Environmental Assessment (Northern Area) Broadwater Road Site, Welwyn Garden City, AL8 6UN, UK

On behalf of:
Wheat Quarter Limited

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Earth & Marine Environmental Consultants Limited
7th Floor, West One,
Forth Banks, Newcastle Upon Tyne,
NE1 3PA, UK

enquiry@eame.co.uk
www.eame.co.uk

United Kingdom | Romania | Iraq | Kurdistan Region of Iraq | Guyana

Earth & Marine Environmental Consultants Limited is a company registered in England and Wales.
Registered number: 7256990. Registered office: Fron Fawr Farm, Llanfairtalhaiarn, Abergele, Clwyd, Wales, LL22 8DJ, UK

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1 Introduction

1.1 Background

Earth & Marine Environmental Consultants Ltd ("EAME") was commissioned by Wheat Quarter Limited ("the Client") to undertake an environmental assessment in relation to a parcel of land located at Broadwater Road, Welwyn Garden City, AL8 6UN, UK ("the Site") (*Figure 1.1*). It is understood that the Client is planning to redevelop the site as a mixed development with residential properties (without gardens), office, retail, and leisure elements ("Proposed Development"). This report relates solely to the northern area of the development (*Figure 1-1*). A separate report will deal with the southern area, which has a different site history and contamination status to the northern site.

Figure 1-1: *Proposed Development Area*

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2 Phase I Environmental Assessment

2.1 Introduction

The site has been the subject of several Phase I Environmental Assessments since 1998, namely:

- Feb-1998 – Phase I Environmental Assessment (Ref. R2109) for Williams PLC by Dames and Moore (*Report not available*).
- July-2006 – Combined Phase I/II Environmental Assessment Cereal Partners (UK) Broadwater Road, Welwyn Garden City (Ref. 05-3046.01) for Cereal Partners (UK) by Delta-Simons (*Report available*).
- Jan-2015 – Phase I Environmental Assessment, Former Shredded Wheat Factory, Broadwater Road, Welwyn Garden City (Ref. 2342.17 V2) for Spen Hill Developments Ltd by Delta-Simons (*Report available*).

This Chapter outlines a summary of the current environmental conditions, where possible referring to previous Phase I Environmental Assessments (outlined above), as well as incorporating recent changes and updates associated with EAME's recent works at the site. Welwyn and Hatfield Borough Council has already formally accepted the Delta-Simons Phase I Environmental Assessment (Ref. 2342.17 V2) in relation to planning application reference N6/2015/0294/PP.

2.2 Site Location and Setting

The site is split into two distinct areas via a public road (Hydeway). As these are two distinct land parcels they are described separately and will be dealt with separately in terms of investigation and remedial activities. The broad distinction in contamination terms being that the northern site has had a relatively benign development history, whereas the southern site has a known contaminative history.

2.2.1 Northern Site

The northern site is approximately 5.3 ha and is accessed via Hydeway off Broadwater Road (A1000). The Site is located centrally within the town of Welwyn Garden City at National Grid Reference (NGR) TL 24199 12957 (51.801470, -0.20019472). The land is relatively flat and lies at an elevation of between 84 and 85 metres above ordnance datum (AOD). The site was (prior to partial demolition) 95% covered with buildings. Most of these buildings, apart from those with Grade II listing, have been demolished as part of the Proposed Development.

The following current uses were identified surrounding the northern Site:

- **NORTH** – Bridge Road beyond which is a large-scale retail park.
- **EAST** – Broadwater Road (A1000) beyond which are commercial premises and offices.
- **SOUTH** – Hydeway beyond which is the southern Site.
- **WEST** – Railway lines (East Coast Mainline) associated with Welwyn Garden City station beyond which is the Howard Centre (2-storey mall with high-street fashion shops and department stores).

2.2.2 Southern Site

The southern site is approximately 3.6 ha in area and is also accessed via Hydeway off Broadwater Road (A1000) (*Figure 2-1*). The site is located centrally within the town of Welwyn Garden City at National Grid Reference (NGR) TL 24134 12739 (51.799529, -0.20121127). The site is relatively flat and lies at an elevation of between 84 and 85 metres above ordnance datum (AOD). The Site has been cleared of all above ground structures.

The following current uses were identified surrounding the southern Site:

- **NORTH** – Hydeway beyond which is the northern Site.
- **EAST** – Broadwater Road (A1000) beyond which are commercial premises and offices.
- **SOUTH** – Disused Roche Products facility (buildings Grade II listed) and multiple residential blocks.
- **WEST** – P.W Gates Distribution Ltd warehouse (southern hub) beyond which are railway lines (East Coast Mainline) associated with Welwyn Garden City station and car parking.

The site is located within the jurisdiction of Hertfordshire County Council and Welwyn Hatfield Council (district council).

The remainder of this report will solely discuss the environmental aspects associated with the northern site.

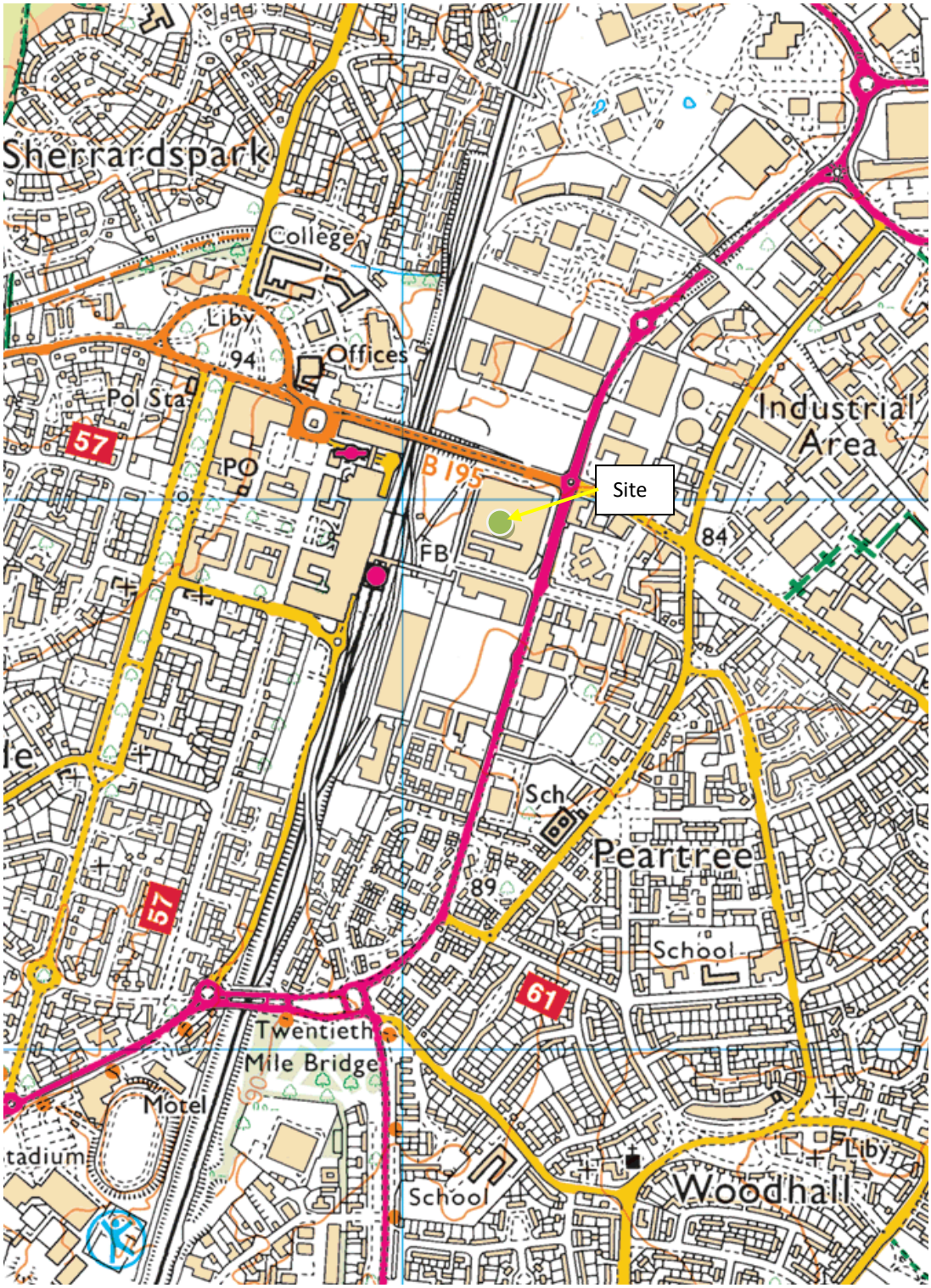

Figure 2-1: *Site Location*

Ordnance Survey 1: 25,000 scale map - with the permission of The Controller of Her Majesty's Stationery Office, Crown Copyright Earth and Marine Environmental Consultants Ltd, Licence No. 100050755

2.3 Northern Site History and Zoning

As part of the environmental assessment, historical maps, photographs and previous assessments were obtained and reviewed by EAME to determine the historical development of the site to identify potentially contaminative activities

The northern site has been divided into three zones based on historic uses (*Figure 2-2*).

Figure 2-2: *Northern Site Zoning*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

The historical characteristics and potential environmental issues within each of the identified zones is outlined below.

2.4 Zone N01 – Historic Shredded Wheat factory

2.4.1 Introduction

The historical maps for the area have been reviewed to assess historical land use of the Cereal Partners Facility (North of Hydeway).

- 1878 - 1923 – the Site is undeveloped agricultural land with a track crossing the northern part of the Site, running in a west to east direction.
- 1923 – the northern and north-western boundaries of the Site are occupied by embankments for the adjacent railway track and roadway;
- 1938 – the Site has undergone development and is occupied by a large building, which is labelled as a cereal manufactory, six smaller buildings, a chimney and a tennis court. Tanks (type unknown) are located at the northern end of the Site. Railway lines are present along the western side of the building.
- 1960 – the cereal factory building has undergone significant expansion, with the layout consistent with that of the current day. By 1968, the factory is annotated as a biscuit factory.
- 1993 – the railway tracks on the western side of the Site have been cleared. The Site layout reflects the current Site layout, which remains unchanged in the 2005 map.

Areas of interest noted by Delta-Simons (during previous Phase I assessments) are outlined in *Table 2-1*.

Table 2-1: *Shredded Wheat Factory - Areas on Interest*

Item	Delta Simons Observations	EAME Observations
11 kV Substation	Located at the northern end of the Site.	Confirmed (51.802235°, -0.200910°) No staining observed either within or around the building.
Above Ground Storage Tanks (ASTs) at northern end of original building	An unspecified number of ASTs located at the northern end of the Site.	Confirmed (51.802110°, -0.200760°) Historical plans obtained by EAME confirm placement of historic ASTs.

Item	Delta Simons Observations	EAME Observations
Fire Water Pump house and diesel generator	Located near to Hydeway on the southern side of the Site.	Confirmed (51.800882°, -0.201284°) No staining observed either within or around the building.
Boiler house and associated diesel storage tanks	Delta-Simons reports that a former boiler house and associated diesel storage tanks were formerly located around the current sprinkler tanks.	Confirmed (51.801018°, -0.201357°) No staining observed either within or around the building.
Former Underground Storage Tanks (USTs) near to the silos	Delta-Simons reports the presence of an underground storage tank (UST), which was located halfway down the vehicle access ramp. Upon inspection, the UST appeared to have been decommissioned and filled as the manhole cover had been concreted. Delta-Simons could not confirm its capacity, or what it had been used for.	Confirmed (51.801054°, -0.199971°) USTs removed by demolition contractor.
Former UST north of factory building	Delta-Simons ascertained that a UST was present to the north of the factory building, under the visitor car parking bays. Delta-Simons were informed that this UST had never been used.	Unconfirmed John F Hunt (demolition contractor) did not uncover any USTs to the north of the factory during the demolition and site clearance process. During the service tracing of the northern site (25/07/18) RP Drilling conducted an outline Ground Penetrating Radar (GPR) survey of the northern edge of the site. No potential targets were identified.
Cereal packaging print works	Delta-Simons reported that the southern area of the main factory had historically been utilised as a print works for the packaging of cereal products.	Unknown

Item	Delta Simons Observations	EAME Observations
Wastewater disposal via a "clearwell" (soakaway)	Delta-Simons reports an area inside the factory referred to as the 'clearwells'. Upon inspection, the 'clearwells' were noted to be two outside areas of the factory, which were separated by an enclosed office. A small drain was observed in each of the 'clearwells'. Delta-Simons confirmed that residue from the manufacturing process was released into the 'clearwells' and down the drains.	Unknown

The location of the items identified within *Table 2-1* are outlined (where known) in *Figure 2-3*.

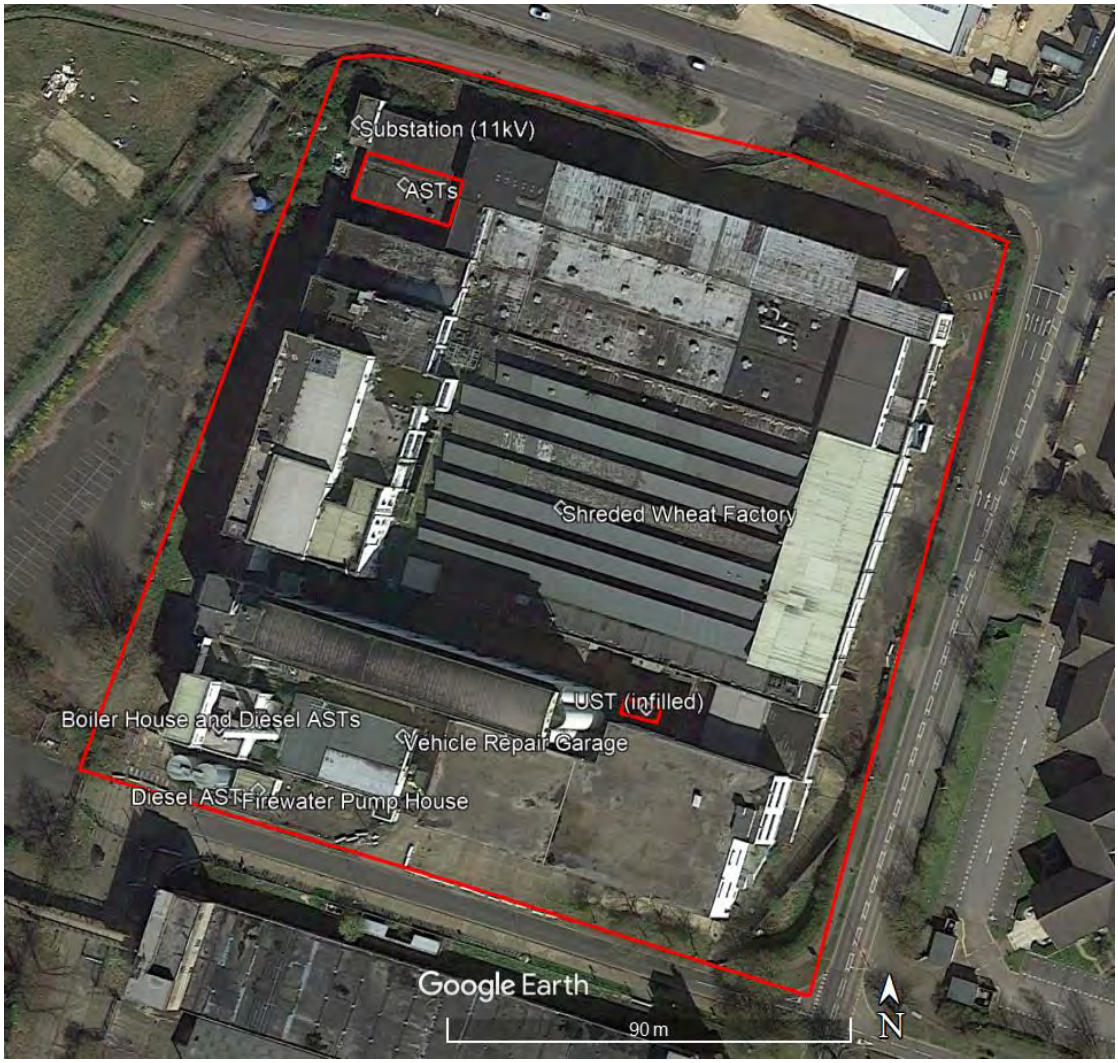

Figure 2-3: *Key potential contamination sources - Shredded Wheat Factory*

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2.4.2 Boiler House

The boiler house (*Photograph 2-1*) is located immediately adjacent to Hydeway and forms part of the Site which is included within the Grade II listing (*i.e.* is part of the original 1924 factory). Delta-Simons reports that a former boiler house and associated diesel storage tanks were formerly located in the area of the current sprinkler tanks. No further details regarding these possible tanks has been located via any of the historical sources.

Photograph 2-1: *Boiler house and fire water tanks*

2.4.3 Fire Water Pump house and diesel generator

A small fire water pump house (with associated diesel day tank) is located immediately adjacent to Hydeway (*Photograph 2-2*).

Photograph 2-2: *Firewater pumphouse*

2.4.4 Vehicle Repair Garage

A small vehicle repair garage (single bay) with pit was located adjacent to the silos (*Photograph 2-3*).

Photograph 2-3: *Vehicle repair garage*

2.4.5 Former Underground Storage Tank (UST) near to the silos

Within the 2006 Delta-Simons Report[1] it is reported that their client, Cereal Partners (U.K), informed Delta-Simons about the presence of an underground storage tank (UST), which was located halfway down the vehicle access ramp. Upon inspection by Delta-Simons, the UST appeared to have been decommissioned and filled as the manhole cover had been concreted. Their client was unable to inform Delta-Simons of its capacity, or what it had been used for.

The USTs were uncovered (*Photograph 2-4*) and excavated (*Photograph 2-5*) by John F Hunt (demolition contractor) in March 2018.

1 Delta-Simons (2006). Combined Phase I/II Environmental Assessment Cereal Partners (U.K), Broadwater Road, Welwyn Garden City for Cereal Partners (U.K.), Delta-Simons Project No. 05-3046.01

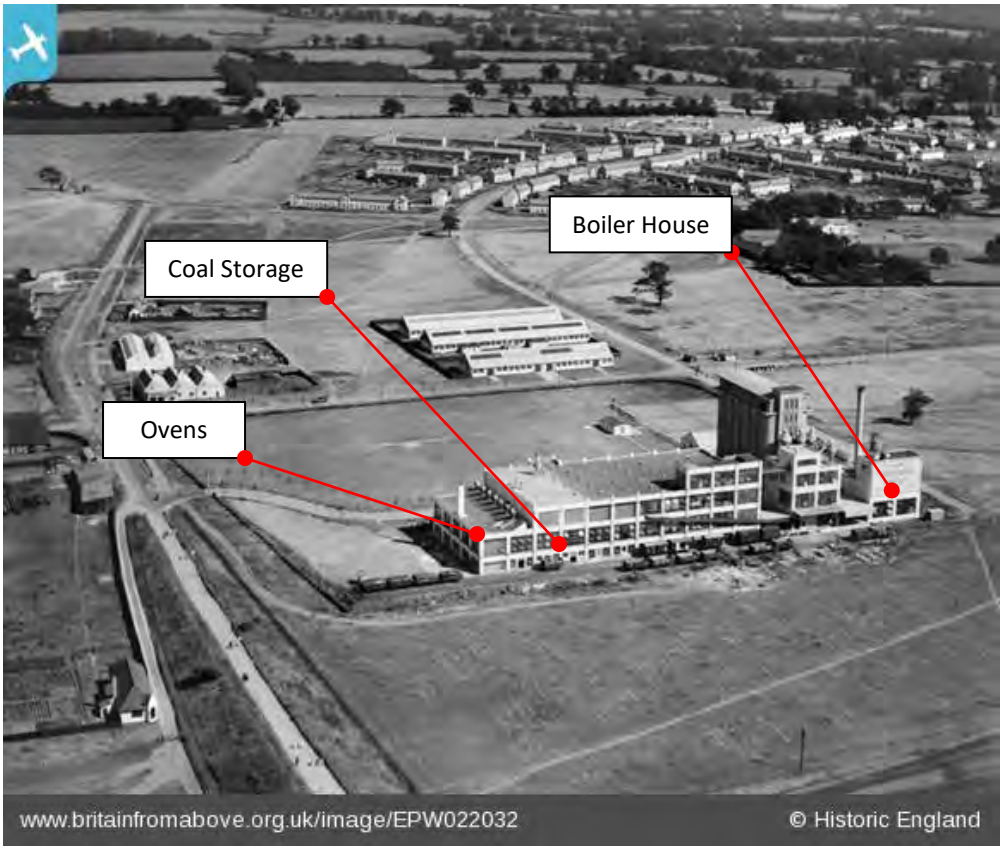
Photograph 2-4: *Initial uncovering of USTs at rear of silos*

Photograph 2-5: *USTs removed from rear of silos*

John F Hunt reported that the USTs were sand filled and free from hydrocarbon staining and odours. No hydrocarbon staining, sheens or odours were reported in the surrounding soils upon excavation of the USTs. The USTs were removed from site for off-site disposal. The area of the USTs was targeted during the windowless sampling exercise.

2.4.6 Above Ground Storage Tanks (ASTs) at northern end of original building

According to the Heritage Statement[2] the northern end of the original building contained a coal store and two ovens with space for two future ovens. This plan corresponds to the 1928 aerial photograph held by Historic England (*Photograph 2-6*).



Photograph 2-6: *Aerial photograph 1928*

Historic England aerial photography outlines a possible series of above ground storage tanks at the northern end of the main building by 1937 (*Photograph 2-7*). There is a possibility that the ovens (located at the end of the northern building) were converted to run on fuel oil/diesel although there is no documentary evidence to confirm this.

2 KM Heritage (2018). The Former Shredded Wheat Factory, Welwyn Garden City, heritage Assessment, January 2018

Photograph 2-7: *Aerial Photography 1937*

John F Hunts uncovered a concrete slab at the northern end of the Shredded Wheat factory in March 2018 (*Photograph 2-8*).

Photograph 2-8: *Slab removal in area of possible historic ASTs*

No evidence of any hydrocarbon staining, or olfactory evidence of contamination was reported during any of the works (*Photograph 2-9*).

Photograph 2-9: *Slab removal adjacent to 11kV substation*

2.4.7 Zone N02 – Employee Car Park and Trailer Park

The historical maps for the area have been reviewed to assess historical land use associated with the historic employee car park. From 1878 until the 1960s the Site remain undeveloped until a collection of four small structures (buildings) were located at the far end of the Site. It is reported in the Delta-Simons report that an engine shed was in the staff car park[3]. Three other small buildings are shown near to the southern end of the Site. These structures were likely cleared by the early 1990s.

No significant sources of potential contamination have been identified in this area.

Figure 2-4: *Key potential contamination sources - Employee car park*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

3 Delta-Simons (2006). Combined Phase 1/II Environmental Assessment Cereal partners (UK) Broadwater Road, Welwyn Garden City, No. 05-3046.01, July 2006.

2.4.8 Zone N03 – Vacant Land

The vacant plot of land located in the northern part of the Site (*Figure 2-5*), is accessed from Bridge Road, along the roadway that leads to the staff car park.

Figure 2-5: *Key potential contamination sources - Vacant land*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

This part of the Site was noted to be completely undeveloped and largely overgrown, except for several manholes covers associated with a drainage system and three concrete slabs, indicating the presence of former buildings.

An aerial photograph held by the WGC Heritage Trust[4] shows the area in use during the 1980s (*Photograph 2-10*).

Photograph 2-10: *Aerial Photograph 1980s*

No significant sources of potential contamination have been identified in this area.

4 http://www.welwyngarden-heritage.org/archive/item/105-aerial-images-of-shredded-wheat-factory

3 Environmental Setting

3.1 Introduction

Desk-based research of the local geology, hydrogeology, hydrology and ecology was carried out to establish the potential for migration of contamination onto or away from the site, and to assess the surface water and groundwater sensitivity of the surrounding area. Information was obtained from several sources, namely:

- inspection of the British Geological Survey (BGS) information *i.e.* Geology of Britain Viewer, Lexicon of Named Rock Units and borehole logs for the area[5];
- examination of the Environment Agency's (EA's) on-line aquifer classification[6];
- examination of EA's flood map for planning[7];
- a review of MAGIC geographic information about the natural environment from across UK government[8]; and
- a review of online web-based information searches.

The significance of the environmental Site setting is provided below.

3.2 Geology

The relevant British Geological Survey (BGS) 1:50,000 map of the area (Sheet 239, Hertford, drift, 1:50,000, 1996) (*Figure 3-1*) and the BGS Geology of Britain Viewer, outline that the site is directly underlain by:

- **Superficial deposits** – The northern part of the site is underlain by Kesgrave Catchment Subgroup (Sand and Gravel) and the southern area by Boulder Clay (Lowestoft Formation – Diamicton).
- **Bedrock deposits** – The entire site is underlain by Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated).

[5] http://www.bgs.ac.uk/
[6] http://maps.Environment-agency.gov.uk/
[7] https://flood-map-for-planning.service.gov.uk/
[8] http://www.natureonthemap.naturalengland.org.uk/

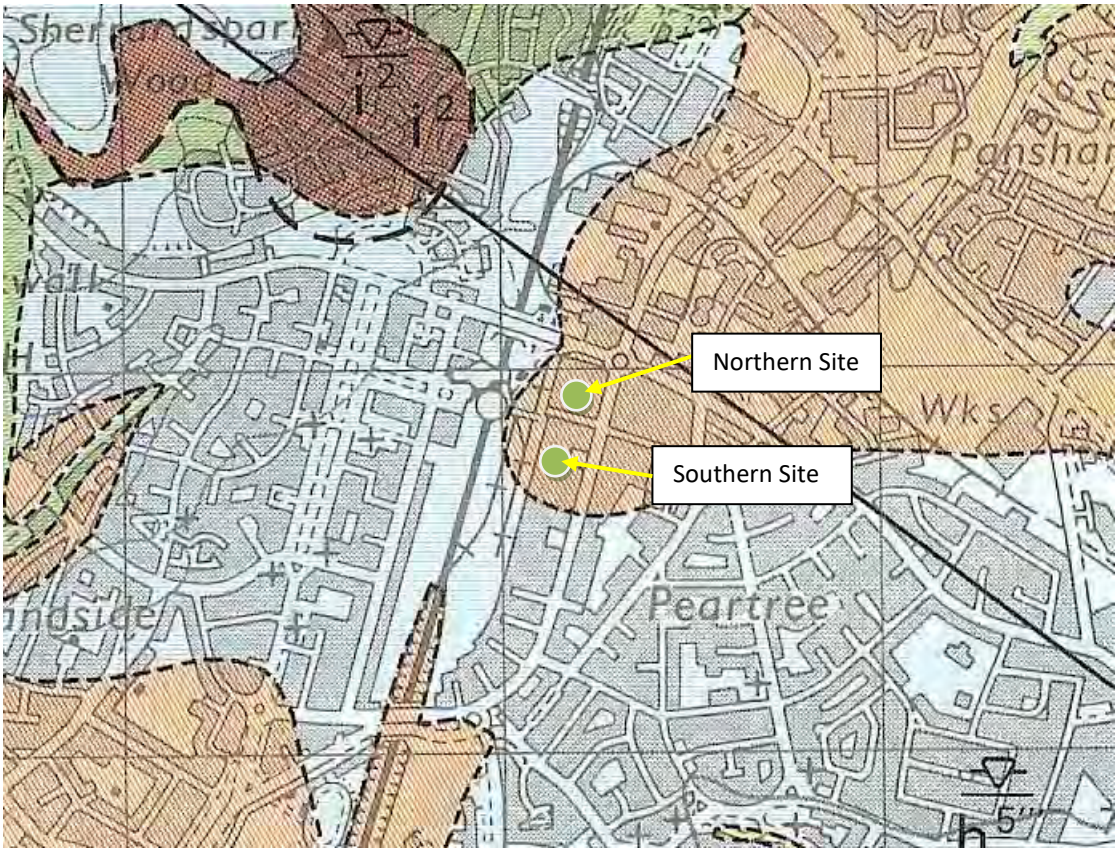


Figure 3-1: *Site Geology*

British Geological Survey (http://www.largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001732)

Two BGS boreholes are recorded adjacent to the site:

- BGS ID: 533333: BGS Reference: TL21SW22/A (British National Grid (27700): 524000,212480) Depth 91.44 metres – Roche Products water abstraction borehole (off-site).
- BGS ID: 18726905: BGS Reference: TL21SW211 (British National Grid (27700): 524090,212710) Depth 30 metres – WR38 record related to the remedial activities (2008).

3.3 Hydrogeology

The aquifer classification system was last updated on 1st April 2010 which provided new aquifer designations to replace the old system of aquifer classifications, such as Major, Minor and Non-Aquifer. This revised system is in line with the EA's Groundwater Protection Policy (GP3) and the Water Framework Directive (WFD) and is based on British Geological Survey mapping. From a review of the EA on-line maps the site is located on the following:

- **Superficial deposits** – The northern part of the Site is underlain by Kesgrave Catchment Subgroup (Sand and Gravel) and classified by the EA as a Secondary A Aquifer. These are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. The southern area (Boulder Clay of the Lowestoft Formation – Diamicton) is classified by the EA as a Secondary (Undifferentiated) Aquifer. This has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

- **Bedrock deposits** – The entire Site is underlain by Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated). This is defined by the EA as a Principal Aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

The EA have defined Groundwater Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones are designated to protect the location from the risk of contamination from any activities that might cause pollution in the area, *i.e.* the closer the activity, the greater the risk. The maps show three main zones; an inner, an outer and the total catchment with a fourth zone of special interest, which the EA occasionally apply, to a groundwater source. The EA website indicates that the entirety of the Site is within the Total Catchment Zone 3 (*Figure 3-2*).

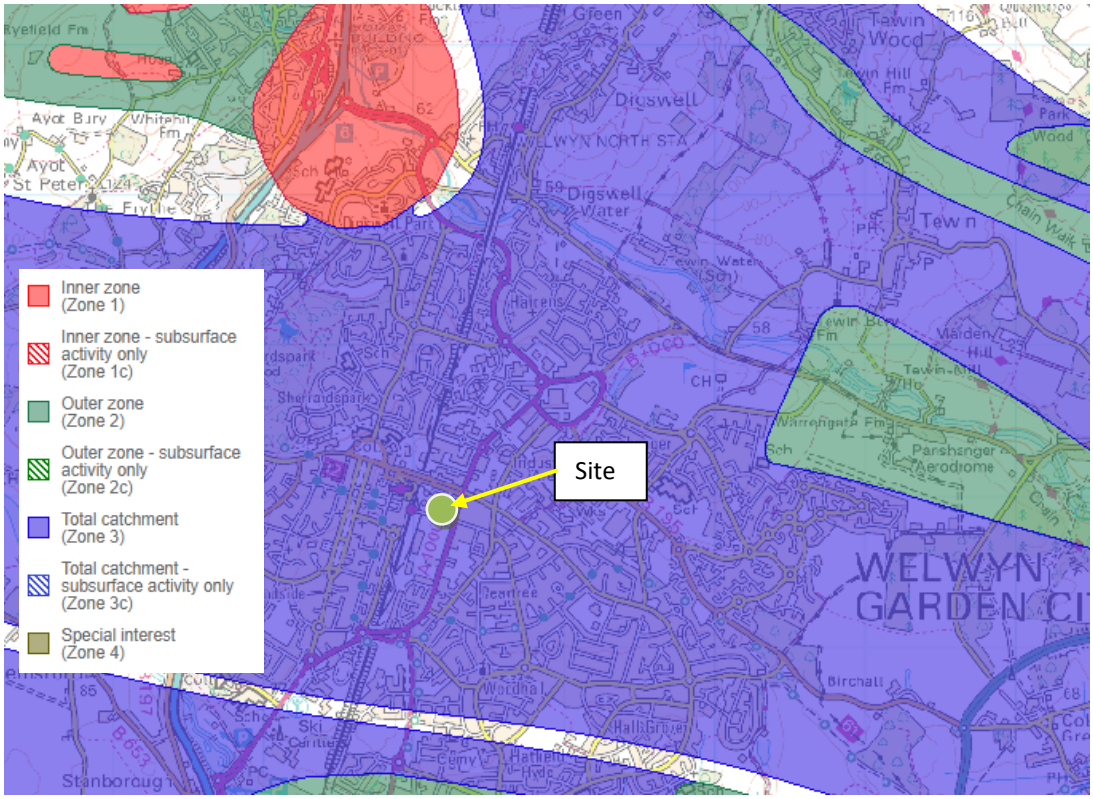


Figure 3-2: *Source Protection Zones*

http://maps.environment-agency.gov.uk/

3.4 Hydrology

The nearest surface watercourse to the Site is the River Mimram (1.75 km north) and the River Lee (1.76 km south southwest) (*Figure 3-3*).

There are no on-site water features.

3.4.1 Flood Risk

According to the EA flood mapping the Site is not located in a Flood Zone (Zone I, II, III) and is not at risk of flooding from rivers.

Parts of the Site are predicted to be at risk of surface water flooding (*Figure 3-4*).

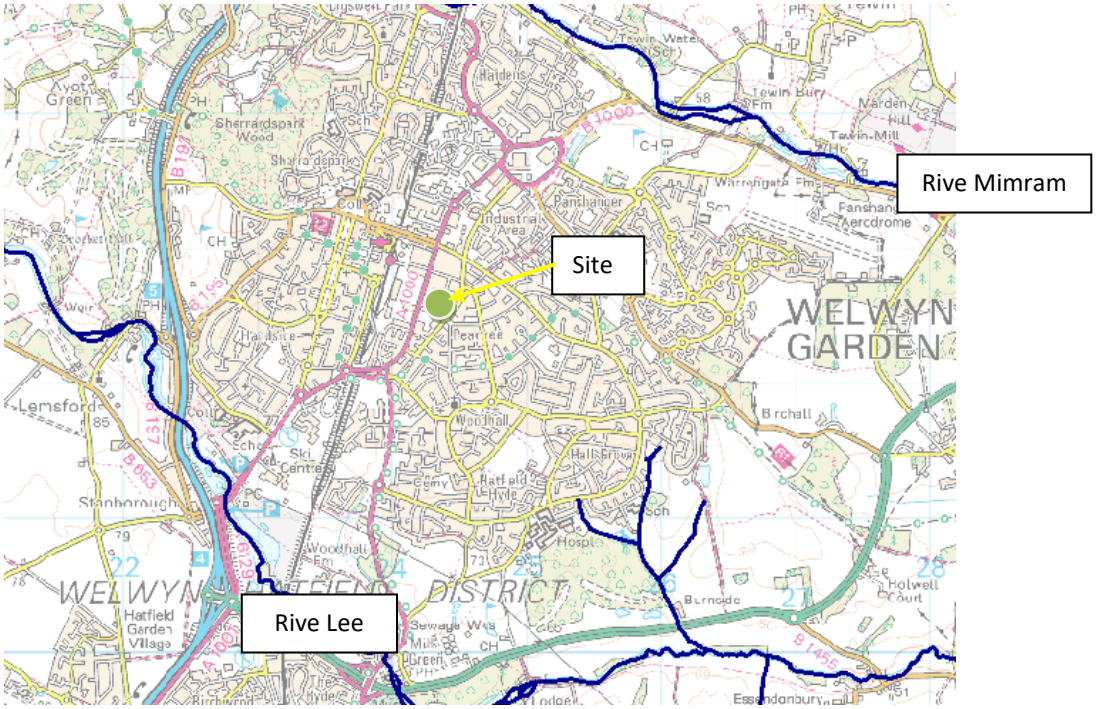


Figure 3-3: *Main Rivers*

http://maps.environment-agency.gov.uk/

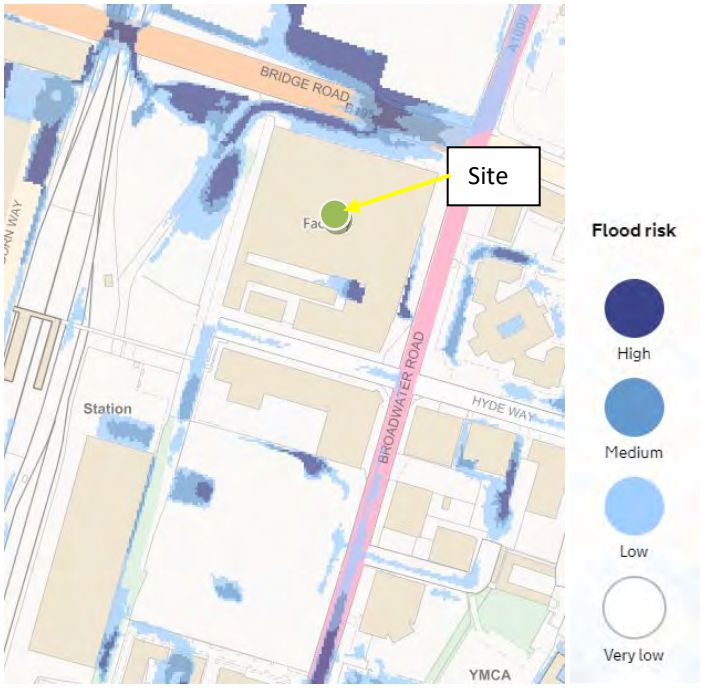


Figure 3-4: *Flood risk from surface water*

https://flood-warning-information.service.gov.uk/

3.5 Sensitive Land Uses

3.5.1 Ecological Receptors

The MAGIC website which is managed by the Department for Environment, Food and Rural Affairs (Defra), was queried to locate Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, National Nature Reserves (NNR), Areas of Outstanding Natural Beauty (AONB), National Parks and Local Nature Reserves (LNR) within 1-km of the Site. The closest designated site is the Sherrard Spark Wood SSSI, located c.940 metres to northwest of the Site (*Figure 3-5*).

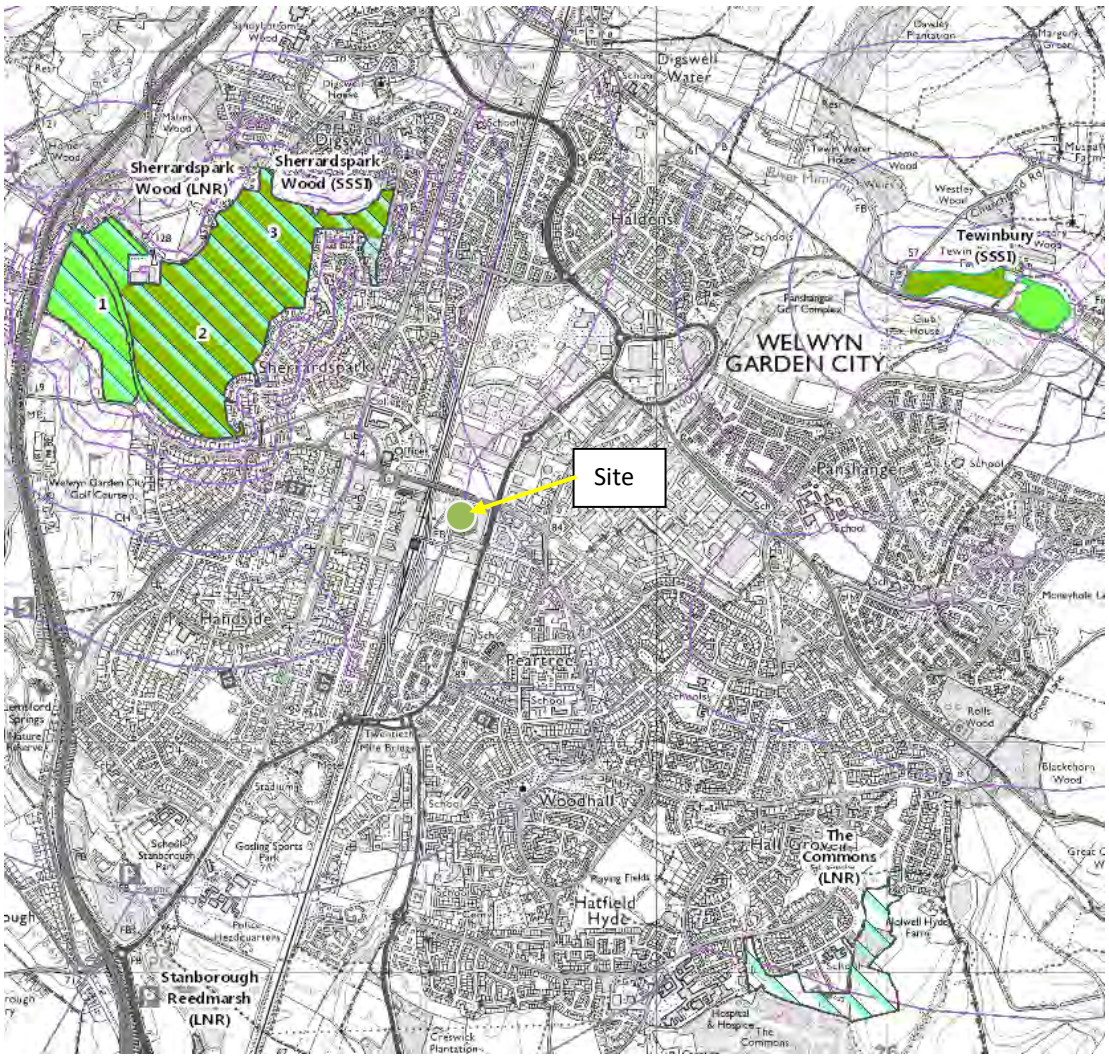


Figure 3-5: *Environmental landscape and ecological designations*

https://flood-warning-information.service.gov.uk/

3.5.2 Protected Buildings

Both the MAGIC and Historic England websites were queried to locate Scheduled Monuments, World Heritage Sites and Listed Buildings within 1-km of the Site. There is one listing associated with the northern Site:

- The Nabisco Shredded Wheat Factory, Reference1101084, Grade II, Legacy UID158251.

In addition, there is a single listed property immediately adjacent to the southern boundary of the southern site:

- Office Block (Buildings 1 to 4) To Roche Products Factory, Reference1348142, Grade II, Legacy UID158234.

3.5.3 Residential Receptors

The closest residential properties (an apartment block) is located approximately 260 metres south of the northern site boundary.

3.6 Significance of the Environmental Setting

The significance of the environmental setting is considered by EAME to be as follows:

- **Groundwater [HIGH SENSITIVITY]** – The Site is partially located on a Secondary A Aquifer and a Secondary (Undifferentiated) Aquifer (superficial deposits) and underlain by a Principal Aquifer (bedrock). The site is in the Total Catchment (Zone 3) of an SPZ.
- **Surface Water [LOW SENSITIVITY]** – The nearest surface watercourse to the Site is the River Mimram (1.75 km north) and the River Lee (1.76 km south southwest).
- **Flood Risk [LOW SENSITIVITY]** – The site is not located in area at risk of flooding due to Rivers. Parts of the Site are predicted to be at risk of surface water flooding.
- **Ecological Sensitive Areas [LOW SENSITIVITY]** – The closest designated site is the Sherrard Spark Wood SSSI, located c.940 metres to northwest of the Site.
- **Protected Buildings and Structures [MODERATE SENSITIVITY]** – There is one listing associated with the northern site *i.e.* The Nabisco Shredded Wheat Factory, Reference1101084, Grade II, and one property immediately adjacent to the southern boundary of the southern site *i.e.* Office Block (Buildings 1 to 4) To Roche Products Factory, Reference1348142, Grade II.
- **Residential Areas [LOW SENSITIVITY]** – There are no residential receptors adjacent to the site boundary.

4 Site Investigation and Assessment History

4.1 Introduction

The Site has been subject to various phases of environmental assessment as outlined in *Table 4-1*.

Table 4-1: *Historic Environmental Assessments and Reports*

Report Date	Report	Client	Contractor	Report Status
July-2006	(h) Combined Phase I/II Environmental Assessment Cereal Partners (UK) Broadwater Road, Welwyn Garden City (Ref. 05-3046.01)	Cereal Partners (UK)	Delta-Simons	Partially available
Feb-2007	(j) Executive Summary Supplementary Site Investigation Cereal Partners (UK), Broadwater Road, Welwyn Garden City (Ref. 05-3046.02)	Cereal Partners (UK)	Delta-Simons	Available
Jan-2015	(x) Factual and Interpretative Geotechnical Report Former Shredded Wheat Factory, Broadwater Road, Welwyn Garden City, AL7 3AX (Ref. 2342.18_G V2)	Spen Hill Developments Ltd	Delta-Simons	Available

4.2 Summary of Previous Works

4.2.1 Delta-Simons Combined Phase I/II (May 2006)

The first environmental assessment works undertaken on the northern site were conducted by Delta-Simons in May 2006. The works included the excavation of the following locations (in relation to the zoning stated in *Section 2*):

- Zone N01 (Shredded Wheat Factory) – Four boreholes (BHA, BHC, BHG and BHH) and six Window Samples (WS1A, WS4A, WS8A, WS9A, WS10A and WS11A).
- Zone N02 (Employee Car park and Trailer Park) – Two Window Samples (WS6A and WS7A and one borehole (BHD).

- Zone N03 (Vacant Land) – Five trial pits (TP1 – TP5).

4.2.2 Delta-Simons Additional Site Investigation (November 2006)

The second environmental assessment on the northern site was conducted by Delta-Simons in November 2006. The works included the excavation of the following locations (in relation to the zoning stated in *Section 2*):

- Zone N01 (Shredded Wheat Factory) – Four Window Samples (WS6B, WS7B, WS8B, WS9B and WS10B).
- Zone N02 (Employee Car park and Trailer Park) – None.
- Zone N03 (Vacant Land) – None.

4.2.3 Delta-Simons Geotechnical Site Investigation (January 2015)

An extensive site-wide ground investigation was conducted by Delta-Simons in January 2015. The purpose of the investigation was to provide detailed information on the ground conditions at the Site to aid foundation design. The works included the excavation of the following locations (in relation to the zoning stated in *Section 2*):

- Zone N01 (Shredded Wheat Factory) – Six boreholes (BH408, BH409, BH410, BH411, BH412, BH415).
- Zone N02 (Employee Car park and Trailer Park) – Two boreholes (BH413 and BH414).
- Zone N03 (Vacant Land) – One borehole (BH416).

The borehole logs from the geotechnical investigation are provided in *Annex B*.

4.2.4 Remediation Summary

No remediation has been undertaken on the northern site.

5 Assessment Strategy

5.1 Scope of Works

Based on the previous Site investigations the following staged approach was outlined within the site investigation scheme submitted to Welwyn Hatfield Borough Council (WHBC) on 29th September 2017 in relation to N6/2015/0294/PP – Planning Condition No. 1 *i.e. "A site investigation scheme, based on the submitted phase 1 Environmental Assessment (Delta-Simons ref 2342.17 V2) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site"* (*Figure 5-1*).

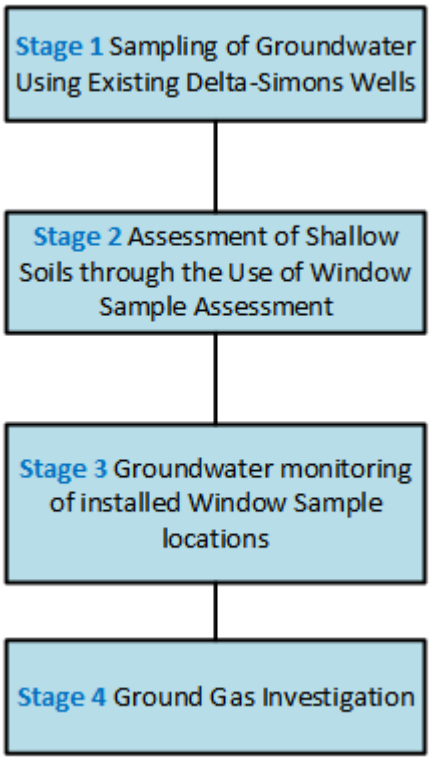


Figure 5-1: *Agreed Site Investigation Scheme with WHBC*

Formal acceptance of the site investigation scheme was received from Mr. Tim Croot (WHBC Environmental Health Department) on 07/11/17.

6 Groundwater Assessment (Existing Wells)

6.1 Introduction

The assessment of groundwater conditions on the northern site have been assessed through the consideration of previous works conducted by Delta-Simons (2006-2015) and current monitoring conducted by EAME in 2017.

6.2 Previous Groundwater Assessments

The groundwater conditions on the northern site have been previously investigated by Delta-Simons in 2006 and 2015 through the drilling of 15 boreholes (*Figure 6-1*).

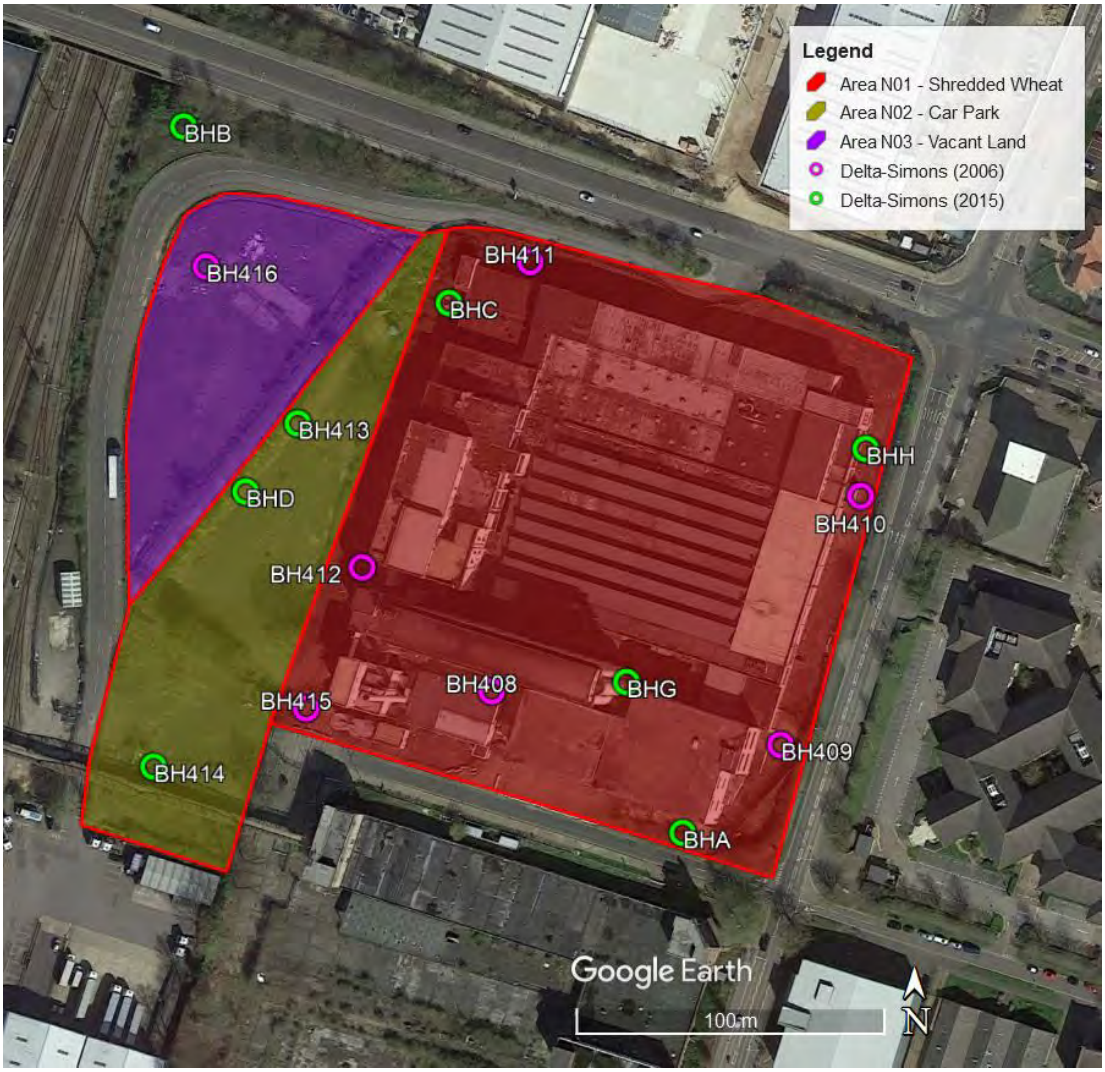


Figure 6-1: *Delta-Simons Boreholes 2006 - 2015*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

A summary of the 15 boreholes (within the proposed development area) are provided in *Table 6-1*.

Table 6-1: *Northern site boreholes (2006 – 2015)*

BH Ref.	Installed by	Zone	Comments
BHA	DS (2006)	Area N01 – Shredded Wheat	Borehole log not available in report. Installed to 25.05 m bgl. Water at 23.02 m bgl (01/06/06). Groundwater sample obtained.
BHB	DS (2006)	Outside current area	Borehole log not available in report. Installed to 21.85 m bgl. Borehole found to be dry.
BHC	DS (2006)	Area N01 – Shredded Wheat	Borehole log not available in report. Installed to 23.64 m bgl. Water at 22.25 m bgl (01/06/06). Groundwater sample obtained.
BHG	DS (2006)	Area N01 – Shredded Wheat	Borehole log not available in report. Installed to 25.69 m bgl. Water at 20.84 m bgl (01/06/06). Groundwater sample obtained.
BHH	DS (2006)	Area N01 – Shredded Wheat	Borehole log not available in report. Installed to 26.45 m bgl. Water at 23.82 m bgl. Groundwater sample obtained.
BH408	DS (2015)	Area N01 – Shredded Wheat	Installed to 20.00 m bgl (CHALK), no water. Log provided in *Annex B*.
BH409	DS (2015)	Area N01 – Shredded Wheat	Installed to 20.00 m bgl (CHALK), no water. Log provided in *Annex B*.
BH410	DS (2015)	Area N01 – Shredded Wheat	Installed to 25.00 m bgl (CHALK), water at 22.35 m bgl. Log provided in *Annex B*.
BH411	DS (2015)	Area N01 – Shredded Wheat	Installed to 20.00 m bgl (CHALK), no water. Log provided in *Annex B*.
BH412	DS (2015)	Area N01 – Shredded Wheat	Installed to 20.00 m bgl (CHALK), no water. Log provided in *Annex B*.
BH413	DS (2015)	Area N02 – Car Park	Installed to 20.00 m bgl (CHALK), no water. Log provided in *Annex B*.

BH Ref.	Installed by	Zone	Comments
BH414	DS (2015)	Area N02 – Car Park	Installed to 30.00 m bgl (CHALK), water at 25.00 m bgl. Log provided in *Annex B*.
BH415	DS (2015)	Area N01 – Shredded Wheat	Installed to 30.00 m bgl (CHALK), water at 27.00 m bgl.
BHD	DS (2006)	Area N02 – Car Park	Borehole log not available in report. Installed to 22.70 m bgl. Water at 21.64 m bgl. Groundwater sample obtained.
BHB	DS (2006)	Area N03 – Vacant Land	Outside current development area. Borehole log not available within report. Installed to 21.85 m bgl. BH was reported dry (01/06/06).
BH416	DS (2015)	Area N03 – Vacant Land	Installed to 13.50 m bgl (Flint obstruction), no water.

Based on the available reports environmental groundwater samples were obtained from the boreholes outlined in *Figure 6-2*.

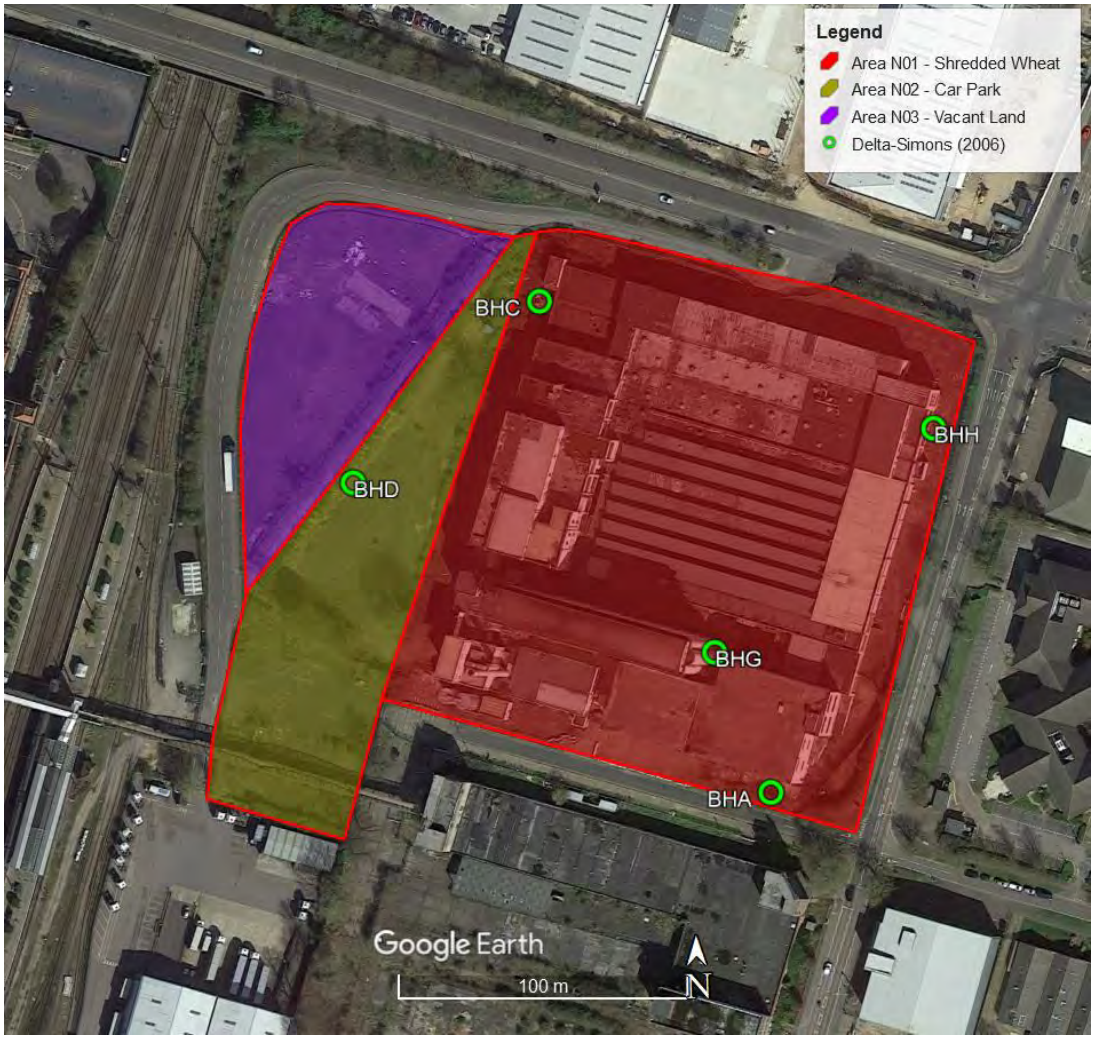


Figure 6-2: *Delta-Simons Groundwater Samples 2006*

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6.3 Groundwater Results

The results stated in the Delta-Simons 2006 report are outlined within this report. It is important to note that determinands have only been included within Table *6-2* where one or more boreholes has exceeded laboratory Method Detection Levels (MDLs) for a specific determinand.

Table 6-2: *Groundwater results summary*

	BHA (µg/l)	BHC (µg/l)	BHD (µg/l)	BHH (µg/l)	BHG (µg/l)
Arsenic Dissolved	<1	2	<1	2	1
Boron Dissolved	106	159	26	31	97
Chromium Dissolved	3	<1	1	<1	<1
Copper Dissolved	<1	4	<1	4	<1
Lead Dissolved	1	<1	<1	<1	<1
Nickel Dissolved	19	4	7	21	3
Selenium Dissolved	<1	6	1	<1	2
Zinc Dissolved	6	25	19	30	16
pH Value	7.67	7.76	7.69	7.55	7.80
GRO (C4-C12)	7901	-	-	-	-
Ethyl benzene	22	-	-	-	-
m & p Xylene	75	-	-	-	-
Aliphatics >C8-C10	2433	-	-	-	-
Aliphatics >C10-C12	689	-	-	-	-
Aliphatics >C12-C16	679	-	-	-	-
Aliphatics >C16-C21	14	-	-	-	-
Total Aliphatics C5-C35	3815	-	-	-	-
Aromatics >EC8-EC10	3746	-	-	-	-
Aromatics >EC10-EC12	1033	-	-	-	-
Total Aromatics C6-C35	4779	-	-	-	-
TPH (Aliphatics and Aromatics C5-C35)	8594	-	-	-	-
EPH (DRO) (C10-C40)	-	833	<10	<10	<10
SVOC Suite					
cis-1-2-Dichloroethene	2	<1	<1	<1	<1

	BHA (µg/l)	BHC (µg/l)	BHD (µg/l)	BHH (µg/l)	BHG (µg/l)
VOC Suite					
Trichloroethene	6	<1	<1	4	2
Toluene	1	<1	<1	12	<1
Ethylbenzene	8	<1	<1	<1	<1
p/m-Xylene	38	<1	<1	<1	<1
o-Xylene	7	<1	<1	<1	<1
Isopropylbenzene	41	<1	<1	<1	<1
Propylbenzene	68	<1	<1	<1	<1
1.2.4-Trimethylbenzene	2484	<1	<1	<1	<1
4-Isopropyltoluene	24	<1	<1	<1	<1
1.3.5-Trimethylbenzene	847	<1	<1	<1	<1
sec-Butylbenzene	16	<1	<1	<1	<1
tert-Butylbenzene	4	<1	<1	<1	<1
Notes: All results are in µg/l except for pH which is unitless.					

The Site was visited by EAME on 19th – 20th September 2017 during which the existing boreholes (last monitored by Delta-Simons in September 2015) were GPS located (approximately), photographed, dipped to verify accessibility and cleared of surrounding vegetation. All groundwater wells were clearly marked using road cones and/or 50 cm sections of (yellow) gas-pipe fixed to the ground using Postcrete. The location of all wells was formally recorded and communicated to the demolition contractors (John F Hunt).

In total 3 boreholes were located on the northern site (BH415, BHA and BHD) (*Figure 6-3* and *Table 6-3*).

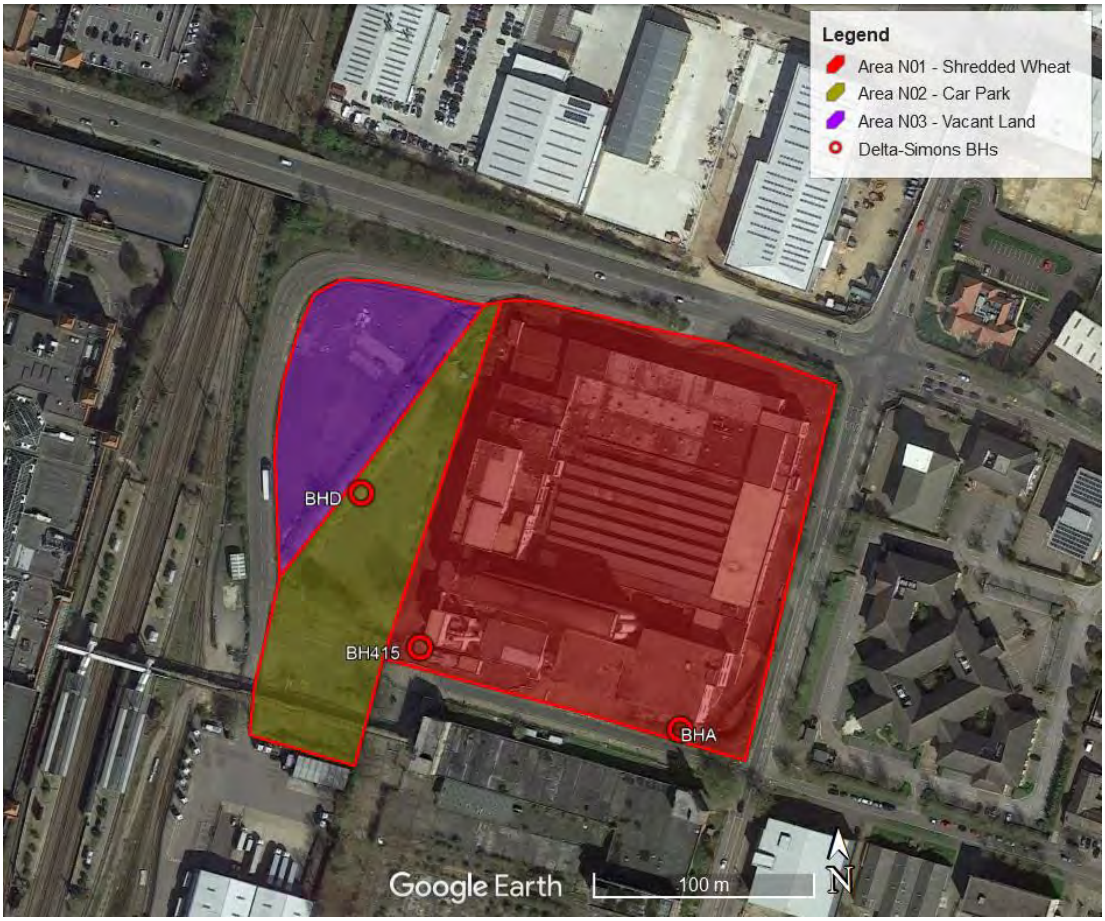

Figure 6-3: *Groundwater wells monitored during September 2017*

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Table 6-3: *Existing Boreholes – Location Details*

Ref.	Easting	Northing	Elevation	Notes
BH415	524076.388	212752.482	85.461 m AOD	Delta-Simons
BHA	524180.394	212675.938	84.971 m AOD	Delta-Simons
BHD	524096.494	212991.642	84.326 m AOD	Delta-Simons

Of the 3 boreholes located BHD was found to be dry.

The Site was visited again by EAME between the 26th – 28th September 2017 during which time the available groundwater wells (BH415 and BHA) were purged and sampled.

6.4 Sample Acquisition and On-Site Analysis

6.4.1 Purging of Wells

The on-site wells had not been purged or sampled since the last round of Delta-Simons monitoring in September 2015. In addition, most wells on-site were found without gas taps or protective caps (apparently removed by Delta-Simons). Due to these poor conditions, all available groundwater wells were purged using Waterra Standard High-Density Polyethylene (HDPE) tubing (16 mm) and a Waterra PP1 Power-pack (*Photograph 6-1*). Pipework was dedicated to each borehole and not re-used.

Photograph 6-1: *Groundwater well purging through use of HDPE tubing and Power-pack*

All wells were dipped prior to purging, using a Geotech Interface Meter to determine current well volume and to determine if any free-phase liquid was present. All wells were then purged using the three-standard well volume methodology (where achievable)[9,10]. All wells were left for a minimum of 24 hours between purging and sampling.

6.4.2 Groundwater Sampling

Prior to sampling all wells were again dipped using a Geotech Interface Meter to determine resting groundwater level and to verify whether free product was present.

9 Environment Agency (2003). Guidance on monitoring of landfill leachate, groundwater and surface water. 283pp.
10 ASTM (2012). ASTM D6542 2012. Standard guide for purging methods for wells used for groundwater quality investigations

Groundwater samples were then obtained from all wells using a Geotech Geocontrol Pro low-flow sampler combined with a Geotech stainless steel bladder pump (*Photograph 6-2*). The use of low flow sampling was 'recommended' by the Environment Agency (EA) who visited the Site on 20th September 2017. Dedicated polyethylene (PE) 42 mm bladders and low-density polyethylene (LDPE) tubing were used with each well.

Photograph 6-2: *Groundwater sampling using low-flow bladder pump*

All samples were collected in new glassware (*i.e.* 2 x 40 ml amber vials followed by 2 x 300 ml amber bottles) provided by i2 Analytical Ltd. After the sample collection the groundwater from the wells was examined visually and any unusual odours were noted. A separate sample (approximately 125-ml) was collected within a 250-ml jar and lidded (with a small sealable hole) for headspace testing.

6.4.3 Headspace Testing

All groundwater samples were tested by dynamic headspace analysis, for the presence of volatile organic compounds (VOCs) using a Photoionization Detector (PID). Dynamic headspace analysis refers to the manual agitation (warming) of a sample to facilitate the volatilisation of organic compounds present in the water into the headspace above which is then analysed using the PID. The PID screens for a wide range of volatile organic compounds including hydrocarbon compounds and certain chlorinated solvents but does not indicate a specific compound. The measurements obtained by the instrument in parts per million by

volume (ppmv) provide a semi-quantitative indication of the concentration of hydrocarbon vapours that are.

The PID used during the assessment, and associated calibration status, is outlined in *Table 6-4*.

Table 6-4: *PID Details*

Criteria	Description
Instrument	PhoCheck Tiger
Supplied by	Shawcity Limited
Lamp	10.6 eV krypton PID
Serial No.	T-105329
Calibration Method	CM03
Ambient Conditions	20°C ± 2°C and 50% (± 20%) Relative Humidity
Results	Isobutylene (Lot No. 270123), Ref value 100 ppm, indicated value 100 ppm
Calibration Date	09/05/2017
Certificate No.	60913

6.4.4 Sample Integrity

All samples were placed in containers appropriate to the type of analysis being undertaken and stored in cool boxes maintained at a low temperature (using ice packs), to avoid the loss of volatile compounds. Dispatch to the accredited laboratory took place as soon as possible following the completion of the investigation.

Samples were then collected, placed immediately into containers appropriate to the type of analysis being undertaken and stored in cool boxes (with ice packs) maintained at a low temperature, to avoid the loss of volatile compounds.

All sampling was undertaken using EAME in-house field procedures (available on request) and relevant guidance, such as BS ISO 5667-11:2009, BS 6068-6.11:2009 Water quality Sampling. Guidance on sampling of groundwaters.

All collected samples were submitted to i2 Analytical Ltd a UKAS (ISO 17025) accredited laboratory for chemical analysis. Discussions were held with the laboratory prior to the

commencement of any works to determine the quantity of sample required and the containers to be used.

All samples were given a unique reference number, dated and the information recorded on an appropriate Chain of Custody (CoC) form for dispatch with the samples to the appropriate laboratory.

6.4.5 Groundwater Observations and Headspace Test Results

Visual and/or olfactory evidence of groundwater contamination was noted during the works. These combined with the associated headspace results are outlined in *Table 6-5*.

Table 6-5: *Groundwater Observations and Headspace Test Results (ppmv)*

Borehole	Appearance	Odour	PID (ppmv)
BHA	No sheen	Slight VOC odour	19
BH415	No sheen	No odour detected	0.075
Notes: No free product was detected during the monitoring of the wells.			

6.5 Groundwater Flow

The groundwater flow within the Chalk aquifer was assessed by Delta-Simons in 2014/2015 (*Figure 6-4*).

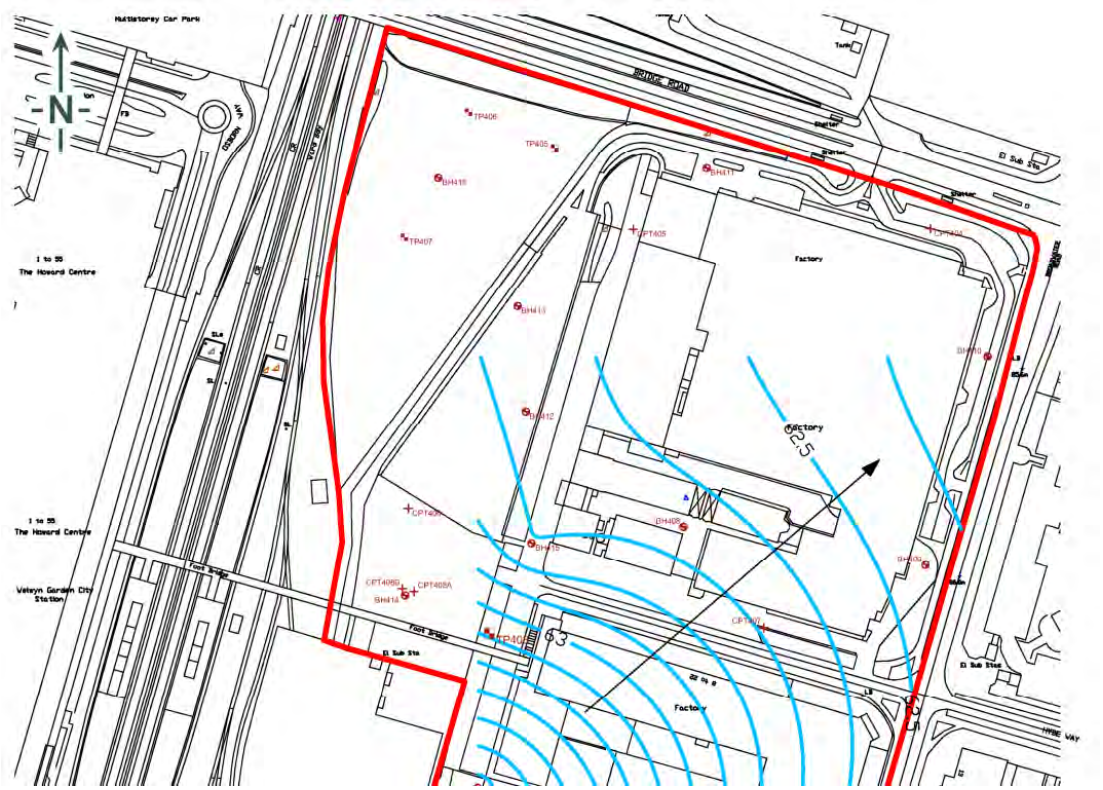


Figure 6-4: *Groundwater flow – Northern Site (October 2014)*

Source: Delta Simons (2015). Factual and Interpretative Geotechnical Report, Former Shredded Wheat Factory, Broadwater, Road, Welwyn Garden City, AL7 3AX, For Spen Hill Developments Ltd, Delta-Simons Project No. 2342.18_G V2, Issued: January 2015 (Extract from Figure 6)

It was concluded by Delta-Simons (2015) that the resting groundwater in the chalk formation was circa 22 m to 23 m bgl and that any shallow perched groundwater is likely to be limited in extent and discontinuous and unlikely to represent a significant constraint to development. The generalised flow direction was towards the north northeast.

6.6 Groundwater Chemical Data

6.6.1 Groundwater Analytical Strategy

The analytical strategy was designed by EAME to provide an assessment of the presence of a common range of potential contaminants likely to be associated with the previous uses of the Site and to ensure alignment and comparison with the earlier work conducted by Delta-Simons. The analytical suites are outlined in *Table 6-6*.

Table 6-6: *Analytical Strategy*

Analytical Suite	Groundwater Samples
EAME Suite B Arsenic (dissolved), Cadmium (dissolved), Chromium (dissolved), Cr (VI), Lead (dissolved), Mercury (dissolved), Selenium (dissolved), Copper (dissolved), Nickel (dissolved), Zinc (dissolved), Vanadium (dissolved), Beryllium (dissolved), Water Soluble Boron, Total Cyanide, Monohydric Phenols, pH Value, Total Petroleum Hydrocarbon TPH - CWG (C5-35) Aliphatic/Aromatic Split (with CWG banding - Aliphatic C5-6,>6-8,>8-10,>10-12,>12-16,>16-21,>21-35) (Aromatic - >C6-7,>7-8,>8-10,>C10-12,>12-16,>16-21,>21-35), Speciated Polycyclic Aromatic Hydrocarbon (PAHs) (USEPA-16), Sulphate (water soluble), benzene, toluene, ethylbenzene, and xylenes (BTEX) and Methyl tert-butyl ether (MTBE)	**2 samples** BH415 BHA
Volatile Organic Compounds (VOCs) + Tentatively Identified Compounds (TICs) Standard i2 Analytical Ltd VOC suite was amended to include Dichloromethane (DCM) in-line with previous works conducted by Delta-Simons.	
Semi Volatile Organic Compounds (SVOCs) + TICs Standard range of PAHs, Phenols that form the standard i2 Analytical Ltd SVOC suite.	
Polychlorinated Biphenyls (PCBs) 7 Congeners + Total PCBs	**2 samples** BH415 BHA

6.6.2 Groundwater Analysis

Two groundwater sample were recovered (*i.e.* BH415 and BHA) and were scheduled for laboratory analysis. The first stage of assessment was to screen out those compounds that were not recorded above the laboratory analytical method detection limits (MDLs). These are listed below and have not been considered further:

- Total Cyanide (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C5 - C6 (MDL 1 µg/l);
- TPH-CWG - Aliphatic >C6 - C8 (MDL 1 µg/l);
- TPH-CWG - Aliphatic >C8 - C10 (MDL 1 µg/l);
- TPH-CWG - Aliphatic >C10 - C12 (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C12 - C16 (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C16 - C21 (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C21 - C35 (MDL 10 µg/l);
- TPH-CWG - Aliphatic (C5 - C35) (MDL 10 µg/l);
- TPH-CWG - Aromatic >C5 - C7 (MDL 1 µg/l);
- TPH-CWG - Aromatic >C7 - C8 (MDL 1 µg/l);
- TPH-CWG - Aromatic >C8 - C10 (MDL 1 µg/l);
- TPH-CWG - Aromatic >C12 - C16 (MDL 10 µg/l);
- TPH-CWG - Aromatic >C16 - C21 (MDL 10 µg/l);
- TPH-CWG - Aromatic >C21 - C35 (MDL 10 µg/l);
- Speciated PAHs (Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(ghi)perylene) (Individual PAH MDL 0.01 µg/l);
- Beryllium (MDL 0.1 µg/l);
- Cadmium (MDL 0.02 µg/l);

- Chromium (hexavalent) (MDL 5 µg/l);
- Mercury (MDL 0.05 µg/l);
- Monoaromatics (Benzene, Toluene, Ethylbenzene, p & m-xylene, o-xylene and Methyl Tertiary Butyl Ether (MTBE) (Individual MDL 1 µg/l);
- Specific VOCs as listed within analytical report 17-62108 (MDL 1 µg/l);
- Specific SVOCs as listed within analytical report 17-62108 (MDL variable);
- PCBs (PCB Congener 28, PCB Congener 52, PCB Congener 101, PCB Congener 118, PCB Congener 138, PCB Congener 153 and PCB Congener 180) (MDL 0.02 µg/l); and
- PCB (total) (MDL 0.14 µg/l).

The groundwater analytical results are provided within EAME report 016-1512 Wheat Quarter WGC Environmental Assessment - Southern Area.

6.6.3 Tier 1 Screening – Generic Quantitative Risk Assessment

The remaining determinands, present in the samples above their respective laboratory MDLs, have been reported and compared with stated Tier 1 screening values as outlined within *Table 6-7*. The following Generic Quantitative Risk Assessment screening values have been used within the assessment process:

(E) Environmental Guideline Values

*E1 – AA-EQS (micrograms per litre) *The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015*. An annual average concentration EQS (AA), defined as the highest concentration to which an aquatic ecosystem may be exposed without any likely adverse effects.

*E2 – MAC-EQS (micrograms per litre) *The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015*. A maximum allowable concentration EQS (MAC), defined as the highest transient concentration that would be expected to cause adverse effects. The MAC is designed to protect against short-term episodic pollution events, while the AA is designed to protect against long-term continuous pollution.

*E3 – N J Ayscough, W Young and P Whitehouse (2002). Proposed Environmental Quality Standards for Ethylbenzene in Water, R&D Technical Report P2-115/TR4, WRc-NSF Ltd, Environment Agency 2002.

(H) Human Health Guideline Values

*H1 – Drinking Water Standards (*The Water Supply (Water Quality) Regulations 2016*)

*H2 – Drinking Water Standards (*The Water Supply (Water Quality) Regulations 1989*)

*H3 – WHO Guidelines for Drinking Water Quality. Fourth Edition (2011)

*H4 – WHO (2008). Petroleum Products in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, WHO/SDE/WSH/05.08/123

Table 6-7: *Tier 1 Groundwater Risk Assessment (n = 2)*

Parameter	Range	Environmental			Human Health		
		Guideline	Exceedences		Guideline	Exceedences	
General Inorganics							
pH	7.7 to 7.2	6 – 9*[E2]	0	-	6.5 – 9.5*[H1]	0	-
Sulphate as SO_4 (mg/l)	20.4 – 31.4	400*[E1]	0	-	250*[H1]	0	-
Heavy Metals / Metalloids							
Arsenic (dissolved) (µg/l)	0.33 – 1.1	50*[E1]	0	-	10*[H1]	0	-
Boron (dissolved) (µg/l)	47 – 120	2000*[E1]	0	-	1000*[H1]	0	-
Chromium (dissolved) (µg/l)	<MDL – 0.4	4.7*[E1]	0	-	50*[H1]	0	-
Copper (dissolved) (µg/l)	<MDL – 2.0	1.0*[E1]	1	BH415 (2.0 µg/l)	2000*[H1]	0	-
Lead (dissolved) (µg/l)	<MDL – 0.3	1.2*[E1]	0	-	10*[H1]	0	-
Nickel (dissolved) (µg/l)	1.1 – 3.6	4.0*[E1]	0	-	20*[H1]	0	-
Selenium (dissolved) (µg/l)	<MDL – 0.7	NA	-	-	10*[H1]	0	-
Vanadium (dissolved) (µg/l)	<MDL – 0.3	20 – 60*[E1]	0	-	NA	-	-

Parameter	Range	Environmental			Human Health		
		Guideline	Exceedences		Guideline	Exceedences	
Zinc (dissolved) (µg/l)	13 - 22	10.9[*E1]	2	BHA (13 µg/l) BH415 (22 µg/l)	5,000[*H2]	0	-
Petroleum Hydrocarbons							
TPH-CWG - Aromatic >C10 - C12 (µg/l)	<MDL – 1,400	NA	-	-	90[*H4]	1	BHA (1,400 µg/l)
TPH-CWG - Aromatic (C5 - C35) (µg/l)	<MDL – 1,400	NA	-	-	NA	-	-
Volatile Organic Compounds (VOCs)							
Tetrachloroethene (PCE or PERC) (µg/l)	<MDL – 7.4	NA	-	-	40[*H3]	0	-
Semi-volatile Organic Compounds (SVOCs)							
Naphthalene (µg/l)	<MDL – 2.21	2[*E1]	1	BHA (2.21 µg/l)	NA	-	-

Parameter	Range	Environmental		Human Health	
		Guideline	Exceedences	Guideline	Exceedences
Notes: All results expressed in µg/l except for pH (unitless) and where indicated <MDL = Less than Method Detection Limit ND = Not recorded above limit of detection NA= Not available - = Not relevant					

7 Soils Assessment

7.1 Introduction

The planning permission (N6/2015/0294/PP) and associated conditions state:

1) A site investigation scheme, based on the submitted phase 1 Environmental Assessment (Delta-Simons ref 2342.17 V2) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

The previously referred to Delta-Simons report outlines previous work but did not include a detailed scope of works beyond the paragraph *'Prior to the redevelopment of the Site, additional Site-wide investigation of the shallow soils, including ground gas and soil vapour monitoring is likely to be required to confirm, through standard planning conditions, that the Site is suitable for the proposed mixed use including residential, retail, office, hotel, gym and community hub'*.

As a result, EAME developed a detailed scope of works (Ref. 016-1512 Plutus Estates Welwyn Garden City - Planning Condition1 LETTER REV00 – 29/09/17) which was submitted to Welwyn Hatfield Borough Council for approval. The scheme of or works was approved by Mr. Tim Croot (Welwyn Hatfield Borough Council, Environmental Health Department) on 7th November 2017.

7.2 Scope of Works

A targeted intrusive investigation at the Site was undertaken to better understand the ground conditions and to assess the nature and extent of any contamination. The breakdown of the strategy to investigate and assess conditions can be summarised as follows:

- a non-intrusive utility search for the presence of Site services was carried out by obtaining service utility plans and the undertaking of a survey of the Site by an EAME approved service tracing specialist (RP Drilling Ltd);
- the drilling of sixteen (16) windowless sample locations to a maximum depth of 5.0 metres below ground level (bgl) by an EAME approved sub-contractor (RP Drilling Ltd);
- the installation of 50mm diameter monitoring wells at eight (8) locations to facilitate gas and groundwater monitoring;
- positioning of all intrusive locations using a standalone Leica Global Positioning System (GPS)/ Global Navigation Satellite System (GNSS);

- the logging, sampling and on-site screening of soil samples for Volatile Organic Compounds (VOCs) at regular intervals throughout the soil profile using a Photo Ionisation Detector (PID); and

- submission of selected soil samples and groundwater samples to a UKAS and MCERTS accredited independent laboratory (i2 Analytical Ltd) for the analysis of a range of contaminants, which are likely to be associated with the former/current activities and ground conditions on the Site.

The window sample locations are outlined in *Figure 7-1* with the co-ordinates in *Table 7-1*.

Figure 7-1: *Windowless Sample Locations (WS01-18 to WS16-18)*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

Table 7-1: *Windowless Sample Locations (2018)*

Ref.	Easting	Northing	Elevation	Rationale
WS01-18	524046.573	212889.92	85.580 m AOD	Historic employee carpark
WS02-18	524096.34	212948.924	84.809 m AOD	Historic employee carpark
WS03-18	524042.547	212962.252	85.364 m AOD	Vacant land adjacent to railway
WS04-18	524107.982	213011.881	84.288 m AOD	Historic employee carpark
WS05-18	524057.586	213021.924	84.978 m AOD	Vacant land adjacent to railway
WS06-18	524101.982	213046.09	84.674 m AOD	Vacant land adjacent to railway
WS07-18	524149.315	213028.756	85.081 m AOD	Area of historic ASTs
WS08-18	524180.923	212988.054	83.957 m AOD	Site coverage
WS09-18	524163.897	212944.531	83.947 m AOD	Site coverage
WS10-18	524167.353	212912.194	85.194 m AOD	Site coverage
WS11-18	524191.746	212880.509	85.683 m AOD	Site coverage
WS12-18	524234.49	212877.197	83.938 m AOD	Site coverage
WS13-18	524207.105	212915.244	83.161 m AOD	Area of previous UST
WS14-18	524206.158	212947.845	83.972 m AOD	Site coverage
WS15-18	524259.168	212970.482	83.997 m AOD	Site coverage
WS16-18	524249.497	213009.934	83.907 m AOD	Site coverage

7.2.1 Health and Safety

A detailed project specific Health and Safety Plan (HSP) was prepared in advance of the commencement of the investigatory works. The project specific HSP was approved by the Project Director and was provided to all on-site EAME employees. For the avoidance of doubt, EAME staff as a minimum adhere to relevant legislation and best practice, including the Health and Safety Executive Guidance Note HS(G) 47 “Avoiding Danger from Underground Services”, and other relevant regulatory and legal requirements *e.g. Health & Safety at Work Act 1974 etc.*

7.2.2 Drilling

All drilling and windowless sample installations were undertaken by RP Drilling Ltd using a small tracked windowless rig (*Photograph 7-1*). Since 2008 RP Drilling Ltd has supplied windowless sampling services to both the geotechnical and environmental industries. Lead drillers hold NVQs and all operatives possess CSCS cards.

Photograph 7-1: *Windowless rig (WS06-18)*

The well installations were made using <1mm slotted well screen, 1-2mm washed and graded filter gravel and high-quality bentonite sealing materials. All materials were supplied by RP Drilling Limited. Drilling commenced on 26/06/18 and was completed on 27/06/18.

7.2.3 PID Field Data (Headspace Testing)

All soil samples were tested by dynamic headspace analysis, for the presence of volatile organic compounds (VOCs) using a Photoionization Detector (PID). Dynamic headspace analysis refers to the manual agitation (warming) of a sample to facilitate the volatilisation of organic compounds present in the water into the headspace above which is then analysed using the PID. The PID screens for a wide range of volatile organic compounds including hydrocarbon compounds and certain chlorinated solvents but does not indicate a specific compound. The measurements obtained by the instrument in parts per million by volume (ppmv) provide a semi-quantitative indication of the concentration of hydrocarbon vapours that are.

The unit used was a MiniRae Lite ATEX supplied by Environmental Science and Technology Limited (Serial No. 595-003336). The results of the headspace testing are outlined in *Table 7-2*.

Table 7-2: *Windowless Sample PID Results (2018)*

WS Ref.	Visual and Olfactory Observations	Sample Depth (m)	PID Reading (ppmv)	Laboratory analysis	Installed
WS01-18	No odour, no staining.	0.4 - 0.7	1.4	Yes	Yes
WS01-18	No odour, no staining.	2.0 - 2.3	1.9	Yes	
WS02-18	No odour, no staining.	0.15 - 0.4	2.2	No	Yes
WS02-18	No odour, no staining.	0.6 - 0.8	2.3	Yes	
WS02-18	No odour, no staining.	1.8 – 2.0	1.4	Yes	
WS03-18	No odour, no staining.	0.5 - 0.8	2.6	Yes	No
WS03-18	No odour, no staining.	1.5 - 1.8	2.1	Yes	
WS04-18	No odour, no staining.	0.1 - 0.4	3.4	Yes	No
WS04-18	No odour, no staining.	1.0 - 1.2	2.2	Yes	
WS05-18	No odour, no staining.	0.7 - 0.9	2.3	Yes	Yes
WS05-18	No odour, no staining.	1.5 - 1.8	0.2	No	
WS05-18	No odour, no staining.	4.5 – 5.0	3.0	Yes	
WS06-18	No odour, no staining.	0.3 - 0.6	2.1	Yes	No
WS06-18	No odour, no staining.	1.5 - 1.8	0.3	Yes	
WS07-18	No odour, no staining.	0.7 – 1.0	5.2	Yes	Yes
WS07-18	Diesel odour, no staining.	3.5 - 3.8	22.5	Yes	
WS07-18	Diesel odour, no staining.	4.6 - 4.8	7.3	No	
WS08-18	No odour, no staining.	0.8 – 1.0	1.7	Yes	Yes
WS08-18	No odour, no staining.	2.0 - 2.2	2.5	Yes	
WS08-18	No odour, no staining.	4.4 - 4.7	2.5	No	
WS09-18	No odour, no staining.	0.5 - 0.8	1.3	Yes	No
WS09-18	No odour, no staining.	1.6 - 1.8	3.1	Yes	
WS09-18	No odour, no staining.	2.2 - 2.5	2.7	No	
WS10-18	No odour, no staining.	1.2 - 1.5	5.3	Yes	No
WS10-18	No odour, no staining.	3.0 - 3.5	3.1	Yes	

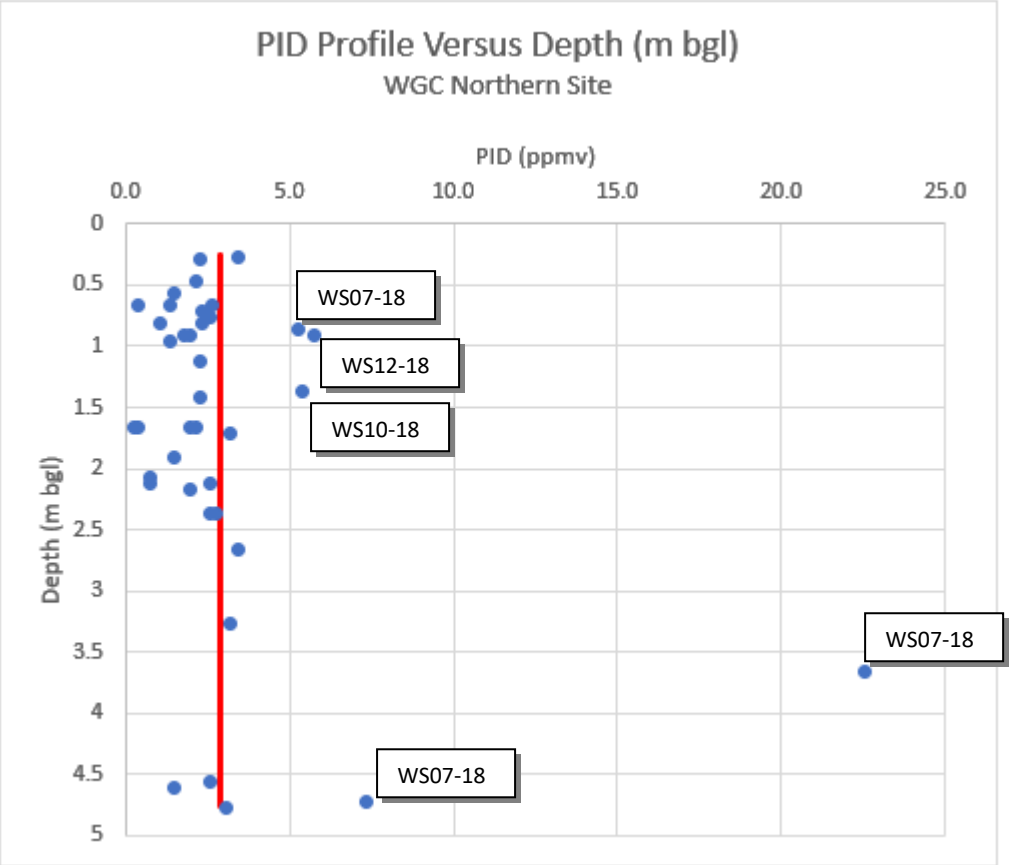
WS Ref.	Visual and Olfactory Observations	Sample Depth (m)	PID Reading (ppmv)	Laboratory analysis	Installed
WS11-18	No odour, no staining.	0.8 – 1.0	1.9	Yes	Yes
WS11-18	No odour, no staining.	2.2 - 2.5	2.5	Yes	
WS11-18	No odour, no staining.	4.4 - 4.8	1.4	No	
WS12-18	No odour, no staining.	0.8 – 1.0	5.7	Yes	No
WS12-18	No odour, no staining.	2.5 - 2.8	3.4	Yes	
WS13-18	No odour, no staining.	0.7 - 0.9	1.0	Yes	Yes
WS13-18	No odour, no staining.	1.9 - 2.2	0.7	Yes	
WS14-18	No odour, no staining.	0.8 - 1.1	1.3	Yes	No
WS14-18	No odour, no staining.	2.0 - 2.2	0.7	Yes	
WS15-18	No odour, no staining.	0.5 - 0.8	0.3	Yes	No
WS15-18	No odour, no staining.	1.5 - 1.8	1.9	Yes	
WS16-18	No odour, no staining.	0.6 - 0.9	2.5	Yes	Yes
WS16-18	No odour, no staining.	1.3 - 1.5	2.2	Yes	

Notes:

All installed Window Sample locations identified above (16 in total) were dipped on the 27/06/18 and 02/07/18. All locations were dry except for WS07-18 which had a rest water level of 2.92 m bgl.

The spread of the PID readings versus depth is outlined in *Figure 7-2* with the Mean value shown as a redline. A single outlier is associated with WS07-18 (3.5 – 3.8 m) which is around the historic above ground tanks (no longer present) associated with the ovens at the northern end of the main Shredded Wheat factory (please refer to page 13). The elevated PID level as this location appeared to reduce by 4.6 m bgl.

Figure 7-2: *Windowless Sample PID Profile (Northern Site)*



7.2.4 Sample Integrity

All collected soil samples were submitted to an MCERTS (Soils) and UKAS (ISO 17025) accredited laboratory (i2 Analytical) for chemical analysis. Discussions were held with the laboratory prior to the commencement of any works to determine the quantity of sample required and the containers to be used.

All samples obtained were placed in the appropriate container for the analysis to be carried out and were immediately put into a temperature regulated cool box with frozen cool packs. All samples were given a unique reference number, dated and the information recorded on an appropriate Chain of Custody (CoC) form for dispatch with the samples to the appropriate laboratory.

7.3 Soil Analytical Strategy

The analytical strategy was designed by EAME to provide an assessment of the presence of a common range of potential contaminants likely to be associated with the previous uses of the Site. The analytical suites are outlined in *Table 7-3*.

Table 7-3: *Window Sample (2017) Analytical Strategy*

Analytical Suite	Soil Samples
EAME Suite B Arsenic, Cadmium, Chromium, Chrome (VI), Lead, Mercury, Selenium, Copper, Nickel, Zinc, Vanadium, Beryllium, Water Soluble Boron, Total Cyanide, Monohydric Phenols, pH Value, Total Petroleum Hydrocarbon TPH - CWG (C5-35) Aliphatic/Aromatic Split (with CWG banding - Aliphatic C5-6,>6-8,>8-10,>10-12,>12-16,>16-21,>21-35) (Aromatic - >C6-7,>7-8,>8-10,>C10-12,>12-16,>16-21,>21-35), Speciated Polycyclic Aromatic Hydrocarbon (PAHs) (USEPA-16), Sulphate (water soluble), benzene, toluene, ethylbenzene, and xylenes (BTEX) and Methyl tert-butyl ether (MTBE)	WS01-18 (0.4-0.7 m), WS01-18 (2.0-2.3 m) WS02-18 (0.6-0.8 m), WS02-18 (1.8-2.0 m) WS03-18 (0.5-0.8 m), WS03-18 (1.5-1.8 m) WS04-18 (0.1-0.4 m), WS04-18 (1.0-1.2 m) WS05-18 (0.7-0.9 m), WS05-18 (4.5-5.0 m) WS06-18 (0.3-0.6 m), WS06-18 (1.5-1.8 m) WS07-18 (0.7-1.0 m), WS07-18 (3.5-3.8 m) WS08-18 (0.8-1.0 m), WS08-18 (2.0-2.2 m) WS09-18 (0.5-0.8 m), WS09-18 (1.6-1.8 m) WS10-18 (1.2-1.5 m), WS10-18 (3.0-3.5 m) WS11-18 (0.8-1.0 m), WS11-18 (2.2-2.5 m) WS12-18 (0.8-1.0 m), WS12-18 (2.5-2.8 m) WS13-18 (0.7-0.9 m), WS13-18 (1.9-2.2 m) WS14-18 (0.8-1.1 m), WS14-18 (2.0-2.2 m) WS15-18 (0.5-0.8 m), WS15-18 (1.5-1.8 m) WS16-18 (0.6-0.9 m), WS16-18 (1.3-1.5 m)
Volatile Organic Compounds (VOCs) Standard i2 Analytical Ltd VOC suite.	
Semi Volatile Organic Compounds (SVOCs) Standard range of PAHs, Phenols that form the standard i2 Analytical Ltd SVOC suite.	
Asbestos Screen & ID	
Polychlorinated Biphenyls (PCBs) 7 Congeners + Total PCBs	WS04-18 (1.0-1.2 m), WS06-18 (0.3-0.6 m) WS07-18 (3.5-3.8 m), WS08-18 (0.8-1.0 m) WS13-18 (0.7-0.9 m)
Soil Organic Matter	WS01-18 (0.4-0.7 m), WS03-18 (0.5-0.8 m) WS05-18 (0.7-0.9 m), WS08-18 (0.8-1.0 m) WS12-18 (0.8-1.0 m), WS14-18 (0.8-1.1 m)

7.3.1 Soil Chemical Data

Thirty-two (#32) soil samples were recovered (0.0 – 5.0 m bgl) and were scheduled for laboratory analysis (*Table 7-3*). The first stage of initial assessment was to screen out those compounds that were not recorded above the laboratory analytical method detection limits (MDLs). These are provided below and have not been considered further:

- Total Cyanide (MDL 1 mg/kg);
- Total Phenols (MDL 1 mg/kg);
- Selected Polyaromatic Hydrocarbons (PAHs) (*i.e.* Naphthalene) – Individual MDL 0.05 mg/kg);
- Cadmium (MDL 0.2 mg/kg);
- Chromium (hexavalent) (MDL 4 mg/kg);
- Monoaromatics (*i.e.* Benzene, Toluene, Ethylbenzene, p & m-xylene, o-xylene, MTBE (Methyl Tertiary Butyl Ether - Individual MDL 1 µg/kg)
- TPH-CWG - Aliphatic >C5 - C6 (MDL 0.001 mg/kg);
- TPH-CWG - Aliphatic >C6 – C8 (MDL 0.001 mg/kg);
- TPH-CWG - Aliphatic >C8 – C10 (MDL 0.001 mg/kg);
- TPH-CWG - Aromatic >C5 – C7 (MDL 0.001 mg/kg);
- TPH-CWG - Aromatic >C7 – C8 (MDL 0.001 mg/kg);
- TPH-CWG - Aromatic >EC8 - EC10 (MDL 0.001 mg/kg);
- All VOCs (Individual MDL 1 µg/kg);
- All SVOCs (MDL variable) except for 2-Methylnaphthalene, Carbazole and PAHs identified above;
- PCBs (PCB Congener 28, PCB Congener 52, PCB Congener 101, PCB Congener 118, PCB Congener 138, PCB Congener 153 and PCB Congener 180) (Individual MDL 0.001 mg/kg); and
- PCB (total) (MDL 0.007 mg/kg).

7.3.2 Assessment Criteria

Assessment of contaminated soils in the UK follows a risk-based approach and is structured in a tiered manner. As well as having a systematic approach to collecting the data it is also necessary to adopt recognised techniques and standards in assessing them and particularly regarding environmental risk assessment.

The information gathered during the site investigation was utilised to develop a conceptual site model based on the risk assessment principles of source, pathway and receptor.

The soil analytical results have been compared against an appropriate set of assessment criteria:

- Soil Guideline Values (SGVs) for the 11 compounds published in 2009 by the Environment Agency (EA);
- Suitable 4 Use Levels (S4UL) for 89 substances published by the Chartered Institute of Environmental Health (CIEH) and the Land Quality Management Group (LQM) in 2015[11]. S4UL replaces the 2nd edition of the LQM/CIEH generic assessment criteria published in 2009. The LQM/CIEH S4ULs are intended to provide a complete and updated replacement for the LQM/CIEH General Assessment Criteria (GAC)[12];
- Defra. Category 4 Screening Levels (C4SLs) for Lead; and
- Contaminated Land: Applications in Real Environments (2010). Soil Generic Assessment Criteria (GAC) for Human Health Risk Assessment, C:LAIRE, ISBN 978-1-905046-20-1, January 2010.

The SGV values for soil assessment were developed in accordance with current UK legislation and Environment Agency policy using the Contaminated Land Exposure Assessment (CLEA) risk assessment model (CLEA Version 1.06). The S4UL values are based on health criteria values, updated to reflect changes since 2009. They are derived for the standard CLEA land uses and the two public open space scenarios outlined in document SP1010[13] (CL:AIRE, 2014). The S4ULs are also compliant with EA document SR2[14] and the

11 Nathanail, C.P.; McCaffrey,C.; Gillett, A.G.; Ogden, R.C. & Nathanail, J.F. (2015), LQM/CIEH Suitable 4 Use Levels, Land Quality Press, Nottingham, ISBN: 978-0-9931084-0-2

12 Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3241

13 Contaminated Land: Applications in Real Environments (CL:AIRE) (2014), SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, Final Project Report (Revision 2)

14 Environment Agency (2009), Human health toxicological assessment of contaminants in soil, Science Report – Final SC050021/SR2

long standing principle of 'suitable for use' whilst also reflecting changes to exposure parameters outlined in document in SP1010 (CL:AIRE, 2014).

The S4UL values are intended to be 'trigger values' that mark the concentration of a substance in soil at or below which human exposure can be considered to represent a 'tolerable' or 'minimal' level of risk such that the land is suitable for its use.

Neither of these guidelines referred to have any legal status in the UK, they merely provide a useful screening guide to help identify where more site-specific risk assessment may be required *i.e.* exceedence of a guideline value should trigger further consideration and not be presumed to imply remediation is needed. Where known contamination exists above guideline values and this presents a significant risk to potential receptors then more sophisticated site-pecific Quantitative Risk Assessment (QRA) can be undertaken to better define the risks and identify appropriate remediation target values for the substances of concern.

7.3.3 Site End use

Six land use categories are outlined within the S4UL guidance:

- residential with home-grown produce;
- residential without home-grown produce;
- allotment;
- commercial;
- public open spaces (residential); and
- public open spaces (park).

The proposed development is residential but there are no individual gardens. All green spaces are shared *i.e.* The weave (a central public area of green space), Podium level residential gardens (recreational space for residents located above ground floor parking), Sensory garden (a publicly accessible space with individual and combined sensory opportunities), Roof gardens (roof level gardens) and a Green edge infrastructure (utilising existing trees and vegetation).

As a result, public open spaces (residential) has been selected as the appropriate land use.

7.3.4 Soil Organic Matter

Six samples were submitted for organic matter analysis. The results range from 0.1 % to 4.9 %. The Tier 1 LQM/CIEH screening value is therefore based on S4UL Public Open Spaces (Residential) (SOM 1%) has been used in the assessment except for heavy metals/metalloids where no SOM is stated.

The Tier 1 screening values used are:

*1 LQM/CIEH (Public Open Spaces (Residential) S4ULs, based on 1% Soil Organic Matter)

*2 LQM/CIEH (Public Open Spaces (Residential) S4ULs, no Soil Organic Matter stated)

*3 Category 4 Screening Levels (C4SLs), Public Open Spaces 1 (Grassed area adjacent to residential housing)

*4 C:LAIRE GAC for 1% SOM residential without homegrown produce (January 2010)

The Tier 1 soils assessment is outlined within *Table 7-4.*

Table 7-4: *Tier 1 Soil Assessment – North Site (n = 32)*

Contaminant	No. Samples Tested	No. Samples > MDL	Concentration Range (mg/kg)	Location and Max. Concentration	Screening Value (mg/kg)	No. of Exceedences of Screening Criteria
General Inorganics						
pH	32	32	4.8 - 12	WS12-18 (0.8-1.0m)	NG	-
Sulphate (water soluble) as SO_4 (g/l), (2:1 Leachate Equivalent)	32	32	0.0092 – 0.48	WS01-18 (0.4-0.7m) 0.048 g/l	NG	-
Asbestos in soil	32	1	N/A	WS01-18 (0.4-0.7m) Chrysotile, Amosite- Loose Fibrous Debris	NG	-
Speciated PAHs						
Acenaphthylene	32	1	0.21 - 0.21	WS06-18 (0.3-0.6m) 0.21 mg/kg	15000[*1]	0
Acenaphthene	32	2	0.37 - 0.44	WS07-18 (0.7-1.0m) 0.44 mg/kg	15000[*1]	0
Fluorene	32	1	0.3 - 0.3	WS06-18 (0.3-0.6m) 0.3 mg/kg	9900[*1]	0
Phenanthrene	32	7	0.36 - 3.8	WS06-18 (0.3-0.6m) 3.8 mg/kg	3100[*1]	0
Anthracene	32	3	0.19 - 1.1	WS06-18 (0.3-0.6m) 1.1 mg/kg	74000[*1]	0
Fluoranthene	32	7	0.53 - 9.4	WS06-18 (0.3-0.6m) 9.4 mg/kg	3100[*1]	0
Pyrene	32	7	0.47 - 8.6	WS06-18 (0.3-0.6m) 8.6 mg/kg	7400[*1]	0

Contaminant	No. Samples Tested	No. Samples > MDL	Concentration Range (mg/kg)	Location and Max. Concentration	Screening Value (mg/kg)	No. of Exceedences of Screening Criteria
Benzo(a)anthracene	32	5	0.37 - 5.1	WS06-18 (0.3-0.6m) 5.1 mg/kg	29[*1]	0
Chrysene	32	5	0.59 - 5.2	WS06-18 (0.3-0.6m) 5.2 mg/kg	57[*1]	0
Benzo(b)fluoranthene	32	5	0.32 - 6.9	WS06-18 (0.3-0.6m) 6.9 mg/kg	7.1[*1]	0
Benzo(k)fluoranthene	32	5	0.36 - 3.3	WS06-18 (0.3-0.6m) 3.3 mg/kg	190[*1]	0
Benzo(a)pyrene	32	5	0.31 - 7.2	WS06-18 (0.3-0.6m) 7.2 mg/kg	5.7[*1]	1
Indeno(1,2,3-cd)pyrene	32	4	0.75 - 4.6	WS06-18 (0.3-0.6m) 4.6 mg/kg	82[*1]	0
Dibenz(a,h)anthracene	32	1	1.2 - 1.2	WS06-18 (0.3-0.6m) 1.2 mg/kg	0.57[*1]	1
Benzo(ghi)perylene	32	4	0.85 - 5.7	WS06-18 (0.3-0.6m) 5.7 mg/kg	640[*1]	0
Total PAH						
Speciated Total EPA-16 PAHs	32	7	1.36 - 63	WS06-18 (0.3-0.6m) 63 mg/kg	NG	-
Heavy Metals / Metalloids						
Arsenic	32	32	4.5 - 120	WS13-18 (0.7-0.9m) 120 mg/kg	79[*2]	4
Beryllium	32	32	0.61 - 18	WS04-18 (0.1-0.4m) 18 mg/kg	2.2[*2]	3
Boron	32	32	0.3 - 6.3	WS02-18 (1.8-2.0m) 6.3 mg/kg	21000[*2]	0
Chromium	32	32	19 - 46	WS06-18 (1.5-1.8m) 46 mg/kg	1500[*2]	0

Contaminant	No. Samples Tested	No. Samples > MDL	Concentration Range (mg/kg)	Location and Max. Concentration	Screening Value (mg/kg)	No. of Exceedences of Screening Criteria
Copper	32	32	6.9 - 63	WS04-18 (0.1-0.4m) 63 mg/kg	12000[*2]	0
Lead	32	32	8.5 - 110	WS06-18 (0.3-0.6m) 110 mg/kg	630[*3]	0
Mercury	32	5	5 - 7.1	WS11-18 (2.2-2.5m) and WS13-18 (0.7-0.9m) 7.1 mg/kg	16[*2]	0
Nickel	32	32	14 - 88	WS10-18 (1.2-1.5m) 88 mg/kg	230[*2]	0
Selenium	32	5	1.2 - 3.7	WS16-18 (1.3-1.5m) 3.7 mg/kg	1100[*2]	0
Vanadium	32	32	27 - 96	WS04-18 (0.1-0.4m) 96 mg/kg	2000[*2]	0
Zinc	32	32	44 - 330	WS13-18 (0.7-0.9m) 330 mg/kg	81000[*2]	0
Petroleum Hydrocarbons						
TPH-CWG – Aliphatic >EC10 - EC12	32	4	1.4 - 48	WS07-18 (3.5-3.8m) 48 mg/kg	13000[*1]	0
TPH-CWG – Aliphatic >EC12 – EC16	32	5	4.6 - 430	WS07-18 (3.5-3.8m) 430 mg/kg	13000[*1]	0
TPH-CWG – Aliphatic >EC16 – EC21	32	5	11 - 660	WS07-18 (3.5-3.8m) 660 mg/kg	250000[*1]	0
TPH-CWG – Aliphatic >EC21 – EC35	32	6	43 - 410	WS07-18 (3.5-3.8m) 410 mg/kg	250000[*1]	0

Contaminant	No. Samples Tested	No. Samples > MDL	Concentration Range (mg/kg)	Location and Max. Concentration	Screening Value (mg/kg)	No. of Exceedences of Screening Criteria
TPH-CWG - Aliphatic (EC5 - EC35)	32	6	45 - 1500	WS07-18 (3.5-3.8m) 1500 mg/kg	NG	0
TPH-CWG – Aromatic >EC10 - EC12	32	4	3.9 - 30	WS07-18 (3.5-3.8m) 30 mg/kg	5000[*1]	0
TPH-CWG – Aromatic >EC12 – EC16	32	6	3.1 - 390	WS07-18 (3.5-3.8m) 390 mg/kg	5100[*1]	0
TPH-CWG – Aromatic >EC16 – EC21	32	6	18 - 740	WS07-18 (3.5-3.8m) 740 mg/kg	3800[*1]	0
TPH-CWG – Aromatic >EC21 – EC35	32	7	46 - 610	WS01-18)0.4-0.7m) 610 mg/kg	3800[*1]	0
TPH-CWG - Aromatic (EC5 - EC35)	32	7	49 - 1500	WS07-18 (3.5-3.8m) 1500 mg/kg	NG	0
Semi-volatile Organic Compounds (SVOCs)						
2-Methylnaphthalene	32	1	0.3 – 0.3	WS04-18 (0.1-0.4m) 0.3 mg/kg	NG	-
Carbazole	32	1	0.4 – 0.4	WS06-18 (0.3-0.6m) 0.4 mg/kg	NG	-
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Contaminant	No. Samples Tested	No. Samples > MDL	Concentration Range (mg/kg)	Location and Max. Concentration	Screening Value (mg/kg)	No. of Exceedences of Screening Criteria
Notes: Units are mg/kg except where indicated otherwise NG = No Guideline available <MDL = Below the Method Detection Limit The exceedences of the stated screening values are: **Benzo(a)pyrene** (1 sample) – WS06-18 (0.3-0.6m) 7.2 mg/kg **Dibenz(a,h)anthracene** (1 sample) – WS06-18 (0.3-0.6m) 1.2 mg/kg **Arsenic** (4 samples) – WS13-18 (0.7-0.9m) 120 mg/kg, WS11-18 (0.8-1.0m) 97 mg/kg, WS12-18 (2.5-2.8m) 94 mg/kg, WS10-18 (1.2-1.5m) 80 mg/kg **Beryllium** (3 samples) – WS04-18 (0.1-0.4m) 17 mg/kg, WS01-18 (0.4-0.7m) 4.8 mg/kg, WS11-18 (0.8-1.0m) 2.3 mg/kg						

7.3.5 Background Heavy Metals and Metalloids

According to the BGS Contaminant Distribution in Soil Atlas the Welwyn Garden City area has higher than average 'normal background concentrations' of Arsenic (*Figure 7-3*).

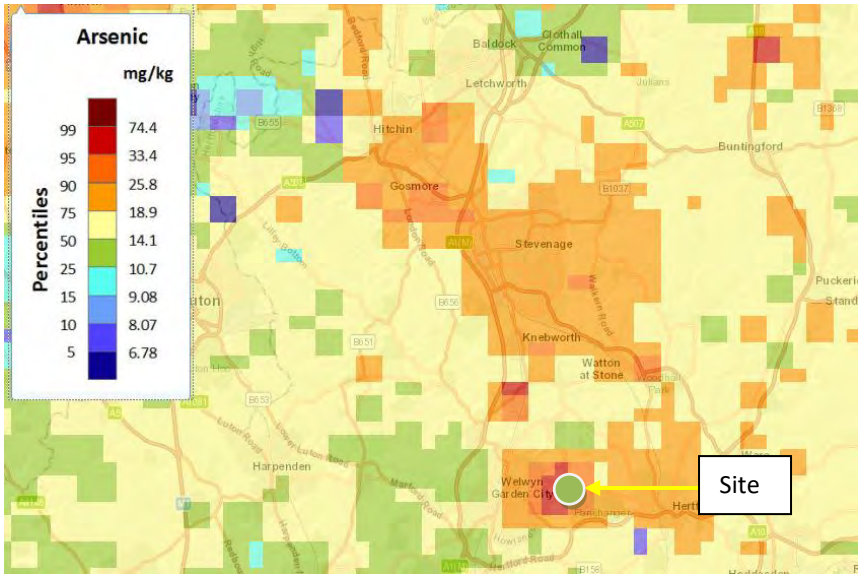

Figure 7-3: *BGS Arsenic in Soil (normal background concentrations)*[15]

No background data is currently available for Beryllium as the BGS has not identified this as a current contaminant of concern. It seems reasonable to conclude, however, that the elevated metals are a natural rather than anthropogenic phenomenon on this site. Nonetheless, we have considered their significance below.

15 http://mapapps2.bgs.ac.uk/bccs/home.html

7.4 Statistical Analysis of Soil Exceedences

To assess the significance of the screening value exceedences the recommended statistical techniques outlined within CL:AIRE guidance has been utilised[16]. The assessments have been undertaken using the 'Planning Scenario' approach.

7.4.1 Arsenic

The data was reviewed and found to meet the data quality criteria outlined within CL:AIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration (May 2008).

The planning scenario is appropriate; therefore, the key question is:

- Is there sufficient evidence that the true mean concentration of Arsenic (μ) is less than the critical concentration (Cc)?

The Null Hypotheses (H0) is that the true mean is equal to, or greater than, the critical concentration. The Alternative Hypothesis(H1) is that the true mean concentration is less than the critical concentration.

No non-detects were reported within the dataset.

Outlier Test

A Grubb's outlier tests was performed (n = 32 and α = 0.05). No outliers have been identified. The full dataset has been utilised.

Probability Plot

A probability plot for the data was produced as the data does not align along the 45-degree line it can be concluded that the dataset is not normally distributed.

Shapiro-Wilk Normality Test

The results are outlined in *Table 7-5*.

16 CL:AIRE (2008). Guidance on Comparing Soil Contamination Data with a Critical Concentration, May 2008, The Chartered Institute of Environmental Health, CL:AIRE, ISBN10 1-904306-79-9, ISBN13 978-1-904306-79-5.

Table 7-5: *Shapiro-Wilk Normality Test (Arsenic)*

Sample Size (n)	32
Mean	38.86
Standard Deviation (SD)	29.84
Calculated W	0.871
Significance Level	0.05
Shapiro-Wilk Critical Level	0.930
Result	W < critical value at significance level of 0.05, therefore data set is not normally distributed. Use Non-Parametric Procedure.
Screening value	79 mg/kg LQM/CIEH (Public Open Spaces (Residential) S4ULs, no Soil Organic Matter stated) (Mean < screening value)
Test	One-sided Chebychev Theorem can be applied

Non-Parametric Test

The results of the non-parametric test are outlined in *Table 7-6*.

Table 7-6: *Non-Parametric Test (Arsenic)*

Upper Tolerance Limit for data	121.6
Mean	38.9
Standard Deviation	29.84
No. of data observations (n)	32
$k_{0.05}$	4.36
Square Root (n)	5.66
$UCL_{0.95}$	61.86
k0	-7.610
Critical Concentration (Cc)	79
Is Mean < Cc?	Yes

K_{crit} = K0.05 therefore K_{crit}	4.36
Is k0 < k_{crit}?	Yes
	H0 is rejected
k_0	-7.610
minus k_0	7.610
therefore k_1	7.610
therefore alpha	0.01
p_1	0.99
Estimate against H0 being true	99%
Is p_1>95%	YES

The conclusion is that there is a very high degree of confidence H0 is rejected *i.e.* the true mean concentration is less than the critical concentration.

7.4.2 Beryllium

The data was reviewed and found to meet the data quality criteria outlined within CL:AIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration (May 2008).

The planning scenario is appropriate; therefore, the key question is:

- Is there sufficient evidence that the true mean concentration of Beryllium (μ) is less than the critical concentration (Cc)?

The Null Hypotheses (H0) is that the true mean is equal to, or less than, the critical concentration. The Alternative Hypothesis(H1) is that the true mean concentration is greater than the critical concentration.

No non-detects were reported within the dataset.

Outlier Test

A Grubb's outlier tests was performed (n = 32 and α = 0.05). The 4.8 mg/kg and 18 mg/kg values are considered outliers at a confidence level of 95%. These data points have been excluded from further assessment.

Probability Plot

A probability plot for the data was produced and it can be concluded that the dataset is normally distributed.

Shapiro-Wilk Normality Test

The results are outlined in *Table 7-7*.

Table 7-7: *Shapiro-Wilk Normality Test (Beryllium)*

Sample Size (n)	30
Mean	1.22
Standard Deviation (SD)	0.41
Calculated W	0.941
Significance Level	0.05
Shapiro-Wilk Critical Level	0.927
Result	W > critical value at significance level of 0.05, therefore data set is normally distributed. Use t-test procedure.
Screening value	2.2 mg/kg LQM/CIEH (Public Open Spaces (Residential) S4ULs, no Soil Organic Matter stated) (Mean < screening value)
Test	One sample t-test

One sample t-test

The results of the t-test are outlined in *Table 7-8*.

Table 7-8: *One sample t-test (Beryllium)*

Count	30
Sample Mean	1.2 mg/kg
Standard Deviation	0.4062
Standard Error	0.0742
Variance	0.1595
Degrees of Freedom	29
t Statistic	-13.2368
t Critical	1.6991
α value	0.05
p Value	1
Conclusion	
Do Not Reject H0, Conclude Mean <= 2.2 mg/kg P-Value > Alpha (0.05)	

The conclusion is that there is a very high degree of confidence H0 is accepted *i.e.* the true mean concentration is less than the critical concentration.

8 Shallow Groundwater

8.1 Introduction

The targeted intrusive investigation at the Site involved the drilling of sixteen (16) windowless sample locations to a maximum depth of 5.0 metres bgl by RP Drilling Ltd. of which 8 were installed with 50mm diameter monitoring wells to facilitate gas and (where possible) groundwater monitoring (*Figure 8-1*).

Figure 8-1: *Installations (EAME 2018)*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

All installed wells (*Table 8-1*) were observed to be dry during the visits conducted on 28/06/18, 02/07/18, 12/07/18 and 17/07/18 except for WS07-18.

Table 8-1: *Windowless Sample Installations (2018)*

Ref.	Groundwater Observations	Well Base	Comments
WS01-18	Dry	5.03 m bgl	-
WS02-18	Dry	3.48 m bgl	-
WS05-18	Dry	5.01 m bgl	-
WS07-18	Silty brown water, no discernible odour	4.13 m bgl	In area of historic ASTs
WS08-18	Dry	4.87 m bgl	-
WS11-18	Dry	4.96 m bgl	-
WS13-18	Dry	2.68 m bgl	-
WS16-18	Dry	4.90 m bgl	-

The presence of perched water within WS07-18 was unexpected given the previous investigations by Delta-Simons and the remainder of the 2018 locations drilled by EAME. There is a possibility that the perched water in this location is due to a leaking water pipe associated with the adjacent Shredded Wheat factory. This has yet to be confirmed.

8.2 Sample Acquisition

8.2.1 Purging of Wells

WS07-18 was dipped (02/07/18) prior to purging, using a Geotech Interface Meter to determine current well volume and to determine if any free-phase liquid was present. The well was then purged using the three-standard well volume methodology[17,18]. The well was left for 3 hours between purging and sampling.

8.2.2 Groundwater Sampling

Prior to sampling WS07-18 was again dipped using a Geotech Interface Meter to determine resting groundwater level and to verify whether free product was present. The well was then sampled using a 38 mm disposable BioBailer (02/07/18).

17 Environment Agency (2003). Guidance on monitoring of landfill leachate, groundwater and surface water. 283pp.
18 ASTM (2012). ASTM D6542 2012. Standard guide for purging methods for wells used for groundwater quality investigations

All samples were collected in new glassware (*i.e.* 2 x 40 ml amber vials followed by 2 x 300 ml amber bottles) provided by i2 Analytical Ltd. After the sample collection the groundwater from the wells was examined visually and any unusual odours were noted.

8.2.3 Sample Integrity

The sample was placed in containers appropriate to the type of analysis being undertaken and stored in a fridge, to avoid the loss of volatile compounds. Dispatch to the accredited laboratory took place as soon as possible following the completion of the investigation.

All sampling was undertaken using EAME in-house field procedures (available on request) and relevant guidance, such as BS ISO 5667-11:2009, BS 6068-6.11:2009 Water quality Sampling. Guidance on sampling of groundwaters.

All collected samples were submitted to i2 Analytical Ltd a UKAS (ISO 17025) accredited laboratory for chemical analysis. Discussions were held with the laboratory prior to the commencement of any works to determine the quantity of sample required and the containers to be used.

All samples were given a unique reference number, dated and the information recorded on an appropriate Chain of Custody (CoC) form for dispatch with the samples to the appropriate laboratory.

8.3 Groundwater Chemical Data

8.3.1 Groundwater Analytical Strategy

The analytical strategy was designed by EAME to provide an assessment of the presence of a common range of potential contaminants likely to be associated with the previous uses of the Site in this area (*i.e.* potential historic hydrocarbon-based ASTs).

8.3.2 Groundwater Analysis

The first stage of assessment was to screen out those compounds that were not recorded above the laboratory analytical method detection limits (MDLs). These are listed below and have not been considered further:

- Speciated PAHs (Acenaphthylene, Anthracene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(ghi)perylene) (Individual PAH MDL 0.01 µg/l)
- Beryllium (MDL 0.1 µg/l);

- Boron (MDL 10 µg/l);
- Cadmium (MDL 0.02 µg/l);
- Chromium (hexavalent) (MDL 5 µg/l);
- Mercury (MDL 0.05 µg/l);
- Monoaromatics (Benzene, Toluene, Ethylbenzene, p & m-xylene, o-xylene and Methyl Tertiary Butyl Ether (MTBE) (Individual MDL 1 µg/l);
- TPH-CWG - Aliphatic >C5 - C6 (MDL 1 µg/l);
- TPH-CWG - Aliphatic >C6 - C8 (MDL 1 µg/l);
- TPH-CWG - Aliphatic >C8 - C10 (MDL 1 µg/l);
- TPH-CWG - Aliphatic >C10 - C12 (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C12 - C16 (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C16 - C21 (MDL 10 µg/l);
- TPH-CWG - Aliphatic >C21 - C35 (MDL 10 µg/l);
- TPH-CWG - Aliphatic (C5 - C35) (MDL 10 µg/l);
- TPH-CWG - Aromatic >C5 - C7 (MDL 1 µg/l);
- TPH-CWG - Aromatic >C7 - C8 (MDL 1 µg/l);
- TPH-CWG - Aromatic >C8 - C10 (MDL 1 µg/l);
- TPH-CWG - Aromatic >C16 - C21 (MDL 10 µg/l);
- TPH-CWG - Aromatic >C21 - C35 (MDL 10 µg/l);
- Specific VOCs as listed within analytical report 18-91281-1 (MDL 1 µg/l);
- Specific SVOCs as listed within analytical report 18-91281-1 (MDL variable);
- PCBs (PCB Congener 28, PCB Congener 52, PCB Congener 101, PCB Congener 118, PCB Congener 138, PCB Congener 153 and PCB Congener 180) (MDL 0.02 µg/l); and
- PCB (total) (MDL 0.14 µg/l).

8.3.3 Tier 1 Screening – Generic Quantitative Risk Assessment

The remaining determinands, above their respective laboratory MDLs, have been reported and compared with stated Tier 1 screening values as outlined within *Table 6-7*. The following Generic Quantitative Risk Assessment screening values have been used within the assessment process:

(E) Environmental Guideline Values

*E1 – AA-EQS (micrograms per litre) *The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015*. An annual average concentration EQS (AA), defined as the highest concentration to which an aquatic ecosystem may be exposed without any likely adverse effects.

*E2 – MAC-EQS (micrograms per litre) *The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015*. A maximum allowable concentration EQS (MAC), defined as the highest transient concentration that would be expected to cause adverse effects. The MAC is designed to protect against short-term episodic pollution events, while the AA is designed to protect against long-term continuous pollution.

*E3 – N J Ayscough, W Young and P Whitehouse (2002). Proposed Environmental Quality Standards for Ethylbenzene in Water, R&D Technical Report P2-115/TR4, WRc-NSF Ltd, Environment Agency 2002.

(H) Human Health Guideline Values

*H1 – Drinking Water Standards (*The Water Supply (Water Quality) Regulations 2016*)

*H2 – Drinking Water Standards (*The Water Supply (Water Quality) Regulations 1989*)

*H3 – WHO Guidelines for Drinking Water Quality. Fourth Edition (2011)

*H4 – WHO (2008). Petroleum Products in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, WHO/SDE/WSH/05.08/123

Table 8-2: *Tier 1 Groundwater Risk Assessment (n = 1)*

Parameter	WS07-18	Environmental & Human Health Guideline Values		
		Env Guideline	HH Guideline	Exceedence
General Inorganics				
pH	12	6 – 9*[E2]	6.5 – 9.5*[H1]	Y (Env/HH)
Total Cyanide	120	1*[E1]	50*[H1]	Y (Env)
Sulphate (mg/l)	48	400*[E1]	250*[H1]	-
Total Phenols				
Total Phenols (monohydric)	330	7.7*[E1]	0.5*[H1]	Y (Env/HH)
Speciated PAHs				
Naphthalene	3.01	2*[E1]	NA	Y (Env)
Acenaphthene	1.74	NA	NA	-
Fluorene	1.68	NA	NA	-
Phenanthrene	1.6	NA	NA	-
Fluoranthene	0.25	NA	NA	-
Pyrene	0.17	NA	NA	-
Total EPA-16 PAHs	8.45	NA	NA	-
Heavy Metals/Metalloids				
Arsenic (dissolved)	12.4	50*[E1]	10*[H1]	Y (Env)
Chromium (dissolved)	15	4.7*[E1]	50*[H1]	Y (Env)
Copper (dissolved)	62	1.0*[E1]	2000*[H1]	Y (Env)
Lead (dissolved)	1.8	1.2*[E1]	10*[H1]	Y (Env)
Nickel (dissolved)	46	4.0*[E1]	20*[H1]	Y (Env/HH)
Selenium (dissolved)	1.8	NA	10*[H1]	-
Vanadium (dissolved)	4.1	20 – 60*[E1]	NA	-
Zinc (dissolved)	5	10.9*[E1]	5,000*[H2]	-
Petroleum Hydrocarbons				
TPH-CWG - Aromatic >C10 - C12	22	NA	120*[H4]	-

Parameter	WS07-18	Environmental & Human Health Guideline Values		
		Env Guideline	HH Guideline	Exceedence
TPH-CWG - Aromatic >C12 - C16	110	NA	120*H4	-
TPH-CWG - Aromatic (C5 - C35)	140	NA	NA	-
VOCs				
Trichlorofluoromethane	10.4	NA	NA	-
SVOCs				
Aniline	1.4	NA	NA	-
Phenol	1.5	7.7*E1	0.5*H2	Y (HH)
2-Methylnaphthalene	2.8	NA	NA	-

Notes:

All results expressed in µg/l except for pH (unitless) and where indicated

<MDL = Less than Method Detection Limit

ND = Not recorded above limit of detection

NA= Not available

- = Not relevant

9 Ground Gas Assessment

9.1 Introduction

Land gas is produced because of the decomposition of organic materials such as paper, vegetation, wood, *etc.* but it may also originate from natural sources, such as coal seams and organic rich soils. The principal components of ground gas are methane and carbon dioxide although trace gases such as hydrogen sulphide and carbon monoxide can also be present. Ground gases can present a hazard to site workers during construction activities (*e.g.* carbon dioxide is heavier than air and may accumulate in voids and methane is flammable), and can enter buildings, thus presenting a hazard to occupants in terms of asphyxiation or explosion. Methane is explosive at concentrations of between 5 and 15%, with 5% being the lower explosive limit (LEL).

Several guidance documents have been produced for new developments on gassing sites. BRE Report 465 (2004) is aimed at providing a framework for planners to ensure 'contaminated land' issues are adequately addressed, including guidance for methane and other ground gases. The framework includes CIRIA's Report 149, which provides further guidance and an initial attempt at characterising gassing sites in terms of volume of gas rather than just concentrations. This was further developed by Wilson and Card's paper in 1999, which provided an approach considering the distribution of gas concentrations and flow rates. For this assessment, reference has been made to the recent CIRIA (665) document, assessing risks poses by hazardous ground gases to building, 2007, which provides the most up to date and comprehensive reference criteria for assessing land gas, by providing advice relevant to existing or planned development and a step-wise approach to risk assessment. The CIRIA guidance has been supplemented using BS 8485:2015 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*.

9.2 Development Type

CIRIA C665 identifies two development situations:

- Situation A – Any development other than Situation B *e.g.* factories, shops, commercial, warehouse, schools, cinemas, sports centres, stadiums, high rise housing, housing with basements; and
- Situation B – Low rise building with minimum ventilated under floor (minimum 150 mm).

Situation A has been selected for the assessment.

Under BS8485:2015 the building type proposed would be Type B.

9.3 Determination of Gas Screening Value

The CIRIA C665 document uses both gas concentrations and borehole flow rates to define a characteristic situation for a site based on the limiting borehole gas volume flow for methane and carbon dioxide. This provides a Gas Screening Value (GSV), based on the maximum gas concentrations (methane or carbon dioxide) and flow rates recorded at the site (*i.e.* calculated for each window sample under consideration):

- GSV (litres of gas per hour) = max borehole flow rate (l/hr) x max gas concentration (%)

This then enables an appropriate Characteristic Situation to be determined (*Table 9-1*). The GSV should only be considered as a guideline value and not as an absolute threshold.

Table 9-1: *Modified Wilson and Card Classification (adapted from CIRIA Report 665)*

Characteristic Situation (CIRIA R149 & BS 8485:2015	Risk Classification	Gas Screening Value (CH_4 or CO_2 (l/hr))	Additional Factors
CS1	Very low risk	<0.07 l/hr	Typical methane </=1% v/v and/or carbon dioxide </=5% v/v. Otherwise increase to Situation 2.
CS2	Low risk	<0.7 l/hr	Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to Situation 3.
CS3	Moderate risk	<3.5 l/hr	-
CS4	Moderate to high risk	<15 l/hr	Quantitative risk assessment required to evaluate scope of protective measures
CS5	High risk	<70 l/hr	-
CS6	Very high risk	<70 l/hr	-

Note:

Gas Screening Value (GSV): litres of gas/hour is calculated by multiplying the gas concentration (%) by the measured borehole flow rate (l/hr).

As a worst-case scenario, the C665 maximum Methane and Carbon dioxide concentrations have been used to calculate the individual window sample GSVs as well as the site-wide maximum.

9.4 Scope of Required Gas Protection Measures

The characteristic situation defined above can be used to define the general scope of gas protective measures required. The philosophy behind this is that as the risks posed by the presence of methane and carbon dioxide in the ground increase the degree of redundancy within the type of protective system proposed is also increased, so if one method or element of the protection fails for any reason the building is not exposed to unacceptable risk. CIRIA C665 (*Table 9-2*) and BS 8485:2015 differ slightly in the presentation and scope of required protection measures versus the site-specific characteristic situation.

Table 9-2: *Typical Scope of Protective Measures (adapted from CIRIA Report 665)*

Characteristic Situation	Residential building (not those that belong to Situation B)	
	Number of Levels of Protection	Typical Scope of Protection Measures
CS1	None	No special precautions.
CS2	2	Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200g DPM and under floor venting. Beam and block or pre-cast concrete and minimum 2000g DPM/reinforced gas membrane and underfloor venting. All joints and penetrations sealed.
CS3	2	All types of floor slab as above. All joints and penetrations sealed. Proprietary gas resistant membrane and passively ventilated or positively pressurised underfloor sub-space.
CS4	3	All types of floor slab as above. All joints and penetrations sealed. Proprietary gas resistance membrane and passively ventilated underfloor subspace or positively pressurised underfloor sub-space, oversite capping or blinding and in-ground venting layer.
CS5	4	Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft). All joints and penetrations sealed. Proprietary gas resistant membrane and ventilated or positively pressurised underfloor sub-space, oversite capping and in-ground venting layer and in-ground venting wells or barriers.

Characteristic Situation	Residential building (not those that belong to Situation B)	
	Number of Levels of Protection	Typical Scope of Protection Measures
CS6	5	Not suitable unless gas regime is reduced first, and quantitative risk assessment carried out to assess design of protection measures in conjunction with foundation design.

The gas protection requirements outlined in BS 8495:2015 are based around a point system that varies depending on the Characteristic Situation and building type.

Table 9-3: *Gas Protection Score (BS 8454:2015)*

Characteristic Situation	Minimum Gas Protection Score (Points)			
	High Risk	High Risk	Medium Risk	Low Risk
	Type A Building	Type B Building	Type C Building	Type D Building
CS1	0	0	0	0
CS2	3.5	3.5	2.5	1.5
CS3	4.5	4	3	2.5
CS4	6.5[A]	5.5[A]	4.5	3.5
CS5	_[B]	6.5[A]	5.5	4.5
CS6	_[B]	_[B]	7.5	6.5

Notes:

[A] Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated *e.g.* high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, *e.g.* in institutional and/or fully serviced contractual situations.

[B] The gas hazard is too high for this empirical method to be used to define the gas protection measures.

When the minimum gas protection score has been determined for the building, or for each part of the building, then a combination of two or more of the following three types of protection measures should be used to achieve that score *i.e.* structural barrier of the floor slab or basement slab and walls; ventilation measures and a gas resistant membrane.

9.5 Gas Monitoring Equipment and Procedure

Periodic monitoring includes measurement of borehole flow rates, bulk gas concentrations (*i.e.* methane, carbon dioxide and oxygen), trace gas compounds (*i.e.* hydrogen sulphide and carbon monoxide), barometric pressure and temperature. It is best practice that a range of atmospheric conditions are encountered within the monitoring period to cover worst case conditions. Monitoring should ideally include one visit under low pressure (less than 1,000 mbar), one visit under falling atmospheric pressure and one visit under high atmospheric pressure.

9.6 Land Gas Assessment Results

Three phases (7 separate rounds) of ground gas assessment have been undertaken on the northern site between 2006 and 2018.

Figure 9-1: *Ground gas monitoring (2006 - 2018)*

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9.6.1 Delta-Simons Monitoring (2006)

Delta-Simons undertook a combined Phase I/II assessment of the northern and southern sites in 2006 during which a single round of gas monitoring was undertaken of 5 boreholes on June 1st, 2006 (*Table 9-4*).

Table 9-4: *Delta-Simons (2006) gas monitoring results*

Monitoring Well	Methane (% v/v)	Carbon dioxide (% v/v)	Oxygen (% v/v)	Atmospheric Pressure (mb)
BHA	<0.1	1.3	19.4	1016
BHC	<0.1	<0.1	20.9	1015
BHD	<0.1	<0.1	21.1	1016
BHG	<0.1	0.1	21.0	1015
BHH	<0.1	1.3	19.5	1012
Note: Gas flow, hydrogen sulphide, carbon monoxide was not monitored during the Delta-Simons monitoring event.				

9.6.2 Delta-Simons Monitoring (2014)

Delta-Simons undertook a geotechnical assessment of the northern and southern sites in 2014 during which two rounds of gas monitoring were undertaken of 8 boreholes on October 22nd, 2014 (Round 1) and October 29th, 2014 (Round 2).

Table 9-5: *Delta-Simons (2014) gas monitoring results (Round 1)*

Monitoring Well	Flow (Peak/Steady) (l/hr)	Methane (Peak/Steady) (% v/v)	Carbon dioxide (Peak/Steady) (% v/v)	Oxygen (Min/Steady) (% v/v)	Atmospheric Pressure (mb)
BH415	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	20.0 / 20.0	1017
BH412	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	20.1 / 20.1	1018
BH413	0.0 / 0.0	0.0 / 0.0	0.1 / 0.1	19.9 / 19.9	1019
BH408	0.0 / 0.0	0.0 / 0.0	1.6 / 1.6	18.3 / 18.3	1020
BH409	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	20.1 / 20.1	1021

Monitoring Well	Flow (Peak/Steady) (l/hr)	Methane (Peak/Steady) (% v/v)	Carbon dioxide (Peak/Steady) (% v/v)	Oxygen (Min/Steady) (% v/v)	Atmospheric Pressure (mb)
BH410	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	20.1 / 20.1	1022
BH411	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	20.3 / 20.3	1023
BH416	0.0 / 0.0	0.0 / 0.0	2.7 / 2.7	17.4 / 17.4	1024
Note: Hydrogen sulphide, carbon monoxide and PID was not monitored during the Delta-Simons monitoring event. Sunny, windy, 15.2 °C, windspeed 2.6 m/s. Gas monitor - GFM 436.					

Delta-Simons gas monitoring Round 2 data is outlined within *Table 9-6*.

Table 9-6: *Delta-Simons (2014) gas monitoring results (Round 2)*

Monitoring Well	Flow (Peak/Steady) (l/hr)	Methane (Peak/Steady) (% v/v)	Carbon dioxide (Peak/Steady) (% v/v)	Oxygen (Min/Steady) (% v/v)	Atmospheric Pressure (mb)
BH415	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	20.1 / 20.1	1008
BH412	0.0 / 0.0	0.0 / 0.0	0.2 / 0.2	20.0 / 20.0	1008
BH413	0.0 / 0.0	0.0 / 0.0	0.1 / 0.1	20.2 / 20.2	1008
BH408	0.0 / 0.0	0.0 / 0.0	0.5 / 0.5	19.3 / 19.3	1008
BH409	0.0 / 0.0	0.0 / 0.0	0.2 / 0.2	20.1 / 20.1	1008
BH410	0.0 / 0.0	0.0 / 0.0	0.0 / 0.2	20.1 / 20.1	1008
BH411	0.0 / 0.0	0.1 / 0.1	0.1 / 0.1	20.1 / 20.1	1008
BH416	0.0 / 0.0	0.0 / 0.0	0.4 / 0.4	19.9 / 19.9	1008
Note: Hydrogen sulphide, carbon monoxide and PID was not monitored during the Delta-Simons monitoring event. Dull, windy, 11.4 °C, windspeed 3.7 m/s. Gas monitor - GFM 436.					

9.6.3 EAME Monitoring Round 1 to 4 (June 28th, 2018 – July 17th, 2018)

EAME undertook a window sample assessment of the northern site between 26th June 2017 and 27th June 2018 during which 8 locations were installed for gas monitoring (WS01-18, WS02-18, WS05-18, WS07-18, WS08-18, WS11-18, WS13-18 and WS16-18). EAME undertook four rounds of gas monitoring of 8 locations between June 28th, 2018 and July 17th, 2018.

The equipment used during the monitoring event are outlined within *Table 9-7*. In-line with NHBC Guidance[19] the first round of monitoring included screening using a Photo-ionisation Detector (PID).

Table 9-7: *Gas monitoring equipment*

Criteria	PID	Landfill Gas Monitor	
Instrument	MiniRae Lite ATEX	GFM436 (CH_4, CO_2, O_2, H_2S, LEL)	
Supplied by	Environmental Science and Technology Ltd	Shawcity Ltd	
Serial No.	595-003336	12727 (Round 1 -2)	12928 (Round 3-4)
Calibration Date	19/06/2018	10/10/2017	16/04/18
Certificate No.	10114	5089	2633
Notes	Only utilised during round 1.	-	-

The monitoring data has been recorded using the pro-forma suggested within the NHBC Guidance on Methane and Carbon Dioxide[19]. The full results of the monitoring are outlined within *Annex E*.

Although the gas monitoring results obtained only offer a snap shot of conditions at the site the results generally align with the monitoring previously conducted by Delta-Simons in 2006 and 2014. The main findings are outlined below.

19 NHBC (2007). Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present, Report Edition No.4 March 2007

Gas flow

The gas flow observations are summarised in *Table 9-8*.

Table 9-8: *Gas flow monitoring - Peak (Northern Site) (l/hr)*

	28/06/18	02/07/18	12/07/18	17/07/18
	Round 1	Round 2	Round 3	Round 4
WS01-18	0.0	0.0	0.0	0.0
WS02-18	0.0	0.0	0.0	0.0
WS05-18	0.0	0.0	0.0	0.0
WS07-18	0.0	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0	0.0
WS11-18	0.0	0.0	0.0	0.0
WS13-18	0.0	0.0	0.0	0.0
WS16-18	0.0	0.0	0.0	0.0
Notes:				

The key observations are:

- No gas flow was detected in any of the Window Sample locations during the 4 EAME monitoring rounds or during the 2 rounds conducted by Delta-Simons.

Methane

The peak methane observations are summarised in *Table 9-9*.

Table 9-9: *Methane Concentrations - Peak (Northern Site) (% v/v)*

	28/06/18	02/07/18	12/07/18	17/07/18
	Round 1	Round 2	Round 3	Round 4
WS01-18	0.0	0.0	0.0	0.0
WS02-18	0.0	0.0	0.0	0.0
WS05-18	0.0	0.0	0.0	0.0

	28/06/18	02/07/18	12/07/18	17/07/18
	Round 1	Round 2	Round 3	Round 4
WS07-18	0.0	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0	0.0
WS11-18	0.0	0.0	0.0	0.0
WS13-18	0.0	0.0	0.0	0.0
WS16-18	0.0	0.0	0.0	0.0
Notes:				

The key observations are:

- No methane was detected in any of the Window Sample locations during the 4 EAME monitoring rounds or during 2 out of the 3 rounds conducted by Delta-Simons.
- A peak of 0.1% v/v was recorded by Dela-Simons on one occasion from one borehole (BH411) in 2014. This doesn't seem to be representative of the site as methane has not be detected elsewhere across the site or within the same hole previously.

Carbon Dioxide

The peak Carbon dioxide observations are summarised in *Table 9-10*.

Table 9-10: *Carbon dioxide Concentrations - Peak (Northern Site) (% v/v)*

	28/06/18	02/07/18	12/07/18	17/07/18
	Round 1	Round 2	Round 3	Round 4
WS01-18	12.1	10.8	14.1	14.3
WS02-18	2.1	3.7	3.9	3.7
WS05-18	2.4	0.7	0.7	0.6
WS07-18	0.0	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0	0.0
WS11-18	0.9	0.2	0.1	0.1
WS13-18	0.0	0.0	0.0	0.0

	28/06/18	02/07/18	12/07/18	17/07/18
	Round 1	Round 2	Round 3	Round 4
WS16-18	0.2	0.1	0.2	0.3
Notes:				

The maximum Carbon dioxide reading was 14.3% v/v (WS01-18) observed during round 1.

Other gases

No hydrogen sulphide (H_2S) was detected in any of the locations monitored.

The maximum carbon monoxide (CO) detected was 32 ppmv (WS02-18) during round 1. CO was not detected in any of the other locations monitored during any of the monitoring rounds.

Volatile Organic Compounds (VOCs) were detected at all locations above detection with a maximum PID level recorded was 30.6 ppmv (WS05-18).

9.7 Ground Gas Risk Assessment

The CIRIA 665/BS 8485: 2015 guidance has been used for comparative purposes. As such, using the modified Wilson and Card Classification (CIRIA C665, 2007), in respect of the current data and the identified GSVs the worst-case situation (consideration of site-wide maximums) is as follows:

- Maximum Methane – 0.1 %v/v (BH411 – 29/10/14)
- Maximum Carbon dioxide – 14.3 %v/v (WS01-18 – 17/07/18)
- Maximum flow rate – 0.0 l/hr (all monitoring wells, all monitoring events)

This equates to a GSV (0.0 l/hr x 14.3 % v/v/100) = 0.00 l/hr or Characteristic Situation CS1 – Very Low Risk.

Based on the BS 8485:2015 gas protection scores (*Table 9-3:* Gas Protection Score (BS 8454:2015) by CS and building type the minimum gas protection score would be 0 (Type B Building under BS8485:2015).

10 Qualitative Risk Assessment

10.1 Introduction

Part 2A of the *Environmental Protection Act 1990* ("Part 2A") provides the legislative framework for the contaminated land regime in England, Wales and Scotland. It provides for contaminated land to be identified and dealt with in a risk-based manner. *The Contaminated Land (England) Regulations 2006* set out provisions for procedural matters under Part 2A. The 2006 regulations have recently been modified with the introduction of *The Contaminated Land (England) (Amendment) Regulations 2012*, which came into force on 6th April 2012. This includes an amendment to Regulation 3(c) to take account of the updated definition of "controlled waters" in Section 78A(9) of the Environmental Protection Act 1990.

Section 78A(2) of Part 2A of the EPA 1990 defines contaminated land as "land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

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

Contaminated Land Statutory Guidance published in April 2012 provides for a new four category test which is intended to clarify when land does or does not need to be remediated, where Category 1 is deemed as being high risk and Category 4 as being low risk.

"Significant harm" is defined in the Guidance on risk-based criteria and must be the result of a significant "pollutant linkage". The presence of a pollutant linkage relies on the Source-Pathway-Receptor concept, where all three factors must be present and potentially or actually linked for a potential risk to exist. An initial assessment of pollutant linkage can be made qualitatively (*i.e.* through identifying these factors) and may be assessed using qualitative risk assessment models.

A conceptual model is an essential element of any site-specific environmental risk assessment. In this context, they are often simple representations of the hypothesised relationships between sources, pathways and receptors. For this report, a basic conceptual model has been developed based on the principles of CLR11[20] and interpretation of information gathered during the Phase I review. Thus, this allows the identification of potential pollutant linkages and whether these linkages have the potential to comprise

20 Environment Agency (2004). Contaminated Land Report 11: Model Procedures for the Management of Land Contamination (CLR11)

significant harm and/or pollution of controlled waters in relation to the Site. Based on this interpretation, the implications for potential liability associated with soil or water contamination at the Site can be evaluated.

10.2 Conceptual Site Model

The soil and groundwater conditions on the Site, as identified through the environmental assessment, have been summarised into a Conceptual Site Model (CSM), which defines the key sources, pathways and receptors that have been identified as being relevant to this Site. The CSM concludes with potential pollutant linkages for the Site given the current setting:

- SOURCES – the identification of contaminants within the soils and groundwater that represent potential pollution sources;
- PATHWAYS – the identification of the potential exposure mechanisms and migration pathways from the potential sources; and
- RECEPTORS – the identification of the potential receptors that could be sensitive to harm if exposed to these pollution sources.

Collectively, each of these scenarios would be considered a potential pollutant linkage that may require further assessment.

It is understood that this report is required to support a proposed planning application for the redevelopment of the Site. Changes to the above proposals will invalidate the following risk assessment (*i.e.* a more sensitive land use has not been considered). A preliminary conceptual model is presented below in accordance with the guidance outlined within CLR11.

10.2.1 Identification of Potential Sources

Based on the information from the desk study, historical maps and published information, a summary of potential contaminant sources is provided. These have been divided into sources resulting from current and historic uses, both on and off-site (*Table 10-4*).

10.2.2 Identification of Potential Exposure Pathways

Exposure pathways are the potential routes and mechanisms by which on-site sources could be linked to the identified potential receptors and thereby expose them to potential harm. Only plausible pathways need be considered. The following potential exposure pathways have been identified at the Site (note these do not assume a source is present):

- inhalation (*i.e.* dust and vapours);

- dermal contact (*i.e.* direct contact with contaminated materials);
- ingestion of contaminated soils or groundwater;
- direct contact with buildings and services;
- migration of contaminants via on-site drainage systems;
- vertical/horizontal migration of contaminants (within the soil/groundwater); and
- vertical/horizontal migration of ground gases.

10.2.3 Potential Receptors

Based on the Site's environmental setting and the proposed future end use of the Site, the following potential receptors have been identified:

- groundwater;
- surface water
- construction workers;
- future on-site buildings and services;
- future site users (*i.e.* residential occupiers); and
- third-party land and operations (*i.e.* the possibility of contamination migrating off-site onto third party land via contaminated groundwater, surface water run-off *etc.*).

10.2.4 Potential Pollutant Linkages

For there to be a plausible pollutant linkage there must be a source, receptor and pathway and a feasible linkage between them (a so-called pollutant linkage). Consequently, even where a contaminant is identified, if there is no pathway for the contamination to reach a receptor, or no receptor then there can be no significant risk and remedial actions are not required. Furthermore, even if there is a complete pollutant linkage, it is possible that the contaminant concentration that can pass along the linkage does not represent a significant risk to human health or the environment. Central to this risk assessment process is the development of a 'conceptual model'. This is a descriptive and/or pictorial representation of the area of potential contamination, the surrounding environment and the processes acting on the contaminants by which they can move and encounter receptors (*e.g.* by leaching and migration into groundwater).

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, to assess risk both the likelihood and the consequences of an event must be considered. This report adopts the methodology for risk evaluation presented in the guidance document CIRIA C552 Contaminated Land Risk Assessment – A Guide to Good Practice[21].

The method is qualitative and involves the classification of the magnitude of the potential severity or consequence of the risk occurring (*Table 10-1*).

Table 10-1: *Classification of consequence*

Consequence	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of (significant) pollution of sensitive water resource. Catastrophic damage to building/property. A short-term risk to a ecosystem, or organism forming part of such ecosystem.
Medium	Chronic damage to human health (significant harm). Pollution of sensitive water resources. A significant change in an ecosystem, or an organism forming part of such an ecosystem.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing *etc.*). Easily repairable effects of damage to buildings, structures and services.

The magnitude of the likelihood or probability of the risk occurring is estimated using *Table 10-2*.

21 Rudland, D. J., Lancefield, R. M. & Mayell, P. N., (2001). CIRIA C552: Contaminated Land Risk Assessment - A Guide to Good Practice.

Table 10-2: *Classification of probability*

Likelihood	Definition
High	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period that such an event would take place and is even less likely in the shorter term.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

Once the likelihood of an event occurring and its severity have been classified, a risk category can be assigned using *Table 10-3*.

Table 10-3: *Risk assessment matrix*

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Likelihood of Occurrence	**High**	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low

The description of the classified risks and likely actions required, in accordance with CIRIA C552, are:

- VERY HIGH RISK – There is a high probability that severe harm could arise to a designated receptor from an identified hazard OR, there is evidence that sever harm to a designated receptor is currently happening. This risk (if realised) is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.

- HIGH RISK – Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.

- MODERATE RISK – It is possible that harm could arise to a designated receptor from an identified hazard. However, if it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.

- LOW RISK – It is possible that harm could arise to a designated receptor from n identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

- VERY LOW RISK – There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

EAME has devised a conceptual model based on the information obtained to date through the desk-based study and the proposed end use of the Site. This is detailed in tabular format in *Table 10-4* and pictorially in *Annex A, Figure A3* and *Figure A4*. It is important to remember that the stated risk assessment only remains valid if the current proposals are implemented.

Table 10-4: *Conceptual Site Model (CSM)*

Source
Zone N01 – Shredded Wheat factory (1926 – 2008) – Historic, On-site source Site activities included a substation, ASTs, fire water pump house and diesel generator, boiler house and associated diesel storage tanks, former Underground Storage Tanks (USTs), cereal packaging print works and wastewater disposal via a “clearwell” (soakaway).
Zone 02 – Employee Car Park/Trailer Park (1960s – 2008) – Historic, On-site source Site activities included car and trailer parking.

Source
Zone 03 – Vacant land adjacent to railway (1930s – 1990s) – Historic, On-site source Area associated with adjacent railway land use including a drainage system and three concrete slabs, indicating the presence of former buildings.

Pathway	Receptor	Potential Pollutant Linkage and Significance
Ingestion Inhalation Dermal contact	**HHR01 Human Health** Current Site users	**Likelihood [LOW] x Consequence [MINOR] = VERY LOW**
The property is currently disused (no current users) and there is no public access on to the site. The property was subject to recent demolition and site clearance/turn-over (to two metres below ground level) apart from the Grade II listed structures. In addition, two infilled (decommissioned) USTs were removed from site. Minor exceedances of stated soil screening values were found during the site investigation: • PAHs (Benzo(a)pyrene and Dibenz(a,h)anthracene) – One exceedence the Public Open Spaces (Residential) S4Ul screening value. • Heavy metal (Arsenic) – Four exceedences of the Public Open Spaces (Residential) S4Uls screening value. • Heavy metal (Beryllium) – Three exceedences of the Public Open Spaces (Residential) S4Uls screening value. According to the BGS Contaminant Distribution in Soil Atlas the Welwyn Garden City area has higher than average 'normal background concentrations' of Arsenic. Statistical tests conclude that there was a very high degree of confidence that the true mean concentration (arsenic and beryllium) is less than the critical S4UL concentration. All samples were submitted for asbestos in soil screen/identification. Only one detection (Chrysotile, Amosite-Loose Fibrous Debris) was found associated with the shallow soils (0.4 – 0.7 m) beneath the contractor car park (tarmac surface) (WS01-18).		

Pathway	Receptor	Potential Pollutant Linkage and Significance
Ingestion Inhalation Dermal contact	**HHR02 Human Health** Future construction workers	**Likelihood [LOW] x Consequence [MINOR] =VERY LOW**
The property was subject to recent demolition and site clearance/turn-over (to two metres below ground level) including removal of two USTs. The site investigation did not identify any potentially significant on-site (in ground) sources of contamination beyond that identified in HHR01.		

Pathway	Receptor	Potential Pollutant Linkage and Significance
The redevelopment of the Site will involve ground disturbance and removal of the shallow 'Made Ground'. Any localised 'Made Ground' encountered during the redevelopment works should be assessed and removed as required. Normal operational hygiene requirements and procedures will be applied. These would be sufficient to break any potential pollution linkages with the below ground materials (if indeed they are present).		

Pathway	Receptor	Potential Pollutant Linkage and Significance
Ingestion Inhalation Dermal contact	**HHR03 Human Health** Future Site users	**Likelihood [LOW] x Consequence [MINOR] = VERY LOW**
The proposed development is residential but there are no individual gardens. All green spaces are shared *i.e.* The weave (a central public area of green space), Podium level residential gardens (recreational space for residents located above ground floor parking), Sensory garden (a publicly accessible space with individual and combined sensory opportunities), Roof gardens (roof level gardens) and a Green edge infrastructure (utilising existing trees and vegetation). There will be no opportunity for residents to grow and consume produce. The site investigation did not identify any potentially significant on-site (in ground) sources of contamination. Minor exceedances of stated soil screening values were found (See HHR01 Human Health). Any service pipes should be installed to comply with *Water Supply (Water Fittings) Regulations 1999* and *Water Supply (Water Quality) Regulations 2000*. All materials to be Water Regulations Advisory Scheme (WRAS) approved for use on potable water supplies.		

Pathway	Receptor	Potential Pollutant Linkage and Significance
Migration from impacted soils to surface water	**CWR01 Controlled Waters** Surface Water	**Likelihood [LOW] x Consequence [MINOR] = VERY LOW**
The nearest surface watercourse to the Site is the River Mimram (1.75 km north) and the River Lee (1.76 km south southwest). The site investigation did not identify any significant on-site (in ground) sources of contamination. Minor exceedances of stated soil screening values were found (See HHR01 Human Health). There is no evidence of uncontrolled release (from land contamination issues) from the Site due to historic or current activities. The potential for there to be a pollution linkage with the River Mimram (1.75 km north) and the River Lee (1.76 km south southwest) is very low.		

Pathway	Receptor	Potential Pollutant Linkage and Significance
Migration from impacted soils to groundwater	**CWR02 Controlled Waters** Groundwater	**Likelihood [LOW] x Consequence [MINOR] = VERY LOW**
The Site is partially located on a Secondary A Aquifer and a Secondary (Undifferentiated) Aquifer (superficial deposits) and underlain by a Principal Aquifer (bedrock). The site is in the Total Catchment (Zone 3) of an SPZ. The site investigation did not identify any significant on-site (in ground) sources of contamination. Minor exceedances of stated soil screening values were found (See HHR01 Human Health). The targeted intrusive investigation at the site involved the drilling of sixteen (16) windowless sample locations to a maximum depth of 5.0 metres bgl. All installed wells were observed to be dry. The presence of perched water within WS07-18 was unexpected given the previous investigations by Delta-Simons and the remainder of the 2018 locations drilled by EAME. There is a possibility that the perched water in this location is due to a leaking water pipe associated with the adjacent Shredded Wheat factory. This has yet to be confirmed. The groundwater flow within the Chalk aquifer was assessed by Delta-Simons in 2014. It was concluded by Delta-Simons that the resting groundwater in the chalk formation was circa 22 m to 23 m bgl and that any shallow perched groundwater is likely to be limited in extent and discontinuous and unlikely to represent a significant constraint to development.		

Pathway	Receptor	Potential Pollutant Linkage and Significance
Direct contact Migration of land gas through soils	**BER01 - Built Environment** On-site buildings, services and structures	**Likelihood [LOW] x Consequence [MINOR] = VERY LOW**
No evidence of infilled areas on-site was found either during the site investigation or during the demolition activities. Three phases (7 separate rounds) of ground gas assessment have been undertaken on the northern site between 2006 and 2018. The CIRIA 665/BS 8485: 2015 guidance has been used for comparative purposes. As such, using the modified Wilson and Card Classification (CIRIA C665, 2007), in respect of the current data and the identified GSVs the worst-case situation (consideration of site-wide maximums) is (0.0 l/hr x 14.3 % v/v/100) = 0.00 l/hr or Characteristic Situation CS1 – Very Low Risk. Based on the BS 8485:2015 gas protection scores by CS and building type the minimum gas protection score would be 0 (Type B Building under BS8485:2015).		

11 Conclusions

11.1 Soils

Minor exceedances of stated soil screening values were found during the site investigation:

- PAH (Benzo(a)pyrene) – One exceedence (7.2 mg/kg) of the Public Open Spaces (Residential) S4Ul screening value (5.7 mg/kg) associated with WS06-18 (0.3-0.6m). The remaining 31 samples were all less than the screening value.

- PAH (Dibenz(a,h)anthracene) – One exceedence (1.2 mg/kg) of the Public Open Spaces (Residential) S4Ul screening value (0.57 mg/kg) associated with WS06-18 (0.3-0.6m). The remaining 31 samples were all less than the screening value.

- Heavy metal (Arsenic) – Four exceedences of the Public Open Spaces (Residential) S4Uls screening value (79 mg/kg). WS10-18 (1.6-1.8m) (80 mg/kg), WS11-18 (0.8-1.0m) (97 mg/kg), WS12-18 (2.5-2.8m) (94 mg/kg) and WS13-18 (0.7-0.9m) (120 mg/kg). According to the BGS Contaminant Distribution in Soil Atlas the Welwyn Garden City area has higher than average 'normal background concentrations' of Arsenic. Statistical tests conclude that there was a very high degree of confidence that the true mean concentration (arsenic) is less than the critical S4UL concentration of 79 mg/kg.

- Heavy metal (Beryllium) – Three exceedences of the Public Open Spaces (Residential) S4Uls screening value (2.2 mg/kg). WS01-18 (0.4-0.7m) (4.8 mg/kg), WS04-18 (0.1-0.4m) (18 mg/kg) and WS11-18 (0.8-1.0m) (2.3 mg/kg). Statistical tests conclude that there was a very high degree of confidence that the true mean concentration (beryllium) is less than the critical S4UL concentration of 2.2 mg/kg.

- Asbestos – All 32 samples were submitted for asbestos in soil screen/identification. Only one detection (Chrysotile, Amosite- Loose Fibrous Debris) was found associated with the shallow soils (0.4 – 0.7 m) beneath the contractor car park (encapsulated under a tarmac surface) (WS01-18).

The proposed development is residential but there are no individual gardens or opportunities for residents to grow and consume foods. All green spaces are shared *i.e.* The weave (a central public area of green space), Podium level residential gardens (recreational space for residents located above ground floor parking), Sensory garden (a publicly accessible space with individual and combined sensory opportunities), Roof gardens (roof level gardens) and a Green edge infrastructure (utilising existing trees and vegetation). It is concluded that the Site is suitable for the proposed use without remediation. A watching brief should be undertaken during in-ground works in those areas that have not been subject to demolition, but the expectation of significant new conditions is very low.

11.2 Groundwater

The Site is partially located on a Secondary A Aquifer and a Secondary (Undifferentiated) Aquifer (superficial deposits) and underlain by a Principal Aquifer (bedrock). The site is in the Total Catchment (Zone 3) of an SPZ.

The targeted intrusive investigation at the site involved the drilling of sixteen (16) windowless sample locations to a maximum depth of 5.0 metres bgl. All installed wells were observed to be dry. The presence of perched water within WS07-18 was unexpected given the previous investigations by Delta-Simons and the remainder of the 2018 locations drilled by EAME. There is a possibility that the perched water in this location is due to a leaking water pipe associated with the adjacent Shredded Wheat factory. This has yet to be confirmed.

The groundwater flow within the Chalk aquifer was assessed by Delta-Simons in 2014. It was concluded by Delta-Simons that the resting groundwater in the chalk formation was circa 22 m to 23 m bgl and that any shallow perched groundwater is likely to be limited in extent and discontinuous and unlikely to represent a significant constraint to development.

The site investigation did not identify any on-site (in ground) sources of contamination on the northern site that have and/or could impact the Principal Aquifer.

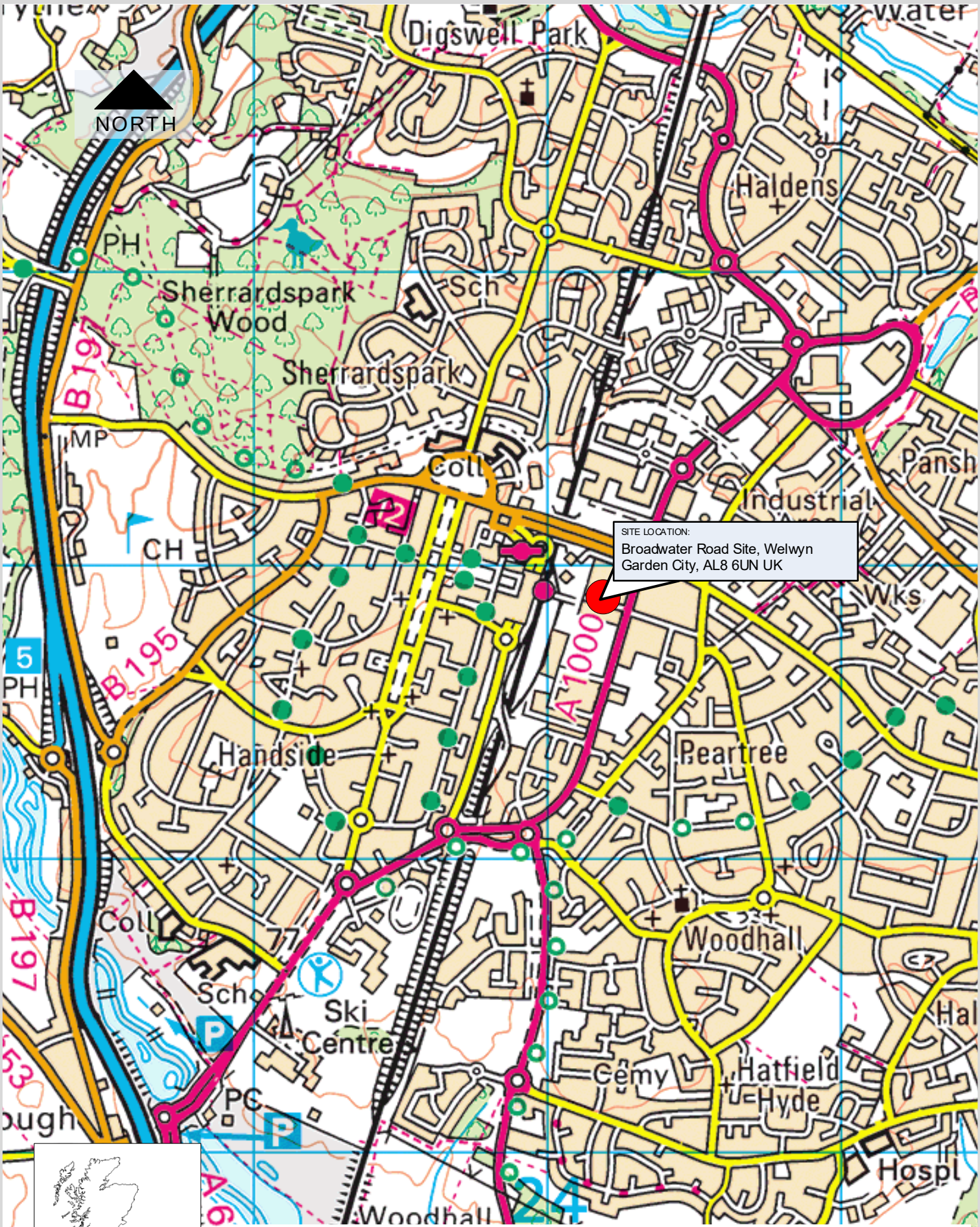
11.3 Ground Gases

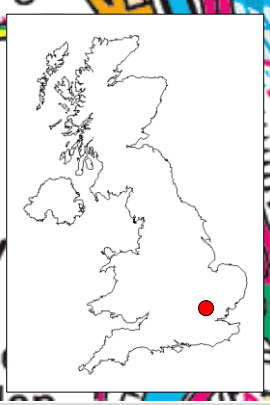
Three phases (7 separate rounds) of ground gas assessment have been undertaken on the northern site between 2006 and 2018.

The CIRIA 665/BS 8485: 2015 guidance has been used for comparative purposes. As such, using the modified Wilson and Card Classification (CIRIA C665, 2007), in respect of the current data and the identified GSVs the worst-case situation (consideration of site-wide maximums) is (0.0 l/hr x 14.3 % v/v/100) = 0.00 l/hr or Characteristic Situation CS1 – Very Low Risk.

Based on the BS 8485:2015 gas protection scores by CS and building type the minimum gas protection score would be 0 (Type B Building under BS8485:2015).

Annex A: Figures





Ordnance Survey 1: 50,000 scale map with the permission of The Controller of Her Majesty's Stationery Office, Crown Copyright
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TITLE: **Figure A1.** Site Location	JOB REFERENCE: 016-1512	REVISIONS:		
		No.	Date.	Description.
		00	21/03/18	Final for report
	DATE: March 21, 2018	-	--/--/--	-
		-	--/--/--	-
		-	--/--/--	-
CLIENT: Wheat Quarter Limited	SCALE: 1:50,000	DRAWN BY: MJS	CHECKED BY: SPR	EAME Earth & Marine Environmental Consultants

Based upon Google Earth Pro Imaging with the permission of Google ™ Licensed to Earth and Marine Environmental Consultants Ltd

Planning Application Area

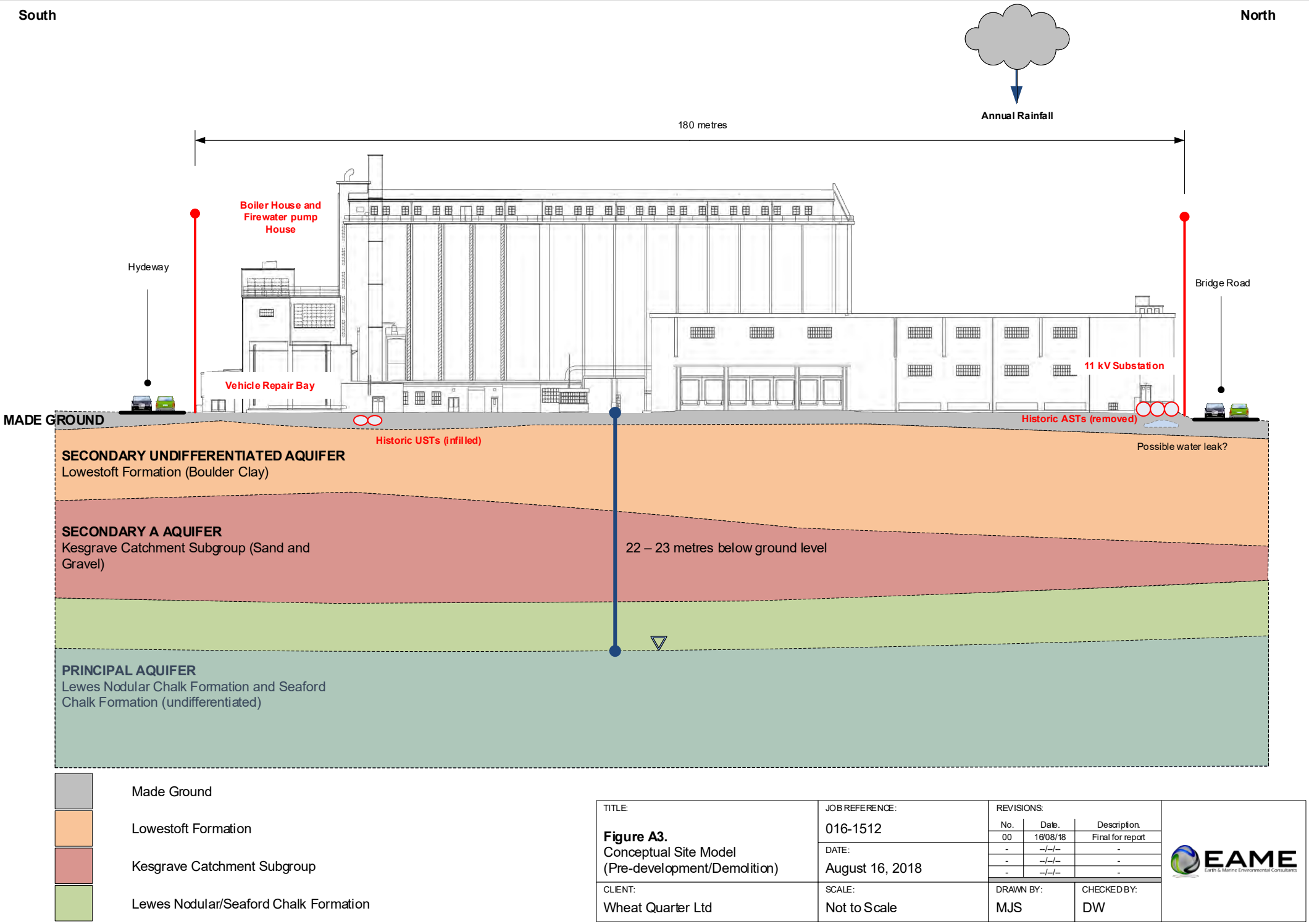
Off-site features

On-site features

Notes:

Site plan is based on March 2017 aerial photography.

TITLE: **Figure A2.** Site Layout	JOB REFERENCE: 016-1512	REVISIONS: No. 00 / Date. 21/03/18 / Description. Final for report		EAME Earth & Marine Environmental Consultants
	DATE: March 21, 2018	- / --/--/-- / -		
CLIENT: Wheat Quarter Limited	SCALE: As stated	DRAWN BY: MJS	CHECKED BY: SPR	



TITLE: **Figure A3.** Conceptual Site Model (Pre-development/Demolition)	JOB REFERENCE: 016-1512	REVISIONS:	
		No. / Date / Description: 00 / 16/08/18 / Final for report	
	DATE: August 16, 2018	- / --/--/-- / -	
		- / --/--/-- / -	
		- / --/--/-- / -	
CLIENT: Wheat Quarter Ltd	SCALE: Not to Scale	DRAWN BY: MJS	CHECKED BY: DW

EAME Earth & Marine Environmental Consultants

South

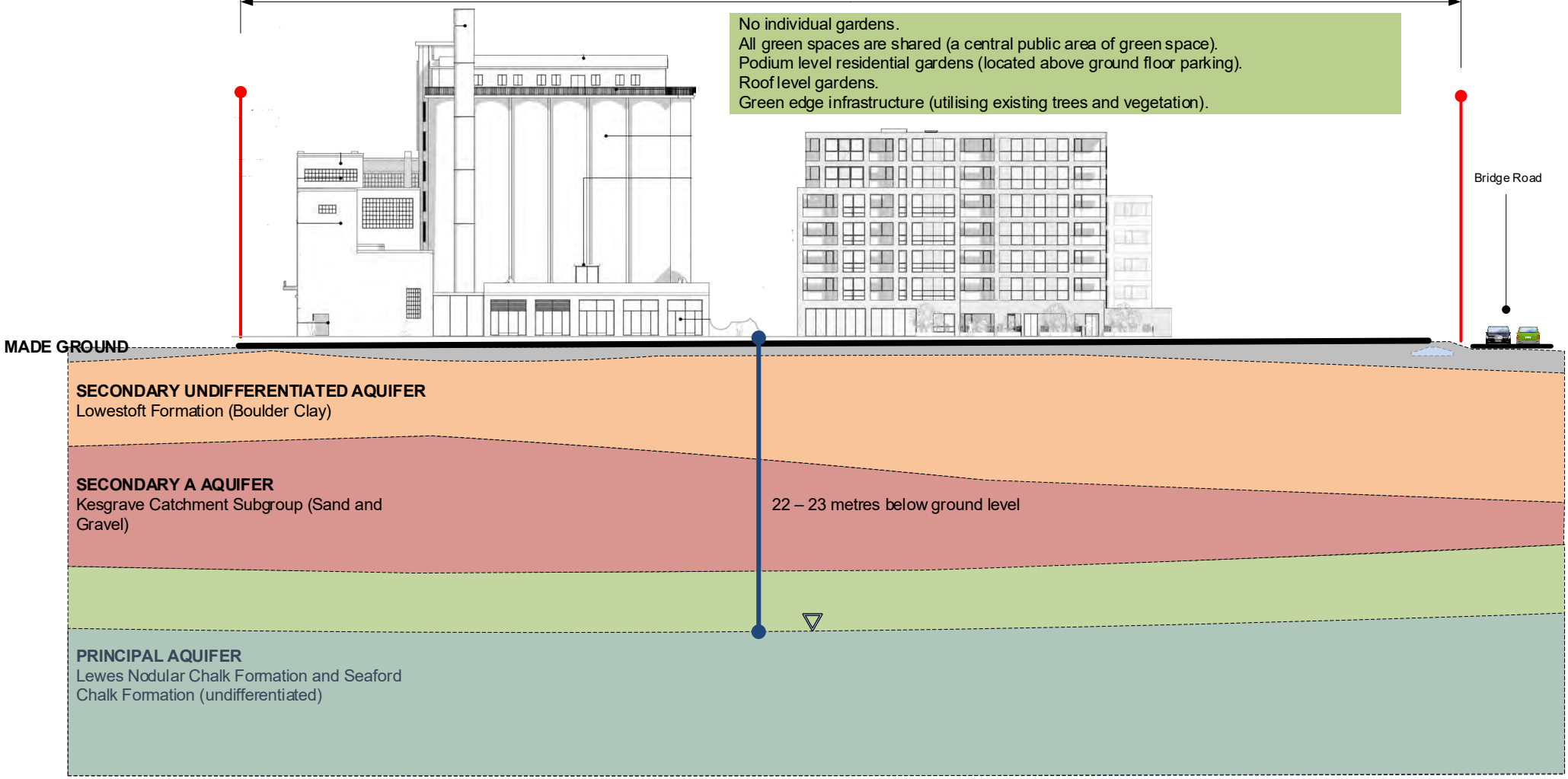
North

Annual Rainfall

180 metres

No individual gardens.
All green spaces are shared (a central public area of green space).
Podium level residential gardens (located above ground floor parking).
Roof level gardens.
Green edge infrastructure (utilising existing trees and vegetation).

Bridge Road



Made Ground

Lowestoft Formation

Kesgrave Catchment Subgroup

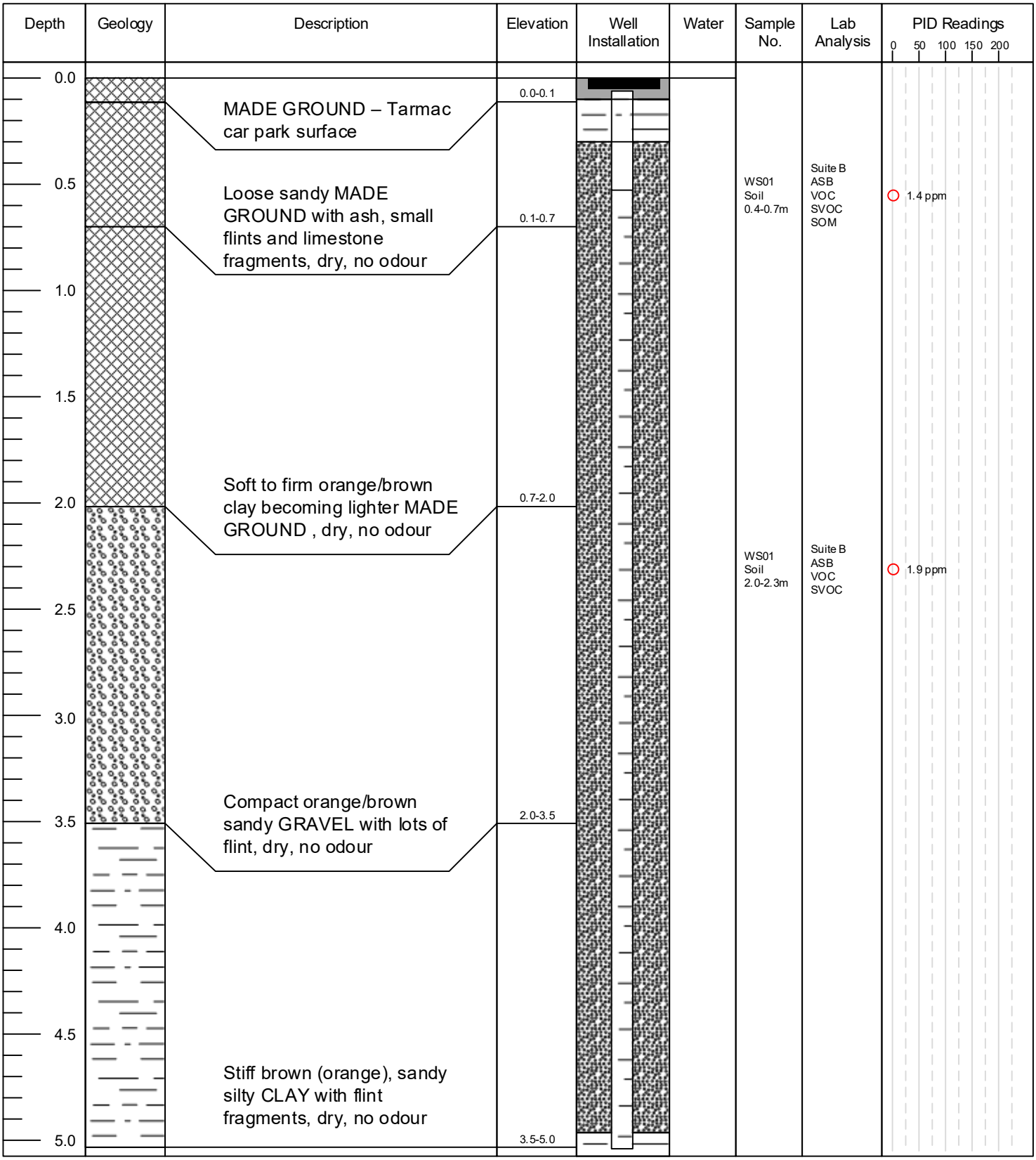
Lewes Nodular/Seaford Chalk Formation

TITLE: **Figure A4.** Conceptual Site Model (Post Development)	JOB REFERENCE: 016-1512	REVISIONS: No. 00 Date. 16/08/18 Description. Final for report; - --/--/-- -; - --/--/-- -; - --/--/-- -	
	DATE: August 16, 2018		
CLIENT: Wheat Quarter Ltd	SCALE: Not to Scale	DRAWN BY: MJS	CHECKED BY: DW

EAME Earth & Marine Environmental Consultants

Annex B: Window Sample and Borehole Logs

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524046.573 212889.920	WS01-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	85.580 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



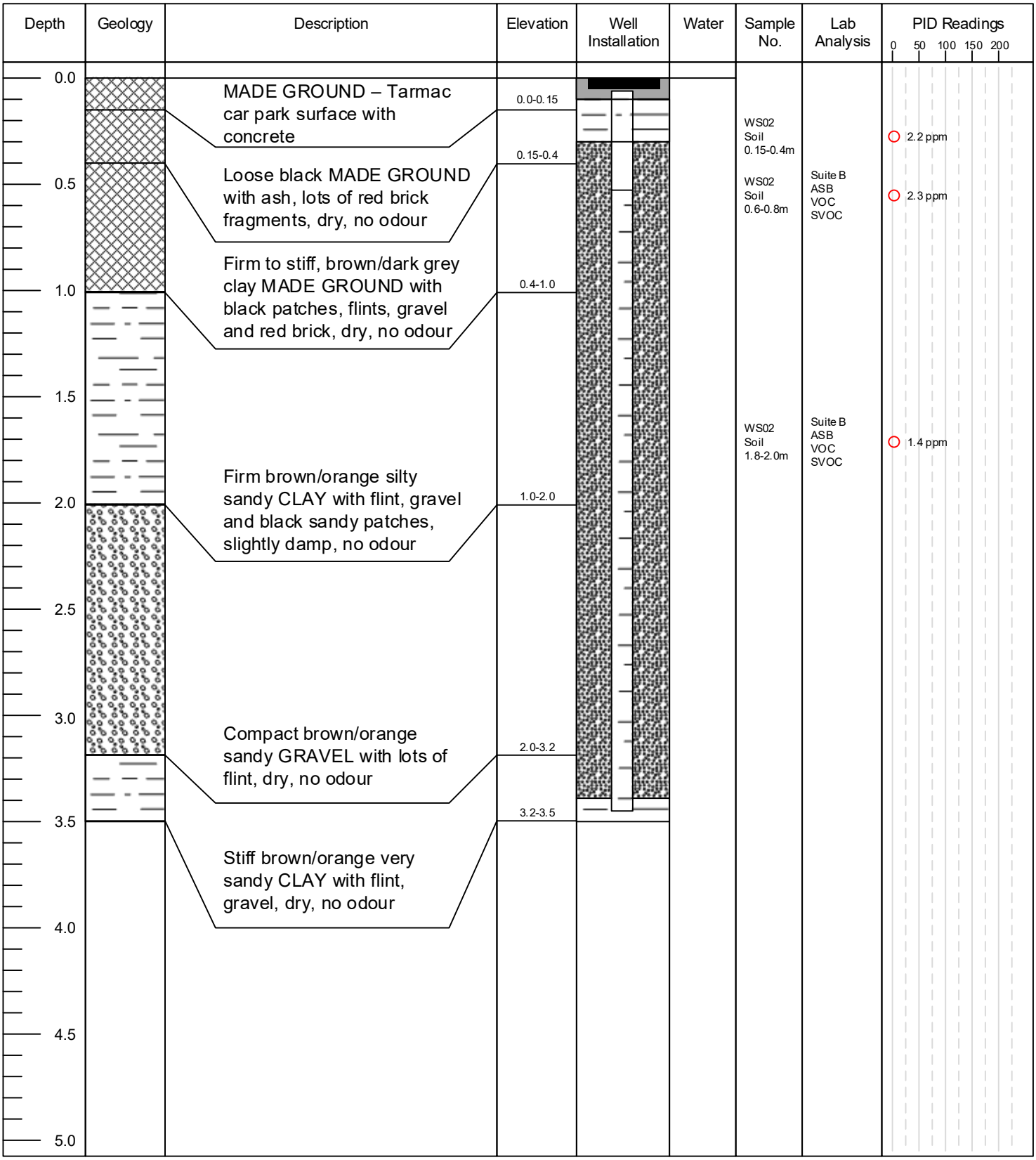
Remarks

J F Hunts compound car park. Location cored.
End @ 5.0 m CLAY
No water encountered.

EAME
Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524096.340 212948.924	WS02-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	84.809 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



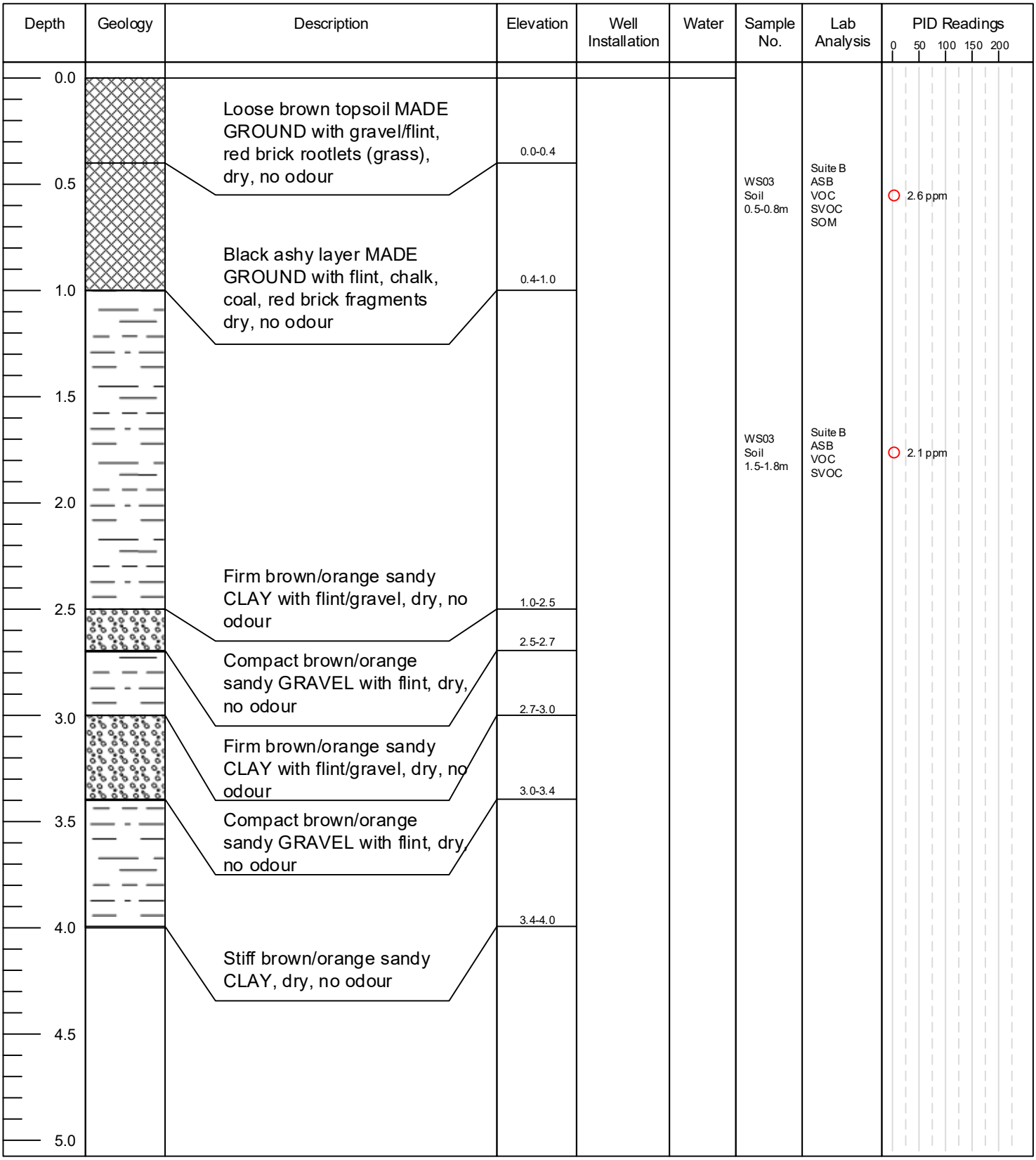
Remarks

Old Shredded Wheat employee car park. Location cored.
End @ 3.5 m CLAY.
No water encountered.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 27/06/18 Finish: 27/06/18	524042.547 212962.252	WS03-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	85.364 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



Remarks

Grassed area near to temporary Hollywell Compound.
End @ 4.0 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524107.982 213011.881	WS04-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	84.288 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	

Depth	Geology	Description	Elevation	Well Installation	Water	Sample No.	Lab Analysis	PID Readings (0 50 100 150 200)
0.0								
		MADE GROUND – Tarmac car park surface	0.0-0.1					
		Loose black MADE GROUND with ash, lots of small red brick fragments, dry, no odour	0.1-0.4			WS04 Soil 0.1-0.4m	Suite B ASB VOC SVOC	3.4 ppm
0.5		Large red brick fragments MADE GROUND	0.4-0.5					
1.0		Stiff brown/orange clay with flint, gravel black sandy patches and some red brick MADE GROUND, dry, no odour	0.5-1.2			WS04 Soil 1.-1.2m	Suite B ASB VOC SVOC PCB	2.2 ppm
1.5								
2.0		Firm to stiff brown/orange CLAY with black sandy patches, dry, no odour	1.2-2.0					
2.5								
3.0		Compact brown/orange sandy GRAVEL with lots of flint, dry, no odour	2.0-3.4					
3.5								
4.0								
4.5								
5.0								

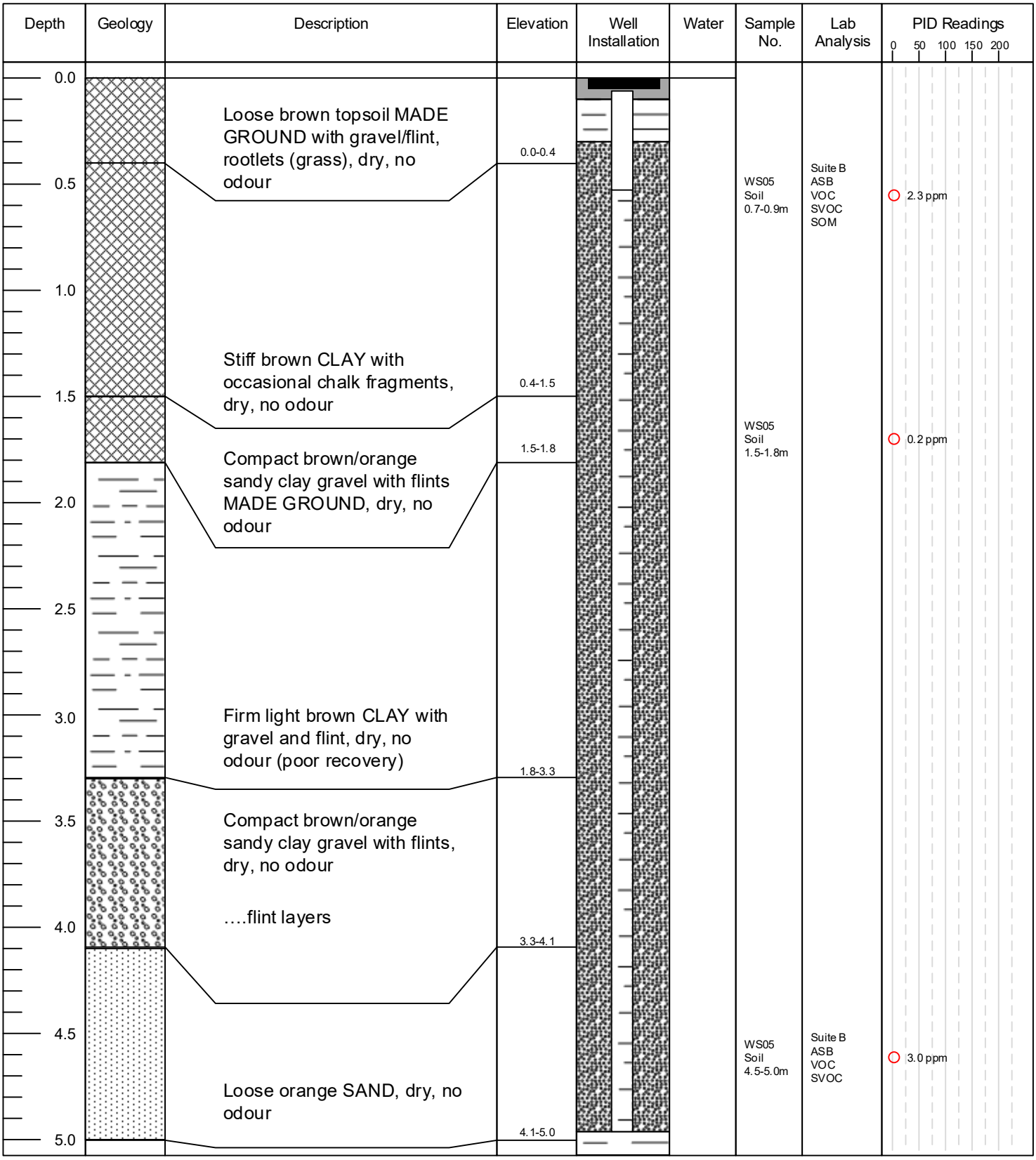
Remarks

Old Shredded Wheat employee car park near to tree line. Location cored.
End @ 3.4 m GRAVEL. Unable to progress past 3.4 m due to large flints.
No water encountered.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 27/06/18 Finish: 27/06/18	524057.586 213021.924	WS05-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	84.978 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



Remarks

Grassed area near to PW Gates access road.
End @ 5.0 m SAND.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 27/06/18 Finish: 27/06/18	524101.982 213046.090	WS06-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	84.674 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	

Depth	Geology	Description	Elevation	Well Installation	Water	Sample No.	Lab Analysis	PID Readings (0 50 100 150 200)
0.0		Loose brown topsoil MADE GROUND with gravel/flint, rootlets (grass), dry, no odour	0.0-0.3			WS06 Soil 0.3-0.6m	Suite B ASB VOC SVOC PCB	2.1 ppm
0.5		Black ash MADE GROUND with gravel, dry, no odour	0.3-0.6					
1.0		Firm black/dark brown/grey CLAY with flints, dry, no odour	0.6-1.0					
1.5		Firm light brown/orange sandy CLAY with gravel and flint, dry, no odour				WS06 Soil 1.5-1.8m	Suite B ASB VOC SVOC	0.3 ppm
2.0		….flint layer 1.9-2.1m bgl	1.0-2.1					
2.5								
3.0								
3.5								
4.0								
4.5								
5.0								

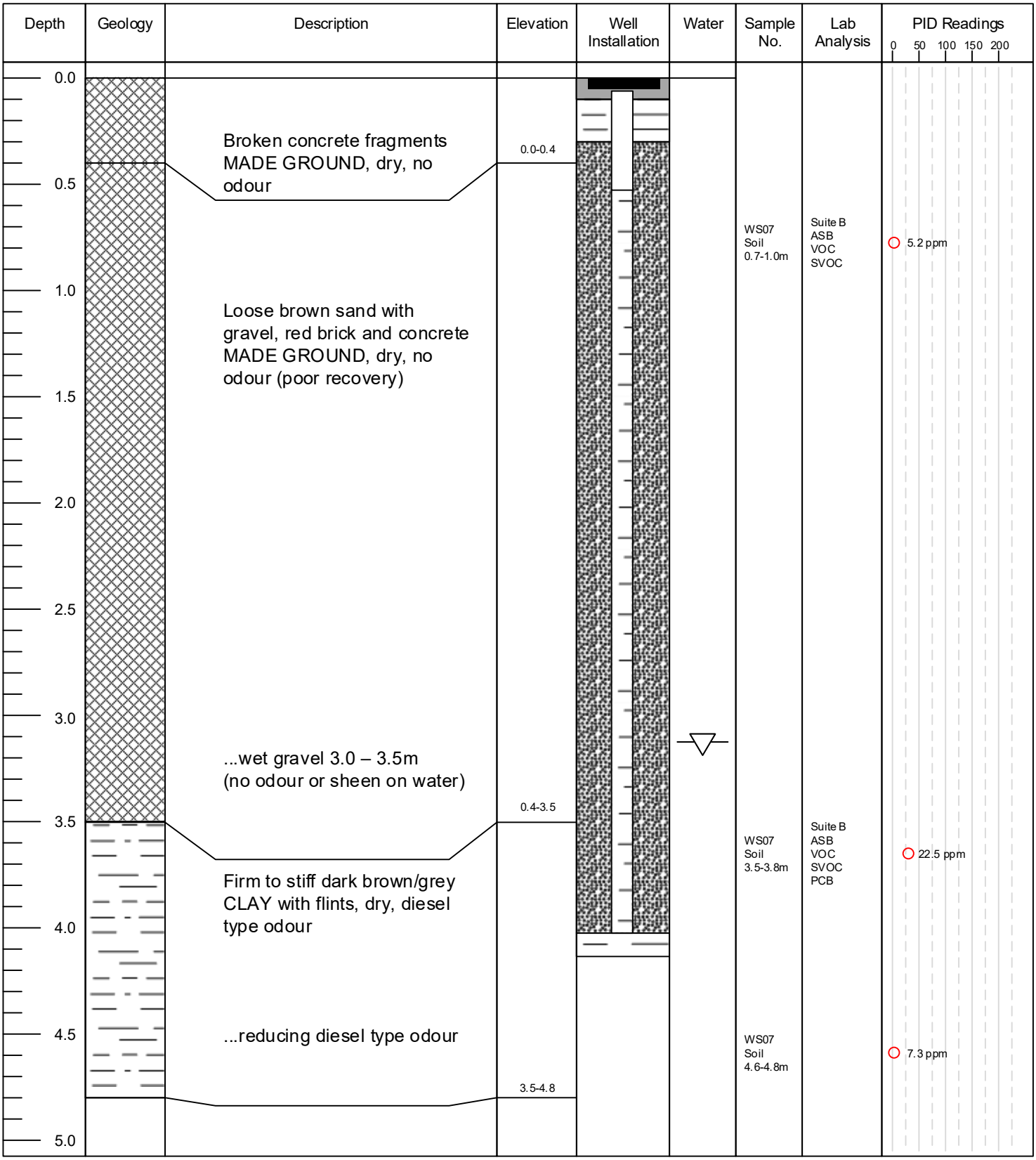
Remarks

Grassed area near to PW Gates access road – northern end.
End @ 2.1 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524149.315 213028.756	WS07-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	85.081 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



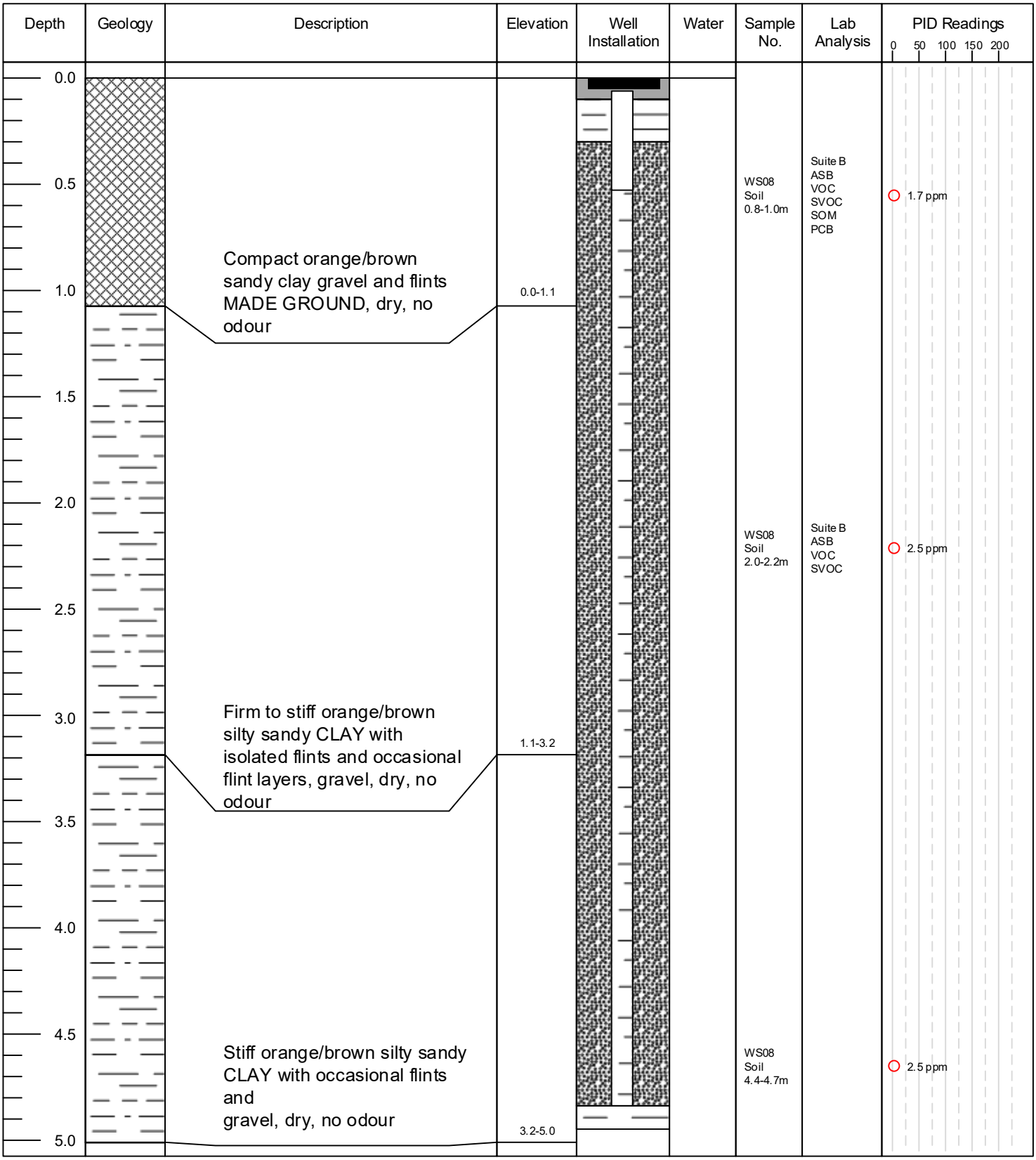
Remarks

Adjacent to 11kV substation in area of historic ASTs. Location cased due to unstable ground.
Well excavated twice due to ground conditions. End @ 4.8 m CLAY.
Wet gravels encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524180.923 212988.054	WS08-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.957 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



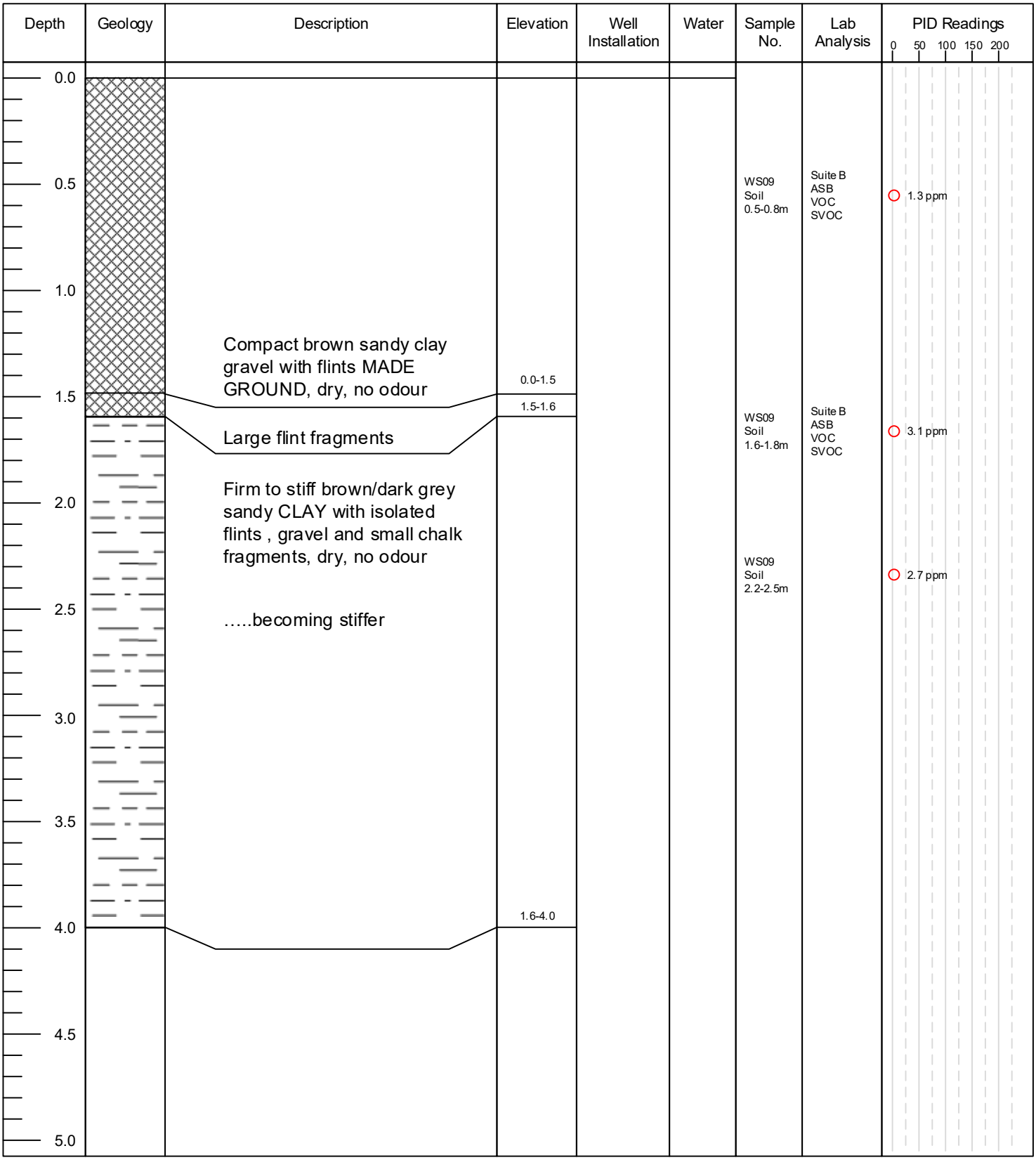
Remarks

Near edge of Grade II listed building.
End @ 5.0 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524163.897 212944.531	WS09-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.947 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



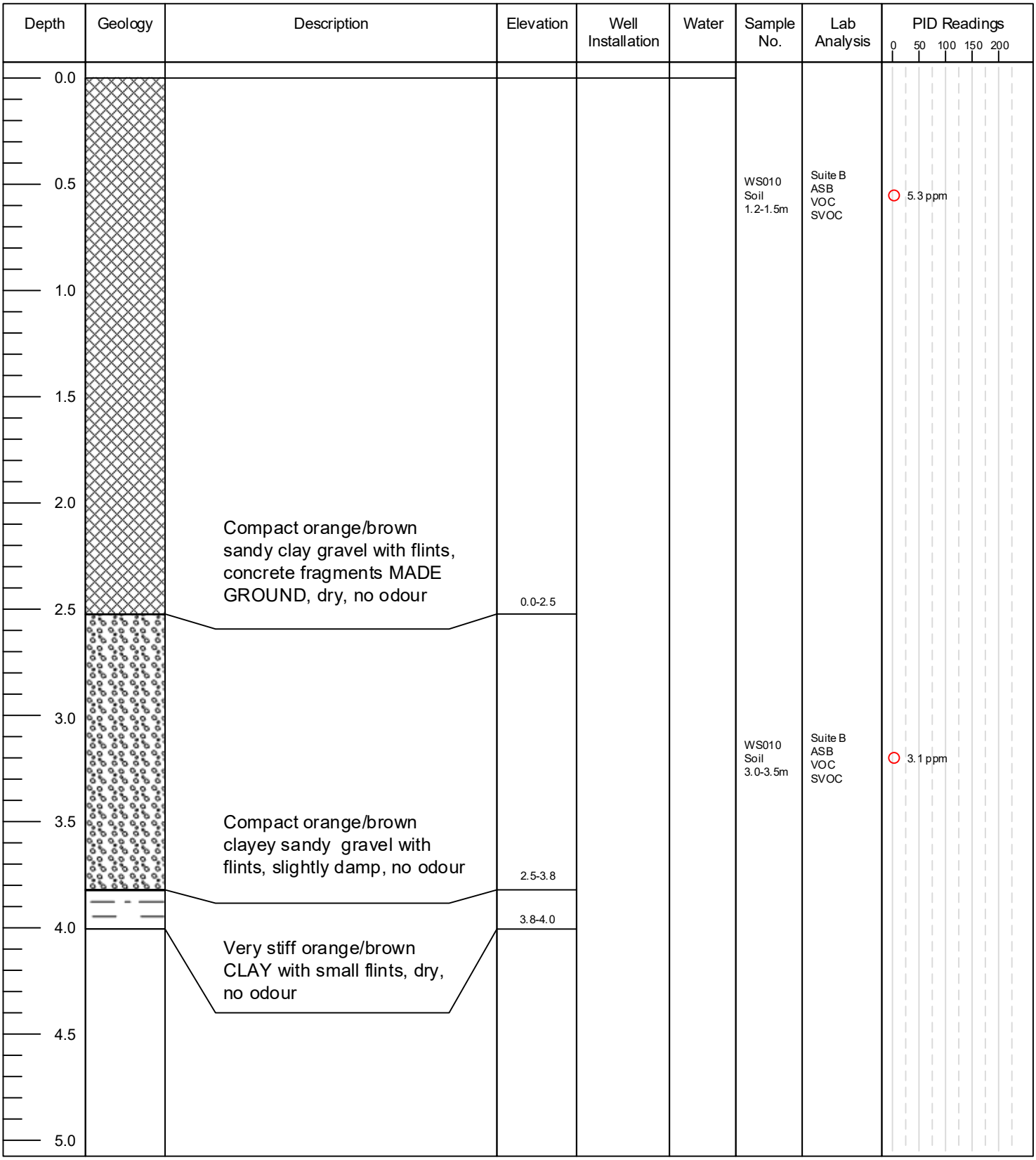
Remarks

Near edge of Grade II listed building.
End @ 4.0 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524167.353 212912.194	WS10-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	85.194 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



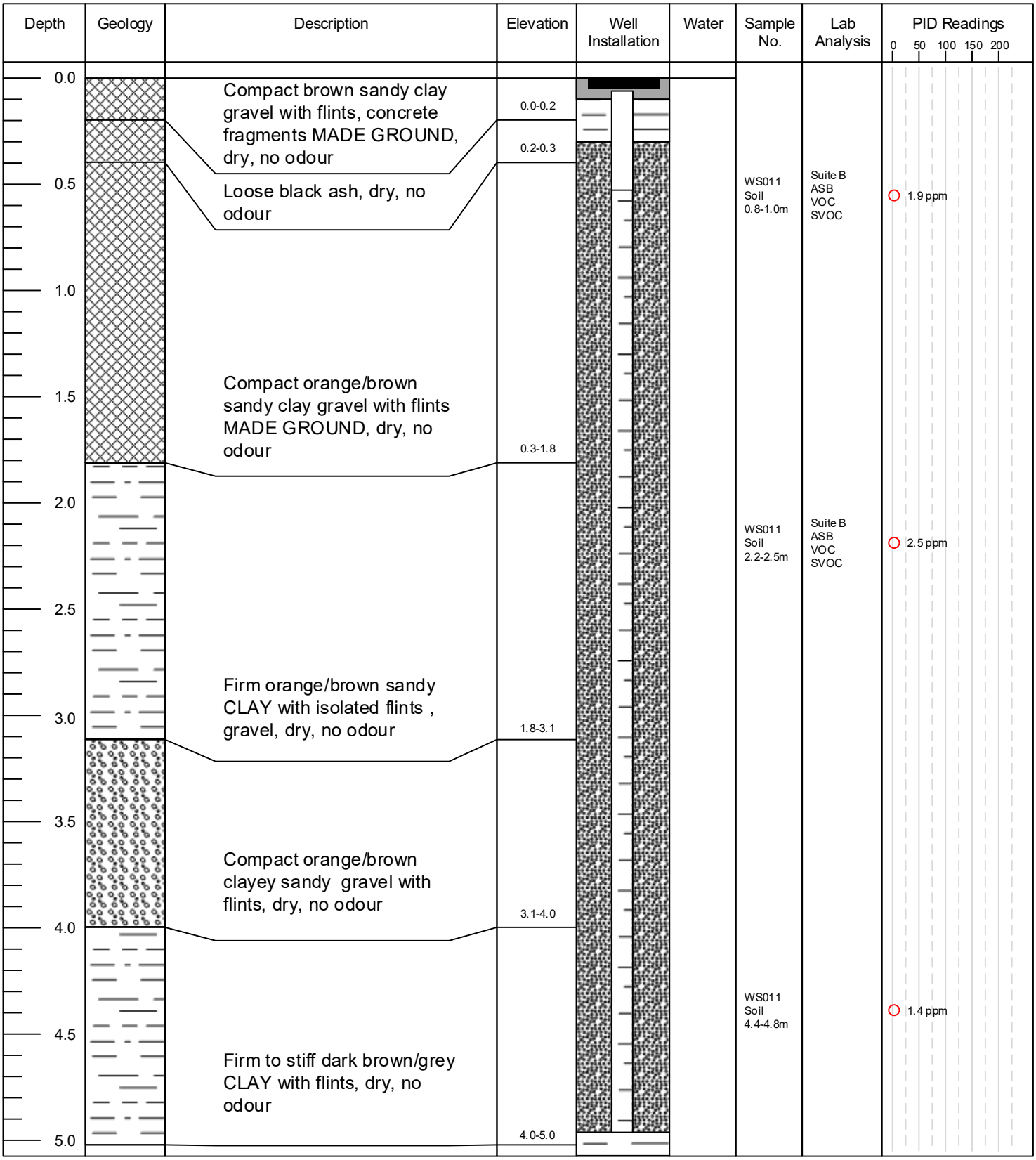
Remarks

Middle of demolished silos.
End @ 4.0 m CLAY. Poor recovery 1.0-2.0m bgl.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524191.746 212880.509	WS11-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	85.683 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



Remarks

Near to Hydeway fence line.
End @ 5.0 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524234.490 212877.197	WS12-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.938 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	

Depth	Geology	Description	Elevation	Well Installation	Water	Sample No.	Lab Analysis	PID Readings (0 50 100 150 200)
0.0								
0.5						WS012 Soil 0.8-1.0m	Suite B ASB VOC SVOC SOM	5.7 ppm
1.0								
1.5		Concrete and red brick fragments, MADE GROUND, dry, no odour	0.0-1.5					
2.0		Compact brown sandy clay gravel with flints MADE GROUND, dry, no odour .....poor recovery	1.5-2.8			WS012 Soil 2.5-2.8m	Suite B ASB VOC SVOC	3.4 ppm
2.5								
3.0								
3.5								
4.0								
4.5								
5.0								

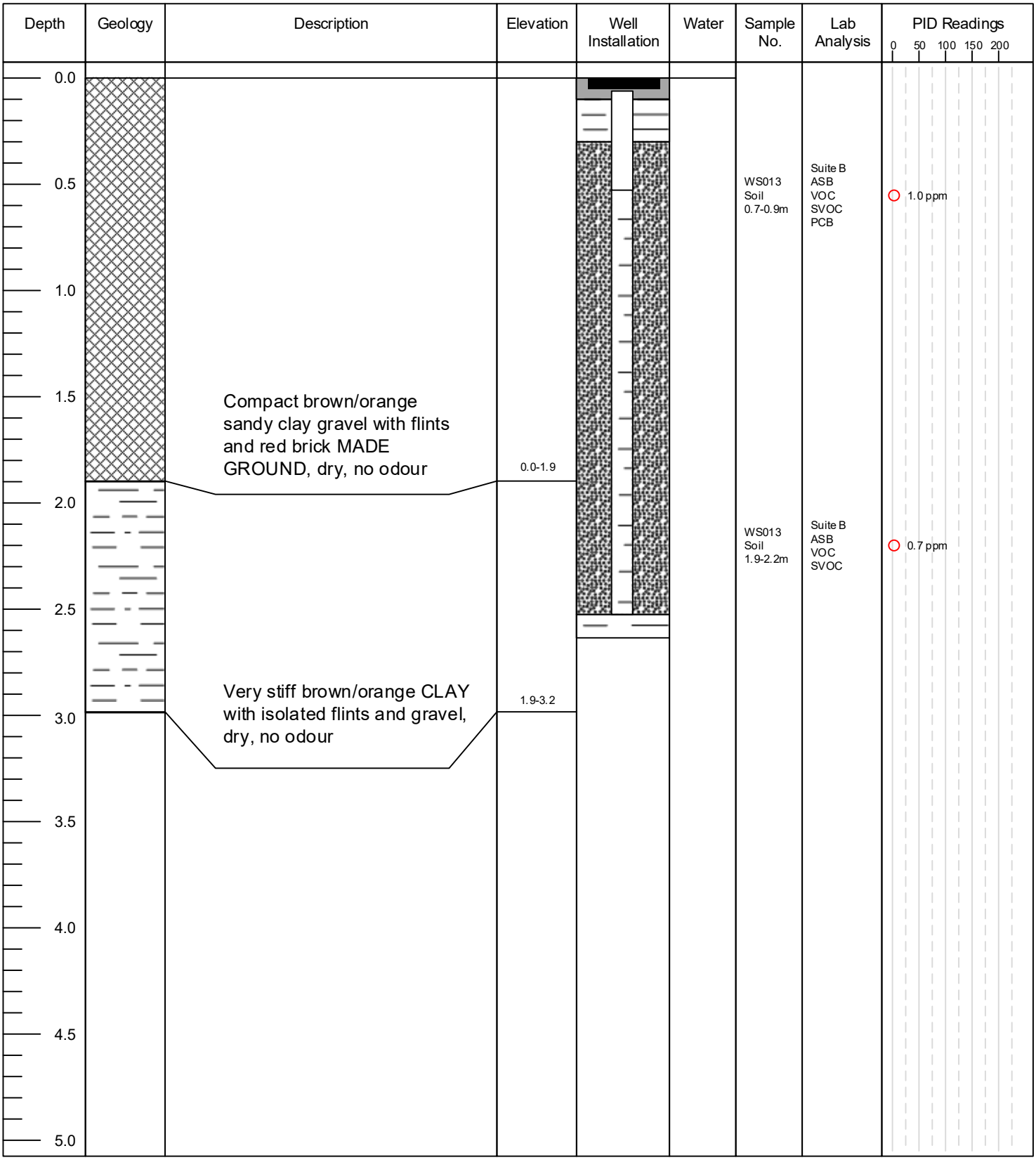
Remarks

Near to Broadwater Road and Hydeway junction.
End @ 2.8 m Sandy Gravel. Poor recovery after 2.0 m bgl.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 26/06/18 Finish: 26/06/18	524207.105 212915.244	WS13-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.161 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



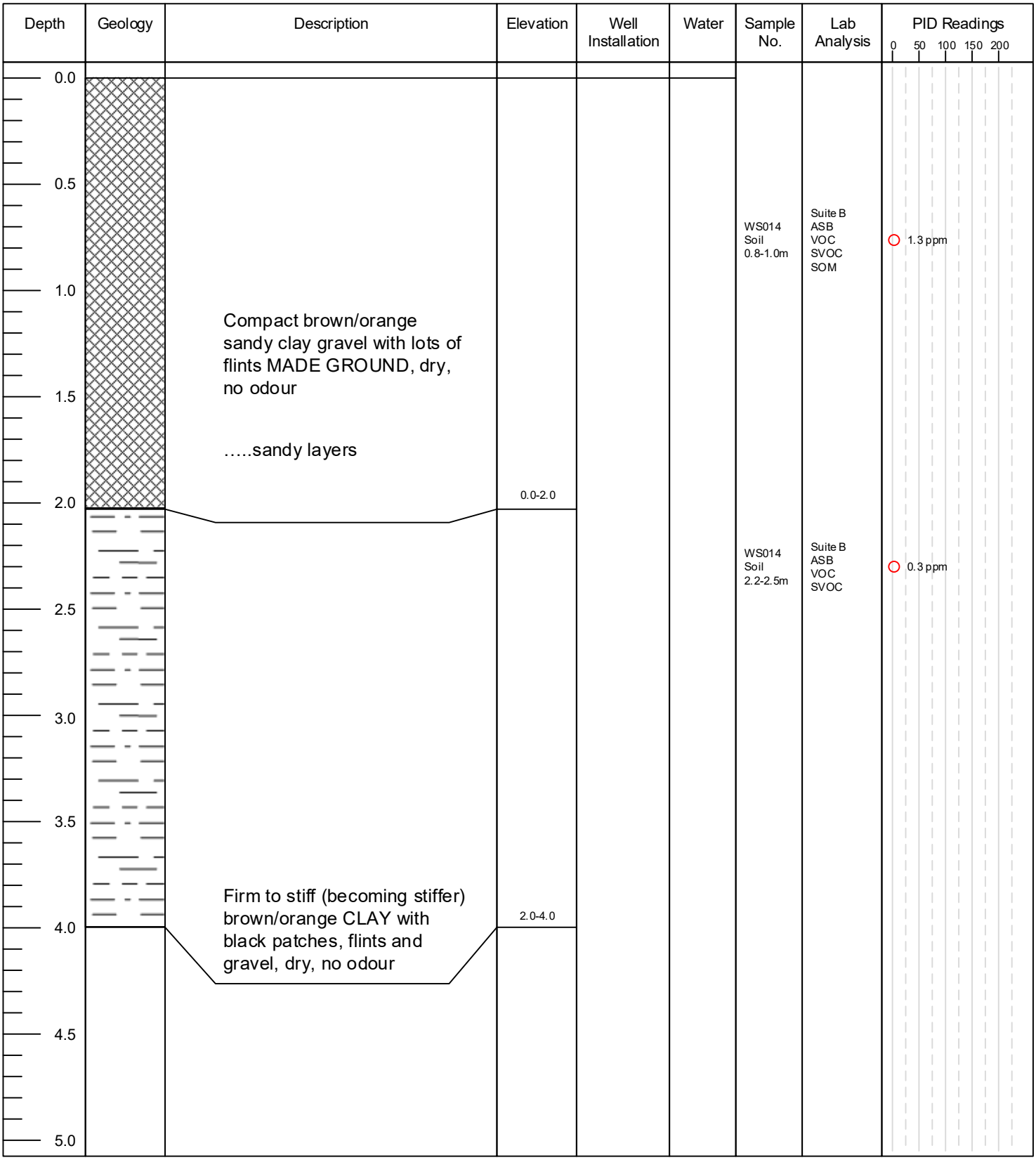
Remarks

Area where UST was removed.
End @ 3.0 m CLAY (flint obstruction).
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 27/06/18 Finish: 27/06/18	524206.158 212947.845	WS14-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.972 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



Remarks

Near to centre of now demolished Shredded Wheat factory.
End @ 4.0 m CLAY – flint obstruction.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 27/06/18 Finish: 27/06/18	524259.168 212970.482	WS15-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.997 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	

Depth	Geology	Description	Elevation	Well Installation	Water	Sample No.	Lab Analysis	PID Readings (0 50 100 150 200)
0.0								
0.5		Compact light brown/orange sandy clay gravel with flints MADE GROUND, dry, no odour				WS015 Soil 0.5-0.8m	Suite B ASB VOC SVOC SOM	0.3 ppm
1.0		.....large red brick fragments						
1.5			0.0-1.5					
2.0		Firm brown/orange clayey sandy gravel with flints, damp to wet, no odour	1.5-2.1			WS015 Soil 1.5-1.8m	Suite B ASB VOC SVOC SOM	1.9 ppm
2.5								
3.0								
3.5		Firm to stiff brown/dark grey/ orange sandy CLAY with isolated flints , gravel and small chalk fragments, dry, no odour						
4.0			2.1-4.0					
4.5								
5.0								

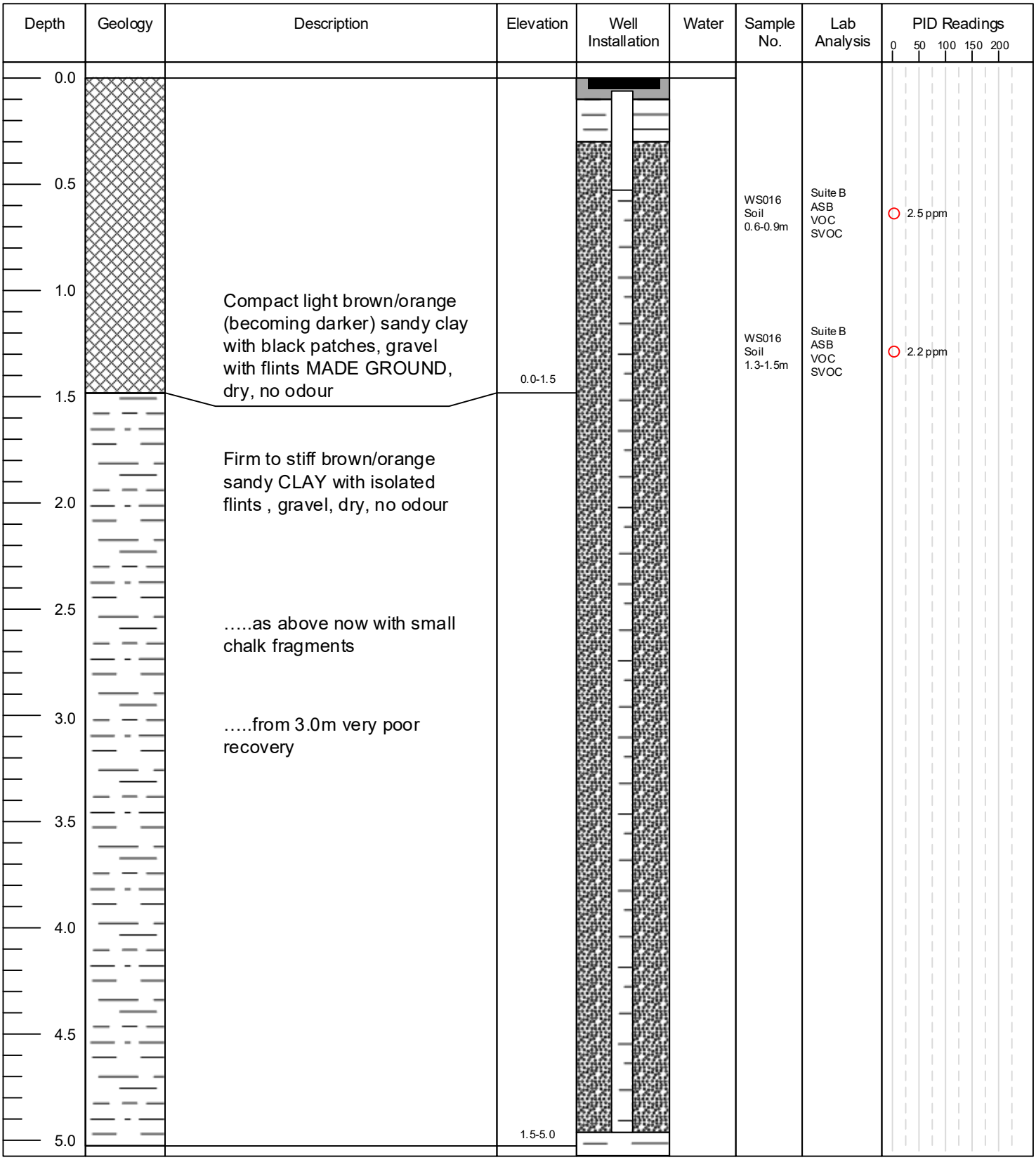
Remarks

Near to eastern edge of site with Broadwater Road.
End @ 4.0 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Project	Date	Co-ordinates	Reference
Wheat Quarter (Shredded Wheat Development), WGC, Northern Site	Start: 27/06/18 Finish: 27/06/18	524249.497 213009.934	WS16-18
Client	**Project Ref.**	**Datum**	**Sheet**
Wheat Quarter Limited	016-1512	83.907 m	01 of 01
Plant and Equipment Used		**Logged by**	
RP Drilling Windowless Tracked Rig		MS	



Remarks

Near to northern edge of site with Bridge Road.
End @ 5.0 m CLAY.
No water encountered during drilling.

EAME Earth & Marine Environmental Consultants

Note: These logs are based on driller/environmental observations and are logged generally in accordance with BS 5930:2015 Code of practice for site investigations. These field observations should not be used for design and/or engineering purposes.

Symbols for Soils and Rocks

British Standards Institute. BS 5930:2015 Code of practice for site investigations.

Soils	Sedimentary	Metamorphic	Igneous
Made Ground	Chalk	Coarse grained	Coarse grained
Gravel	Limestone	Medium grained	Medium grained
Sand	Sandstone	Fine grained	Fine grained
Silt	Siltstone	Pyroclastic	
Clay	Mudstone		
Peat	Shale		
Silty Sand	Coal		

Well Installation

- Cover
- Plain pipework
- Slotted pipework
- Bentonite
- Pea Gravel

Monitoring

- PID Reading
- Rest water level
- Water strike

Laboratory Analysis

Suite B – Arsenic (dissolved), Cadmium (dissolved), Chromium (dissolved), Lead (dissolved), Mercury (dissolved), Selenium (dissolved), Copper (dissolved), Nickel (dissolved), Zinc (dissolved), Vanadium (dissolved), Beryllium (dissolved), Water Soluble Boron, Total Cyanide, Monohydric Phenols, pH Value, TPH - CWG (C5-35) Aliphatic/Aromatic Split (with CWG banding - Ali C5-6,>6-8,>8-10,>10-12,>12-16,>16-21,>21-35) (Aro - >C6-7,>7-8,>8-10,>C10-12,>12-16,>16-21,>21-35)
Speciated PAHs (USEPA-16), Sulphate (water soluble).

Cr (VI) – Chromium (Hexavalent)

VOC – Volatile Organic Compounds

SVOC – Semi-Volatile Organic Compounds

SOM – Soil Organic Matter

ASB – Asbestos

OPP – Organophosphorus Pesticides (OPP)

OCP – Organochlorine Pesticides (OCP)

Tri Herb. – Triazine Herbicides

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH408**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 15/10/2014 - 16/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Concrete.				*85.23* 0.40	D	1	0.50		
MADE GROUND: Brown slightly sandy slightly gravelly clay. Gravel is subangular to subrounded fine to coarse flint and brick. Sand is fine to coarse.				(0.60) *84.63* 1.00	D	2	1.00		
Stiff orange brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse.(LOWESTOFT FORMATION)					D	3	1.50 - 2.00 1.50 - 1.95	CPT N=15 2,3/4,4,3,4	
					B U	1	2.50 - 3.00 2.50 - 2.95	U=50/0mm	
				(5.40)	D	4	3.50 - 4.00 3.50 - 3.95	CPT N=13 2,3/2,3,4,4	
					U	2	4.50 - 4.95	U=40/383mm	
					D	5	5.00		
					D	6	6.00 - 6.50 6.00 - 6.45	SPT N=25 2,3/4,6,6,9	
				79.23 6.40	B	2	6.40		
Loose to medium dense orange brown sandy angular to subrounded fine to coarse flint GRAVEL. Sand is medium to coarse. Occasional flint cobbles.(KESGRAVE CATCHMENT SUBGROUP)			(150mm)		D	7	7.50 - 8.00 7.50 - 7.95	CPT N=8 2,2/2,2,2,2	
					D	8	9.00 - 9.50 9.00 - 9.45	CPT N=17 2,3/4,4,4,5	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.
5. Coordinates estimated due to no GPS signal.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 14.90m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524161 N: 212906 Level: 85.63	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH408**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 15/10/2014 - 16/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Loose to medium dense orange brown sandy angular to subrounded fine to coarse flint GRAVEL. Sand is medium to coarse. Occasional flint cobbles.(KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*				(8.50)	D	9	10.50 - 11.00 10.50 - 10.95	CPT N=20 3,4/4,5,5,6	
					D	10	12.00 - 12.50 12.00 - 12.45	CPT N=23 4,4/5,5,6,7	
					D	11	13.50 - 14.00 13.50 - 13.95	CPT N=17 3,4/4,5,4,4	
			14.90	*70.73* 14.90	B	3	14.90		
Recovered as structureless CHALK composed of cream with rare orange veins sandy gravelly silt. Gravel is angular to subangular fine to medium extremely weak low density cream. Sand is fine to coarse. Rare subrounded coarse gravels and cobbles of rinded flint throughout.Grade Dm. (LEWES NODULAR/SEAFORD CHALK FORMATION)					D	12	15.00 - 15.45 15.00 - 15.45	CPT N=3 1,0/1,0,2,0	
					D	13	16.50 - 17.00 16.50 - 16.95	SPT N=7 1,1/1,2,2,2	
				(5.10)					
					D	14	18.00 - 18.50 18.00 - 18.45	SPT N=10 1,1/2,2,3,3	
					D	15	19.50 - 20.00 19.50 - 19.95	SPT N=8 2,3/2,2,2,2	
				65.63 20.00					

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.
5. Coordinates estimated due to no GPS signal.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 14.90m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524161 N: 212906 Level: 85.63	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH408**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 15/10/2014 - 16/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details			Test Results	Backfill Details
					TYPE	REF	Depth	SPT N Value/Drive mm	
Borehole complete at 20.00m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.
5. Coordinates estimated due to no GPS signal.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 14.90m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524161 N: 212906 Level: 85.63	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH409**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 10/10/2014 - 13/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Concrete.				*82.83* 0.30					
Stiff orangey brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. Possibly reworked to 1.5 m bgl. (LOWESTOFT FORMATION)					D	1	0.50		
					D	2	1.00		
					D	3	1.50 - 1.95 1.50 - 1.95	SPT N=5 1,0/1,0,2,2	
				(2.90)					
					U	1	2.50 - 2.95	U=50/383mm	
					D	4	3.00		
				79.93 3.20	B	1	3.20		
Vey to medium dense orange brown gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse flint. (KESGRAVE CATCHMENT SUBGROUP)					D	5	3.50 - 4.00 3.50 - 3.95	CPT N=12 1,2/2,3,3,4	
			(150mm)						
					D	6	4.50 - 5.00 4.50 - 4.95	CPT N=50/155mm (7,13/17,23,10/5mm)	
				(5.20)					
					D	7	6.00 - 6.50 6.00 - 6.45	CPT N=32 4,6/7,7,9,9	
					D	8	7.50 - 8.00 7.50 - 7.95	CPT N=36 5,7/8,8,10,10	
			8.40	*74.73* 8.40	B	2	8.40		
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely to very weak low to medium density cream. Rare subrounded coarse rinded flint gravel throughout grade Dm. (LEWES NODULAR/SEAFORD CHALK FORMATION)					D	9	9.00 - 9.50 9.00 - 9.45	SPT N=5 2,3/2,1,1,1	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.
5. Coordinates estimated due to no GPS signal.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 8.40m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524255 N: 212891 Level: 83.13	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH409**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 10/10/2014 - 13/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely to very weak low to medium density cream. Rare subrounded coarse rinded flint gravel throughout grade Dm. (LEWES NODULAR/SEAFORD CHALK FORMATION)*(BH Continued)*				(11.60)	D	10	10.50 - 11.00 10.50 - 10.95	SPT N=8 2,2/3,3,1,1	
					D	11	12.00 - 12.50 12.00 - 12.45	SPT N=13 2,3/4,3,3,3	
					D	12	13.50 - 14.00 13.50 - 13.95	SPT N=15 2,3/4,4,4,3	
					D	13	15.00 - 15.50 15.00 - 15.45	SPT N=16 3,3/4,4,4,4	
					D	14	16.50 - 17.00 16.50 - 16.95	SPT N=19 3,4/4,5,5,5	
					D	15	18.00 - 18.50 18.00 - 18.45	SPT N=15 3,4/4,3,4,4	
					D	16	19.50 - 20.00 19.50 - 19.95	SPT N=19 3,4/5,5,5,4	
				63.13 20.00					

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.
5. Coordinates estimated due to no GPS signal.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 8.40m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524255 N: 212891 Level: 83.13	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH409**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 10/10/2014 - 13/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details			Test Results	Backfill Details
					TYPE	REF	Depth	SPT N Value/Drive mm	
Borehole complete at 20.00m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.
5. Coordinates estimated due to no GPS signal.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:					

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 8.40m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524255 N: 212891 Level: 83.13

Logged By: WC

Checked By: WC

Approved By: SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH410**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 16/10/2014 - 20/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Asphalt.				*84.79* 0.15					
MADE GROUND: Brown sandy clayey gravel. Gravel is angular to rounded fine to coarse of mixed lithologies including brick, concrete and flint. Sand is fine to coarse. Frequent brick cobbles.				*84.49* 0.45	D	1	0.50		
					D	2	1.00		
Stiff orangey brown sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. Rare flint cobbles. (LOWESTOFT FORMATION)					D	3	1.50 - 2.00 1.50 - 1.95	CPT N=15 2,2/3,3,4,5	
					D	4	2.50 - 3.00 2.50 - 2.95	CPT N=20 2,3/4,5,5,6	
				(4.65)	D	5	3.50 - 4.00 3.50 - 3.95	CPT N=22 3,3/4,4,7,7	
					D	6	4.50 - 5.00 4.50 - 4.95	CPT N=15 4,5/4,3,4,4	
				79.84 5.10	B	1	5.10		
Stiff orangey brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)				(0.80)					
			(150mm)	*79.04* 5.90	B	2	6.00 - 6.50 6.00 - 6.45	CPT N=19 3,4/4,4,5,6	
Medium dense to dense orangey brown slightly sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. Occasional flint cobbles.(KESGRAVE CATCHMENT SUBGROUP)					D	7	7.50 - 8.00 7.50 - 7.95	CPT N=29 4,5/6,6,7,10	
				(5.80)	D	8	9.00 - 9.50 9.00 - 9.45	CPT N=31 4,6/7,7,8,9	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 22.35m bgl.
4. Installed with HDPE standpipe to 25.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
1	20-10-14		22.35		

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 25.00m	150mm to 11.70m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524279.09 N: 212972.11 Level: 84.94	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH410**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 16/10/2014 - 20/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Medium dense to dense orangey brown slightly sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. Occasional flint cobbles.(KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*					D	9	10.50 - 11.00 10.50 - 10.95	CPT N=31 4,6/7,7,8,9	
			11.70	*73.24* 11.70	B	3	11.70		
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely weak low density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout grade Dm. (LEWES NODULAR/SEAFORD CHALK FORMATION)					D	10	12.00 - 12.50 12.00 - 12.45	SPT N=2 1,1/0,1,1,0	
					D	11	13.50 - 14.00 13.50 - 13.95	SPT N=5 1,1/2,1,1,1	
					D	12	15.00 - 15.50 15.00 - 15.45	SPT N=7 1,2/2,1,2,2	
					D	13	16.50 - 17.00 16.50 - 16.95	SPT N=8 2,2/2,2,2,2	
					D	14	18.00 - 18.50 18.00 - 18.45	SPT N=13 2,2/3,3,3,4	
				(13.30)					
					D	15	19.50 - 20.00 19.50 - 19.95	SPT N=16 3,4/3,3,4,6	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 22.35m bgl.
4. Installed with HDPE standpipe to 25.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
1	20-10-14		22.35		

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 25.00m	150mm to 11.70m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524279.09 N: 212972.11 Level: 84.94	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH410**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 16/10/2014 - 20/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details TYPE	Sample Details REF	Sample Details Depth	Test Results SPT N Value/Drive mm	Backfill Details
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely weak low density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout grade Dm. (LEWES NODULAR/SEAFORD CHALK FORMATION)*(BH Continued)*					D	16	21.00 - 21.50 21.00 - 21.45	SPT N=26 4,4/6,6,6,8	
					D	17	22.50 - 23.00 22.50 - 22.95	SPT N=25 3,4/5,6,7,7	
					D	18	24.00 - 24.50 24.00 - 24.45	SPT N=34 1,0/6,7,14,7	
				59.94 25.00					
Borehole complete at 25.00m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 22.35m bgl.
4. Installed with HDPE standpipe to 25.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
1	20-10-14		22.35		

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 25.00m	150mm to 11.70m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524279.09 N: 212972.11 Level: 84.94	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH411**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 21/10/2014 - 22/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Asphalt.				*83.77* 0.15					
MADE GROUND: Brown slightly sandy gravelly clay. Gravel is angular to subrounded fine to coarse brick and flint. Sand is fine to coarse. Rare brick cobbles.				(1.05)	D	1	0.50		
					D	2	1.00		
				82.72 1.20					
Stiff brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)					D	3	1.50 - 2.00 1.50 - 1.95	CPT N=8 2,1/2,2,2,2	
					D	4	2.50 - 3.00 2.50 - 2.95	CPT N=8 2,2/2,2,2,2	
					B U	1	3.50 - 4.00 3.50 - 3.95	U=35/0mm	
					D	5	4.50 - 5.00 4.50 - 4.95	SPT N=7 1,1/2,1,2,2	
				(8.10)					
			(150mm)		D	6	6.00 - 6.50 6.00 - 6.45	SPT N=7 1,0/1,2,2,2	
					D	7	7.50 - 8.00 7.50 - 7.95	SPT N=8 2,2/2,2,2,2	
					D	8	9.00 - 9.50 9.00 - 9.45	SPT N=20 1,2/2,4,7,7	
				74.62 9.30	B	2	9.30		
Very demse brown slightly clayey sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. (KESGRAVE CATCHMENT SUBGROUP)									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524170.02 N: 213045.29 Level: 83.92	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH411**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 21/10/2014 - 22/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Very demse brown slightly clayey sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. (KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*				(2.20)	D	9	10.50 - 11.00 10.50 - 10.95	CPT N=54/165mm (7,12/14,18,22/15mm)	
			11.50	*72.42* 11.50	B	3	11.50		
Recovered as structureless CHALK composed of cream with rare orange veins sandy very gravelly silt. Gravel is angular to subangular fine to medium extremely to very weak low to medium density cream. Sand is fine to coarse. Rare subrounded coarse gravels and cobbles of rinded flint throughout. Grade Dm. (LEWES NODULAR/ SEAFORD CHALK FORMATION)					D	10	12.00 - 12.50 12.00 - 12.45	SPT N=1 1,0/0,1,0,0	
					D	11	13.50 - 14.00 13.50 - 13.95	SPT N=4 1,0/1,1,1,1	
					D	12	15.00 - 15.50 15.00 - 15.45	SPT N=7 1,1/1,2,2,2	
				(8.50)					
					D	13	16.50 - 17.00 16.50 - 16.95	SPT N=5 2,1/2,2,1,0	
					D	14	18.00 - 18.50 18.00 - 18.45	SPT N=9 2,2/2,2,2,3	
					D	15	19.50 - 20.00 19.50 - 19.95	SPT N=11 2,2/2,3,3,3	
				63.92 20.00					

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524170.02 N: 213045.29 Level: 83.92	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH411**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 21/10/2014 - 22/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details			Test Results	Backfill Details
					TYPE	REF	Depth	SPT N Value/Drive mm	
Borehole complete at 20.00m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING		
Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS				
	Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524170.02 N: 213045.29 Level: 83.92

Logged By: WC

Checked By: WC

Approved By: SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH412**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 17/10/2014 - 20/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Asphalt.				*84.75* 0.10					
MADE GROUND: Reddy brown clayey sandy gravel. Gravel is angular to subangular fine to coarse brick. Sand is fine to coarse. Frequent brick cobbles.				*84.45* 0.40	D	1	0.50		
					D	2	1.00		
Stiff orangey brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)				(1.90)	D	3	1.50 - 1.95 1.50 - 1.95	SPT N=13 1,1/2,3,4,4	
				82.55 2.30					
Dense brown clayey gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse flint. (LOWESTOFT FORMATION)				(1.10)	B	1	2.50 - 2.95 2.50 - 2.95	CPT N=33 3,5/7,8,9,9	
				81.45 3.40	U	1	3.50 - 3.95	U=41/338mm	
Stiff orangey brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)			(150mm)	(1.30)	D	4	3.95 - 4.05		
					D	5	4.50 - 4.95 4.50 - 4.95	SPT N=48 4,5/8,10,14,16	
				80.15 4.70					
Very dense to dense orange brown gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse flint. (KESGRAVE CATCHMENT SUBGROUP)				(3.90)	B	2	6.00 - 6.45 6.00 - 6.45	CPT N=49 7,8/11,12,12,14	
					D	6	7.50 - 7.95 7.50 - 7.95	CPT N=50/85mm (11,14/30mm/41,9/10mm)	
			8.60	*76.25* 8.60					
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely weak low density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout. Grade Dm. (LEWES NODULAR/ SEAFORD CHALK FORMATION)					D	7	9.00 - 9.45 9.00 - 9.45	SPT N=32 4,5/6,7,9,10	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 8.60m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 3

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524118.88 N: 212945.31 Level: 84.85	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH412**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 17/10/2014 - 20/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely weak low density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout. Grade Dm. (LEWES NODULAR/ SEAFORD CHALK FORMATION)*(BH Continued)*					D	8	10.50 - 10.95 10.50 - 10.95	SPT N=34 4,5/7,7,9,11	
					D	9	12.00 - 12.45 12.00 - 12.45	SPT N=21 2,3/5,6,4,6	
					D	10	14.00		
				(11.40)					
					D	11	15.00 - 15.45 15.00 - 15.45	SPT N=27 3,2/3,6,10,8	
					D	12	16.50 - 16.95 16.50 - 16.95	SPT N=13 3,3/2,3,4,4	
					D	13	18.00 - 18.45 18.00 - 18.45	SPT N=50/235mm (4,7/13,15,17,5/10mm)	
					D	14	19.50 - 19.95 19.50 - 19.95	SPT N=41 3,6/9,10,10,12	
				64.85 20.00					

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING		
Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS				
Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 8.60m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524118.88 N: 212945.31 Level: 84.85	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH412**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 17/10/2014 - 20/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details			Test Results	Backfill Details
					TYPE	REF	Depth	SPT N Value/Drive mm	
Borehole complete at 20.00m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 8.60m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524118.88 N: 212945.31 Level: 84.85	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH413**

CABLE PERCUSSION BOREHOLE LOG

Date: 16/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Asphalt.				*83.78* 0.10					
MADE GROUND: Brown clayey slightly sandy gravel. Gravel is angular to rounded fine to coarse of mixed lithologies including brick, flint and concrete. Sand is fine to coarse. Frequent brick cobbles.				*83.48* 0.40	D	1	0.50		
					D	2	1.00		
Stiff orangey brown slightly sandy CLAY. Sand is fine to medium. Medium to coarse sand sized organic patches throughout. (LOWESTOFT FORMATION)					U	1	1.50 - 1.95	U=36/360mm	
					D	3	1.95 - 2.05		
					D	4	2.50 - 2.95 2.50 - 2.95	SPT N=4 1,0/1,1,1,1	
					B	1	3.00 - 3.40		
				(5.50)					
					U	2	3.50 - 3.95	U=52/360mm	
					D	5	3.95 - 4.05		
					D	6	4.50 - 4.95 4.50 - 4.95	SPT N=12 1,1/2,3,3,4	
				77.98 5.90					
Stiff light brown mottled orange and black slightly sandy CLAY. Sand is fine to medium. Potentially high organic content. (LOWESTOFT FORMATION)					U	3	6.00 - 6.45	U=61/360mm	
					D	7	6.45 - 6.55		
				(1.30)					
				76.68 7.20					
Stiff brown mottled black slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse flint. Sand is fine to coarse. Potentially high organic content. (LOWESTOFT FORMATION)					B	2	7.50 - 7.95 7.50 - 7.95	CPT N=40 4,6/8,9,10,13	
			(150mm)	(1.60)					
				75.08 8.80					
Dense to very dense brown clayey sandy angular to rounded fine to coarse flint GRAVEL. Sand is fine to coarse. Rare flint cobbles. (KESGRAVE CATCHMENT SUBGROUP)					B	3	9.00 - 9.45 9.00 - 9.45	CPT N=50/295mm (5,7/9,11,14,16/70mm)	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 16.60m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524096.58 N: 212991.55 Level: 83.88	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH413**

CABLE PERCUSSION BOREHOLE LOG

Date: 16/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Dense to very dense brown clayey sandy angular to rounded fine to coarse flint GRAVEL. Sand is fine to coarse. Rare flint cobbles. (KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*				(7.80)	B	4	10.50 - 10.95 10.50 - 10.95	CPT N=50/275mm (4,6/10,10,14,16/50mm)	
					D	8	12.00 - 12.45 12.00 - 12.45	CPT N=40 4,7/8,9,10,13	
					D	9	13.50 - 13.95 13.50 - 13.95	CPT N=41 5,8/8,10,11,12	
					D	10	15.00 - 15.45 15.00 - 15.45	CPT N=42 3,5/9,9,10,14	
			16.60	*67.28* 16.60	B	5	16.50 - 16.95 16.50 - 16.95	CPT N=9 9,8/3,2,2,2	
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely to very weak low to medium density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout. Grade Dm. (LEWES NODULAR/ SEAFORD CHALK FORMATION)				(3.40)	D	11	18.00 - 18.45 18.00 - 18.45	SPT N=13 2,3/4,3,3,3	
					D	12	19.50 - 19.95 19.50 - 19.95	SPT N=14 2,3/2,3,4,5	
				63.88 20.00					

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 16.60m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524096.58 N: 212991.55 Level: 83.88	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH413**

CABLE PERCUSSION BOREHOLE LOG

Date: 16/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details			Test Results	Backfill Details
					TYPE	REF	Depth	SPT N Value/Drive mm	
Borehole complete at 20.00m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 20.00m bgl.

CHISELLING		
Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS				
	Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 20.00m	150mm to 16.60m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524096.58 N: 212991.55 Level: 83.88

Logged By: WC

Checked By: WC

Approved By: SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH414**

CABLE PERCUSSION BOREHOLE LOG

Date: 14/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm
MADE GROUND: Asphalt.				*85.04* 0.15				
MADE GROUND: Brown clayey slightly sandy gravel. Gravel is angular to rounded fine to coarse of mixed lithologies including brick, flint and concrete. Sand is fine to coarse. Frequent brick cobbles.				(0.85)	D	1	0.50	
				84.19 1.00	D	2	1.00	
Stiff orangey brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)					D	3	1.50 - 2.00 1.50 - 1.95	CPT N=19 2,3/4,4,5,6
				(3.20)	U	1	2.50 - 2.95	U=35/225mm
					D	4	3.50 - 4.00 3.50 - 3.95	SPT N=10 2,3/2,4,2,2
				80.99 4.20	B	1	4.20	
Medium dense orangey brown slightly gravelly fine to medium SAND. Gravel is angular to subrounded fine to medium SAND. Gravel is angular to subrounded fine to coarse flint. (POSSIBLE LOWESTOFT FORMATION)					D	5	4.50 - 5.00 4.50 - 4.95	CPT N=13 2,3/4,3,3,3
				(1.50)				
				79.49 5.70	B	2	5.70	
Stiff orange brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)					D	6	6.00 - 6.50 6.00 - 6.45	SPT N=25 2,3/4,5,7,9
				(2.20)				
					U	2	7.50 - 7.95	U=45/315mm
				77.29 7.90	B D	3 7	8.00	
Medium dense orange brown gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse flint. Rare cobble sized clay pockets.(KESGRAVE CATCHMENT SUBGROUP)					D	8	9.00 - 9.50 9.00 - 9.45	CPT N=26 4,5/6,6,7,7
				(3.90)				

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Backfilled with arisings.

CHISELLING			WATER LEVEL OBSERVATIONS				
Depth From	Depth To	Time Taken	Date	Time	Water Strike	Standing Level	Casing Depth
NO CHISELLING UNDERTAKEN:			NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524052.85 N: 212879.17 Level: 85.19	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH414**

CABLE PERCUSSION BOREHOLE LOG

Date: 14/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm
Medium dense orange brown gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse flint. Rare cobble sized clay pockets.(KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*					D	9	10.50 - 11.00 10.50 - 10.95	CPT N=27 5,6,6,7,7,7
				73.39 11.80	B	4	11.80	
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely weak low density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout.Grade Dm. (LEWES NODULAR/SEAFORD CHALK FORMATION)				(1.15)	D	10	12.00 - 12.50 12.00 - 12.45	SPT N=1 1,0/1,0,0,0
				72.24 12.95				
VOID				(3.35)				
				68.89 16.30				
Loose orange brown gravelly fine to coarse clayey SAND. Gravel is subangular to subrounded fine to coarse flint. (DISSOLUTION SOILS)				(1.20)	D	11	16.50	
				67.69 17.50			17.50 - 17.95	CPT N=2 1,0/0,1,0,1
Borehole terminated due to difficult drilling associated with the void at 17.50m bgl.								

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Backfilled with arisings.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524052.85 N: 212879.17 Level: 85.19

Logged By: WC

Checked By: WC

Approved By: SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH415**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 13/10/2014 - 14/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Concrete.				*84.72* 0.20					
MADE GROUND: Brown clayey slightly sandy gravel. Gravel is angular to rounded fine to coarse of mixed lithologies including brick, flint and concrete. Sand is fine to coarse. Frequent brick cobbles.				*84.32* 0.60	D	1	0.50		
					D	2	1.00		
Stiff orange brown sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse.(LOWESTOFT FORMATION)					B	1	1.50 - 1.95 1.50 - 1.95	CPT N=50/170mm (7,11/19,24,7/20mm)	
				(2.80)					
					D	3	2.50 - 2.95 2.50 - 2.95	CPT N=27 4,5/5,6,7,9	
				81.52 3.40	D	4	3.50 - 3.95 3.50 - 3.95	CPT N=23 3,4/4,5,7,7	
Stiff orange brown sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. Hydrocarbon odour throughout. (LOWESTOFT FORMATION)				(1.20)					
				80.32 4.60	B	2	4.50 - 4.95 4.50 - 4.95	CPT N=24 3,4/5,6,6,7	
Stiff orangey brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to medium. (LOWESTOFT FORMATION)				(1.30)					
			(150mm)	*79.02* 5.90	B	3	6.00 - 6.45 6.00 - 6.45	CPT N=43 4,6/7,10,12,14	
Dense orange brown gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse flint. Rare flint cobbles. (KESGRAVE CATCHMENT SUBGROUP)					D	5	7.50 - 7.95 7.50 - 7.95	CPT N=42 3,5/9,9,11,13	
				(5.60)					
					D	6	9.00 - 9.45 9.00 - 9.45	CPT N=37 3,5/7,8,10,12	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 27.00m bgl.
4. Installed with HDPE standpipe to 30.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
1	14-10-14		27.00	25.00	

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 30.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524101.97 N: 212899.63 Level: 84.92

Logged By: WC

Checked By: WC

Approved By: SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH415**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 13/10/2014 - 14/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Dense orange brown gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse flint. Rare flint cobbles. (KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*					D	7	10.50 - 10.95 10.50 - 10.95	CPT N=42 4,6/8,9,11,14	
			11.50	*73.42* 11.50					
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely to very weak low to medium density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout. Grade Dm. (LEWES NODULAR/ SEAFORD CHALK FORMATION)					D	8	12.00 - 12.45 12.00 - 12.45	CPT N=28 1,2/4,8,11,5	
					D	9	13.50 - 13.95 13.50 - 13.95	SPT N=14 1,2/4,4,3,3	
					D	10	15.00 - 15.45 15.00 - 15.45	SPT N=21 3,4/4,5,6,6	
					D	11	16.50 - 16.95 16.50 - 16.95	SPT N=12 2,2/3,2,4,3	
					D	12	18.00 - 18.45 18.00 - 18.45	SPT N=34 2,3/6,8,9,11	
					D	13	19.50 - 19.95 19.50 - 19.95	SPT N=18 2,2/3,5,6,4	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 27.00m bgl.
4. Installed with HDPE standpipe to 30.00m bgl.

CHISELLING		
Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS				
	Date	Time	Water Strike	Standing Level	Casing Depth
1	14-10-14		27.00	25.00	

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 30.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524101.97 N: 212899.63 Level: 84.92	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH415**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 13/10/2014 - 14/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
Recovered as structureless CHALK composed of cream with rare orange veins slightly gravelly silt. Gravel is angular to subangular fine to medium extremely to very weak low to medium density cream. Rare subrounded coarse gravels and cobbles of rinded flint throughout. Grade Dm. (LEWES NODULAR/ SEAFORD CHALK FORMATION)*(BH Continued)*				(18.50)	D	14	21.00 - 21.45 21.00 - 21.45	SPT N=37 4,5/7,8,10,12	
					D	15	22.50 - 22.95 22.50 - 22.95	SPT N=37 4,5/8,12,9,8	
					D	16	24.00 - 24.45 24.00 - 24.45	SPT N=40 5,8/9,9,10,12	
		1			D	17	25.50 - 25.95 25.50 - 25.95	SPT N=50/275mm (4,7/9,10,15,16/50mm)	
		1			D	18	27.00 - 27.45 27.00 - 27.45	SPT N=43 5,9/9,12,9,13	
					D	19	28.50 - 28.95 28.50 - 28.95	SPT N=42 5,6/7,9,12,14	
				54.92 30.00	D	20	30.00 - 30.45		

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 27.00m bgl.
4. Installed with HDPE standpipe to 30.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
1	14-10-14		27.00	25.00	

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 30.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524101.97 N: 212899.63 Level: 84.92	WC	WC	SS

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Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH415**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 13/10/2014 - 14/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL/* DEPTH (Thickness)	Sample Details			Test Results	Backfill Details
					TYPE	REF	Depth	SPT N Value/Drive mm	
Borehole complete at 30.00m bgl.							30.00 - 30.45	SPT N=41 4,6/8,9,11,13	

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Groundwater encountered at 27.00m bgl.
4. Installed with HDPE standpipe to 30.00m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
1	14-10-14		27.00	25.00	

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 30.00m	150mm to 11.50m	

All measurements in metres unless otherwise stated

10m/page Scale: 1:62.50

Coordinates to National Grid
Ground Level to Ordnance Datum

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524101.97 N: 212899.63 Level: 84.92

Logged By: WC

Checked By: WC

Approved By: SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH416**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 21/10/2014 - 22/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL* / DEPTH (Thickness)	Sample Details TYPE	REF	Depth	Test Results SPT N Value/Drive mm	Backfill Details
MADE GROUND: Dark brown sandy slightly gravelly clay. Gravel is angular to rounded fine to coarse flint and rare brick. Sand is fine to coarse. Abundant rootlets in top 200mm.				(0.60) *83.72* 0.60	D	1	0.50		
Stiff orangey brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (LOWESTOFT FORMATION)					D	2	1.00		
					U	1	1.50 - 1.95	U=90/225mm	
				(2.50)	D	3	1.95 - 20.50		
					B	1	2.50 - 2.95 2.50 - 2.95	CPT N=30 3,4/4,7,9,10	
				81.22 3.10	D	4	3.10		
Stiff brown slightly sandy CLAY. Sand is fine to medium. (LOWESTOFT FORMATION)					U	2	3.50 - 3.95	U=79/450mm	
				(1.50)	D	5	3.95 - 4.05		
				79.72 4.60	D	6	4.50 - 4.95 4.50 - 4.95	SPT N=31 3,4/4,6,9,12	
Dense orangey brown fine to coarse SAND. Rare subangular fine to medium flint gravel. (LOWESTOFT FORMATION)			(150mm)		B	2	6.00 - 6.45 6.00 - 6.45	CPT N=45 5,7/8,10,13,14	
				(3.00)					
				76.72 7.60	B	3	7.50 - 7.95 7.50 - 7.95	CPT N=28 4,5/6,6,7,9	
Medium dense to dense yellowy brown fine to medium SAND. Rare subangular fine to coarse flint gravel. (KESGRAVE CATCHMENT SUBGROUP)									
				(1.80)					
					D	7	9.00 - 9.45 9.00 - 9.45	SPT N=41 4,4/6,9,12,14	
				74.92 9.40					

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 13.50m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:				

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 13.40m	150mm to 12.60m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum |

Plant Used:	Coordinates / Level (mAOD):	Logged By:	Checked By:	Approved By:
Dando 2000	E: 524065.76 N: 213041.5 Level: 84.32	WC	WC	SS

Delta-Simons
3 Henley Office Park, Doddington Road,
Lincoln, LN6 3QR
Tel: +44 (0) 870 0400 012
Fax: +44 (0) 1522 698393
Email: info@deltasimons.com

Project: **Broadwater Road, Welwyn Garden City**

Project No: **2342.18**

Hole ID: **BH416**

CABLE PERCUSSION BOREHOLE LOG

Date From / To: 21/10/2014 - 22/10/2014

Client: **Spen Hill Developments Ltd**

DESCRIPTION OF STRATA	LEGEND	WATER	CASING DEPTH / (Diam. mm)	*REDUCED LEVEL*/ DEPTH (Thickness)	Sample Details TYPE	Sample Details REF	Sample Details Depth	Test Results SPT N Value/Drive mm	Backfill Details
Medium dense orangey brown sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. Rare flint cobbles.(KESGRAVE CATCHMENT SUBGROUP)*(BH Continued)*				(3.20)	B	4	10.50 - 10.95 10.50 - 10.95	CPT N=28 3,4/4,6,8,10	
					D	8	12.00 - 12.45 12.00 - 12.45	CPT N=22 4,5/4,6,6,6	
			12.60	*71.72* 12.60					
No recovery pushing flint cobble.				(0.80)					
				70.92 13.40					
Borehole terminated due to difficult conditions at 13.40m bgl.									

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Installed with HDPE standpipe to 13.50m bgl.

CHISELLING

Depth From	Depth To	Time Taken
NO CHISELLING UNDERTAKEN:		

WATER LEVEL OBSERVATIONS

	Date	Time	Water Strike	Standing Level	Casing Depth
NO WATER ENCOUNTERED:					

BOREHOLE DIAMETER	CASING DIAMETER	DEPTH SEALED
150mm to 13.40m	150mm to 12.60m	

All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 2 of 2

Plant Used: Dando 2000

Coordinates / Level (mAOD): E: 524065.76 N: 213041.5 Level: 84.32

Logged By: WC

Checked By: WC

Approved By: SS

Annex C: Soil Analytical Data

Michael Sylvester
Earth&Marine Environmental Ltd
Office 44
58 Low Friar Street
Newcastle upon Tyne
NE1 5UE

t: 0191 653 1989

e: michael.sylvester@eame.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-90908

Project / Site name:	WGC	**Samples received on:**	28/06/2018
Your job number:	016-1512	**Samples instructed on:**	30/06/2018
Your order number:		**Analysis completed by:**	10/07/2018
Report Issue Number:	1	**Report issued on:**	10/07/2018
Samples Analysed:	34 soil samples		

Signed: [redacted]

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-90908

Project / Site name: WGC

Lab Sample Number				992281	992282	992283	992284	992285
Sample Reference				WS01-18	WS01-18	WS02-18	WS02-18	WS03-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.70	2.00-2.30	0.60-0.80	1.80-2.00	0.50-0.80
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.8	7.9	13	10	12
Total mass of sample received	kg	0.001	NONE	0.53	0.48	0.48	0.50	0.55
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile, Amosite- Loose Fibrous Debris	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.2	8.6	6.7	8.4	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.48	0.094	0.056	0.047	0.037
Organic Matter	%	0.1	MCERTS	4.9	-	-	-	1.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.72	< 0.05	< 0.05	< 0.05	0.68
Anthracene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05	< 0.05	1.1
Pyrene	mg/kg	0.05	MCERTS	2.4	< 0.05	< 0.05	< 0.05	0.94
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	< 0.05	< 0.05	< 0.05	0.37
Chrysene	mg/kg	0.05	MCERTS	1.3	< 0.05	< 0.05	< 0.05	0.59
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05	< 0.05	0.32
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	< 0.05	0.36
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.1	< 0.05	< 0.05	< 0.05	0.31
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.0	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.9	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	18.9	< 0.80	< 0.80	< 0.80	4.68
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	31	4.5	45	22
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	4.8	1.2	0.76	2.1	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	3.2	1.6	3.5	6.3	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	36	29	23	40	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	49	15	15	25	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	67	14	19	20	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	37	19	51	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	79	52	34	77	54
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	89	120	51	130	93

Analytical Report Number: 18-90908

Project / Site name: WGC

Lab Sample Number				992281	992282	992283	992284	992285
Sample Reference				WS01-18	WS01-18	WS02-18	WS02-18	WS03-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.70	2.00-2.30	0.60-0.80	1.80-2.00	0.50-0.80
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	6.3	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	33	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	250	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	290	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	3.1	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	49	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	610	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	670	< 10	< 10	< 10	< 10

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Lab Sample Number				992281	992282	992283	992284	992285
Sample Reference				WS01-18	WS01-18	WS02-18	WS02-18	WS03-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.70	2.00-2.30	0.60-0.80	1.80-2.00	0.50-0.80
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane	µg/kg	100	NONE	-	-	-	-	-

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Lab Sample Number				992281	992282	992283	992284	992285
Sample Reference				WS01-18	WS01-18	WS02-18	WS02-18	WS03-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.70	2.00-2.30	0.60-0.80	1.80-2.00	0.50-0.80
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.72	< 0.05	< 0.05	< 0.05	0.68
Anthracene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05	< 0.05	1.1
Pyrene	mg/kg	0.05	MCERTS	2.4	< 0.05	< 0.05	< 0.05	0.94
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	< 0.05	< 0.05	< 0.05	0.37
Chrysene	mg/kg	0.05	MCERTS	1.3	< 0.05	< 0.05	< 0.05	0.59
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05	< 0.05	0.32
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	< 0.05	0.36
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.1	< 0.05	< 0.05	< 0.05	0.31
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.0	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.9	< 0.05	< 0.05	< 0.05	< 0.05

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Lab Sample Number				992281	992282	992283	992284	992285
Sample Reference				WS01-18	WS01-18	WS02-18	WS02-18	WS03-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.70	2.00-2.30	0.60-0.80	1.80-2.00	0.50-0.80
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

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Project / Site name: WGC

Lab Sample Number				992286	992287	992288	992289	992290
Sample Reference				WS03-18	WS04-18	WS04-18	WS05-18	WS05-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50-1.80	0.10-0.40	1.00-1.20	0.70-0.90	4.50-5.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	14	9.9	14	6.0
Total mass of sample received	kg	0.001	NONE	0.52	0.43	0.48	0.53	0.57
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.6	7.6	7.9	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.054	0.047	0.14	0.0092	0.0093
Organic Matter	%	0.1	MCERTS	-	-	-	1.0	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.94	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.19	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.3	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	2.2	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.2	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.79	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.2	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.76	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.94	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	13.5	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	11	10	14	13
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	18	1.1	1.3	0.61
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	1.1	2.1	1.0	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	19	28	28	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	63	13	23	6.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	55	17	29	8.5
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	58	27	31	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.2	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	43	96	43	40	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	64	47	61	70

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Project / Site name: WGC

Lab Sample Number				992286	992287	992288	992289	992290
Sample Reference				WS03-18	WS04-18	WS04-18	WS05-18	WS05-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50-1.80	0.10-0.40	1.00-1.20	0.70-0.90	4.50-5.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	4.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	8.8	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	18	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	57	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	88	< 10	< 10	< 10

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Lab Sample Number				992286	992287	992288	992289	992290
Sample Reference				WS03-18	WS04-18	WS04-18	WS05-18	WS05-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50-1.80	0.10-0.40	1.00-1.20	0.70-0.90	4.50-5.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Dichloromethane	µg/kg	100	NONE	-	-	-	-	-

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Project / Site name: WGC

Lab Sample Number				992286	992287	992288	992289	992290
Sample Reference				WS03-18	WS04-18	WS04-18	WS05-18	WS05-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50-1.80	0.10-0.40	1.00-1.20	0.70-0.90	4.50-5.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	0.3	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.94	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.19	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.3	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	2.2	< 0.05	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.2	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.79	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.2	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.76	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.94	< 0.05	< 0.05	< 0.05

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Project / Site name: WGC

Lab Sample Number				992286	992287	992288	992289	992290
Sample Reference				WS03-18	WS04-18	WS04-18	WS05-18	WS05-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50-1.80	0.10-0.40	1.00-1.20	0.70-0.90	4.50-5.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	< 0.007	-	-

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Project / Site name: WGC

Lab Sample Number				992291	992292	992293	992294	992295
Sample Reference				WS06-18	WS06-18	WS07-18	WS0718	WS08-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.60	1.50-1.80	0.70-1.00	3.50-3.80	0.80-1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.2	11	6.6	14	10
Total mass of sample received	kg	0.001	NONE	0.56	0.53	0.52	0.45	0.54
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.9	11.2	7.6	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.048	0.026	0.19	0.023	0.088
Organic Matter	%	0.1	MCERTS	-	-	-	-	0.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.37	< 0.05	0.44	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.30	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	3.8	< 0.05	1.4	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	9.4	< 0.05	2.7	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	8.6	< 0.05	2.1	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.1	< 0.05	1.1	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	5.2	< 0.05	1.6	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	6.9	< 0.05	1.2	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.3	< 0.05	0.99	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	7.2	< 0.05	1.2	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.6	< 0.05	0.75	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.7	< 0.05	0.85	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	63.0	< 0.80	14.3	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	17	21	14	29
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.69	1.5	0.66	1.1	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1.3	2.4	0.7	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	46	23	38	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	14	15	23	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	15	51	20	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	34	21	23	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.2	2.1	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	75	35	57	62
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	69	280	54	83

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Project / Site name: WGC

Lab Sample Number				992291	992292	992293	992294	992295
Sample Reference				WS06-18	WS06-18	WS07-18	WS0718	WS08-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.60	1.50-1.80	0.70-1.00	3.50-3.80	0.80-1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	2.5	< 1.0	1.9	48	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.6	< 2.0	5.8	430	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	11	< 8.0	21	660	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	130	< 8.0	200	410	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	150	< 10	230	1500	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.0	< 1.0	3.9	30	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	11	< 2.0	14	390	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	82	< 10	33	740	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	540	< 10	230	340	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	630	< 10	280	1500	< 10

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Project / Site name: WGC

Lab Sample Number				992291	992292	992293	992294	992295
Sample Reference				WS06-18	WS06-18	WS07-18	WS0718	WS08-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.60	1.50-1.80	0.70-1.00	3.50-3.80	0.80-1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Dichloromethane	µg/kg	100	NONE	-	-	-	-	-

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Project / Site name: WGC

Lab Sample Number				992291	992292	992293	992294	992295
Sample Reference				WS06-18	WS06-18	WS07-18	WS0718	WS08-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.60	1.50-1.80	0.70-1.00	3.50-3.80	0.80-1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.37	< 0.05	0.44	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.30	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	3.8	< 0.05	1.4	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	9.4	< 0.05	2.7	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	8.6	< 0.05	2.1	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.1	< 0.05	1.1	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	5.2	< 0.05	1.6	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	6.9	< 0.05	1.2	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.3	< 0.05	0.99	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	7.2	< 0.05	1.2	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.6	< 0.05	0.75	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.7	< 0.05	0.85	< 0.05	< 0.05

Analytical Report Number: 18-90908

Project / Site name: WGC

Lab Sample Number				992291	992292	992293	992294	992295
Sample Reference				WS06-18	WS06-18	WS07-18	WS0718	WS08-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.60	1.50-1.80	0.70-1.00	3.50-3.80	0.80-1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-	< 0.007	< 0.007

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Project / Site name: WGC

Lab Sample Number				992296	992297	992298	992299	992300
Sample Reference				WS08-18	WS09-18	WS09-18	WS10-18	WS1018
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00-2.20	0.50-0.80	1.60-1.80	1.20-1.50	3.00-3.50
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.9	14	11	11	10
Total mass of sample received	kg	0.001	NONE	0.48	0.55	0.49	0.56	0.58
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.4	8.3	7.4	7.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.031	0.17	0.025	0.28	0.051
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	31	33	17	80	47
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.6	0.79	1.7	0.80
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.6	0.4	0.8	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	42	25	33	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	25	15	30	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	21	9.1	27	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	65	62	22	88	50
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	69	61	35	61	55
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	150	44	270	220

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Lab Sample Number				992296	992297	992298	992299	992300
Sample Reference				WS08-18	WS09-18	WS09-18	WS10-18	WS1018
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00-2.20	0.50-0.80	1.60-1.80	1.20-1.50	3.00-3.50
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Lab Sample Number				992296	992297	992298	992299	992300
Sample Reference				WS08-18	WS09-18	WS09-18	WS10-18	WS1018
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00-2.20	0.50-0.80	1.60-1.80	1.20-1.50	3.00-3.50
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Dichloromethane	µg/kg	100	NONE	-	-	-	-	-

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Project / Site name: WGC

Lab Sample Number				992296	992297	992298	992299	992300
Sample Reference				WS08-18	WS09-18	WS09-18	WS10-18	WS1018
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00-2.20	0.50-0.80	1.60-1.80	1.20-1.50	3.00-3.50
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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Lab Sample Number				992296	992297	992298	992299	992300
Sample Reference				WS08-18	WS09-18	WS09-18	WS10-18	WS1018
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00-2.20	0.50-0.80	1.60-1.80	1.20-1.50	3.00-3.50
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

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Project / Site name: WGC

Lab Sample Number				992301	992302	992303	992304	992305
Sample Reference				WS11-18	WS11-18	WS12-18	WS12-18	WS13-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.00	2.20-2.50	0.80-1.00	2.50-2.80	0.70-0.90
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	38	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.2	10	6.2	10	8.6
Total mass of sample received	kg	0.001	NONE	0.51	0.51	0.50	0.57	0.58
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	4.8	12.0	9.1	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.23	0.051	0.049	0.054	0.19
Organic Matter	%	0.1	MCERTS	-	-	0.2	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.67	< 0.05	0.36
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.74	< 0.05	0.53
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	< 0.05	0.47
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	1.98	< 0.80	1.36
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	97	72	18	94	120
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.3	1.1	0.64	1.3	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	0.5	2.4	1.5	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	28	21	29	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	24	36	22	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	19	40	25	43
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	7.1	6.9	6.1	7.1
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	86	52	14	61	85
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	52	27	51	55
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	230	300	80	250	330

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Lab Sample Number				992301	992302	992303	992304	992305
Sample Reference				WS11-18	WS11-18	WS12-18	WS12-18	WS13-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.00	2.20-2.50	0.80-1.00	2.50-2.80	0.70-0.90
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.4	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	5.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	21	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	180	< 8.0	43
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	210	< 10	45
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	7.6	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	19	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	110	< 10	46
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	130	< 10	49

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Lab Sample Number				992301	992302	992303	992304	992305
Sample Reference				WS11-18	WS11-18	WS12-18	WS12-18	WS13-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.00	2.20-2.50	0.80-1.00	2.50-2.80	0.70-0.90
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Dichloromethane	µg/kg	100	NONE	-	-	-	-	-

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Lab Sample Number				992301	992302	992303	992304	992305
Sample Reference				WS11-18	WS11-18	WS12-18	WS12-18	WS13-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.00	2.20-2.50	0.80-1.00	2.50-2.80	0.70-0.90
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.67	< 0.05	0.36
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.74	< 0.05	0.53
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	< 0.05	0.47
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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Lab Sample Number				992301	992302	992303	992304	992305
Sample Reference				WS11-18	WS11-18	WS12-18	WS12-18	WS13-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.00	2.20-2.50	0.80-1.00	2.50-2.80	0.70-0.90
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	< 0.007

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Lab Sample Number				992306	992307	992308	992309	992310
Sample Reference				WS13-18	WS14-18	WS14-18	WS15-18	WS15-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.80-1.10	2.00-2.20	0.50-0.80	1.50-1.80
Date Sampled				26/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	39	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	8.8	12	9.0	13
Total mass of sample received	kg	0.001	NONE	0.47	0.58	0.57	0.59	0.63
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	7.4	7.0	8.0	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.22	0.029	0.11	0.028	0.24
Organic Matter	%	0.1	MCERTS	-	0.1	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	27	64	25	68	59
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.3	1.1	1.2	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.6	0.6	1.1	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	27	30	26	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	25	17	19	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	22	15	26	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	5.0	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	37	59	49	63	66
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	3.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	53	54	62	57
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	77	230	110	220	250

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Lab Sample Number				992306	992307	992308	992309	992310
Sample Reference				WS13-18	WS14-18	WS14-18	WS15-18	WS15-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.80-1.10	2.00-2.20	0.50-0.80	1.50-1.80
Date Sampled				26/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Lab Sample Number				992306	992307	992308	992309	992310
Sample Reference				WS13-18	WS14-18	WS14-18	WS15-18	WS15-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.80-1.10	2.00-2.20	0.50-0.80	1.50-1.80
Date Sampled				26/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Dichloromethane	µg/kg	100	NONE	-	-	-	-	-

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Lab Sample Number				992306	992307	992308	992309	992310
Sample Reference				WS13-18	WS14-18	WS14-18	WS15-18	WS15-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.80-1.10	2.00-2.20	0.50-0.80	1.50-1.80
Date Sampled				26/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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Lab Sample Number				992306	992307	992308	992309	992310
Sample Reference				WS13-18	WS14-18	WS14-18	WS15-18	WS15-18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.80-1.10	2.00-2.20	0.50-0.80	1.50-1.80
Date Sampled				26/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

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Lab Sample Number				992311	992312	992313	992314	
Sample Reference				WS16-18	WS16-18	FR1	FR2	
Sample Number				None Supplied	None Supplied	Surface	Surface	
Depth (m)				0.60-0.90	1.30-1.50	None Supplied	None Supplied	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	31	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	7.4	9.3	4.0	3.0	
Total mass of sample received	kg	0.001	NONE	0.55	0.54	0.52	0.55	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile- Loose Fibrous Debris	-	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	7.2	11.5	10.6	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.29	0.13	0.079	0.12	
Organic Matter	%	0.1	MCERTS	-	-	-	-	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	0.62	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58	0.24	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.4	2.3	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	0.26	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.4	1.7	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.7	1.0	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.2	0.49	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.1	0.78	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	0.35	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	0.38	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.83	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	26.8	8.22	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	61	55	12	36	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.5	0.73	0.94	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.5	2.3	1.8	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	33	23	29	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	24	17	18	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	20	26	15	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	63	77	23	33	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	3.7	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	72	37	49	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	300	120	150	

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Lab Sample Number				992311	992312	992313	992314	
Sample Reference				WS16-18	WS16-18	FR1	FR2	
Sample Number				None Supplied	None Supplied	Surface	Surface	
Depth (m)				0.60-0.90	1.30-1.50	None Supplied	None Supplied	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	11	5.5	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	58	17	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	170	55	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	240	78	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	8.7	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	23	3.4	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	61	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	140	11	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	230	23	

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Lab Sample Number				992311	992312	992313	992314	
Sample Reference				WS16-18	WS16-18	FR1	FR2	
Sample Number				None Supplied	None Supplied	Surface	Surface	
Depth (m)				0.60-0.90	1.30-1.50	None Supplied	None Supplied	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	

Dichloromethane	µg/kg	100	NONE	-	-	< 100	< 100	

Analytical Report Number: 18-90908

Project / Site name: WGC

Lab Sample Number				992311	992312	992313	992314	
Sample Reference				WS16-18	WS16-18	FR1	FR2	
Sample Number				None Supplied	None Supplied	Surface	Surface	
Depth (m)				0.60-0.90	1.30-1.50	None Supplied	None Supplied	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11	< 0.05	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	0.62	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.2	0.7	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58	0.24	
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.4	2.3	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	0.26	
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.4	1.7	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.7	1.0	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.2	0.49	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.1	0.78	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	0.35	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	0.38	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.83	< 0.05	

Analytical Report Number: 18-90908

Project / Site name: WGC

Lab Sample Number				992311	992312	992313	992314	
Sample Reference				WS16-18	WS16-18	FR1	FR2	
Sample Number				None Supplied	None Supplied	Surface	Surface	
Depth (m)				0.60-0.90	1.30-1.50	None Supplied	None Supplied	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	

Analytical Report Number : 18-90908

Project / Site name: WGC

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
992281	WS01-18	None Supplied	0.40-0.70	Brown loam and sand with gravel.
992282	WS01-18	None Supplied	2.00-2.30	Brown clay and sand with gravel.
992283	WS02-18	None Supplied	0.60-0.80	Brown clay and sand with gravel.
992284	WS02-18	None Supplied	1.80-2.00	Brown clay and sand with gravel.
992285	WS03-18	None Supplied	0.50-0.80	Brown clay and sand with gravel.
992286	WS03-18	None Supplied	1.50-1.80	Brown clay and sand with gravel.
992287	WS04-18	None Supplied	0.10-0.40	Grey sand with gravel and clinker.
992288	WS04-18	None Supplied	1.00-1.20	Brown clay and sand with gravel.
992289	WS05-18	None Supplied	0.70-0.90	Brown loam and clay.
992290	WS05-18	None Supplied	4.50-5.00	Brown sand.
992291	WS06-18	None Supplied	0.30-0.60	Brown loam and clay with gravel and rubble.
992292	WS06-18	None Supplied	1.50-1.80	Brown clay and sand with gravel.
992293	WS07-18	None Supplied	0.70-1.00	Light brown sand with rubble.
992294	WS0718	None Supplied	3.50-3.80	Brown clay.
992295	WS08-18	None Supplied	0.80-1.00	Brown clay and sand with gravel.
992296	WS08-18	None Supplied	2.00-2.20	Brown clay and sand with gravel.
992297	WS09-18	None Supplied	0.50-0.80	Brown clay and sand with gravel.
992298	WS09-18	None Supplied	1.60-1.80	Light brown clay with gravel.
992299	WS10-18	None Supplied	1.20-1.50	Brown clay and sand with gravel.
992300	WS1018	None Supplied	3.00-3.50	Brown clay and sand with gravel.
992301	WS11-18	None Supplied	0.80-1.00	Brown clay and sand with gravel and stones.
992302	WS11-18	None Supplied	2.20-2.50	Brown sandy clay with gravel.
992303	WS12-18	None Supplied	0.80-1.00	Brown sand with rubble and brick.
992304	WS12-18	None Supplied	2.50-2.80	Brown clay and sand with gravel.
992305	WS13-18	None Supplied	0.70-0.90	Brown clay and sand with gravel and clinker.
992306	WS13-18	None Supplied	1.90-2.20	Brown clay with chalk and vegetation.
992307	WS14-18	None Supplied	0.80-1.10	Brown clay and sand with stones and gravel
992308	WS14-18	None Supplied	2.00-2.20	Brown clay and sand with gravel.
992309	WS15-18	None Supplied	0.50-0.80	Brown clay and sand with gravel.
992310	WS15-18	None Supplied	1.50-1.80	Brown clay and sand with gravel.
992311	WS16-18	None Supplied	0.60-0.90	Brown clay and sand with gravel and stones.
992312	WS16-18	None Supplied	1.30-1.50	Brown clay and sand with gravel.
992313	FR1	Surface	None Supplied	Light brown sand with rubble and gravel.
992314	FR2	Surface	None Supplied	Light brown sand with rubble and gravel.

Analytical Report Number : 18-90908

Project / Site name: WGC

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

Analytical Report Number : 18-90908

Project / Site name: WGC

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Annex D: Shallow Groundwater Analytical Data

Michael Sylvester
Earth&Marine Environmental Ltd
Office 44
58 Low Friar Street
Newcastle upon Tyne
NE1 5UE

t: 0191 653 1989

e: michael.sylvester@eame.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-91281

Project / Site name:	WGC	**Samples received on:**	03/07/2018
Your job number:	016-1512	**Samples instructed on:**	03/07/2018
Your order number:		**Analysis completed by:**	12/07/2018
Report Issue Number:	1	**Report issued on:**	12/07/2018
Samples Analysed:	1 water sample		

Signe [redacted]

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-91281

Project / Site name: WGC

Lab Sample Number				994299				
Sample Reference				WS07-18				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	12.0				
Total Cyanide	µg/l	10	ISO 17025	120				
Sulphate as SO_4	µg/l	45	ISO 17025	48000				
Sulphate as SO_4	mg/l	0.045	ISO 17025	48.0				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	330				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	3.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	1.74				
Fluorene	µg/l	0.01	ISO 17025	1.68				
Phenanthrene	µg/l	0.01	ISO 17025	1.60				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	0.25				
Pyrene	µg/l	0.01	ISO 17025	0.17				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	8.45				

Analytical Report Number: 18-91281

Project / Site name: WGC

Lab Sample Number				994299				
Sample Reference				WS07-18				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	12.4				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	15				
Copper (dissolved)	µg/l	0.5	ISO 17025	62				
Lead (dissolved)	µg/l	0.2	ISO 17025	1.8				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Nickel (dissolved)	µg/l	0.5	ISO 17025	46				
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.8				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	4.1				
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.0				
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	22				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	110				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	140				

Analytical Report Number: 18-91281

Project / Site name: WGC

Lab Sample Number				994299				
Sample Reference				WS07-18				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0				
Chloroethane	µg/l	1	ISO 17025	< 1.0				
Bromomethane	µg/l	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/l	1	NONE	< 1.0				
Trichlorofluoromethane	µg/l	1	NONE	10.4				
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0				
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloromethane	µg/l	1	ISO 17025	< 1.0				
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0				
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0				
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloroethene	µg/l	1	ISO 17025	< 1.0				
Dibromomethane	µg/l	1	ISO 17025	< 1.0				
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0				
Chlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-Xylene	µg/l	1	ISO 17025	< 1.0				
Styrene	µg/l	1	ISO 17025	< 1.0				
Tribromomethane	µg/l	1	ISO 17025	< 1.0				
o-Xylene	µg/l	1	ISO 17025	< 1.0				
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0				
Bromobenzene	µg/l	1	ISO 17025	< 1.0				
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0				
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				

Analytical Report Number: 18-91281

Project / Site name: WGC

Lab Sample Number				994299				
Sample Reference				WS07-18				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	µg/l	0.05	NONE	1.4				
Phenol	µg/l	0.05	NONE	1.5				
2-Chlorophenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05				
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05				
2-Methylphenol	µg/l	0.05	NONE	< 0.05				
Hexachloroethane	µg/l	0.05	NONE	< 0.05				
Nitrobenzene	µg/l	0.05	NONE	< 0.05				
4-Methylphenol	µg/l	0.05	NONE	< 0.05				
Isophorone	µg/l	0.05	NONE	< 0.05				
2-Nitrophenol	µg/l	0.05	NONE	< 0.05				
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05				
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05				
Naphthalene	µg/l	0.01	ISO 17025	3.0				
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05				
4-Chloroaniline	µg/l	0.05	NONE	< 0.05				
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05				
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2-Methylnaphthalene	µg/l	0.05	NONE	2.8				
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05				
Dimethylphthalate	µg/l	0.05	NONE	< 0.05				
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	1.7				
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Dibenzofuran	µg/l	0.05	NONE	< 0.05				
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Diethyl phthalate	µg/l	0.05	NONE	< 0.05				
4-Nitroaniline	µg/l	0.05	NONE	< 0.05				
Fluorene	µg/l	0.01	ISO 17025	1.7				
Azobenzene	µg/l	0.05	NONE	< 0.05				
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05				
Phenanthrene	µg/l	0.01	ISO 17025	1.6				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Carbazole	µg/l	0.05	NONE	< 0.05				
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05				
Anthraquinone	µg/l	0.05	NONE	< 0.05				
Fluoranthene	µg/l	0.01	ISO 17025	0.25				
Pyrene	µg/l	0.01	ISO 17025	0.17				
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				

Analytical Report Number: 18-91281

Project / Site name: WGC

Lab Sample Number				994299				
Sample Reference				WS07-18				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	µg/l	0.02	NONE	< 0.02				
PCB Congener 52	µg/l	0.02	NONE	< 0.02				
PCB Congener 101	µg/l	0.02	NONE	< 0.02				
PCB Congener 118	µg/l	0.02	NONE	< 0.02				
PCB Congener 138	µg/l	0.02	NONE	< 0.02				
PCB Congener 153	µg/l	0.02	NONE	< 0.02				
PCB Congener 180	µg/l	0.02	NONE	< 0.02				
PCBs by GC-MS								
Total PCBs	µg/l	0.14	NONE	< 0.14				

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 18-91281

Project / Site name: WGC

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
PCB's By GC-MS in water	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L028-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
WS07-18		W	18-91281	994299	d	BTEX and MTBE in water (Monoaromatics)	L073B-PL	d
WS07-18		W	18-91281	994299	d	TPHCWG (Waters)	L070-PL	d
WS07-18		W	18-91281	994299	d	Volatile organic compounds in water	L073B-PL	d

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

Annex E: Ground Gas Monitoring Data

Site Project Wheat Quarter

Project 016-1502

Annex E: *EAME Ground Gas Monitoring - Northern Site - Summary (22/06/18 - 17/07/18)*

Maximum Methane (% v/v)

	28/06/2018	02/07/2018	12/07/2018	17/07/2018			
	Round 1	Round 2	Round 3	Round 4	Minimum	Maximum	Range
WS01-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS02-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS05-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS07-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS08-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS11-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS13-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS16-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0

Maximum Carbon Dioxide (% v/v)

	28/06/2018	02/07/2018	12/07/2018	17/07/2018			
	Round 1	Round 2	Round 3	Round 4	Minimum	Maximum	Range
WS01-18	12.1	10.8	14.1	14.3	10.8	14.3	10.8 - 14.3
WS02-18	2.1	3.7	3.9	3.7	2.1	3.9	2.1 - 3.9
WS05-18	2.4	0.7	0.7	0.6	0.6	2.4	0.6 - 2.4
WS07-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS08-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS11-18	0.9	0.2	0.1	0.1	0.1	0.9	0.1 - 0.9
WS13-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS16-18	0.2	0.1	0.2	0.3	0.1	0.3	0.1 - 0.3

Maximum Flow Rate (l/hr)

	28/06/2018	02/07/2018	12/07/2018	17/07/2018			
	Round 1	Round 2	Round 3	Round 4	Minimum	Maximum	Range
WS01-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS02-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS05-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS07-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS08-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS11-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS13-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0
WS16-18	0.0	0.0	0.0	0.0	0.0	0.0	0 - 0

Site Project Wheat Quarter

Project 016-1502

Annex E: *EAME Ground Gas Monitoring - Northern Site - Round 1 (28th June 2018)*

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H_2S	CO						
WS01-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.7	0.2	0.0	0.0	DRY Base 5.03 m	0.025	1.0		0.0	12.1
	15	0.0	0.0	0	0.0	**0.0**	10.8	6.2	6.3	0.0	0.0		0.023	1.0			
	30	0.0	0.0	0	0.0	**0.0**	11.3	4.1	8.7	0.0	0.0		0.023	1.0			
	45	0.0	0.0	0	0.0	**0.0**	11.4	3.9	9.8	0.0	0.0		0.023	1.0			
	60	0.0	0.0	0	0.0	**0.0**	11.5	3.8	9.4	0.0	0.0		0.023	1.0			
	90	0.0	0.0	0	0.0	**0.0**	11.6	3.6	9.7	0.0	0.0		0.023	1.0			
	120	0.0	0.0	0	0.0	**0.0**	11.8	3.4	9.2	0.0	0.0		0.023	1.0			
	180	0.0	0.0	0	0.0	**0.0**	12.1	3.2	9.2	0.0	0.0		0.023	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1016			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	MiniRae Lite ATEX	595-003336	**Cal.Date**	19/06/2018
Visible signs of vegetation stress	No vegetation. Located on tarmac within J F Hunts compound.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H_2S	CO						
WS02-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.8	1.8	0.0	0.0	DRY Base 3.48	0.027	1.0		0.0	2.1
	15	0.0	0.0	0	0.0	**0.0**	2.0	17.2	11.2	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	2.1	15.7	12.0	0.0	22.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	2.1	15.6	11.7	0.0	23.0		0.027	1.0			
	60	0.0	0.0	0	0.0	**0.0**	2.1	15.6	12.3	0.0	28.0		0.027	1.0			
	90	0.0	0.0	0	0.0	**0.0**	2.1	15.5	11.8	0.0	31.0		0.026	1.0			
	120	0.0	0.0	0	0.0	**0.0**	2.1	15.4	11.4	0.0	31.0		0.026	1.0			
	180	0.0	0.0	0	0.0	**0.0**	2.1	15.4	11.3	0.0	32.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1016			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	MiniRae Lite ATEX	595-003336	**Cal.Date**	19/06/2018
Visible signs of vegetation stress	No vegetation. Located on tarmac within disused employee car park.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H_2S	CO						
WS05-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.2	6.2	0.0	0.0	DRY Base 5.01	0.024	1.0		0.0	2.4
	15	0.0	0.0	0	0.0	**0.0**	0.9	20.4	29.0	0.0	0.0		0.023	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.9	20.0	30.6	0.0	0.0		0.022	1.0			
	45	0.0	0.0	0	0.0	**0.0**	1.0	19.9	29.9	0.0	0.0		0.021	1.0			
	60	0.0	0.0	0	0.0	**0.0**	1.1	19.7	29.3	0.0	0.0		0.022	1.0			
	90	0.0	0.0	0	0.0	**0.0**	1.4	19.2	27.5	0.0	0.0		0.021	1.0			
	120	0.0	0.0	0	0.0	**0.0**	1.7	18.7	26.5	0.0	0.0		0.021	1.0			
	180	0.0	0.0	0	0.0	**0.0**	2.4	17.5	25.2	0.0	0.0		0.021	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1013			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	MiniRae Lite ATEX	595-003336	**Cal.Date**	19/06/2018
Visible signs of vegetation stress	Grassed area. No signs of stressed vegetation.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS07-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.8	0.5	0.0	0.0	Water 2.94 Base 4.13	0.027	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	20.8	4.8	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	20.7	5.0	0.0	0.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	20.7	5.2	0.0	0.0		0.027	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	20.7	5.4	0.0	0.0		0.027	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	20.6	5.2	0.0	0.0		0.026	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	20.6	5.8	0.0	0.0		0.026	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	20.6	5.8	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1014-1015			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	MiniRae Lite ATEX	595-003336	**Cal.Date**	19/06/2018
Visible signs of vegetation stress	No vegetation. Located on pile of demolition rubble.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS08-18	0	0.0	0.0	0	0.0	**0.0**	0.0	19.9	0.2	0.0	0.0	DRY Base 4.87	0.030	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	19.7	3.3	0.0	0.0		0.029	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	19.1	3.7	0.0	0.0		0.029	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	19.0	3.8	0.0	0.0		0.029	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	19.0	3.6	0.0	0.0		0.029	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	18.8	3.5	0.0	0.0		0.028	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	18.7	3.2	0.0	0.0		0.028	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	18.5	3.2	0.0	0.0		0.028	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1014			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	MiniRae Lite ATEX	595-003336	**Cal.Date**	19/06/2018
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS11-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.2	0.6	0.0	0.0	DRY Base 4.96	0.029	1.0		0.0	0.9
	15	0.0	0.0	0	0.0	**0.0**	0.9	19.9	1.1	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.9	19.5	1.2	0.0	0.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.9	19.5	1.1	0.0	0.0		0.027	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.9	19.5	1.1	0.0	0.0		0.026	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.9	19.4	1.1	0.0	0.0		0.026	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.9	19.4	1.1	0.0	0.0		0.025	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.9	19.3	1.1	0.0	0.0		0.025	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1013			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	MiniRae Lite ATEX	595-003336	**Cal.Date**	19/06/2018
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS13-18	0	0.0	0.0	0	0.0	0.0	0.0	21.2	1.0	0.0	0.0	DRY Base 2.68	0.031	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	0.0	0.0	20.1	2.8	0.0	0.0		0.031	1.0			
	30	0.0	0.0	0	0.0	0.0	0.0	19.5	3.2	0.0	0.0		0.030	1.0			
	45	0.0	0.0	0	0.0	0.0	0.0	19.5	3.2	0.0	0.0		0.030	1.0			
	60	0.0	0.0	0	0.0	0.0	0.0	19.4	3.3	0.0	0.0		0.029	1.0			
	90	0.0	0.0	0	0.0	0.0	0.0	19.1	2.8	0.0	0.0		0.028	1.0			
	120	0.0	0.0	0	0.0	0.0	0.0	18.8	2.6	0.0	0.0		0.028	1.0			
	180	0.0	0.0	0	0.0	0.0	0.0	18.5	2.3	0.0	0.0		0.028	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1013			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	Cal.Date	10/10/2017
	MiniRae Lite ATEX	595-003336	Cal.Date	19/06/2018
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS16-18	0	0.0	0.0	0	0.0	0.0	0.0	20.1	1.2	0.0	0.0	DRY Base 4.90	0.029	1.0		0.0	0.2
	15	0.0	0.0	0	0.0	0.0	0.2	20.7	22.0	0.0	0.0		0.029	1.0			
	30	0.0	0.0	0	0.0	0.0	0.2	20.6	20.3	0.0	0.0		0.029	1.0			
	45	0.0	0.0	0	0.0	0.0	0.2	20.6	19.5	0.0	0.0		0.028	1.0			
	60	0.0	0.0	0	0.0	0.0	0.2	20.7	18.8	0.0	0.0		0.029	1.0			
	90	0.0	0.0	0	0.0	0.0	0.2	20.6	17.9	0.0	0.0		0.028	1.0			
	120	0.0	0.0	0	0.0	0.0	0.2	20.6	17.5	0.0	0.0		0.029	1.0			
	180	0.0	0.0	0	0.0	0.0	0.2	20.6	16.8	0.0	0.0		0.028	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1014			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12727	Cal.Date	10/10/2017
	MiniRae Lite ATEX	595-003336	Cal.Date	19/06/2018
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	28/06/2018			

GSV Worst-case (Entire Site) - Monitoring Round

Maximum Methane	0.0	%v/v
Maximum Carbon dioxide	12.1	%v/v
Maximum Flow Rate	0.0	l/hr
Gas Screening Value (GSV)	0.00	Very Low Risk - CS1

28/06/2018	Max Flow (l/hr)	Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS01-18	0.0	0.0	12.1
WS02-18	0.0	0.0	2.1
WS05-18	0.0	0.0	2.4
WS07-18	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0
WS11-18	0.0	0.0	0.9
WS13-18	0.0	0.0	0.0
WS16-18	0.0	0.0	0.2

Site	Project Wheat Quarter
Project	016-1502

Annex E: *EAME Ground Gas Monitoring - Northern Site - Round 2 (2nd July 2018)*

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv) PID	Other Gases (ppmv) H_2S	Other Gases (ppmv) CO	Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS01-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.0	-	0.0	0.0	DRY Base 5.03	0.029	1.0		0.0	10.8
	15	0.0	0.0	0	0.0	**0.0**	8.0	12.0	-	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	9.1	9.1	-	0.0	0.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	8.7	9.2	-	0.0	0.0		0.027	1.0			
	60	0.0	0.0	0	0.0	**0.0**	9.1	9.3	-	0.0	0.0		0.028	1.0			
	90	0.0	0.0	0	0.0	**0.0**	10.2	7.4	-	0.0	0.0		0.027	1.0			
	120	0.0	0.0	0	0.0	**0.0**	9.6	8.2	-	0.0	0.0		0.027	1.0			
	180	0.0	0.0	0	0.0	**0.0**	10.8	6.9	-	0.0	0.0		0.028	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1007			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on tarmac within J F Hunts compound.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv) PID	Other Gases (ppmv) H_2S	Other Gases (ppmv) CO	Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS02-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0	DRY Base 3.48	0.026	1.0		0.0	3.7
	15	0.0	0.0	0	0.0	**0.0**	3.4	15.8	-	0.0	0.0		0.026	1.0			
	30	0.0	0.0	0	0.0	**0.0**	3.6	14.7	-	0.0	0.0		0.026	1.0			
	45	0.0	0.0	0	0.0	**0.0**	3.6	14.6	-	0.0	0.0		0.026	1.0			
	60	0.0	0.0	0	0.0	**0.0**	3.6	14.6	-	0.0	0.0		0.025	1.0			
	90	0.0	0.0	0	0.0	**0.0**	3.7	14.5	-	0.0	0.0		0.025	1.0			
	120	0.0	0.0	0	0.0	**0.0**	3.7	14.5	-	0.0	0.0		0.025	1.0			
	180	0.0	0.0	0	0.0	**0.0**	3.7	14.5	-	0.0	0.0		0.025	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1008-1009			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on tarmac within disused employee car park.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv) PID	Other Gases (ppmv) H_2S	Other Gases (ppmv) CO	Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS05-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0	DRY Base 5.01	0.029	1.0		0.0	0.7
	15	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.7	21.1	-	0.0	0.0		0.028	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1004			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	Grassed area. No signs of stressed vegetation.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS07-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.2	-	0.0	0.0	Water 2.92 Base 4.13	0.027	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.026	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.026	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.026	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.026	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1006			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on pile of demolition rubble.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS08-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.4	-	0.0	0.0	DRY Base 4.87	0.029	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	20.5	-	0.0	0.0		0.028	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	20.3	-	0.0	0.0		0.028	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	20.2	-	0.0	0.0		0.028	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	20.2	-	0.0	0.0		0.028	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	20.1	-	0.0	0.0		0.028	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	20.0	-	0.0	0.0		0.027	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	19.9	-	0.0	0.0		0.027	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1005			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS11-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.4	-	0.0	0.0	DRY Base 4.96	0.026	1.0		0.0	0.2
	15	0.0	0.0	0	0.0	**0.0**	0.0	21.5	-	0.0	0.0		0.025	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	21.5	-	0.0	0.0		0.026	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	21.5	-	0.0	0.0		0.025	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	21.5	-	0.0	0.0		0.025	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	21.5	-	0.0	0.0		0.024	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.1	21.4	-	0.0	0.0		0.024	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.2	21.3	-	0.0	0.0		0.024	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1008-1007			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS13-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0	DRY Base 2.68	0.027	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	21.3	-	0.0	0.0		0.027	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	21.2	-	0.0	0.0		0.027	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.027	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.026	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	21.0	-	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1005-1006			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS16-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0	DRY Base 4.90	0.029	1.0		0.0	0.1
	15	0.0	0.0	0	0.0	**0.0**	0.1	21.6	-	0.0	0.0		0.027	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.1	21.5	-	0.0	0.0		0.027	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.1	21.5	-	0.0	0.0		0.027	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.1	21.5	-	0.0	0.0		0.027	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.1	21.5	-	0.0	0.0		0.027	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.1	21.4	-	0.0	0.0		0.027	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.1	21.4	-	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.

* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1005-1006			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12727	**Cal.Date**	10/10/2017
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	02/07/2018			

GSV Worst-case (Entire Site) - Monitoring Round

Maximum Methane	0.0	%v/v
Maximum Carbon dioxide	10.8	%v/v
Maximum Flow Rate	0.0	l/hr
Gas Screening Value (GSV)	0.00	Very Low Risk - CS1

02/07/2018	Max Flow (l/hr)	Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS01-18	0.0	0.0	10.8
WS02-18	0.0	0.0	3.7
WS05-18	0.0	0.0	0.7
WS07-18	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0
WS11-18	0.0	0.0	0.2
WS13-18	0.0	0.0	0.0
WS16-18	0.0	0.0	0.1

Site	Project Wheat Quarter
Project	016-1502

Annex E: *EAME Ground Gas Monitoring - Northern Site - Round 3 (12th July 2018)*

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv) PID	Other Gases (ppmv) H_2S	Other Gases (ppmv) CO	Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS01-18	0	-0.9	0.0	-5	0.0	**0.0**	0.0	20.7	-	0.0	0.0	DRY Base 5.03	0.019	1.0		0.0	14.1
	15	-1.0	0.0	-5	0.0	**0.0**	12.9	5.5	-	0.0	0.0		0.019	1.0			
	30	-0.9	0.0	-4	0.0	**0.0**	13.6	3.0	-	0.0	0.0		0.019	1.0			
	45	-0.9	0.0	-5	0.0	**0.0**	13.7	2.7	-	0.0	0.0		0.019	1.0			
	60	-0.7	0.0	-3	0.0	**0.0**	13.8	2.6	-	0.0	0.0		0.019	1.0			
	90	-0.6	0.0	-2	0.0	**0.0**	13.9	2.5	-	0.0	0.0		0.019	1.0			
	120	-0.7	0.0	-3	0.0	**0.0**	14.0	2.4	-	0.0	0.0		0.018	1.0			
	180	-0.4	0.0	-3	0.0	**0.0**	14.1	2.2	-	0.0	0.0		0.019	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1011-1010			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	19°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on tarmac within J F Hunts compound.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv) PID	Other Gases (ppmv) H_2S	Other Gases (ppmv) CO	Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS02-18	0	-0.6	0.0	-3	0.0	**0.0**	0.0	20.6	-	0.0	0.0	DRY Base 3.48	0.019	1.0		0.0	3.9
	15	-0.7	0.0	-3	0.0	**0.0**	3.8	15.9	-	0.0	0.0		0.019	1.0			
	30	-0.5	0.0	-3	0.0	**0.0**	3.9	15.2	-	0.0	0.0		0.019	1.0			
	45	-0.8	0.0	-3	0.0	**0.0**	3.9	15.2	-	0.0	0.0		0.019	1.0			
	60	-0.8	0.0	-4	0.0	**0.0**	3.9	15.2	-	0.0	0.0		0.019	1.0			
	90	-0.7	0.0	-3	0.0	**0.0**	3.9	15.2	-	0.0	0.0		0.019	1.0			
	120	-0.7	0.0	-3	0.0	**0.0**	3.8	15.3	-	0.0	0.0		0.019	1.0			
	180	-0.5	0.0	-2	0.0	**0.0**	3.3	16.1	-	0.0	0.0		0.019	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1009-1010			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on tarmac within disused employee car park.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv) PID	Other Gases (ppmv) H_2S	Other Gases (ppmv) CO	Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS05-18	0	-0.9	0.0	-5	0.0	**0.0**	0.0	21.1	-	0.0	0.0	DRY Base 5.01	0.028	1.0		0.0	0.7
	15	-0.8	0.0	-4	0.0	**0.0**	0.6	20.9	-	0.0	0.0		0.028	1.0			
	30	-0.8	0.0	-4	0.0	**0.0**	0.7	20.9	-	0.0	0.0		0.028	1.0			
	45	-0.9	0.0	-5	0.0	**0.0**	0.7	20.9	-	0.0	0.0		0.028	1.0			
	60	-0.9	0.0	-5	0.0	**0.0**	0.7	20.9	-	0.0	0.0		0.028	1.0			
	90	-0.8	0.0	-4	0.0	**0.0**	0.7	20.8	-	0.0	0.0		0.027	1.0			
	120	-0.8	0.0	-4	0.0	**0.0**	0.7	20.8	-	0.0	0.0		0.027	1.0			
	180	-0.8	0.0	-4	0.0	**0.0**	0.7	20.8	-	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												**GSV**	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1008			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	Grassed area. No signs of stressed vegetation.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS07-18	0	-0.5	0.0	-2	0.0	**0.0**	0.0	20.5	-	0.0	0.0	Water 2.92 Base 4.13	0.021	1.0		0.0	0.0
	15	-0.4	0.0	-2	0.0	**0.0**	0.0	20.3	-	0.0	0.0		0.021	1.0			
	30	-0.6	0.0	-3	0.0	**0.0**	0.0	20.2	-	0.0	0.0		0.020	1.0			
	45	-0.4	0.0	-2	0.0	**0.0**	0.0	20.1	-	0.0	0.0		0.020	1.0			
	60	-0.6	0.0	-3	0.0	**0.0**	0.0	20.1	-	0.0	0.0		0.020	1.0			
	90	-0.4	0.0	-2	0.0	**0.0**	0.0	20.0	-	0.0	0.0		0.020	1.0			
	120	-0.5	0.0	-3	0.0	**0.0**	0.0	20.0	-	0.0	0.0		0.020	1.0			
	180	-0.4	0.0	-2	0.0	**0.0**	0.0	20.1	-	0.0	0.0		0.020	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1009			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	19°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on pile of demolition rubble.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS08-18	0	-0.5	0.0	-2	0.0	**0.0**	0.0	20.6	-	0.0	0.0	DRY Base 4.87	0.021	1.0		0.0	0.0
	15	-0.3	0.0	-2	0.0	**0.0**	0.0	19.7	-	0.0	0.0		0.021	1.0			
	30	-0.5	0.0	-2	0.0	**0.0**	0.0	19.4	-	0.0	0.0		0.021	1.0			
	45	-0.3	0.0	-1	0.0	**0.0**	0.0	19.4	-	0.0	0.0		0.020	1.0			
	60	-0.5	0.0	-2	0.0	**0.0**	0.0	19.3	-	0.0	0.0		0.020	1.0			
	90	-0.4	0.0	-2	0.0	**0.0**	0.0	19.2	-	0.0	0.0		0.020	1.0			
	120	-0.4	0.0	-2	0.0	**0.0**	0.0	19.2	-	0.0	0.0		0.020	1.0			
	180	-0.5	0.0	-2	0.0	**0.0**	0.0	19.1	-	0.0	0.0		0.020	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1009			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	20°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS11-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.6	-	0.0	0.0	DRY Base 4.96	0.020	1.0		0.0	0.1
	15	0.0	0.0	0	0.0	**0.0**	0.0	20.1	-	0.0	0.0		0.019	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.019	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.019	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.019	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.1	20.8	-	0.0	0.0		0.020	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.1	20.9	-	0.0	0.0		0.019	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.019	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1010-1011			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	20°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS13-18	0	-1.0	0.0	-5	0.0	**0.0**	0.0	21.0	-	0.0	0.0	DRY Base 2.68	0.024	1.0		0.0	0.0
	15	-1.2	0.0	-6	0.0	**0.0**	0.0	20.5	-	0.0	0.0		0.024	1.0			
	30	-1.0	0.0	-5	0.0	**0.0**	0.0	20.4	-	0.0	0.0		0.024	1.0			
	45	-1.2	0.0	-5	0.0	**0.0**	0.0	20.2	-	0.0	0.0		0.025	1.0			
	60	-1.0	0.0	-5	0.0	**0.0**	0.0	20.1	-	0.0	0.0		0.024	1.0			
	90	-0.9	0.0	-5	0.0	**0.0**	0.0	19.7	-	0.0	0.0		0.025	1.0			
	120	-0.9	0.0	-5	0.0	**0.0**	0.0	19.6	-	0.0	0.0		0.025	1.0			
	180	-0.9	0.0	-5	0.0	**0.0**	0.0	19.4	-	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1011			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS16-18	0	-0.8	0.0	-4	0.0	**0.0**	0.0	20.8	-	0.0	0.0	DRY Base 4.90	0.027	1.0		0.0	0.2
	15	-0.7	0.0	-3	0.0	**0.0**	0.2	21.0	-	0.0	0.0		0.027	1.0			
	30	-0.8	0.0	-3	0.0	**0.0**	0.2	21.1	-	0.0	0.0		0.027	1.0			
	45	-0.7	0.0	-3	0.0	**0.0**	0.2	21.1	-	0.0	0.0		0.026	1.0			
	60	-0.8	0.0	-3	0.0	**0.0**	0.2	21.1	-	0.0	0.0		0.026	1.0			
	90	-0.6	0.0	-3	0.0	**0.0**	0.2	21.0	-	0.0	0.0		0.026	1.0			
	120	-0.8	0.0	-3	0.0	**0.0**	0.2	21.0	-	0.0	0.0		0.026	1.0			
	180	-0.9	0.0	-5	0.0	**0.0**	0.2	20.9	-	0.0	0.0		0.026	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1009			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	25°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	12/07/2018			

GSV Worst-case (Entire Site) - Monitoring Round

Maximum Methane	0.0	%v/v
Maximum Carbon dioxide	14.1	%v/v
Maximum Flow Rate	0.0	l/hr
Gas Screening Value (GSV)	0.00	Very Low Risk - CS1

12/07/2018	Max Flow (l/hr)	Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS01-18	0.0	0.0	14.1
WS02-18	0.0	0.0	3.9
WS05-18	0.0	0.0	0.7
WS07-18	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0
WS11-18	0.0	0.0	0.1
WS13-18	0.0	0.0	0.0
WS16-18	0.0	0.0	0.2

Site	Project Wheat Quarter
Project	016-1502

Annex E: *EAME Ground Gas Monitoring - Northern Site - Round 4 (17th July 2018)*

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H_2S	CO						
WS01-18	0	-0.5	0.0	-2	0.0	**0.0**	0.0	20.7	-	0.0	0.0	DRY Base 5.03	0.024	1.0		0.0	14.3
	15	-0.6	0.0	-3	0.0	**0.0**	11.4	8.1	-	0.0	0.0		0.024	1.0			
	30	-0.4	0.0	-2	0.0	**0.0**	13.6	4.1	-	0.0	0.0		0.024	1.0			
	45	-0.3	0.0	-1	0.0	**0.0**	14.0	3.5	-	0.0	0.0		0.024	1.0			
	60	-0.4	0.0	-2	0.0	**0.0**	14.2	3.3	-	0.0	0.0		0.023	1.0			
	90	-0.3	0.0	-1	0.0	**0.0**	14.2	3.1	-	0.0	0.0		0.023	1.0			
	120	-0.1	0.0	-1	0.0	**0.0**	14.3	3.1	-	0.0	0.0		0.022	1.0			
	180	0.0	0.0	0	0.0	**0.0**	14.2	3.3	-	0.0	0.0		0.021	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1003			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	19°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on tarmac within J F Hunts compound.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H_2S	CO						
WS02-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.6	-	0.0	0.0	DRY Base 3.48	0.021	1.0		0.0	3.7
	15	0.0	0.0	0	0.0	**0.0**	3.5	17.2	-	0.0	0.0		0.022	1.0			
	30	0.0	0.0	0	0.0	**0.0**	3.7	16.6	-	0.0	0.0		0.022	1.0			
	45	0.0	0.0	0	0.0	**0.0**	3.5	16.8	-	0.0	0.0		0.022	1.0			
	60	0.0	0.0	0	0.0	**0.0**	3.5	16.8	-	0.0	0.0		0.022	1.0			
	90	0.0	0.0	0	0.0	**0.0**	3.4	16.8	-	0.0	0.0		0.022	1.0			
	120	0.0	0.0	0	0.0	**0.0**	3.4	16.8	-	0.0	0.0		0.022	1.0			
	180	0.0	0.0	0	0.0	**0.0**	3.3	16.9	-	0.0	0.0		0.023	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1005			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	20°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on tarmac within disused employee car park.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H_2S	CO						
WS05-18	0	-0.1	0.0	-1	0.0	**0.0**	0.0	21.1	-	0.0	0.0	DRY Base 5.01	0.023	1.0		0.0	0.6
	15	-0.3	0.0	-1	0.0	**0.0**	0.5	21.1	-	0.0	0.0		0.023	1.0			
	30	-0.1	0.0	-1	0.0	**0.0**	0.5	21.0	-	0.0	0.0		0.023	1.0			
	45	-0.3	0.0	-1	0.0	**0.0**	0.6	20.9	-	0.0	0.0		0.023	1.0			
	60	-0.3	0.0	-1	0.0	**0.0**	0.6	20.9	-	0.0	0.0		0.023	1.0			
	90	0	0.0	0	0.0	**0.0**	0.6	20.8	-	0.0	0.0		0.022	1.0			
	120	-0.1	0.0	-1	0.0	**0.0**	0.6	20.8	-	0.0	0.0		0.023	1.0			
	180	-0.3	0.0	-1	0.0	**0.0**	0.6	20.7	-	0.0	0.0		0.022	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1003			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	Grassed area. No signs of stressed vegetation.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS07-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0	Water 2.92 Base 4.13	0.024	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.024	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.024	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.024	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.024	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	21.1	-	0.0	0.0		0.024	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0		0.023	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0		0.023	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1005-1004			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	20°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located on pile of demolition rubble.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS08-18	0	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0	DRY Base 4.87	0.021	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	19.8	-	0.0	0.0		0.022	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	19.6	-	0.0	0.0		0.021	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	19.6	-	0.0	0.0		0.022	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	19.5	-	0.0	0.0		0.021	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	19.4	-	0.0	0.0		0.021	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	19.3	-	0.0	0.0		0.021	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	19.2	-	0.0	0.0		0.021	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1005			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	21°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS11-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.0	-	0.0	0.0	DRY Base 4.96	0.023	1.0		0.0	0.1
	15	0.0	0.0	0	0.0	**0.0**	0.1	21.1	-	0.0	0.0		0.022	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.1	21.2	-	0.0	0.0		0.022	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.1	21.2	-	0.0	0.0		0.022	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.1	21.1	-	0.0	0.0		0.022	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.1	21.1	-	0.0	0.0		0.021	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.1	21.1	-	0.0	0.0		0.021	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.1	21.1	-	0.0	0.0		0.021	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1003			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	21°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS13-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.0	-	0.0	0.0	DRY Base 2.68	0.022	1.0		0.0	0.0
	15	0.0	0.0	0	0.0	**0.0**	0.0	21.0	-	0.0	0.0		0.022	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0		0.022	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.021	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.0	20.9	-	0.0	0.0		0.021	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.021	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.0	20.8	-	0.0	0.0		0.021	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.0	20.7	-	0.0	0.0		0.021	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1004-1005			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

WS	Time Seconds (Minutes)	Actual Gas Flow (l/hr)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL*)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppmv)			Depth to Water (m bgl)	Hexane %	PID Correction Factor		Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
									PID	H2S	CO						
WS16-18	0	0.0	0.0	0	0.0	**0.0**	0.0	21.0	-	0.0	0.0	DRY Base 4.90	0.023	1.0		0.0	0.3
	15	0.0	0.0	0	0.0	**0.0**	0.2	21.2	-	0.0	0.0		0.023	1.0			
	30	0.0	0.0	0	0.0	**0.0**	0.3	21.2	-	0.0	0.0		0.023	1.0			
	45	0.0	0.0	0	0.0	**0.0**	0.3	21.2	-	0.0	0.0		0.023	1.0			
	60	0.0	0.0	0	0.0	**0.0**	0.3	21.2	-	0.0	0.0		0.023	1.0			
	90	0.0	0.0	0	0.0	**0.0**	0.3	21.1	-	0.0	0.0		0.023	1.0			
	120	0.0	0.0	0	0.0	**0.0**	0.3	21.0	-	0.0	0.0		0.023	1.0			
	180	0.0	0.0	0	0.0	**0.0**	0.3	21.0	-	0.0	0.0		0.024	1.0			
Max Gas Flow (l/hr)			0.0												GSV	0.0	0.0
													CIRIA Characteristic Situation			Very Low Risk - CS1	Very Low Risk - CS1

Notes:

Monitoring order is from left to right across table. All monitoring was undertaken for at least 3 minutes. However, where high concentrations of gases were initially recorded, monitoring was extended up to 10 minutes.
* LEL = Lower Explosive Limit = 5%v/v. Monitoring only undertaken when ambient temeperature is between -10°C to +40°C.

Monitored by (name)	Michael Sylvester (EAME)			
Atmospheric pressure (mB)	1003			
Weather	Sunny, dry, slight wind, very warm, no clouds.			
Temperature (°C)	22°C			
Monitoring equipment used:	GFM436	12928	**Cal.Date**	16/04/2018
	-	-	**Cal.Date**	-
Visible signs of vegetation stress	No vegetation. Located within demolition area.			
Other comments/observations	None.			
Sampled for laboratory analysis	None.			
Date	17/07/2018			

GSV Worst-case (Entire Site) - Monitoring Round

Maximum Methane	0.0	%v/v
Maximum Carbon dioxide	14.3	%v/v
Maximum Flow Rate	0.0	l/hr
Gas Screening Value (GSV)	0.00	Very Low Risk - CS1

17/07/2018	Max Flow (l/hr)	Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)
WS01-18	0.0	0.0	14.3
WS02-18	0.0	0.0	3.7
WS05-18	0.0	0.0	0.6
WS07-18	0.0	0.0	0.0
WS08-18	0.0	0.0	0.0
WS11-18	0.0	0.0	0.1
WS13-18	0.0	0.0	0.0
WS16-18	0.0	0.0	0.3