg/kg	0.0187 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		41	mg/kg	1.462	40.407	mg/kg	0.00404 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	1402	mg/kg		945.381	mg/kg	0.0945 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		308	mg/kg	1.353	281.102	mg/kg	0.0281 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		131	mg/kg	1.579	139.524	mg/kg	0.014 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		841	mg/kg	3.22	1825.973	mg/kg	0.183 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.139	mg/kg		0.0937	mg/kg	0.00000937 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.059	mg/kg		0.0398	mg/kg	0.00000398 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.048	mg/kg		0.0324	mg/kg	0.00000324 %	✓	
15	fluorene		201-695-5	86-73-7		0.029	mg/kg		0.0196	mg/kg	0.00000196 %	✓	
16	phenanthrene		201-581-5	85-01-8		1.047	mg/kg		0.706	mg/kg	0.0000706 %	✓	
17	anthracene		204-371-1	120-12-7		0.124	mg/kg		0.0836	mg/kg	0.00000836 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.508	mg/kg		0.343	mg/kg	0.0000343 %	✓	
19	pyrene		204-927-3	129-00-0		0.455	mg/kg		0.307	mg/kg	0.0000307 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.461	mg/kg		0.311	mg/kg	0.0000311 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.542	mg/kg		0.365	mg/kg	0.0000365 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.543	mg/kg		0.366	mg/kg	0.0000366 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.551	mg/kg		0.372	mg/kg	0.0000372 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.525	mg/kg		0.354	mg/kg	0.0000354 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.708	mg/kg		0.477	mg/kg	0.0000477 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.074	mg/kg		0.724	mg/kg	0.0000724 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.074	mg/kg		0.724	mg/kg	0.0000724 %	✓	
28	pH			PH		7.61	pH		7.61	pH	7.61 pH		
29	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
										Total:	0.357 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS2[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	**WS2[1m]**	LoW Code:	
Sample Depth:	**1.00 m**	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	**18.5%** (dry weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18 mg/kg	1.32	20.056 mg/kg	0.00201 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	1.085 mg/kg	0.0000844 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		136 mg/kg	1.252	143.664 mg/kg	0.0144 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		32 mg/kg	1.462	39.468 mg/kg	0.00395 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	408 mg/kg		344.304 mg/kg	0.0344 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		37 mg/kg	1.579	49.318 mg/kg	0.00493 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		259 mg/kg	3.22	703.754 mg/kg	0.0704 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.389 mg/kg		0.328 mg/kg	0.0000328 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.209 mg/kg		0.176 mg/kg	0.0000176 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.818 mg/kg		0.69 mg/kg	0.000069 %	✓	
15	fluorene		201-695-5	86-73-7		0.784 mg/kg		0.662 mg/kg	0.0000662 %	✓	
16	phenanthrene		201-581-5	85-01-8		9.251 mg/kg		7.807 mg/kg	0.000781 %	✓	
17	anthracene		204-371-1	120-12-7		0.905 mg/kg		0.764 mg/kg	0.0000764 %	✓	
18	fluoranthene		205-912-4	206-44-0		6.391 mg/kg		5.393 mg/kg	0.000539 %	✓	
19	pyrene		204-927-3	129-00-0		5.351 mg/kg		4.516 mg/kg	0.000452 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		2.467 mg/kg		2.082 mg/kg	0.000208 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		3.051 mg/kg		2.575 mg/kg	0.000257 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		2.268 mg/kg		1.914 mg/kg	0.000191 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		1.342 mg/kg		1.132 mg/kg	0.000113 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		1.239 mg/kg		1.046 mg/kg	0.000105 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		1.705 mg/kg		1.439 mg/kg	0.000144 %	✓	
26	coronene		205-881-7	191-07-1		0.477 mg/kg		0.403 mg/kg	0.0000403 %	✓	
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		4.16 mg/kg		3.511 mg/kg	0.000351 %	✓	
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		4.16 mg/kg		3.511 mg/kg	0.000351 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
30	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		**<LOD**
34	pH			PH		8.35 pH		8.35 pH	8.35 pH		
35	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5 mg/kg	1.884	<4.71 mg/kg	<0.000471 %		**<LOD**
								Total:	0.135 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS2[3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	**WS2[3m]**	LoW Code:	
Sample Depth:	**3.00 m**	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	**30.9%** (dry weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 30.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		71 mg/kg	1.32	71.614 mg/kg	0.00716 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	0.982 mg/kg	0.0000764 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		238 mg/kg	1.252	227.596 mg/kg	0.0228 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		23 mg/kg	1.462	25.681 mg/kg	0.00257 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	972 mg/kg		742.552 mg/kg	0.0743 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		9 mg/kg	1.353	9.306 mg/kg	0.000931 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		64 mg/kg	1.579	77.225 mg/kg	0.00772 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		312 mg/kg	3.22	767.458 mg/kg	0.0767 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.23 mg/kg		0.176 mg/kg	0.0000176 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.168 mg/kg		0.128 mg/kg	0.0000128 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		acenaphthene		201-469-6	83-32-9		0.054	mg/kg		0.0413	mg/kg	0.00000413 %	✓	
15		fluorene		201-695-5	86-73-7		0.065	mg/kg		0.0497	mg/kg	0.00000497 %	✓	
16		phenanthrene		201-581-5	85-01-8		1.006	mg/kg		0.769	mg/kg	0.0000769 %	✓	
17		anthracene		204-371-1	120-12-7		0.268	mg/kg		0.205	mg/kg	0.0000205 %	✓	
18		fluoranthene		205-912-4	206-44-0		1.087	mg/kg		0.83	mg/kg	0.000083 %	✓	
19		pyrene		204-927-3	129-00-0		0.974	mg/kg		0.744	mg/kg	0.0000744 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.726	mg/kg		0.555	mg/kg	0.0000555 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.842	mg/kg		0.643	mg/kg	0.0000643 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.765	mg/kg		0.584	mg/kg	0.0000584 %	✓	
23		indeno[123-cd]pyrene		205-893-2	193-39-5		0.534	mg/kg		0.408	mg/kg	0.0000408 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.483	mg/kg		0.369	mg/kg	0.0000369 %	✓	
25		benzo[ghi]perylene		205-883-8	191-24-2		0.722	mg/kg		0.552	mg/kg	0.0000552 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.513	mg/kg		1.156	mg/kg	0.000116 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.513	mg/kg		1.156	mg/kg	0.000116 %	✓	
28		benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
29		toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
30		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
31		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
32		pH			PH		8.24	pH		8.24	pH	8.24 pH		
33		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
34		TPH (C6 to C40) petroleum group			TPH		8.45	mg/kg		6.455	mg/kg	0.000646 %	✓	
35		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
											Total:	0.194 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00064%)

Classification of sample: WS2[5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS2[5m]
Sample Depth:
5.00 m
Moisture content:
55.6%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 55.6% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		150 mg/kg	1.32	127.281 mg/kg	0.0127 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	35 mg/kg	1.285	28.91 mg/kg	0.00225 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		292 mg/kg	1.252	234.909 mg/kg	0.0235 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		44 mg/kg	1.462	41.329 mg/kg	0.00413 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	1425 mg/kg		915.81 mg/kg	0.0916 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		320 mg/kg	1.353	278.352 mg/kg	0.0278 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		173 mg/kg	1.579	175.613 mg/kg	0.0176 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		1124 mg/kg	3.22	2325.927 mg/kg	0.233 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.05 mg/kg		0.0321 mg/kg	0.00000321 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.029 mg/kg		0.0186 mg/kg	0.00000186 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.036	mg/kg		0.0231	mg/kg	0.00000231 %	✓	
15	fluorene		201-695-5	86-73-7		0.019	mg/kg		0.0122	mg/kg	0.00000122 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.457	mg/kg		0.294	mg/kg	0.0000294 %	✓	
17	anthracene		204-371-1	120-12-7		0.057	mg/kg		0.0366	mg/kg	0.00000366 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.3	mg/kg		0.193	mg/kg	0.0000193 %	✓	
19	pyrene		204-927-3	129-00-0		0.259	mg/kg		0.166	mg/kg	0.0000166 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.224	mg/kg		0.144	mg/kg	0.0000144 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.292	mg/kg		0.188	mg/kg	0.0000188 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.297	mg/kg		0.191	mg/kg	0.0000191 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.284	mg/kg		0.183	mg/kg	0.0000183 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.246	mg/kg		0.158	mg/kg	0.0000158 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.378	mg/kg		0.243	mg/kg	0.0000243 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.583	mg/kg		0.375	mg/kg	0.0000375 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.583	mg/kg		0.375	mg/kg	0.0000375 %	✓	
28	pH			PH		7.72	pH		7.72	pH	7.72 pH		
29	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		<LOD
										Total:	0.413 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS3[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS3[0.5m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.50 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
14.3% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 14.3% Dry Weight Moisture Correction applied (MC)

#		Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	20.793	mg/kg	0.00208 %	✓	
2		cadmium { cadmium sulfide } 048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.124	mg/kg	0.0000875 %	✓	
3		copper { copper(II) oxide } 029-016-00-6	215-269-1	1317-38-0		113	mg/kg	1.252	123.754	mg/kg	0.0124 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		22	mg/kg	1.462	28.131	mg/kg	0.00281 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6			1	821	mg/kg		718.285	mg/kg	0.0718 %	✓	
7		mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		3	mg/kg	1.353	3.552	mg/kg	0.000355 %	✓	
8		nickel { nickel dihydroxide } 028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		33	mg/kg	1.579	45.602	mg/kg	0.00456 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10		zinc { zinc oxide } 030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11		boron { diboron trioxide; boric oxide } 005-008-00-8	215-125-8	1303-86-2		256	mg/kg	3.22	721.163	mg/kg	0.0721 %	✓	
12		naphthalene 601-052-00-2	202-049-5	91-20-3		0.225	mg/kg		0.197	mg/kg	0.0000197 %	✓	
13		acenaphthylene	205-917-1	208-96-8		0.17	mg/kg		0.149	mg/kg	0.0000149 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14	●	acenaphthene				0.156	mg/kg		0.136	mg/kg	0.0000136 %	✓	
			201-469-6	83-32-9									
15	●	fluorene				0.147	mg/kg		0.129	mg/kg	0.0000129 %	✓	
			201-695-5	86-73-7									
16	●	phenanthrene				2.073	mg/kg		1.814	mg/kg	0.000181 %	✓	
			201-581-5	85-01-8									
17	●	anthracene				0.338	mg/kg		0.296	mg/kg	0.0000296 %	✓	
			204-371-1	120-12-7									
18	●	fluoranthene				2.56	mg/kg		2.24	mg/kg	0.000224 %	✓	
			205-912-4	206-44-0									
19	●	pyrene				2.259	mg/kg		1.976	mg/kg	0.000198 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				1.236	mg/kg		1.081	mg/kg	0.000108 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				1.408	mg/kg		1.232	mg/kg	0.000123 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[a]pyrene; benzo[def]chrysene				1.158	mg/kg		1.013	mg/kg	0.000101 %	✓	
		601-032-00-3	200-028-5	50-32-8									
23	●	indeno[123-cd]pyrene				1.036	mg/kg		0.906	mg/kg	0.0000906 %	✓	
			205-893-2	193-39-5									
24		dibenz[a,h]anthracene				0.836	mg/kg		0.731	mg/kg	0.0000731 %	✓	
		601-041-00-2	200-181-8	53-70-3									
25	●	benzo[ghi]perylene				1.238	mg/kg		1.083	mg/kg	0.000108 %	✓	
			205-883-8	191-24-2									
26		benzo[b]fluoranthene				2.281	mg/kg		1.996	mg/kg	0.0002 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				2.281	mg/kg		1.996	mg/kg	0.0002 %	✓	
		601-036-00-5	205-916-6	207-08-9									
28	●	pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
29		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		<LOD
		006-007-00-5											
										Total:	0.169 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS3[4m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS3[4m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
4.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
21% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 21% Dry Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9	mg/kg	1.32	9.821	mg/kg	0.000982 %	✓	
2		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.062	mg/kg	0.0000826 %	✓	
3		copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		13	mg/kg	1.252	13.449	mg/kg	0.00134 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		25	mg/kg	1.462	30.197	mg/kg	0.00302 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	183	mg/kg		151.24	mg/kg	0.0151 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18	mg/kg	1.579	23.497	mg/kg	0.00235 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		79	mg/kg	3.22	210.223	mg/kg	0.021 %	✓	
12		naphthalene	601-052-00-2	202-049-5	91-20-3		0.068	mg/kg		0.0562	mg/kg	0.00000562 %	✓	
13		acenaphthylene		205-917-1	208-96-8		0.316	mg/kg		0.261	mg/kg	0.0000261 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.051 mg/kg		0.0421 mg/kg	0.00000421 %	✓	
15	fluorene		201-695-5	86-73-7		0.11 mg/kg		0.0909 mg/kg	0.00000909 %	✓	
16	phenanthrene		201-581-5	85-01-8		2.835 mg/kg		2.343 mg/kg	0.000234 %	✓	
17	anthracene		204-371-1	120-12-7		0.84 mg/kg		0.694 mg/kg	0.0000694 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.41 mg/kg		0.339 mg/kg	0.0000339 %	✓	
19	pyrene		204-927-3	129-00-0		3.672 mg/kg		3.035 mg/kg	0.000303 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		2.38 mg/kg		1.967 mg/kg	0.000197 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		2.222 mg/kg		1.836 mg/kg	0.000184 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		2.097 mg/kg		1.733 mg/kg	0.000173 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		1.235 mg/kg		1.021 mg/kg	0.000102 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		1.081 mg/kg		0.893 mg/kg	0.0000893 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		1.334 mg/kg		1.102 mg/kg	0.00011 %	✓	
26	coronene		205-881-7	191-07-1		0.342 mg/kg		0.283 mg/kg	0.0000283 %	✓	
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		3.591 mg/kg		2.968 mg/kg	0.000297 %	✓	
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		3.591 mg/kg		2.968 mg/kg	0.000297 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
34	pH			PH		7.99 pH		7.99 pH	7.99 pH		
35	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5 mg/kg	1.884	<4.71 mg/kg	<0.000471 %		<LOD
36	TPH (C6 to C40) petroleum group			TPH		20.07 mg/kg		16.587 mg/kg	0.00166 %	✓	
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
								Total:	0.0485 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00166%)

Classification of sample: WS4[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS4[0.5m]
Sample Depth:
0.50 m
Moisture content:
7.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.8% Dry Weight Moisture Correction applied (MC)

#	Determinand / CLP index number / EC Number / CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		7 mg/kg	1.32	8.574 mg/kg	0.000857 %	✓	
2	cadmium { cadmium sulfide } 048-010-00-4 / 215-147-8 / 1306-23-6	1	1 mg/kg	1.285	1.192 mg/kg	0.0000928 %	✓	
3	copper { copper(II) oxide } 029-016-00-6 / 215-269-1 / 1317-38-0		47 mg/kg	1.252	54.577 mg/kg	0.00546 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		34 mg/kg	1.462	46.097 mg/kg	0.00461 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	168 mg/kg		155.844 mg/kg	0.0156 %	✓	
7	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide } 028-008-00-X / 235-008-5 [1] 234-348-1 [2] / 12054-48-7 [1] 11113-74-9 [2]		48 mg/kg	1.579	70.33 mg/kg	0.00703 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide } 030-013-00-7 / 215-222-5 / 1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide } 005-008-00-8 / 215-125-8 / 1303-86-2		207 mg/kg	3.22	618.288 mg/kg	0.0618 %	✓	
12	naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		0.056 mg/kg		0.0519 mg/kg	0.00000519 %	✓	
13	acenaphthylene 205-917-1 / 208-96-8		0.049 mg/kg		0.0455 mg/kg	0.00000455 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.037	mg/kg		0.0343	mg/kg	0.00000343 %	✓	
15	fluorene		201-695-5	86-73-7		0.036	mg/kg		0.0334	mg/kg	0.00000334 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.339	mg/kg		0.314	mg/kg	0.0000314 %	✓	
17	anthracene		204-371-1	120-12-7		0.116	mg/kg		0.108	mg/kg	0.0000108 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.564	mg/kg		0.523	mg/kg	0.0000523 %	✓	
19	pyrene		204-927-3	129-00-0		0.568	mg/kg		0.527	mg/kg	0.0000527 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.499	mg/kg		0.463	mg/kg	0.0000463 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.46	mg/kg		0.427	mg/kg	0.0000427 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.614	mg/kg		0.57	mg/kg	0.000057 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.764	mg/kg		0.709	mg/kg	0.0000709 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.273	mg/kg		0.253	mg/kg	0.0000253 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.729	mg/kg		0.676	mg/kg	0.0000676 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.822	mg/kg		0.763	mg/kg	0.0000763 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.822	mg/kg		0.763	mg/kg	0.0000763 %	✓	
28	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
29	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
32	pH			PH		8.71	pH		8.71	pH	8.71 pH		
33	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
34	TPH (C6 to C40) petroleum group			TPH		389	mg/kg		360.853	mg/kg	0.0361 %	✓	
35	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
36	phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
										Total:	0.133 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0361%)

Classification of sample: WS4[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS4[2m]
Sample Depth:
2.00 m
Moisture content:
20.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15	mg/kg	1.32	16.436	mg/kg	0.00164 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.067	mg/kg	0.000083 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		134	mg/kg	1.252	139.202	mg/kg	0.0139 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		18	mg/kg	1.462	21.832	mg/kg	0.00218 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	289	mg/kg		239.834	mg/kg	0.024 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		30	mg/kg	1.579	39.324	mg/kg	0.00393 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		124	mg/kg	3.22	331.34	mg/kg	0.0331 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.036	mg/kg		0.0299	mg/kg	0.00000299 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.013	mg/kg		0.0108	mg/kg	0.00000108 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		0.016	mg/kg		0.0133	mg/kg	0.00000133 %	✓	
15	●	fluorene		201-695-5	86-73-7		0.007	mg/kg		0.0058	mg/kg	0.000000581 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		0.221	mg/kg		0.183	mg/kg	0.0000183 %	✓	
17	●	anthracene		204-371-1	120-12-7		0.068	mg/kg		0.0564	mg/kg	0.00000564 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		0.234	mg/kg		0.194	mg/kg	0.0000194 %	✓	
19	●	pyrene		204-927-3	129-00-0		0.247	mg/kg		0.205	mg/kg	0.0000205 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.315	mg/kg		0.261	mg/kg	0.0000261 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.285	mg/kg		0.237	mg/kg	0.0000237 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.151	mg/kg		0.125	mg/kg	0.0000125 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		0.155	mg/kg		0.129	mg/kg	0.0000129 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.081	mg/kg		0.0672	mg/kg	0.00000672 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		0.139	mg/kg		0.115	mg/kg	0.0000115 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.315	mg/kg		0.261	mg/kg	0.0000261 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.315	mg/kg		0.261	mg/kg	0.0000261 %	✓	
28	●	pH			PH		8.69	pH		8.69	pH	8.69 pH		
29		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
											Total:	0.0798 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS5[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS5[0.5m]
Sample Depth:
0.50 m
Moisture content:
15.1%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20	mg/kg	1.32	22.942	mg/kg	0.00229 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<1	mg/kg	1.285	<1.285	mg/kg	<0.0001 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		96	mg/kg	1.252	104.405	mg/kg	0.0104 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		20	mg/kg	1.462	25.396	mg/kg	0.00254 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	829	mg/kg		720.243	mg/kg	0.072 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		38	mg/kg	1.579	52.147	mg/kg	0.00521 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		120	mg/kg	3.22	335.695	mg/kg	0.0336 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.046	mg/kg		0.04	mg/kg	0.000004 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.044	mg/kg		0.0382	mg/kg	0.00000382 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene		201-469-6	83-32-9		0.029 mg/kg		0.0252 mg/kg	0.00000252 %	✓	
15	•	fluorene		201-695-5	86-73-7		0.04 mg/kg		0.0348 mg/kg	0.00000348 %	✓	
16	•	phenanthrene		201-581-5	85-01-8		0.68 mg/kg		0.591 mg/kg	0.0000591 %	✓	
17	•	anthracene		204-371-1	120-12-7		0.175 mg/kg		0.152 mg/kg	0.0000152 %	✓	
18	•	fluoranthene		205-912-4	206-44-0		1.136 mg/kg		0.987 mg/kg	0.0000987 %	✓	
19	•	pyrene		204-927-3	129-00-0		0.801 mg/kg		0.696 mg/kg	0.0000696 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.257 mg/kg		0.223 mg/kg	0.0000223 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.569 mg/kg		0.494 mg/kg	0.0000494 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.428 mg/kg		0.372 mg/kg	0.0000372 %	✓	
23	•	indeno[123-cd]pyrene		205-893-2	193-39-5		0.278 mg/kg		0.242 mg/kg	0.0000242 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.16 mg/kg		0.139 mg/kg	0.0000139 %	✓	
25	•	benzo[ghi]perylene		205-883-8	191-24-2		0.279 mg/kg		0.242 mg/kg	0.0000242 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.751 mg/kg		0.652 mg/kg	0.0000652 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.751 mg/kg		0.652 mg/kg	0.0000652 %	✓	
28	•	pH			PH		8.51 pH		8.51 pH	8.51 pH		
29		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
									Total:	0.127 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS5[2m]

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS5[2m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
2.00 m		Entry:	17 05 03 * (Soil and stones containing hazardous substances)
Moisture content:			
23.1% (dry weight correction)			

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1A; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.184%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinands:

copper(II) oxide: (compound conc.: 0.12%)
lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.184%)

Determinands

Moisture content: 23.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		31	mg/kg	1.32	33.249	mg/kg	0.00332 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.044	mg/kg	0.0000812 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		1179	mg/kg	1.252	1198.899	mg/kg	0.12 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		37	mg/kg	1.462	43.93	mg/kg	0.00439 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		**<LOD**
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	2263	mg/kg		1838.343	mg/kg	0.184 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		**<LOD**

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		48	mg/kg	1.579	61.589	mg/kg	0.00616 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		296	mg/kg	3.22	774.235	mg/kg	0.0774 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.051	mg/kg		0.0414	mg/kg	0.00000414 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.013	mg/kg		0.0106	mg/kg	0.00000106 %	✓	
14	acenaphthene		201-469-6	83-32-9		0.031	mg/kg		0.0252	mg/kg	0.00000252 %	✓	
15	fluorene		201-695-5	86-73-7		0.018	mg/kg		0.0146	mg/kg	0.00000146 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.326	mg/kg		0.265	mg/kg	0.0000265 %	✓	
17	anthracene		204-371-1	120-12-7		0.093	mg/kg		0.0755	mg/kg	0.00000755 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.41	mg/kg		0.333	mg/kg	0.0000333 %	✓	
19	pyrene		204-927-3	129-00-0		0.364	mg/kg		0.296	mg/kg	0.0000296 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.182	mg/kg		0.148	mg/kg	0.0000148 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.399	mg/kg		0.324	mg/kg	0.0000324 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.406	mg/kg		0.33	mg/kg	0.000033 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.434	mg/kg		0.353	mg/kg	0.0000353 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.22	mg/kg		0.179	mg/kg	0.0000179 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.429	mg/kg		0.348	mg/kg	0.0000348 %	✓	
26	coronene		205-881-7	191-07-1		0.196	mg/kg		0.159	mg/kg	0.0000159 %	✓	
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.796	mg/kg		0.647	mg/kg	0.0000647 %	✓	
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.796	mg/kg		0.647	mg/kg	0.0000647 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
34	pH			PH		8.32	pH		8.32	pH	8.32 pH		

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
35		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5		<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		**<LOD**
36		phenol 604-001-00-2 / 203-632-7 / 108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
						Total:	0.396 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
(red)	Hazardous result
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS5[5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS5[5m]
Sample Depth:
5.00 m
Moisture content:
19.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19.7% Dry Weight Moisture Correction applied (MC)

#		Determinand (CLP index number / EC Number / CAS Number)	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		9	mg/kg	1.32	9.927	mg/kg	0.000993 %	✓	
2		cadmium { cadmium sulfide } 048-010-00-4 / 215-147-8 / 1306-23-6	1	<1	mg/kg	1.285	<1.285	mg/kg	<0.0001 %		<LOD
3		copper { copper(II) oxide } 029-016-00-6 / 215-269-1 / 1317-38-0		10	mg/kg	1.252	10.458	mg/kg	0.00105 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		16	mg/kg	1.462	19.536	mg/kg	0.00195 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	99	mg/kg		82.707	mg/kg	0.00827 %	✓	
7		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
8		nickel { nickel dihydroxide } 028-008-00-X / 235-008-5 [1] 234-348-1 [2] / 12054-48-7 [1] 11113-74-9 [2]		9	mg/kg	1.579	11.876	mg/kg	0.00119 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10		zinc { zinc oxide } 030-013-00-7 / 215-222-5 / 1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11		boron { diboron trioxide; boric oxide } 005-008-00-8 / 215-125-8 / 1303-86-2		42	mg/kg	3.22	112.978	mg/kg	0.0113 %	✓	
12		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		0.077	mg/kg		0.0643	mg/kg	0.00000643 %	✓	
13		acenaphthylene 205-917-1 / 208-96-8		0.021	mg/kg		0.0175	mg/kg	0.00000175 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		acenaphthene		201-469-6	83-32-9		0.045	mg/kg		0.0376	mg/kg	0.00000376 %	✓	
15		fluorene		201-695-5	86-73-7		0.122	mg/kg		0.102	mg/kg	0.0000102 %	✓	
16		phenanthrene		201-581-5	85-01-8		0.554	mg/kg		0.463	mg/kg	0.0000463 %	✓	
17		anthracene		204-371-1	120-12-7		0.248	mg/kg		0.207	mg/kg	0.0000207 %	✓	
18		fluoranthene		205-912-4	206-44-0		0.553	mg/kg		0.462	mg/kg	0.0000462 %	✓	
19		pyrene		204-927-3	129-00-0		0.411	mg/kg		0.343	mg/kg	0.0000343 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.154	mg/kg		0.129	mg/kg	0.0000129 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.375	mg/kg		0.313	mg/kg	0.0000313 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.213	mg/kg		0.178	mg/kg	0.0000178 %	✓	
23		indeno[123-cd]pyrene		205-893-2	193-39-5		0.122	mg/kg		0.102	mg/kg	0.0000102 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.091	mg/kg		0.076	mg/kg	0.0000076 %	✓	
25		benzo[ghi]perylene		205-883-8	191-24-2		0.127	mg/kg		0.106	mg/kg	0.0000106 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.339	mg/kg		0.283	mg/kg	0.0000283 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.339	mg/kg		0.283	mg/kg	0.0000283 %	✓	
28		pH			PH		8.41	pH		8.41	pH	8.41 pH		
29		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
											Total:	0.0259 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS6[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name: **WS6[1m]**	LoW Code:		
Sample Depth: **1.00 m**	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)	
Moisture content: **33.5%** (dry weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	

Hazard properties

None identified

Determinands

Moisture content: 33.5% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				35	mg/kg	1.32	34.615	mg/kg	0.00346 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		cadmium { cadmium sulfide }			1	<1	mg/kg	1.285	<1.285	mg/kg	<0.0001 %		<LOD
		048-010-00-4	215-147-8	1306-23-6									
3		copper { copper(II) oxide }				66	mg/kg	1.252	61.886	mg/kg	0.00619 %	✓	
		029-016-00-6	215-269-1	1317-38-0									
4		chromium in chromium(III) compounds { chromium(III) oxide }				33	mg/kg	1.462	36.128	mg/kg	0.00361 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	606	mg/kg		453.933	mg/kg	0.0454 %	✓	
		082-001-00-6											
7		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
8		nickel { nickel dihydroxide }				66	mg/kg	1.579	78.088	mg/kg	0.00781 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
		034-002-00-8											
10		zinc { zinc oxide }				<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
		030-013-00-7	215-222-5	1314-13-2									
11		boron { diboron trioxide; boric oxide }				142	mg/kg	3.22	342.489	mg/kg	0.0342 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
12		naphthalene				0.055	mg/kg		0.0412	mg/kg	0.00000412 %	✓	
		601-052-00-2	202-049-5	91-20-3									
13		acenaphthylene				0.024	mg/kg		0.018	mg/kg	0.0000018 %	✓	
			205-917-1	208-96-8									

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene		201-469-6	83-32-9		0.035	mg/kg		0.0262	mg/kg	0.00000262 %	✓	
15	•	fluorene		201-695-5	86-73-7		0.024	mg/kg		0.018	mg/kg	0.0000018 %	✓	
16	•	phenanthrene		201-581-5	85-01-8		0.327	mg/kg		0.245	mg/kg	0.0000245 %	✓	
17	•	anthracene		204-371-1	120-12-7		0.09	mg/kg		0.0674	mg/kg	0.00000674 %	✓	
18	•	fluoranthene		205-912-4	206-44-0		0.281	mg/kg		0.21	mg/kg	0.000021 %	✓	
19	•	pyrene		204-927-3	129-00-0		0.251	mg/kg		0.188	mg/kg	0.0000188 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.503	mg/kg		0.377	mg/kg	0.0000377 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.34	mg/kg		0.255	mg/kg	0.0000255 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.277	mg/kg		0.207	mg/kg	0.0000207 %	✓	
23	•	indeno[123-cd]pyrene		205-893-2	193-39-5		0.272	mg/kg		0.204	mg/kg	0.0000204 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.186	mg/kg		0.139	mg/kg	0.0000139 %	✓	
25	•	benzo[ghi]perylene		205-883-8	191-24-2		0.247	mg/kg		0.185	mg/kg	0.0000185 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.535	mg/kg		0.401	mg/kg	0.0000401 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.535	mg/kg		0.401	mg/kg	0.0000401 %	✓	
28	•	pH			PH		8.66	pH		8.66	pH	8.66 pH		
29		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
											Total:	0.102 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS6[4m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS6[4m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
4.00 m			
Moisture content:			
21% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 21% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	14.185 mg/kg	0.00142 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<1 mg/kg	1.285	<1.285 mg/kg	<0.0001 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		22 mg/kg	1.252	22.76 mg/kg	0.00228 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		12 mg/kg	1.462	14.495 mg/kg	0.00145 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	125 mg/kg		103.306 mg/kg	0.0103 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		11 mg/kg	1.579	14.359 mg/kg	0.00144 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		59 mg/kg	3.22	157.002 mg/kg	0.0157 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.055 mg/kg		0.0455 mg/kg	0.00000455 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.013 mg/kg		0.0107 mg/kg	0.00000107 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.035	mg/kg		0.0289	mg/kg	0.00000289 %	✓	
15	fluorene		201-695-5	86-73-7		0.077	mg/kg		0.0636	mg/kg	0.00000636 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.363	mg/kg		0.3	mg/kg	0.00003 %	✓	
17	anthracene		204-371-1	120-12-7		0.131	mg/kg		0.108	mg/kg	0.0000108 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.454	mg/kg		0.375	mg/kg	0.0000375 %	✓	
19	pyrene		204-927-3	129-00-0		0.318	mg/kg		0.263	mg/kg	0.0000263 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.298	mg/kg		0.246	mg/kg	0.0000246 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.186	mg/kg		0.154	mg/kg	0.0000154 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.124	mg/kg		0.102	mg/kg	0.0000102 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.077	mg/kg		0.0636	mg/kg	0.00000636 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.04	mg/kg		0.0331	mg/kg	0.00000331 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.079	mg/kg		0.0653	mg/kg	0.00000653 %	✓	
26	coronene		205-881-7	191-07-1		0.04	mg/kg		0.0331	mg/kg	0.00000331 %	✓	
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.218	mg/kg		0.18	mg/kg	0.000018 %	✓	
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.218	mg/kg		0.18	mg/kg	0.000018 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
34	pH			PH		8.04	pH		8.04	pH	8.04 pH		
35	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
36	TPH (C6 to C40) petroleum group			TPH		2	mg/kg		1.653	mg/kg	0.000165 %	✓	
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
38	phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
										Total:	0.0338 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00016%)

Classification of sample: WS7[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS7[1m]
Sample Depth:
1.00 m
Moisture content:
10.9%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	13.096 mg/kg	0.00131 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	2 mg/kg	1.285	2.318 mg/kg	0.00018 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		31 mg/kg	1.252	34.991 mg/kg	0.0035 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17 mg/kg	1.462	22.404 mg/kg	0.00224 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	109 mg/kg		98.287 mg/kg	0.00983 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		45 mg/kg	1.579	64.092 mg/kg	0.00641 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		96 mg/kg	3.22	278.727 mg/kg	0.0279 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
13	acenaphthylene		205-917-1	208-96-8		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene		201-469-6	83-32-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
15	•	fluorene		201-695-5	86-73-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
16	•	phenanthrene		201-581-5	85-01-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
17	•	anthracene		204-371-1	120-12-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
18	•	fluoranthene		205-912-4	206-44-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
19	•	pyrene		204-927-3	129-00-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
21		chrysene	601-048-00-0	205-923-4	218-01-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
23	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
25	•	benzo[ghi]perylene		205-883-8	191-24-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
28	•	pH			PH		8.13	pH		8.13	pH	8.13 pH		
29		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
											Total:	0.0537 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS7[3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS7[3m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
3.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
22.5% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 22.5% Dry Weight Moisture Correction applied (MC)

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		19	mg/kg	1.32	20.479	mg/kg	0.00205 %	✓	
2		cadmium { cadmium sulfide } 048-010-00-4 / 215-147-8 / 1306-23-6	1	1	mg/kg	1.285	1.049	mg/kg	0.0000816 %	✓	
3		copper { copper(II) oxide } 029-016-00-6 / 215-269-1 / 1317-38-0		89	mg/kg	1.252	90.945	mg/kg	0.00909 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		21	mg/kg	1.462	25.055	mg/kg	0.00251 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	739	mg/kg		603.265	mg/kg	0.0603 %	✓	
7		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		16	mg/kg	1.353	17.678	mg/kg	0.00177 %	✓	
8		nickel { nickel dihydroxide } 028-008-00-X / 235-008-5 [1] 234-348-1 [2] / 12054-48-7 [1] 11113-74-9 [2]		47	mg/kg	1.579	60.601	mg/kg	0.00606 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10		zinc { zinc oxide } 030-013-00-7 / 215-222-5 / 1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11		boron { diboron trioxide; boric oxide } 005-008-00-8 / 215-125-8 / 1303-86-2		122	mg/kg	3.22	320.674	mg/kg	0.0321 %	✓	
12		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
13		acenaphthylene 205-917-1 / 208-96-8		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
15	fluorene		201-695-5	86-73-7		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
16	phenanthrene		201-581-5	85-01-8		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
17	anthracene		204-371-1	120-12-7		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
18	fluoranthene		205-912-4	206-44-0		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
19	pyrene		204-927-3	129-00-0		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
21	chrysene	601-048-00-0	205-923-4	218-01-9		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
23	indeno[123-cd]pyrene		205-893-2	193-39-5		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
25	benzo[ghi]perylene		205-883-8	191-24-2		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<1 mg/kg		<1 mg/kg	<0.0001 %		**<LOD**
28	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
29	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
32	pH			PH		7.71 pH		7.71 pH	7.71 pH		
33	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		**<LOD**
34	TPH (C6 to C40) petroleum group			TPH		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
35	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
36	phenol	604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<LOD**
								Total:	0.116 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS7[5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS7[5m]
Sample Depth:
5.00 m
Moisture content:
13.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3	mg/kg	1.32	3.481	mg/kg	0.000348 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.129	mg/kg	0.0000879 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		19	mg/kg	1.252	20.9	mg/kg	0.00209 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		22	mg/kg	1.462	28.255	mg/kg	0.00283 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		**<LOD**
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	24	mg/kg		21.09	mg/kg	0.00211 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		**<LOD**
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		35	mg/kg	1.579	48.579	mg/kg	0.00486 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		**<LOD**
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		**<LOD**
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		70	mg/kg	3.22	198.059	mg/kg	0.0198 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
13	acenaphthylene		205-917-1	208-96-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene		201-469-6	83-32-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
15	•	fluorene		201-695-5	86-73-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
16	•	phenanthrene		201-581-5	85-01-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
17	•	anthracene		204-371-1	120-12-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
18	•	fluoranthene		205-912-4	206-44-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
19	•	pyrene		204-927-3	129-00-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
21		chrysene	601-048-00-0	205-923-4	218-01-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
23	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
25	•	benzo[ghi]perylene		205-883-8	191-24-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
28	•	pH			PH		8.65	pH		8.65	pH	8.65 pH		
29		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
30		phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
											Total:	0.0344 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS8[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS8[2m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
2.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
25.2% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 25.2% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				26	mg/kg	1.32	27.419	mg/kg	0.00274 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		cadmium { cadmium sulfide }			1	1	mg/kg	1.285	1.027	mg/kg	0.0000799 %	✓	
		048-010-00-4	215-147-8	1306-23-6									
3		copper { copper(II) oxide }				544	mg/kg	1.252	543.903	mg/kg	0.0544 %	✓	
		029-016-00-6	215-269-1	1317-38-0									
4		chromium in chromium(III) compounds { chromium(III) oxide }				15	mg/kg	1.462	17.511	mg/kg	0.00175 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	1118	mg/kg		892.971	mg/kg	0.0893 %	✓	
		082-001-00-6											
7		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
8		nickel { nickel dihydroxide }				40	mg/kg	1.579	50.463	mg/kg	0.00505 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
		034-002-00-8											
10		zinc { zinc oxide }				<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
		030-013-00-7	215-222-5	1314-13-2									
11		boron { diboron trioxide; boric oxide }				419	mg/kg	3.22	1077.579	mg/kg	0.108 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
12		naphthalene				0.037	mg/kg		0.0296	mg/kg	0.00000296 %	✓	
		601-052-00-2	202-049-5	91-20-3									
13		acenaphthylene				0.07	mg/kg		0.0559	mg/kg	0.00000559 %	✓	
			205-917-1	208-96-8									

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.034	mg/kg		0.0272	mg/kg	0.00000272 %	✓	
15	fluorene		201-695-5	86-73-7		0.049	mg/kg		0.0391	mg/kg	0.00000391 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.352	mg/kg		0.281	mg/kg	0.0000281 %	✓	
17	anthracene		204-371-1	120-12-7		0.086	mg/kg		0.0687	mg/kg	0.00000687 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.179	mg/kg		0.143	mg/kg	0.0000143 %	✓	
19	pyrene		204-927-3	129-00-0		0.19	mg/kg		0.152	mg/kg	0.0000152 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.191	mg/kg		0.153	mg/kg	0.0000153 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.229	mg/kg		0.183	mg/kg	0.0000183 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.311	mg/kg		0.248	mg/kg	0.0000248 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.297	mg/kg		0.237	mg/kg	0.0000237 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.36	mg/kg		0.288	mg/kg	0.0000288 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.548	mg/kg		0.438	mg/kg	0.0000438 %	✓	
26	coronene		205-881-7	191-07-1		0.198	mg/kg		0.158	mg/kg	0.0000158 %	✓	
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.498	mg/kg		0.398	mg/kg	0.0000398 %	✓	
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.498	mg/kg		0.398	mg/kg	0.0000398 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
34	pH			PH		8.32	pH		8.32	pH	8.32 pH		
35	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		<LOD
36	TPH (C6 to C40) petroleum group			TPH		3.11	mg/kg		2.484	mg/kg	0.000248 %	✓	
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
										Total:	0.262 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00024%)

Classification of sample: WS9[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS9[0.5m]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.50 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:		
20.3% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 20.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.56	mg/kg	0.00176 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.068	mg/kg	0.0000831 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		55	mg/kg	1.252	57.23	mg/kg	0.00572 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		20	mg/kg	1.462	24.299	mg/kg	0.00243 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	236	mg/kg		196.176	mg/kg	0.0196 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		25	mg/kg	1.579	32.824	mg/kg	0.00328 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		116	mg/kg	3.22	310.479	mg/kg	0.031 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.21	mg/kg		0.175	mg/kg	0.0000175 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.106	mg/kg		0.0881	mg/kg	0.00000881 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene		201-469-6	83-32-9		1.23	mg/kg		1.022	mg/kg	0.000102 %	✓	
15	•	fluorene		201-695-5	86-73-7		0.662	mg/kg		0.55	mg/kg	0.000055 %	✓	
16	•	phenanthrene		201-581-5	85-01-8		7.987	mg/kg		6.639	mg/kg	0.000664 %	✓	
17	•	anthracene		204-371-1	120-12-7		1.073	mg/kg		0.892	mg/kg	0.0000892 %	✓	
18	•	fluoranthene		205-912-4	206-44-0		9.923	mg/kg		8.249	mg/kg	0.000825 %	✓	
19	•	pyrene		204-927-3	129-00-0		9.612	mg/kg		7.99	mg/kg	0.000799 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		4.413	mg/kg		3.668	mg/kg	0.000367 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		5.104	mg/kg		4.243	mg/kg	0.000424 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		4.355	mg/kg		3.62	mg/kg	0.000362 %	✓	
23	•	indeno[123-cd]pyrene		205-893-2	193-39-5		2.67	mg/kg		2.219	mg/kg	0.000222 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		2.137	mg/kg		1.776	mg/kg	0.000178 %	✓	
25	•	benzo[ghi]perylene		205-883-8	191-24-2		3.446	mg/kg		2.865	mg/kg	0.000286 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		7.529	mg/kg		6.259	mg/kg	0.000626 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		7.529	mg/kg		6.259	mg/kg	0.000626 %	✓	
28	•	pH			PH		8.04	pH		8.04	pH	8.04 pH		
29		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
											Total:	0.0704 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS9[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS9[1m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
20.5% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 20.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	14.244 mg/kg	0.00142 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	1.067 mg/kg	0.000083 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		77 mg/kg	1.252	79.989 mg/kg	0.008 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		18 mg/kg	1.462	21.832 mg/kg	0.00218 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	243 mg/kg		201.66 mg/kg	0.0202 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1 mg/kg	1.353	1.123 mg/kg	0.000112 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18 mg/kg	1.579	23.594 mg/kg	0.00236 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		115 mg/kg	3.22	307.291 mg/kg	0.0307 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.496 mg/kg		0.412 mg/kg	0.0000412 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.228 mg/kg		0.189 mg/kg	0.0000189 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		2.203	mg/kg		1.828	mg/kg	0.000183 %	✓	
15	●	fluorene		201-695-5	86-73-7		1.621	mg/kg		1.345	mg/kg	0.000135 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		20.568	mg/kg		17.069	mg/kg	0.00171 %	✓	
17	●	anthracene		204-371-1	120-12-7		2.39	mg/kg		1.983	mg/kg	0.000198 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		20.578	mg/kg		17.077	mg/kg	0.00171 %	✓	
19	●	pyrene		204-927-3	129-00-0		18.2	mg/kg		15.104	mg/kg	0.00151 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		8.172	mg/kg		6.782	mg/kg	0.000678 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		8.739	mg/kg		7.252	mg/kg	0.000725 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		7.209	mg/kg		5.983	mg/kg	0.000598 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		4.377	mg/kg		3.632	mg/kg	0.000363 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		3.874	mg/kg		3.215	mg/kg	0.000321 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		5.605	mg/kg		4.651	mg/kg	0.000465 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		12.56	mg/kg		10.423	mg/kg	0.00104 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		12.56	mg/kg		10.423	mg/kg	0.00104 %	✓	
28	●	pH			PH		8.16	pH		8.16	pH	8.16 pH		
29		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		<LOD
											Total:	0.0765 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS11[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
WS11[0.5m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.50 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
8.2% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 8.2% Dry Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
2		toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
3		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
4	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
5	●	TPH (C6 to C40) petroleum group			TPH		396 mg/kg		365.989 mg/kg	0.0366 %	✓	
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
									Total:	0.0366 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Below limit of detection

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0366%)

Classification of sample: WS11[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS11[2m]
Sample Depth:
2.00 m
Moisture content:
23.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		7	mg/kg	1.32	7.465	mg/kg	0.000747 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<1	mg/kg	1.285	<1.285	mg/kg	<0.0001 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		14	mg/kg	1.252	14.156	mg/kg	0.00142 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		11	mg/kg	1.462	12.986	mg/kg	0.0013 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	77	mg/kg		62.197	mg/kg	0.00622 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		9	mg/kg	1.579	11.483	mg/kg	0.00115 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		45	mg/kg	3.22	117.039	mg/kg	0.0117 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.351	mg/kg		0.284	mg/kg	0.0000284 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.206	mg/kg		0.166	mg/kg	0.0000166 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.337 mg/kg		0.272 mg/kg	0.0000272 %	✓	
15	fluorene		201-695-5	86-73-7		0.721 mg/kg		0.582 mg/kg	0.0000582 %	✓	
16	phenanthrene		201-581-5	85-01-8		2.456 mg/kg		1.984 mg/kg	0.000198 %	✓	
17	anthracene		204-371-1	120-12-7		0.65 mg/kg		0.525 mg/kg	0.0000525 %	✓	
18	fluoranthene		205-912-4	206-44-0		2.634 mg/kg		2.128 mg/kg	0.000213 %	✓	
19	pyrene		204-927-3	129-00-0		2.395 mg/kg		1.935 mg/kg	0.000193 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		2.016 mg/kg		1.628 mg/kg	0.000163 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		1.52 mg/kg		1.228 mg/kg	0.000123 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.828 mg/kg		0.669 mg/kg	0.0000669 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.539 mg/kg		0.435 mg/kg	0.0000435 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.363 mg/kg		0.293 mg/kg	0.0000293 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.535 mg/kg		0.432 mg/kg	0.0000432 %	✓	
26	coronene		205-881-7	191-07-1		0.205 mg/kg		0.166 mg/kg	0.0000166 %	✓	
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.538 mg/kg		1.242 mg/kg	0.000124 %	✓	
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.538 mg/kg		1.242 mg/kg	0.000124 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2		0.02 mg/kg		0.0162 mg/kg	0.00000162 %	✓	
30	toluene	601-021-00-3	203-625-9	108-88-3		0.1 mg/kg		0.0808 mg/kg	0.00000808 %	✓	
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.04 mg/kg		0.0323 mg/kg	0.00000323 %	✓	
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		0.17 mg/kg		0.137 mg/kg	0.0000137 %	✓	
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
34	pH			PH		8.67 pH		8.67 pH	8.67 pH		
35	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
36	TPH (C6 to C40) petroleum group			TPH		634 mg/kg		512.116 mg/kg	0.0512 %	✓	
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		0.14 mg/kg		0.113 mg/kg	0.0000113 %	✓	
38	phenol	604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
								Total:	0.0761 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration low.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 1.62e-06%)
toluene: (conc.: 8.08e-06%)
ethylbenzene: (conc.: 0.00001%)
tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (conc.: 0.00001%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 3.23e-06%)
TPH (C6 to C40) petroleum group: (conc.: 0.0512%)

Classification of sample: WS11[3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS11[3m]
Sample Depth:
3.00 m
Moisture content:
10.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.7% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3 mg/kg	1.32	3.578 mg/kg	0.000358 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	2 mg/kg	1.285	2.322 mg/kg	0.000181 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		26 mg/kg	1.252	29.4 mg/kg	0.00294 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		32 mg/kg	1.462	42.249 mg/kg	0.00422 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	25 mg/kg		22.584 mg/kg	0.00226 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		51 mg/kg	1.579	72.768 mg/kg	0.00728 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		105 mg/kg	3.22	305.408 mg/kg	0.0305 %	✓	
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
13	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.02 mg/kg		0.0181 mg/kg	0.00000181 %	✓	
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		0.05 mg/kg		0.0452 mg/kg	0.00000452 %	✓	
16	pH			PH		8.7 pH		8.7 pH	8.7 pH		
17	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
18	TPH (C6 to C40) petroleum group			TPH		31 mg/kg		28.004 mg/kg	0.0028 %	✓	
19	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
								Total:	0.0513 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

ethylbenzene: (conc.: 4.52e-06%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 1.81e-06%)
TPH (C6 to C40) petroleum group: (conc.: 0.0028%)

Classification of sample: WS12[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS12[0.5m]
Sample Depth:
0.50 m
Moisture content:
21.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21.7% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		27 mg/kg	1.32	29.292 mg/kg	0.00293 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	1.056 mg/kg	0.0000822 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		306 mg/kg	1.252	314.744 mg/kg	0.0315 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		22 mg/kg	1.462	26.421 mg/kg	0.00264 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	481 mg/kg		395.234 mg/kg	0.0395 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		60 mg/kg	1.579	77.872 mg/kg	0.00779 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		233 mg/kg	3.22	616.46 mg/kg	0.0616 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.056 mg/kg		0.046 mg/kg	0.0000046 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.08 mg/kg		0.0657 mg/kg	0.00000657 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.068	mg/kg		0.0559	mg/kg	0.00000559 %	✓	
15	fluorene		201-695-5	86-73-7		0.062	mg/kg		0.0509	mg/kg	0.00000509 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.02	mg/kg		0.0164	mg/kg	0.00000164 %	✓	
17	anthracene		204-371-1	120-12-7		0.149	mg/kg		0.122	mg/kg	0.0000122 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.505	mg/kg		0.415	mg/kg	0.0000415 %	✓	
19	pyrene		204-927-3	129-00-0		0.36	mg/kg		0.296	mg/kg	0.0000296 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.457	mg/kg		0.376	mg/kg	0.0000376 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.604	mg/kg		0.496	mg/kg	0.0000496 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.544	mg/kg		0.447	mg/kg	0.0000447 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.387	mg/kg		0.318	mg/kg	0.0000318 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.317	mg/kg		0.26	mg/kg	0.000026 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.537	mg/kg		0.441	mg/kg	0.0000441 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.007	mg/kg		0.827	mg/kg	0.0000827 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.007	mg/kg		0.827	mg/kg	0.0000827 %	✓	
28	pH			PH		8.21	pH		8.21	pH	8.21 pH		
29	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
										Total:	0.147 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS12[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS12[1m]
Sample Depth:
1.00 m
Moisture content:
14%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		27	mg/kg	1.32	31.271	mg/kg	0.00313 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.127	mg/kg	0.0000877 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		610	mg/kg	1.252	669.81	mg/kg	0.067 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		19	mg/kg	1.462	24.359	mg/kg	0.00244 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	937	mg/kg		821.93	mg/kg	0.0822 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		38	mg/kg	1.579	52.65	mg/kg	0.00526 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		228	mg/kg	3.22	643.976	mg/kg	0.0644 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.047	mg/kg		0.0412	mg/kg	0.00000412 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.026	mg/kg		0.0228	mg/kg	0.00000228 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.083	mg/kg		0.0728	mg/kg	0.00000728 %	✓	
15	fluorene		201-695-5	86-73-7		0.041	mg/kg		0.036	mg/kg	0.0000036 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.503	mg/kg		0.441	mg/kg	0.0000441 %	✓	
17	anthracene		204-371-1	120-12-7		0.141	mg/kg		0.124	mg/kg	0.0000124 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.566	mg/kg		0.496	mg/kg	0.0000496 %	✓	
19	pyrene		204-927-3	129-00-0		0.52	mg/kg		0.456	mg/kg	0.0000456 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.537	mg/kg		0.471	mg/kg	0.0000471 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.555	mg/kg		0.487	mg/kg	0.0000487 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.385	mg/kg		0.338	mg/kg	0.0000338 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.179	mg/kg		0.157	mg/kg	0.0000157 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.116	mg/kg		0.102	mg/kg	0.0000102 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.218	mg/kg		0.191	mg/kg	0.0000191 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.537	mg/kg		0.471	mg/kg	0.0000471 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.537	mg/kg		0.471	mg/kg	0.0000471 %	✓	
28	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
29	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
32	pH			PH		8.01	pH		8.01	pH	8.01 pH		
33	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
34	TPH (C6 to C40) petroleum group			TPH		4.02	mg/kg		3.526	mg/kg	0.000353 %	✓	
35	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
										Total:	0.226 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00035%)

Classification of sample: BH1[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH1[2m]
Sample Depth:
2.00 m
Moisture content:
33.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 33.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	10.895 mg/kg	0.00109 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.5 mg/kg	1.285	<0.643 mg/kg	<0.00005 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		28 mg/kg	1.252	26.294 mg/kg	0.00263 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		10 mg/kg	1.462	10.964 mg/kg	0.0011 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	362 mg/kg		271.568 mg/kg	0.0272 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		14 mg/kg	1.579	16.589 mg/kg	0.00166 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		62 mg/kg	3.22	149.762 mg/kg	0.015 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.075 mg/kg		0.0563 mg/kg	0.00000563 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.019 mg/kg		0.0143 mg/kg	0.00000143 %	✓	

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene 201-469-6 / 83-32-9		0.066 mg/kg		0.0495 mg/kg	0.00000495 %	✓	
15	●	fluorene 201-695-5 / 86-73-7		0.105 mg/kg		0.0788 mg/kg	0.00000788 %	✓	
16	●	phenanthrene 201-581-5 / 85-01-8		0.559 mg/kg		0.419 mg/kg	0.0000419 %	✓	
17	●	anthracene 204-371-1 / 120-12-7		0.179 mg/kg		0.134 mg/kg	0.0000134 %	✓	
18	●	fluoranthene 205-912-4 / 206-44-0		0.393 mg/kg		0.295 mg/kg	0.0000295 %	✓	
19	●	pyrene 204-927-3 / 129-00-0		0.298 mg/kg		0.224 mg/kg	0.0000224 %	✓	
20		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		0.179 mg/kg		0.134 mg/kg	0.0000134 %	✓	
21		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		0.147 mg/kg		0.11 mg/kg	0.000011 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		0.135 mg/kg		0.101 mg/kg	0.0000101 %	✓	
23	●	indeno[123-cd]pyrene 205-893-2 / 193-39-5		0.061 mg/kg		0.0458 mg/kg	0.00000458 %	✓	
24		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		0.051 mg/kg		0.0383 mg/kg	0.00000383 %	✓	
25	●	benzo[ghi]perylene 205-883-8 / 191-24-2		0.095 mg/kg		0.0713 mg/kg	0.00000713 %	✓	
26		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		0.181 mg/kg		0.136 mg/kg	0.0000136 %	✓	
27		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		0.181 mg/kg		0.136 mg/kg	0.0000136 %	✓	
28	●	pH PH		8.63 pH		8.63 pH	8.63 pH		
29		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5		<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
						Total:	0.0494 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH3[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH3[2m]
Sample Depth:
2.0 m
Moisture content:
23.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8 mg/kg	1.32	8.553 mg/kg	0.000855 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.5 mg/kg	1.285	<0.643 mg/kg	<0.00005 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		7 mg/kg	1.252	7.095 mg/kg	0.00071 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		16 mg/kg	1.462	18.935 mg/kg	0.00189 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	30 mg/kg		24.291 mg/kg	0.00243 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		16 mg/kg	1.579	20.463 mg/kg	0.00205 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		59 mg/kg	3.22	153.824 mg/kg	0.0154 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
13	acenaphthylene		205-917-1	208-96-8		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene		201-469-6	83-32-9		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
15	•	fluorene		201-695-5	86-73-7		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
16	•	phenanthrene		201-581-5	85-01-8		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
17	•	anthracene		204-371-1	120-12-7		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
18	•	fluoranthene		205-912-4	206-44-0		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
19	•	pyrene		204-927-3	129-00-0		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
21		chrysene	601-048-00-0	205-923-4	218-01-9		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
23	•	indeno[123-cd]pyrene		205-893-2	193-39-5		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
25	•	benzo[ghi]perylene		205-883-8	191-24-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
28		benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29		toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	•	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	•	pH			PH		8.93 pH		8.93 pH	8.93 pH		
33		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
34	•	TPH (C6 to C40) petroleum group			TPH		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
35		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
									Total:	0.0255 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH3[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH3[0.5m]
Sample Depth:
0.50 m
Moisture content:
24.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 24.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		30 mg/kg	1.32	31.866 mg/kg	0.00319 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.5 mg/kg	1.285	<0.643 mg/kg	<0.00005 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		91 mg/kg	1.252	91.643 mg/kg	0.00916 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		16 mg/kg	1.462	18.813 mg/kg	0.00188 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	466 mg/kg		374.899 mg/kg	0.0375 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		46 mg/kg	1.579	58.453 mg/kg	0.00585 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		98 mg/kg	3.22	253.86 mg/kg	0.0254 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.077 mg/kg		0.0619 mg/kg	0.00000619 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.065 mg/kg		0.0523 mg/kg	0.00000523 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		0.038	mg/kg		0.0306	mg/kg	0.00000306 %	✓	
15	●	fluorene		201-695-5	86-73-7		0.045	mg/kg		0.0362	mg/kg	0.00000362 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		0.618	mg/kg		0.497	mg/kg	0.0000497 %	✓	
17	●	anthracene		204-371-1	120-12-7		0.251	mg/kg		0.202	mg/kg	0.0000202 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		0.76	mg/kg		0.611	mg/kg	0.0000611 %	✓	
19	●	pyrene		204-927-3	129-00-0		0.764	mg/kg		0.615	mg/kg	0.0000615 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.247	mg/kg		0.199	mg/kg	0.0000199 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.624	mg/kg		0.502	mg/kg	0.0000502 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.46	mg/kg		0.37	mg/kg	0.000037 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		0.381	mg/kg		0.307	mg/kg	0.0000307 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.398	mg/kg		0.32	mg/kg	0.000032 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		0.701	mg/kg		0.564	mg/kg	0.0000564 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.937	mg/kg		0.754	mg/kg	0.0000754 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.937	mg/kg		0.754	mg/kg	0.0000754 %	✓	
28	●	pH			PH		8.98	pH		8.98	pH	8.98 pH		
29		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
											Total:	0.0841 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH3[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
BH3[1m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
24.4% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 24.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		naphthalene	601-052-00-2	202-049-5	91-20-3		0.007 mg/kg		0.0056 mg/kg	0.000000563 %	✓	
2	•	acenaphthylene		205-917-1	208-96-8		0.003 mg/kg		0.0024 mg/kg	0.000000241 %	✓	
3	•	acenaphthene		201-469-6	83-32-9		0.019 mg/kg		0.0153 mg/kg	0.00000153 %	✓	
4	•	fluorene		201-695-5	86-73-7		0.002 mg/kg		0.0016 mg/kg	0.000000161 %	✓	
5	•	phenanthrene		201-581-5	85-01-8		0.052 mg/kg		0.0418 mg/kg	0.00000418 %	✓	
6	•	anthracene		204-371-1	120-12-7		0.012 mg/kg		0.0096 mg/kg	0.000000965 %	✓	
7	•	fluoranthene		205-912-4	206-44-0		0.032 mg/kg		0.0257 mg/kg	0.00000257 %	✓	
8	•	pyrene		204-927-3	129-00-0		0.027 mg/kg		0.0217 mg/kg	0.00000217 %	✓	
9		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.032 mg/kg		0.0257 mg/kg	0.00000257 %	✓	
10		chrysene	601-048-00-0	205-923-4	218-01-9		0.036 mg/kg		0.0289 mg/kg	0.00000289 %	✓	
11		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.007 mg/kg		0.0056 mg/kg	0.000000563 %	✓	
12	•	indeno[123-cd]pyrene		205-893-2	193-39-5		0.014 mg/kg		0.0113 mg/kg	0.00000113 %	✓	
13		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.006 mg/kg		0.0048 mg/kg	0.000000482 %	✓	
14	•	benzo[ghi]perylene		205-883-8	191-24-2		0.022 mg/kg		0.0177 mg/kg	0.00000177 %	✓	
15	•	coronene		205-881-7	191-07-1		0.008 mg/kg		0.0064 mg/kg	0.000000643 %	✓	
16		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.036 mg/kg		0.0289 mg/kg	0.00000289 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.036	mg/kg		0.0289	mg/kg	0.00000289 %	✓	
18		benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
19		toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
20		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
21	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
22	●	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
23	●	TPH (C6 to C40) petroleum group			TPH		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
											Total:	0.00004 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Below limit of detection

Classification of sample: BH4[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
BH4[1m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.00 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
9.5% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9.5% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				26	mg/kg	1.32	31.35	mg/kg	0.00314 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		cadmium { cadmium sulfide }			1	1	mg/kg	1.285	1.174	mg/kg	0.0000913 %	✓	
		048-010-00-4	215-147-8	1306-23-6									
3		copper { copper(II) oxide }				237	mg/kg	1.252	270.932	mg/kg	0.0271 %	✓	
		029-016-00-6	215-269-1	1317-38-0									
4		chromium in chromium(III) compounds { chromium(III) oxide }				28	mg/kg	1.462	37.373	mg/kg	0.00374 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		**<LOD**
		024-001-00-0	215-607-8	1333-82-0									
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	392	mg/kg		357.991	mg/kg	0.0358 %	✓	
		082-001-00-6											
7		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		**<LOD**
		080-010-00-X	231-299-8	7487-94-7									
8		nickel { nickel dihydroxide }				40	mg/kg	1.579	57.699	mg/kg	0.00577 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
		034-002-00-8											
10		zinc { zinc oxide }				<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		**<LOD**
		030-013-00-7	215-222-5	1314-13-2									
11		boron { diboron trioxide; boric oxide }				153	mg/kg	3.22	449.901	mg/kg	0.045 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
12		naphthalene				0.072	mg/kg		0.0658	mg/kg	0.00000658 %	✓	
		601-052-00-2	202-049-5	91-20-3									
13		acenaphthylene				0.101	mg/kg		0.0922	mg/kg	0.00000922 %	✓	
			205-917-1	208-96-8									

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		0.054	mg/kg		0.0493	mg/kg	0.00000493 %	✓	
15	●	fluorene		201-695-5	86-73-7		0.068	mg/kg		0.0621	mg/kg	0.00000621 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		1.062	mg/kg		0.97	mg/kg	0.000097 %	✓	
17	●	anthracene		204-371-1	120-12-7		0.26	mg/kg		0.237	mg/kg	0.0000237 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		1.407	mg/kg		1.285	mg/kg	0.000128 %	✓	
19	●	pyrene		204-927-3	129-00-0		1.379	mg/kg		1.259	mg/kg	0.000126 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.86	mg/kg		0.785	mg/kg	0.0000785 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.932	mg/kg		0.851	mg/kg	0.0000851 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.039	mg/kg		0.949	mg/kg	0.0000949 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		0.896	mg/kg		0.818	mg/kg	0.0000818 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.678	mg/kg		0.619	mg/kg	0.0000619 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		1.117	mg/kg		1.02	mg/kg	0.000102 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.808	mg/kg		1.651	mg/kg	0.000165 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.808	mg/kg		1.651	mg/kg	0.000165 %	✓	
28	●	pH			PH		8.49	pH		8.49	pH	8.49 pH		
29		cyanides { ● salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		<LOD
											Total:	0.123 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH4[5-5.3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
BH4[5-5.3m]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
5.0-5.3 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	23.766	mg/kg	0.00238 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.285	mg/kg	0.0001 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		270	mg/kg	1.252	337.98	mg/kg	0.0338 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		14	mg/kg	1.462	20.462	mg/kg	0.00205 %	✓	
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	430	mg/kg		430	mg/kg	0.043 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.5	mg/kg	1.353	2.03	mg/kg	0.000203 %	✓	
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		29	mg/kg	1.579	45.805	mg/kg	0.00458 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<3	mg/kg	2.554	<7.661	mg/kg	<0.000766 %		**<LOD**
9	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		**<LOD**
10	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		260	mg/kg	3.22	837.168	mg/kg	0.0837 %	✓	
										Total:	0.171 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH4[6-6.3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH4[6-6.3m]
Sample Depth:
6.0-6.3 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand / CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		22	mg/kg	1.32	29.047	mg/kg	0.0029 %	✓	
2	cadmium { cadmium sulfide } 048-010-00-4 / 215-147-8 / 1306-23-6	1	1	mg/kg	1.285	1.285	mg/kg	0.0001 %	✓	
3	copper { copper(II) oxide } 029-016-00-6 / 215-269-1 / 1317-38-0		250	mg/kg	1.252	312.944	mg/kg	0.0313 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %	✓	
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	480	mg/kg		480	mg/kg	0.048 %	✓	
6	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		2.1	mg/kg	1.353	2.842	mg/kg	0.000284 %	✓	
7	nickel { nickel dihydroxide } 028-008-00-X / 235-008-5 [1] 234-348-1 [2] / 12054-48-7 [1] 11113-74-9 [2]		40	mg/kg	1.579	63.18	mg/kg	0.00632 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<3	mg/kg	2.554	<7.661	mg/kg	<0.000766 %		<LOD
9	zinc { zinc oxide } 030-013-00-7 / 215-222-5 / 1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
10	boron { diboron trioxide; boric oxide } 005-008-00-8 / 215-125-8 / 1303-86-2		240	mg/kg	3.22	772.771	mg/kg	0.0773 %	✓	
							Total:	0.17 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH4[7.2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH4[7.2m]
Sample Depth:
7.20 m
Moisture content:
40.9%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 40.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	15.93	mg/kg	0.00159 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	0.912	mg/kg	0.000071 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		42	mg/kg	1.252	37.313	mg/kg	0.00373 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		16	mg/kg	1.462	16.597	mg/kg	0.00166 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	222	mg/kg		157.559	mg/kg	0.0158 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		26	mg/kg	1.579	29.146	mg/kg	0.00291 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		95	mg/kg	3.22	217.096	mg/kg	0.0217 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.039	mg/kg		0.0277	mg/kg	0.00000277 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.009	mg/kg		0.0063	mg/kg	0.000000639 %	✓	

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	•	acenaphthene 201-469-6 / 83-32-9		0.027	mg/kg		0.0192	mg/kg	0.00000192 %	✓	
15	•	fluorene 201-695-5 / 86-73-7		0.025	mg/kg		0.0177	mg/kg	0.00000177 %	✓	
16	•	phenanthrene 201-581-5 / 85-01-8		0.34	mg/kg		0.241	mg/kg	0.0000241 %	✓	
17	•	anthracene 204-371-1 / 120-12-7		0.033	mg/kg		0.0234	mg/kg	0.00000234 %	✓	
18	•	fluoranthene 205-912-4 / 206-44-0		0.113	mg/kg		0.0802	mg/kg	0.00000802 %	✓	
19	•	pyrene 204-927-3 / 129-00-0		0.092	mg/kg		0.0653	mg/kg	0.00000653 %	✓	
20		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		0.117	mg/kg		0.083	mg/kg	0.0000083 %	✓	
21		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		0.171	mg/kg		0.121	mg/kg	0.0000121 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		0.078	mg/kg		0.0554	mg/kg	0.00000554 %	✓	
23	•	indeno[123-cd]pyrene 205-893-2 / 193-39-5		0.071	mg/kg		0.0504	mg/kg	0.00000504 %	✓	
24		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		0.086	mg/kg		0.061	mg/kg	0.0000061 %	✓	
25	•	benzo[ghi]perylene 205-883-8 / 191-24-2		0.137	mg/kg		0.0972	mg/kg	0.00000972 %	✓	
26		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		0.193	mg/kg		0.137	mg/kg	0.0000137 %	✓	
27		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		0.193	mg/kg		0.137	mg/kg	0.0000137 %	✓	
28	•	pH PH		7.84	pH		7.84	pH	7.84 pH		
29		cyanides { • salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5		<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		<LOD
								Total:	0.0483 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH5[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH5[2m]
Sample Depth:
2.00 m
Moisture content:
23.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15	mg/kg	1.32	16.075	mg/kg	0.00161 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.5	mg/kg	1.285	<0.643	mg/kg	<0.00005 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		145	mg/kg	1.252	147.328	mg/kg	0.0147 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30	mg/kg	1.462	35.59	mg/kg	0.00356 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	602	mg/kg		488.636	mg/kg	0.0489 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		29	mg/kg	1.579	37.18	mg/kg	0.00372 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		103	mg/kg	3.22	269.194	mg/kg	0.0269 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.074	mg/kg		0.0601	mg/kg	0.00000601 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.044	mg/kg		0.0357	mg/kg	0.00000357 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	●	acenaphthene		201-469-6	83-32-9		0.03	mg/kg		0.0244	mg/kg	0.00000244 %	✓	
15	●	fluorene		201-695-5	86-73-7		0.021	mg/kg		0.017	mg/kg	0.0000017 %	✓	
16	●	phenanthrene		201-581-5	85-01-8		0.49	mg/kg		0.398	mg/kg	0.0000398 %	✓	
17	●	anthracene		204-371-1	120-12-7		0.19	mg/kg		0.154	mg/kg	0.0000154 %	✓	
18	●	fluoranthene		205-912-4	206-44-0		0.879	mg/kg		0.713	mg/kg	0.0000713 %	✓	
19	●	pyrene		204-927-3	129-00-0		0.941	mg/kg		0.764	mg/kg	0.0000764 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.257	mg/kg		1.02	mg/kg	0.000102 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9		0.826	mg/kg		0.67	mg/kg	0.000067 %	✓	
22		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.816	mg/kg		0.662	mg/kg	0.0000662 %	✓	
23	●	indeno[123-cd]pyrene		205-893-2	193-39-5		0.501	mg/kg		0.407	mg/kg	0.0000407 %	✓	
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.348	mg/kg		0.282	mg/kg	0.0000282 %	✓	
25	●	benzo[ghi]perylene		205-883-8	191-24-2		0.678	mg/kg		0.55	mg/kg	0.000055 %	✓	
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.417	mg/kg		1.15	mg/kg	0.000115 %	✓	
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.417	mg/kg		1.15	mg/kg	0.000115 %	✓	
28		benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
29		toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
30		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
31	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	●	pH			PH		8.13	pH		8.13	pH	8.13 pH		
33	●	TPH (C6 to C40) petroleum group			TPH		7.6	mg/kg		6.169	mg/kg	0.000617 %	✓	
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35		phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
											Total:	0.101 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free draining liquid phase present, concentration very low.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00061%)

Classification of sample: BH6[1m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH6[1m]
Sample Depth:
1.00 m
Moisture content:
15%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	17.222 mg/kg	0.00172 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	1.118 mg/kg	0.000087 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		42 mg/kg	1.252	45.717 mg/kg	0.00457 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		15 mg/kg	1.462	19.064 mg/kg	0.00191 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	439 mg/kg		381.739 mg/kg	0.0382 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18 mg/kg	1.579	24.723 mg/kg	0.00247 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		91 mg/kg	3.22	254.79 mg/kg	0.0255 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.108 mg/kg		0.0939 mg/kg	0.00000939 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.201 mg/kg		0.175 mg/kg	0.0000175 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.079	mg/kg		0.0687	mg/kg	0.00000687 %	✓	
15	fluorene		201-695-5	86-73-7		0.118	mg/kg		0.103	mg/kg	0.0000103 %	✓	
16	phenanthrene		201-581-5	85-01-8		1.969	mg/kg		1.712	mg/kg	0.000171 %	✓	
17	anthracene		204-371-1	120-12-7		0.699	mg/kg		0.608	mg/kg	0.0000608 %	✓	
18	fluoranthene		205-912-4	206-44-0		3.233	mg/kg		2.811	mg/kg	0.000281 %	✓	
19	pyrene		204-927-3	129-00-0		2.372	mg/kg		2.063	mg/kg	0.000206 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		3.324	mg/kg		2.89	mg/kg	0.000289 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		1.387	mg/kg		1.206	mg/kg	0.000121 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.366	mg/kg		1.188	mg/kg	0.000119 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.781	mg/kg		0.679	mg/kg	0.0000679 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.455	mg/kg		0.396	mg/kg	0.0000396 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.857	mg/kg		0.745	mg/kg	0.0000745 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.963	mg/kg		1.707	mg/kg	0.000171 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.963	mg/kg		1.707	mg/kg	0.000171 %	✓	
28	pH			PH		8.45	pH		8.45	pH	8.45 pH		
29	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
										Total:	0.077 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH6[2m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH6[2m]
Sample Depth:
2.00 m
Moisture content:
27.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 27.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		27 mg/kg	1.32	28.026 mg/kg	0.0028 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	1.01 mg/kg	0.0000786 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		99 mg/kg	1.252	97.426 mg/kg	0.00974 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		20 mg/kg	1.462	22.98 mg/kg	0.0023 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1 mg/kg	1.923	<0.192 mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	1187 mg/kg		933.176 mg/kg	0.0933 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		5 mg/kg	1.353	5.32 mg/kg	0.000532 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		35 mg/kg	1.579	43.461 mg/kg	0.00435 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1 mg/kg	1.245	<1.245 mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		139 mg/kg	3.22	351.858 mg/kg	0.0352 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		5.377 mg/kg		4.227 mg/kg	0.000423 %	✓	
13	acenaphthylene		205-917-1	208-96-8		2.351 mg/kg		1.848 mg/kg	0.000185 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.994	mg/kg		0.781	mg/kg	0.0000781 %	✓	
15	fluorene		201-695-5	86-73-7		3.38	mg/kg		2.657	mg/kg	0.000266 %	✓	
16	phenanthrene		201-581-5	85-01-8		27.765	mg/kg		21.828	mg/kg	0.00218 %	✓	
17	anthracene		204-371-1	120-12-7		10.691	mg/kg		8.405	mg/kg	0.00084 %	✓	
18	fluoranthene		205-912-4	206-44-0		34.308	mg/kg		26.972	mg/kg	0.0027 %	✓	
19	pyrene		204-927-3	129-00-0		28.495	mg/kg		22.402	mg/kg	0.00224 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		21.106	mg/kg		16.593	mg/kg	0.00166 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		16.33	mg/kg		12.838	mg/kg	0.00128 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		16.122	mg/kg		12.675	mg/kg	0.00127 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		10.079	mg/kg		7.924	mg/kg	0.000792 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		10.344	mg/kg		8.132	mg/kg	0.000813 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		10.027	mg/kg		7.883	mg/kg	0.000788 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		28.064	mg/kg		22.063	mg/kg	0.00221 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		28.064	mg/kg		22.063	mg/kg	0.00221 %	✓	
28	pH			PH		8.38	pH		8.38	pH	8.38 pH		
29	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2.5	mg/kg	1.884	<4.71	mg/kg	<0.000471 %		**<LOD**
										Total:	0.169 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
(icon)	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH7[0.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH7[0.5m]
Sample Depth:
0.5 m
Moisture content:
3.9%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 3.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		27	mg/kg	1.32	34.311	mg/kg	0.00343 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<1	mg/kg	1.285	<1.285	mg/kg	<0.0001 %		<LOD
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		29	mg/kg	1.252	34.939	mg/kg	0.00349 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		23	mg/kg	1.462	32.354	mg/kg	0.00324 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	183	mg/kg		176.131	mg/kg	0.0176 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		16	mg/kg	1.579	24.323	mg/kg	0.00243 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		118	mg/kg	3.22	365.684	mg/kg	0.0366 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.002	mg/kg		0.0019	mg/kg	0.000000192 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.004	mg/kg		0.0038	mg/kg	0.000000385 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		0.016	mg/kg		0.0154	mg/kg	0.00000154 %	✓	
15	fluorene		201-695-5	86-73-7		0.001	mg/kg		0.0009	mg/kg	0.000000096 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.005	mg/kg		0.0048	mg/kg	0.000000481 %	✓	
17	anthracene		204-371-1	120-12-7		0.002	mg/kg		0.0019	mg/kg	0.000000192 %	✓	
18	fluoranthene		205-912-4	206-44-0		0.078	mg/kg		0.0751	mg/kg	0.00000751 %	✓	
19	pyrene		204-927-3	129-00-0		0.153	mg/kg		0.147	mg/kg	0.0000147 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08	mg/kg		0.077	mg/kg	0.0000077 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9		0.061	mg/kg		0.0587	mg/kg	0.00000587 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.047	mg/kg		0.0452	mg/kg	0.00000452 %	✓	
23	indeno[123-cd]pyrene		205-893-2	193-39-5		0.058	mg/kg		0.0558	mg/kg	0.00000558 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.021	mg/kg		0.0202	mg/kg	0.00000202 %	✓	
25	benzo[ghi]perylene		205-883-8	191-24-2		0.062	mg/kg		0.0597	mg/kg	0.00000597 %	✓	
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.085	mg/kg		0.0818	mg/kg	0.00000818 %	✓	
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.085	mg/kg		0.0818	mg/kg	0.00000818 %	✓	
28	pH			PH		9.21	pH		9.21	pH	9.21 pH		
29	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
30	phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
										Total:	0.0677 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH7[3m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
BH7[3m]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
3 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:			
17.8% (dry weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 17.8% Dry Weight Moisture Correction applied (MC)

#		Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		benzene 601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
2		toluene 601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
3		xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
4	●	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
5	●	TPH (C6 to C40) petroleum group		TPH		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
										Total:	0.00001 %		

Key

(yellow)	User supplied data
(grey)	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Below limit of detection

Classification of sample: BH7[6.5m]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
BH7[6.5m]
Sample Depth:
6.50 m
Moisture content:
7.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8	mg/kg	1.32	9.798	mg/kg	0.00098 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1	mg/kg	1.285	1.192	mg/kg	0.0000928 %	✓	
3	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		18	mg/kg	1.252	20.902	mg/kg	0.00209 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17	mg/kg	1.462	23.049	mg/kg	0.0023 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.1	mg/kg	1.923	<0.192	mg/kg	<0.0000192 %		<LOD
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	22	mg/kg		20.408	mg/kg	0.00204 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		28	mg/kg	1.579	41.026	mg/kg	0.0041 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		<1	mg/kg	1.245	<1.245	mg/kg	<0.000124 %		<LOD
11	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		72	mg/kg	3.22	215.057	mg/kg	0.0215 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
13	acenaphthylene		205-917-1	208-96-8		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14	acenaphthene		201-469-6	83-32-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
15	fluorene		201-695-5	86-73-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
16	phenanthrene		201-581-5	85-01-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
17	anthracene		204-371-1	120-12-7		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
18	fluoranthene		205-912-4	206-44-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
19	pyrene		204-927-3	129-00-0		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
21	chrysene	601-048-00-0	205-923-4	218-01-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
23	indeno[123-cd]pyrene		205-893-2	193-39-5		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
25	benzo[ghi]perylene		205-883-8	191-24-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
26	coronene		205-881-7	191-07-1		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
27	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
28	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
29	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
30	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
32	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
33	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
34	pH			PH		8.67	pH		8.67	pH	8.67 pH		
35	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		**<LOD**
36	phenol	604-001-00-2	203-632-7	108-95-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<LOD**
										Total:	0.0355 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 1; Carcinogenic to humans; Lead REACH Consortium considers some lead compounds Carcinogenic category 1A
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2 H371

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s)/Risk Phrase(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on Hazard Statement.

cadmium {cadmium sulfide}

Worst case species based on Hazard Statements.

copper {copper(II) oxide}

Reasonable

chromium in chromium(III) compounds {chromium(III) oxide}

oxide conversion factor included

chromium in chromium(VI) compounds {chromium(VI) oxide}

most conservative

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Hexavalent Chromium not detected above Limit of detection, Chromium present as Chromium 3+

mercury {mercury dichloride}

Worst case species based on Hazard Statements.

nickel {nickel dihydroxide}

Worst case species based on Hazard Statements.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on Hazard Statements.

zinc {zinc oxide}

Concentrations of chromium VI insufficient for zinc chormate to be present.

boron {diboron trioxide; boric oxide}

Reasonable

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2018.306.3704.7580 (03 Nov 2018)
HazWasteOnline Database: 2018.306.3704.7580 (03 Nov 2018)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7
Ireland

T | +353 (0)1 8682000
F | +353 (0)1 8682100
W | www.ocsc.ie

Dublin | London | Abu Dhabi | Belfast | Cork | Galway | Glasgow | Libya | Poland | Romania | Russia