

# Alberton House, Manchester

## Pre Demolition Phase 2 Ground Investigation

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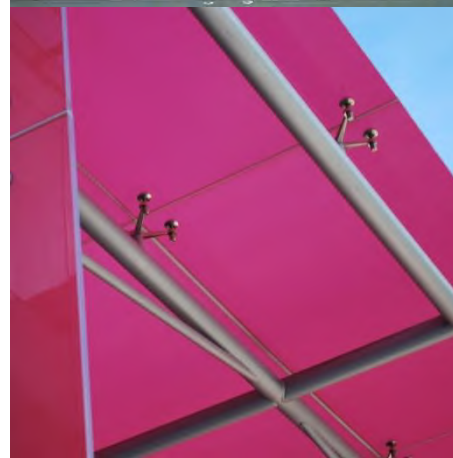
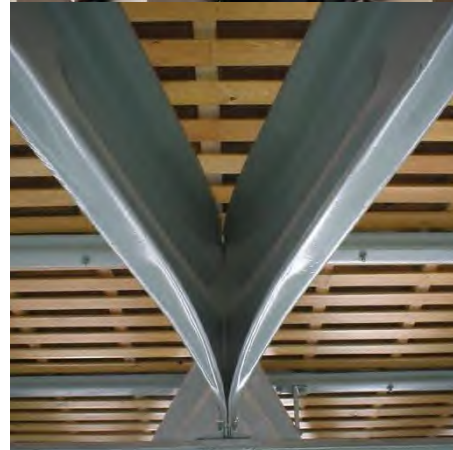
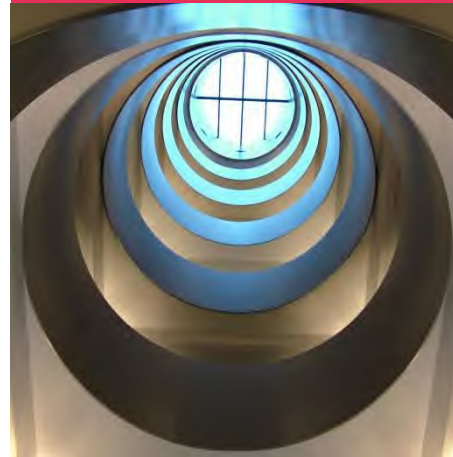
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Site Address: Alberton House, 30 St Mary's Parsonage, Manchester, M3 2WJ



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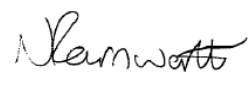
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## Executive Summary

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appointment</b>                      | In October 2021 Curtins were instructed by Bruntwood RB Limited to undertake a Phase 2 Ground Investigation of land at Alberton House, 30 St Mary's Parsonage, Manchester, M3 2WJ. The site covers approximately 0.19 Ha. Development proposals for the site currently include the demolition of the existing structure followed by site redevelopment for a circa 19 storey mixed-use development of offices, event space, cafe and rooftop bar, restaurant, and spa.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Current Site Status</b>              | The site is currently occupied by a 12-storey building with 4 storey annexe situated off St Mary's Parsonage, with hardstanding surrounding as well as areas of raised landscaping present on site. At the eastern side there is car parking and access to the north of site of the site. There is also car parking and access at the west of the site leading to a basement car park which extends under the footprint of the 12-storey section. The site's topography is relatively flat except at the vehicular access route at the west which slopes moderately towards the basement access.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Summary of Phase 1</b>               | <p>Earliest mapping (1840's) shows the site as developed with a copper and brass works in the north of the site with Albert Street splitting the site and a gas works encroaching on to the south of the site. By 1891; the metal works was no longer shown and the north of the site appears to be used for warehouse buildings later identified for yarn and cork. The gas works was also demolished at this time and a police station constructed on the southern part of the site. The police station was demolished on the southern boundary by 1938 and by 1948 the warehouses are marked as Ruins after WWII. The site fully re-developed with Alberton House buildings by 1973 with associated carparking areas.</p> <p>BGS records indicate the site is underlain by Chester Formation bedrock. No superficial soils are identified.</p> <p>Defra data indicates that the site, corresponding with the underlying bedrock geology a Principal Aquifer underlies the site.</p> <p>The nearest surface water feature is the River Irwell recorded 1m north of the site.</p> <p>A Detailed UXO Risk Assessment was subsequently obtained from 1<sup>st</sup> Line Defence, which identified a Medium risk. Recommendations were made for providing a UXO Risk Management Plan and Site Specific UXO Awareness Briefings to all personnel conducting intrusive works. All intrusive ground investigation on site will require supervision by a UXO specialist with Intrusive Magnetometer Survey down to maximum bomb penetration depth.</p>                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Fieldworks Undertaken</b>            | <p>The pre demolition ground investigation comprised 4no. Window Sample boreholes to a maximum depth of 5.00m bgl, 1no. Rotary Cored boreholes to 30.50m bgl, 7no. Hand Dug Foundation Inspection Pits. Boreholes were undertaken in accessible positions reflecting the proposed location of the new structures and hardstanding to aid piled foundation design, and to undertake soil sampling, ground gas monitoring and groundwater level monitoring.</p> <p>Ground gas monitoring standpipes were installed within the 3no. Window Sample boreholes and the Rotary Cored borehole. Selected soil samples were subjected to laboratory analysis. Groundwater samples were taken. Six ground gas monitoring visits have been undertaken.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Encountered Ground Conditions</b>    | <p>Made Ground was encountered in all exploratory holes, from ground level to depths between 0.10m and 3.45m bgl. Made Ground generally comprised surface covering of brick paving, concrete, or tarmacadam. Made Ground underlying was predominantly granular with various obstructions noted. A hydrocarbon odour was recorded between 0.95m and 1.80m bgl (32.66m to 31.81m AOD). In WS02 cohesive Made Ground was also encountered.</p> <p>Deposits of indicative of Glaciofluvial Deposits were encountered below the Made Ground in two exploratory holes (RH01 and WS02). Indicative cohesive Glaciofluvial deposits were encountered in exploratory holes RH01 and WS02 to depths between 2.00m and 4.45m bgl (31.61m to 28.27m AOD). RH01 encountered soft brown slightly sandy slightly gravelly silty clay, gravel of sandstone. WS02 recorded very stiff slightly gravelly sandy silty clay. Indicative granular Glaciofluvial deposits was encountered in the exploratory hole RH01 between 2.00m and 9.50m bgl (31.61m and 24.11m AOD). It comprised a dense to very dense brown and grey angular to rounded fine to coarse Gravel of sandstone and siltstone with clay inclusions and low coble content. WS02 recorded very clayey fine to medium sand underlying cohesive superficial deposits from 4.45m to 5.00m (28.27m to 27.72m AOD).</p> <p>The Chester Formation bedrock was encountered in one exploratory hole (RH01) from 9.50m to 30.50m (24.11m to 3.11m AOD). The bedrock comprised interbedded layers of very weak to weak reddish-brown fine to medium grained Sandstone, weak reddish-brown medium to coarse grained Sandstone with occasional gravel inclusions and medium strong reddish-brown medium to coarse grained Sandstone with occasional gravel inclusions.</p> <p>A groundwater table appears to be present at the top of the bedrock between 19.65m and 19.62m AOD.</p> |
| <b>Environmental Laboratory Testing</b> | <p>The environmental chemistry soil results have been compared with the Generic Assessment Criteria (GAC) for soils with respect to human health against the 'Commercial' threshold. No exceedances have been noted. No suspected asbestos containing materials (ACMs) were identified within any of the exploratory hole logs or during laboratory screening.</p> <p>A <b>Moderate/Low</b> risk rating is identified to site end-users and construction workers, from soils and dust from inhalation and ingestion. No significant sources of contamination have been found to date however contamination may exist in areas which were not accessible during this ground investigation considering the sites historical industrial land uses. Additional post-demolition chemical analysis to be undertaken.</p> <p>The environmental chemistry groundwater results have been compared with Generic Assessment Criteria (GAC) with respect to human health against the 'Commercial' SoBRA thresholds for volatile organic compounds. No exceedances were recorded.</p> <p>A <b>Low</b> risk is rating is identified to site end-users, adjacent site users from vapour inhalation from groundwater.</p> <p>The environmental chemistry groundwater results have been compared with Generic Assessment Criteria (GAC) with respect to Controlled Waters against the UK DWS and WFD EQS thresholds.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    | <p>No exceedances of WFD EQS thresholds were identified. However an exceedance of UK DWS thresholds was recorded for TCE in single groundwater sample obtained from bedrock aquifer.</p> <p>A <b>Low</b> and <b>Moderate/Low</b> risk rating is identified to controlled waters (Groundwater and Surface Waters respectively) following the ground investigation. The site soils are considered unlikely to be the source given no evidence of gross contamination was identified and TCE was recorded below the laboratories limit of detection in soils. An off site source is therefore likely to be responsible. Additional post- demolition should be undertaken given historical land uses including further groundwater sampling.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Ground Gas Assessment</b>                       | <p>During the ground gas monitoring programme, no elevated carbon dioxide (CO<sub>2</sub>) concentrations were recorded (&gt;5% v/v) in any of the monitoring wells.</p> <p>Maximum methane (CH<sub>4</sub>) was recorded in WS04 on the sixth monitoring visit. However, this stabilised to below detection limit (&lt;0.1% v/v) after a period of 3 seconds. All other recordings of methane have been below the detection limit (&gt;5% v/v).</p> <p>Using the 'borehole Q<sub>hg</sub> representative' scenario, due to results across various atmospheric pressures and weather conditions, the maximum calculated Q<sub>hg</sub> for the site was 0.0033 l/hr l/hr for carbon dioxide and 0.014 l/hr for methane which are taken as the sites Gas Screening Values.</p> <p>The site has been consequently classified as a CS1 classification not requiring protection measures. The risk to site end users from ground gases is therefore considered to be <b>Low</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Geotechnical Assessment and Recommendations</b> | <p>It is understood that the proposed development is to consist of a circa 19 story mixed-use development of offices, event space, café, and rooftop bar, restaurant, and spa.</p> <p>It is advised that a piled foundation solution is adopted, taking loads to the very weak to weak sandstone bedrock. It is important that the piling contractor has experience piling in similar conditions and it is advised that early engagement with the suitably qualified and experienced piling contractor is considered.</p> <p>Based on observations onsite together with the results of laboratory tests, it is recommended that consideration is given to a suspended ground floor slab, bearing on pile caps with a network of beams to minimise differential settlement.</p> <p>The site has been classified in accordance with BRE Special Digest 1 and it is considered that a Design Sulphate Class may be taken as DS-2 with an ACEC class of AC-2 for Made Ground and a Design Sulphate Class of DS-1 with an ACEC class of AC-1 for the superficial deposits and bedrock.</p> <p>Groundwater may be encountered during shallow excavations and any excavations for foundations and services are likely to require close side support in the short term. The inflow of water into excavations will likely be able to be managed by a standard water pump.</p> |
| <b>Recommendations</b>                             | <p>Based on the findings of the ground investigation, the following recommendations are made:</p> <ol style="list-style-type: none"> <li>1) Post-demolition ground investigation will be required to further characterise ground conditions in previously inaccessible areas; this should include obtaining additional soil and groundwater samples for chemical testing given the potential risks identified. Further rotary cored boreholes should be undertaken beneath the existing building footprint to obtain further rock cores for geotechnical analysis to inform pile design.</li> <li>2) Further trial pitting is recommended to confirm extent and geometry of existing foundations which may be undertaken prior to or post demolition.</li> <li>3) It is recommended that construction workers are provided with appropriate PPE and sanitary facilities, with reference to the environmental testing results presented herein and within Appendix C.</li> <li>4) Should unexpected contamination be observed during demolition or construction advice should be obtained from a Geo-environmental Engineer.</li> <li>5) Undertake deep foundation/piling risk assessment.</li> </ol>                                                                                                                                                                 |

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## 1.0 Introduction

### 1.1 Project Background

In October 2021 Curtins were instructed by Bruntwood RB Limited to undertake a Phase 2 Ground Investigation of land at Alberton House, 30 St Mary's Parsonage, Manchester, M3 2WJ. The site is centred at the approximate national grid reference SD 88072 17936 and is 0.38 Ha in size. A site location plan is presented on *Figure 2.1*.

Development proposals for the site currently include the demolition of an existing 4 and 12 storey structure followed by site redevelopment for a circa 19 storey mixed-use development of offices, event space, cafe and rooftop bar, restaurant, and spa.

Relevant development proposals are included within *Appendix A* for review.

### 1.2 Scope of Services

A scope for the intrusive ground investigation was developed with the following aims:

- i) Obtain environmental and geotechnical information specifically at the location of the proposed development and characterise shallow site soils and deeper ground conditions for foundation design for the proposed structures.

Specifically, the Phase 2 Ground Investigation Report is intended to:

- a) Determine the risk of the proposed end-user being adversely impacted by potential contamination in shallow site soils that may be present on the site due to its known current, recent and historical use;
- b) Determine if there is a risk to the end-user from soil gases including methane, carbon dioxide, carbon monoxide and hydrogen sulphide;
- c) Characterise site wide natural soils;
- d) Recommendations for the design of foundations and building ground floor slabs; and
- e) Recommendations for the specification of sub-structure concrete.

Detailed flood risk assessment, ecology, archaeological studies and waste classification for off-site disposal are outside of the scope of this report.

## 2.0 Phase 1 Preliminary Site Assessment Summary

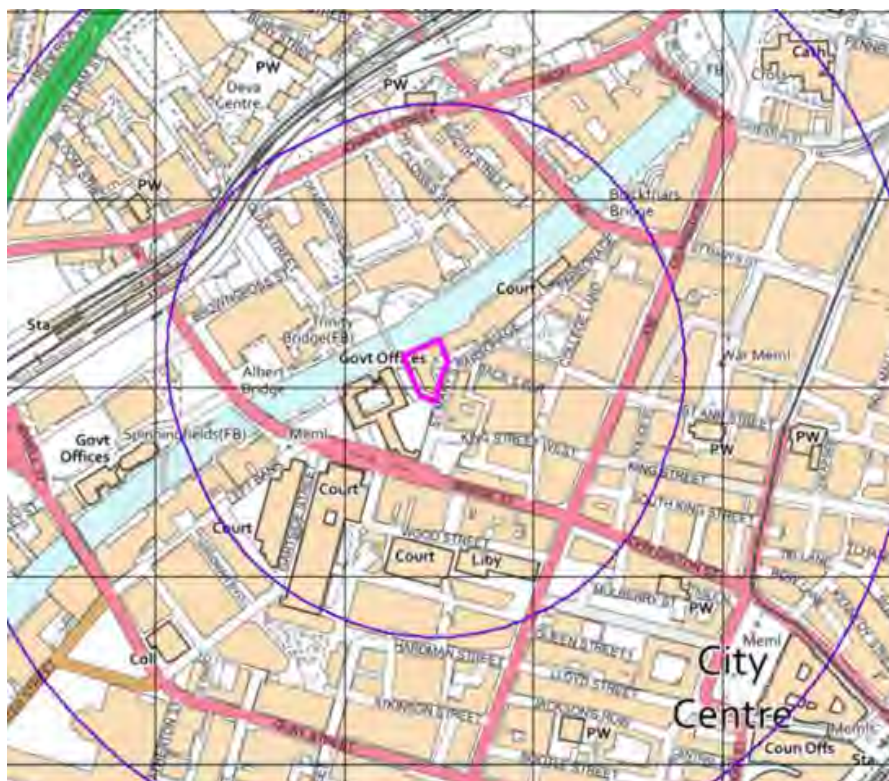
A Phase 1 Desk Study was undertaken for the site by Curtins in September 2021 (Ref.1). A summary of the detailed findings of this Desk Study, comprising current site setting, history, geology and hydrogeology/hydrology is presented within this Section with reference to additional information sources. The area referred to as 'the site' is shown in *Figure 2.1*.

### 2.1 Current Setting

The site is currently occupied by an office building known as Alberton House, part 4 storey at the southwest and the remaining part 12 storey with a basement, with areas of landscaping south of the buildings towards St Mary's Parsonage. The site is covered by hardstanding with surface level car parking accessed by two security barriers off St Mary's Parsonage. At the eastern side there is car parking and access through the 12 storey part of the building to the north of site of the site between the building footprint and the wall/embankment to the River Irwell. There is also car parking and access at the west of the site leading to a basement car park which extends under the footprint of the 12-storey section.

The site's topography is relatively flat except at the vehicular access route on the west which slopes moderately towards the basement access.

The site location and boundary are illustrated in *Figure 2.1*.



*Figure 2.1 – Site Location Plan (pink line is the site boundary).  
(Ref. 1)*

## 2.2 Previous Site Use

Earliest mapping (1840's) shows the site as developed with a copper and brass works in the north of the site with Albert Street splitting the site from a gas works encroaching the south of the site. By 1891; the metal works was no longer shown and the north of the site appears to be used for warehouse buildings later identified for yarn and cork. The gas works was also demolished at this time and a police station constructed on the southern part of the site.

The police station was demolished on the southern boundary by 1938 and by 1948 the warehouses are marked as Ruins after WWII. Albert Street was de-constructed by 1962, and the site fully re-developed with Alberton House buildings by 1973 with associated carparking areas. The site remains in a similar lay out to the present day.

The surrounding area is re-developed with Albert Bridge House immediately west of the site by 1962. By 1980's, almost all industrial land use surrounding the site is re-developed for commercial businesses, office space and multistorey carparking. By 1996, Trinity Bridge was constructed within 10m northwest of the site.

## 2.3 Published Geology

A study of the Phase 1 Preliminary Risk Assessment (Ref. 1) Report and the British Geological Survey (BGS) 1:50,000 mapping records (Solid and Drift) for Manchester (Sheet 085) dated 2010 (Ref. 3) indicates the following geological and hydrogeological succession underlying the site:

- **Superficial Deposits:** None
- **Solid Geology:** Chester Formation

### 2.3.1 Made Ground and Reworked Ground Deposits

BGS map records do not indicate the presence of Made Ground on site, however given the various phases of development including industrial previous land uses on site a thickness of Made Ground is anticipated.

### 2.3.2 Superficial Deposits

No superficial deposits are recorded by the BGS.

### 2.3.3 Bedrock Deposits

The proposed development site underlain by the Chester Formation (sandstone), recorded as fine to coarse grained sandstone with pebble beds recorded in subordinate strata.

### 2.3.4 BGS Recorded Borehole Logs

There are two available BGS borehole scans within 500m of the site, the nearest is located approximately 172m north of the site and is summarised in *Table 2.3.4*.

**Table 2.3.4** – Summary of BGS Recorded Borehole Logs

| Record Reference | Location (NGR)                                | Details<br>(bottom to top of strata/details/thickness of strata) |                                                                                    |
|------------------|-----------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------|
| SJ89NW3730       | Off site<br>172m north<br>(383330,<br>398310) | 0.00m to 2.00m bgl                                               | Inspection Pit: Drillers description (2.00m)                                       |
|                  |                                               | 2.00m to 2.70m bgl                                               | Clayey silty SAND (0.70m)                                                          |
|                  |                                               | 2.70m to 3.00m bgl                                               | Dense red SAND (0.20m)                                                             |
|                  |                                               | 3.00m to 4.80m bgl                                               | Very weathered red SANDSTONE (1.80m)                                               |
|                  |                                               | 4.80m to 8.00m bgl                                               | Moderate to strong SANDSTONE with thin weak bands (3.20m)                          |
|                  |                                               | 8.00m to 8.50m bgl                                               | Strong SANDSTONE (0.50m)                                                           |
|                  |                                               | 8.50m to 12.00m bgl                                              | Medium to strong SANDSTONE with slight weathering (3.50m)                          |
|                  |                                               | 12.00m to 19.00m bgl                                             | Firm to strong SANDSTONE (7.00m)                                                   |
|                  |                                               | 19.00m to 20.00m bgl                                             | Hard SANDSTONE with thin soft bands (1.00m)                                        |
|                  |                                               | 20.00m to 22.00m bgl                                             | Moderately strong SANDSTONE (2.00m)                                                |
|                  |                                               | 22.00m to 45.15m bgl                                             | Strong SANDSTONE onto very strong SANDSTONE (23.15m)                               |
|                  |                                               | 45.15m to 47.00m bgl                                             | Red coarse grained SANDSTONE (1.85m)                                               |
|                  |                                               | 47.00m to 48.00m bgl                                             | Fine grained reddish grey SANDSTONE with strong bands (1.00m)                      |
|                  |                                               | 48.00m to 62.15m bgl                                             | Reddish grey MARL with occasional hard bands (14.15m)                              |
|                  |                                               | 62.15m to 79.50m bgl                                             | Strong reddish grey MARL with sand bands (17.35m)                                  |
|                  |                                               | 79.50m to 105.0m bgl                                             | Strong SANDSTONE with small weathered bands (25.50m)                               |
|                  |                                               | 105.0m to 110.15m bgl                                            | SANDSTONE with strong bands (5.15m)                                                |
|                  |                                               | 110.15m to 111.25m bgl                                           | Weak to very weak reddish brown calcareous MUDSTONE (Distinctly weathered) (5.15m) |
|                  |                                               | <b>111.25m bgl</b>                                               | <b>Borehole complete</b>                                                           |

### 2.3.5 Mining

A review of the Coal Authority interactive mapping (Ref. 4) for the area indicates that the site is located within a Coal Mining Reporting Area, however it is not located within a Development High-Risk Area.

There are no recorded mine entries within 1km of the site.

There are no recorded coal workings and no probable coal workings within 1km of the site.

Consequently, the risk to development from historic coal mining is considered to be **Low**. No further actions are required to further assess the risk to development from historic coal mining.

There are no active or inactive BGS recorded mineral sites within 500m of the site.

### 2.3.6 Radon

The site is located within a Lower Probability Radon Area (<1% of homes are estimated to be at or above the Action Level). No radon protective measures are necessary.

If a basement is proposed, a radon specialist should be contacted for advice.

## 2.4 Hydrogeology and Hydrology

The Phase 1 Preliminary Risk Assessment (Ref. 1) data indicates that the geological sequence underlying the site has the following hydrogeological characteristics:

**Table 2.4 – Hydrogeology and Hydrology Summary**

| Geology                        | Associated Hydrogeological Classification |
|--------------------------------|-------------------------------------------|
| Chester Formation <sup>1</sup> | Principal Aquifer <sup>2</sup>            |

Notes:

1. Weathered, coarse grained typically well-cemented proximal facies to a fine-grained, less well-cemented distal facies. The gravel is composed of well-rounded pebbles, cobbles and boulders in a coarse to fine granulestone and silty sandstone matrix.
2. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

The site is not located within a Source Protection Zone (SPZ).

There are six groundwater abstraction points located within 500m of the site. The nearest being 169m southwest of the site is for industrial usage. There are three groundwater abstraction for potable water supplies located within 1km of the site. The nearest being 805m northeast of the site and is used by Interbrew UK Ltd.

The nearest surface water feature identified is 1m to the north which is the River Irwell, river quality E with a southwest flow direction.

There are three active discharge consents within 250m of the site and three within 250 to 500m from the site, all relate to United Utilities Water Ltd storm water overflow outages into the River Irwell.

## 2.5 Unexploded Ordnance (UXO) Risk Assessment

The likelihood of UXO being encountered on a development site is influenced by several factors including; the proximity to strategic targets, the nature of the development works being undertaken and evidence of local damage in the post-war periods amongst others. To determine the likelihood of UXO being present on a site, a step-wise risk assessment process is followed. This process is outlined within CIRIA C681 Unexploded Ordnance: A Guide for the Construction Industry (Ref. 5).

UXO's has placed the site in a **High** risk area. High-risk regions are those with a bombing density of greater than 50 bombs per 1000 acres.

A review of the available historic mapping has identified the presence several ruins and features indicative of bomb damage following WWII directly on site and within 150m of the site boundary. It shows bombing damage 150m west and south and 50m east. 7 bombs were recorded within 150m of the site.

A Detailed UXO Risk Assessment has been obtained from 1st Line Defence. The findings of the risk assessment concluded a medium risk from encountering German UXO on site, recommending; A UXO Risk Management Plan and Site Specific UXO Awareness Briefings must be provided to all personnel conducting intrusive works. All intrusive ground investigation on site will require supervision by a UXO specialist. All boreholes and pile locations will require Intrusive Magnetometer Survey down to maximum bomb penetration depth.

If unexploded ordnance is discovered during any works, stop immediately, prevent access to the area, and inform the police. If the site boundary or location changes then the UXO risk should be reassessed.

Contractors undertaking excavations works should carry out their own UXO Risk Assessment in respect to their works.

## 2.6 Landfill

There are no BGS recorded landfill sites within 250m of the site. There are no historical landfill sites recorded within 500m of the site.

## 2.7 Summary of Phase 1 PCSM

A summary of potential pollutant linkages at the development site as identified in the Curtins Phase 1 Report (Ref. 1) are presented in *Table 2.8*. These potential pollutant linkages were identified as requiring further investigation to enable the safe redevelopment of the site.

Potential contaminants of concern associated with any Made Ground present include, amongst others; broad range aliphatic and aromatic hydrocarbons present within any fuel oils; polycyclic aromatic hydrocarbons (PAHs); inorganic compounds including heavy metals; toxic metals, phytotoxic metals, sulphate, sulphur, sulphide, cyanide compounds (total, free, complex thiocyanate), ammonium compounds, phenols, VOCs, SVOCs and asbestos present in discarded building materials.

The risks presented to controlled waters (groundwater and surface water) were identified as **Moderate** respectively due to an underlying sensitive aquifer and proximity to the nearest surface water feature. Obtaining groundwater samples is therefore recommended as part of the Generic Quantitative Risk Assessment.

**Table 2.8 – Preliminary Conceptual Site Model**

| Source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Pathway                                                                                                 | Receptor                                                                                       | Risk Rating     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------|
| <b>On-site sources of potential contamination:</b><br><br>Made Ground of unknown composition from uncontrolled deposition of materials associated with previous phases of development including construction and demolition of metal works and gas works, all warehouse buildings and Alberton House buildings on site.<br><br>Potential for gross contamination arising from historic industrial land use of the site associated with the metal works (copper/brass) and gas works.<br><br><b>Off-site sources of potential contamination:</b><br><br>Uncontrolled deposition of Made Ground during the construction and demolition of roads, garage and structures adjacent to the site's boundaries. | Direct contact, ingestion, inhalation (dust and vapours)                                                | <b>Site End Users</b><br>(Commercial)                                                          | <b>Moderate</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                         | <b>Construction and Maintenance Workers</b>                                                    |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Vertical migration through the superficial deposits (soils)                                             | <b>Controlled Waters</b><br>(Groundwater – Principal Aquifer)                                  | <b>Moderate</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Horizontal migration over and through the superficial deposits (soils)                                  | <b>Controlled Waters</b><br>(Surface Waters – the River Irwell less than 5m north of the site) | <b>Moderate</b> |
| <b>On and off-site soils with the potential to generate ground gases:</b><br><br>Potential ground gas generation from Made Ground containing VOCs / putrescible content on and off site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Vertical and horizontal migration through underlying superficial deposits into buildings and air spaces | <b>Site End Users</b><br>(Commercial)                                                          | <b>Moderate</b> |

### 3.0 Ground Investigation Scope of Works

Pre-Demolition site investigation works were undertaken by Curtins between 14<sup>th</sup> January and 28<sup>th</sup> January 2022.

The scope of the ground investigation was designed in general accordance with current UK guidance including:

- LCRM (Ref. 7);
- British Standard (BS) 10175:2011+A2:2017 (Ref. 8);
- BS5930:2015+2020 (Ref. 9); and
- BS EN1997: Part 2:2007 Eurocode 7 (Ref. 10).

The scope and rationale are summarised in *Table 3.0*.

**Table 3.0 – Scope and Rationale of Fieldwork Undertaken**

| Exploratory Hole Type                      | Exploratory Hole Ref.                                    | Ground level (m AOD)                                        | Exploratory Hole Depth (m bgl)                       | Rationale                                                                                                                                                                                                                                                            |
|--------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rotary Cored Borehole</b>               | RH01                                                     | 33.61                                                       | 30.50                                                | Confirm the shallow and deeper ground and groundwater conditions in the location of the proposed new building;<br>Collect soil samples for chemical analysis;<br>Collect rock samples geotechnical soil testing;<br>Undertake Groundwater sampling level monitoring. |
| <b>Window Sample Boreholes</b>             | WS01<br>WS02<br>WS03<br>WS04                             | 33.53<br>32.72<br>30.70<br>30.70                            | 0.90<br>5.00<br>3.45<br>3.45                         | Confirm shallow ground and groundwater conditions;;<br>Collect soil samples for chemical analysis;<br>Collect samples for geotechnical soil testing; and<br>Gas and groundwater level monitoring in the area of the new building.                                    |
| <b>Hand Dug Foundation Inspection Pits</b> | HD01<br>HD02<br>HD02A<br>HD02B<br>HD02C<br>HD02D<br>HD03 | 33.35<br>30.70<br>30.70<br>30.70<br>30.70<br>30.70<br>30.70 | 0.10<br>1.20<br>0.35<br>0.30<br>1.18<br>1.20<br>0.50 | Obtain information regarding existing foundation dimensions and information regarding formation horizons;<br>Present foundation cross-sections of the existing building to inform constraints of the proposed development.                                           |

Boreholes were undertaken in accessible areas prior to demolition, additional investigation is intended to be undertaken following building demolition. For the location of the exploratory holes refer to Curtins drawing ref: 077764-CUR-00-XX-DR-GE-004-P01 Exploratory Hole Location Plan included in *Appendix A*.

#### 3.1 Soil Logging and Sampling

Exploratory hole arisings were logged onsite by an Engineer from Curtins and in accordance with the requirements of BS5930 (Ref. 9). No observed visual and olfactory indications of contamination were recorded. Exploratory hole logs can be referred to *Appendix B*.

## 3.2 Monitoring Well Installations

Ground gas and groundwater monitoring 50mm diameter slotted pipes were installed within the rotary cored exploratory borehole (RH01), and in three of the window sample boreholes (WS02 to WS04). A bentonite seal was placed at the top and bottom of each of the exploratory holes, surrounding the screened sections of the pipe. A gravel surround was installed in the annulus between the sides of the borehole and the slotted sections of the pipe.

The monitoring wells installed in the window sample boreholes were designed to assess the potential for ground gas and monitor shallow / perched groundwater levels. The monitoring wells installed in the rotary cored borehole was designed to monitor the groundwater levels at depth.

The screened sections therefore focused on the more permeable deposits where encountered, where groundwater may be encountered and deposits most likely to contain putrescible materials which may generate ground gas.

A summary of the response zone is presented in *Table 3.2*.

**Table 3.2 – Monitoring Well Response Zones**

| Borehole Ref. | Response Zone<br>m bgl<br>(m AOD) | Strata Description(s)  |
|---------------|-----------------------------------|------------------------|
| RH01          | 12.00 – 18.00<br>(18.51 – 12.51)  | SANDSTONE<br>(Bedrock) |
| WS02          | 1.00 – 3.00<br>(31.72 – 29.72)    | MADE GROUND            |
| WS03          | 0.50 – 2.00<br>(30.20 – 28.70)    | MADE GROUND            |
| WS04          | 1.00 – 3.00<br>(29.69 – 27.69)    | MADE GROUND            |

A copy of the borehole logs can be referred to in *Appendix B* of this report.

## 3.3 Post-Investigation Monitoring

### 3.3.1 Groundwater and Ground Gas Monitoring

Six groundwater level and ground gas monitoring visits over three months have been undertaken, to assess the groundwater levels and the ground gas conditions. These were undertaken from 10<sup>th</sup> February to 13<sup>th</sup> April 2021. Groundwater samples using low flow methods of sampling were taken on 13<sup>th</sup> April 2022.

The results of the groundwater level monitoring are detailed in *Section 5.8*.

The results of the ground gas monitoring are detailed in *8.0*.

## 4.0 Laboratory Analysis

### 4.1 Geo-environmental Analysis

Representative soil samples were selected for laboratory chemical analysis, based on field observations and to provide information about the encountered ground conditions.

A total of 9 No. Made Ground samples were selected for chemical testing. Soil samples were placed in laboratory provided containers and stored in cool boxes prior to being transported to the nominated laboratory under the laboratory's chain of custody documentation. The laboratory selected by Curtins for chemical and geotechnical analysis was Envirolab Ltd (UKAS and MCERTS accredited). Geotechnical analysis was sub-contracted to Ian Farmers Associates, RSK Group, a UKAS accredited laboratory.

Given the lack of any obvious sources of potential contamination the sampling positions were generally located in a non-targeted, systematic array, beneath the proposed footprint, to give adequate and representative coverage of the sites proposed end use and the immediate environmental setting, concentrated in the near surface deposits.

#### 4.1.1 Soil Analysis

The source material of contaminants of concern potentially present on the site was considered to include, amongst others; organic matter, ash and fill, hydrocarbons (e.g. fuel/oils), polyaromatic hydrocarbons (PAHs), heavy metals, and asbestos.

The extent of the above is captured by the broad environmental testing suites listed in *Table 4.1.1*.

**Table 4.1.1** – *Environmental Chemistry Analysis Suite: Soils*

| Suite Ref.    | Analyte                                                        | LOD           |
|---------------|----------------------------------------------------------------|---------------|
| Soils Suite A | Asbestos Screen                                                | -             |
|               | pH Value                                                       | 0.1 pH        |
|               | 2:1 Water Soluble Sulphate                                     | 0.01 g/l      |
|               | Soil Organic Matter (SOM)                                      | 0.1% w/w      |
|               | Arsenic, Chromium, Chromium VI, Copper, Lead, Nickel, Selenium | 1 – 1.2 mg/kg |
|               | Zinc                                                           | 1 mg/kg       |
|               | Boron (water soluble)                                          | 0.2 mg/kg     |
|               | Cadmium                                                        | 0.2 mg/kg     |
|               | Mercury                                                        | 0.3 mg/kg     |
|               | Total Phenols (screen)                                         | 1 mg/kg       |

| Suite Ref.    | Analyte                                                   | LOD              |
|---------------|-----------------------------------------------------------|------------------|
|               | PAHs (USEPA 16)                                           | 0.05 mg/kg       |
|               | TPH (Aro/Alk Split)                                       | 0.001 – 10mg/kg  |
| Soils Suite B | Volatile Organic Compounds (VOCs) &                       | 1 ug/kg          |
|               | Semi Volatile Organic Compounds (SVOCs)                   | 0.05 - 0.3 mg/kg |
|               | Total Cyanide, Complex Cyanide, Free Cyanide, Thiocyanate | 1 to 5mg/kg      |
|               | Ammoniacal Nitrogen                                       | 0.5 mg/kg        |

A total of nine soil samples were obtained from the boreholes and tested for Suite A. Four of these samples were also tested for soils Suite B including a sample from RH01 at 1.00m which exhibited olfactory evidence of potential contamination (odour).

Copies of the environmental chemistry testing certificates are presented in *Appendix C*.

#### 4.1.2 Groundwater Analysis

As detailed in *Section 2.7*, the Curtins Phase 1 desk study (Ref. 1) assessed Moderate risk to groundwater and surface water receptors respectively, this considers the site's industrial history, the site is not located in a SPZ and the proximal distance from the nearest surface water feature.

Generally limited visual and olfactory evidence of soil contamination was encountered during the Curtins 2021 ground investigation however a hydrocarbon odour was identified in RH01 from 0.95m to 1.80m bgl, suggest there is a potential risk to controlled waters from the Made Ground soils on site.

Consequently, groundwater samples were obtained as part of this investigation. Samples were obtained by Low Flow methods given the potential for contamination on site including volatile contamination associated with historical industrial land uses including a gas works.

## 4.2 Geotechnical Testing

Soil samples for testing were prepared in accordance with BS1377: Part 1:2016 (Ref. 11). The undertaken geotechnical testing is summarised in *Table 4.2*.

**Table 4.2 – Geotechnical Testing**

| Test Type                                                       | Quantity | Standard                      |
|-----------------------------------------------------------------|----------|-------------------------------|
| <b>In Situ Testing</b>                                          |          |                               |
| Standard Penetration Testing                                    | 24       | BS 5930: 2015+2020, Clause 41 |
| <b>Laboratory Testing (General Testing - Foundation Design)</b> |          |                               |

| Test Type                                     | Quantity | Standard                                    |
|-----------------------------------------------|----------|---------------------------------------------|
| Atterberg Limit                               | 2        | BS1377 1990, Part 2 (clause 4.5, 5.3 & 5.4) |
| Moisture Content                              | 17       | BS1377 1990, Part 2                         |
| Water Soluble Sulphate                        | 17       | ISO 17025 MCERTS                            |
| pH Value                                      | 17       | ISO 17025 MCERTS                            |
| Laboratory Testing (Rock – Foundation Design) |          |                                             |
| Point Load Index Test                         | 14       | ISRM 1974-206                               |
| Unconfined Compressive Strength               | 1        | ISRM 1974-206                               |
| BRE Suite                                     | 2        | BS1377 1990, Part 3 (clause 5.3 & 5.5)      |

The results of the geotechnical testing are summarised in *Section 6.0* of this report.

Copies of the geotechnical testing certificates can be referred to in *Appendix D*.

## 5.0 Ground Conditions

The ground conditions across the site, determined during the Curtins ground investigation works, generally comprised surface cover of reinforced concrete or block paving or tarmacadam overlying Made Ground of generally clayey gravelly sand with occasional cobble content, and locally sandy gravel and sandy gravelly clay. This overlies soft to very stiff sandy gravelly clay with variable silt content which overlies medium dense to dense sand or gravels with low cobble content and clay inclusions. Bedrock of extremely weak to weak fine to medium grained sandstone was encountered immediately underlying the superficial soils. The natural soils encountered were generally consistent across the site and will be summarised in the following sections.

### 5.1 Encountered Ground Conditions

A summary of the ground conditions encountered during the Curtins site investigation works is presented below, with detailed information presented on the exploratory hole logs which can be referred to in *Appendix B*.

**Table 5.1** – Summary of Ground Conditions Encountered in the Curtins Investigation

| Stratum                                    | Depth to top of strata, m bgl (m AOD) | Recorded Thickness (m) |      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------|---------------------------------------|------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            |                                       | Min                    | Max  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Made Ground</b>                         | 0.00<br>(33.61 – 30.70)               | 0.10 <sup>1</sup>      | 3.45 | <p><b>External Positions:</b></p> <p>Upper surface covering of concrete, block paving or tarmacadam.</p> <p><u>Overlying</u></p> <p>MADE GROUND: Grey to greyish brown gravelly to very gravelly slightly fine to coarse sand. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone.</p> <p>-</p> <p><b>Internal Positions:</b></p> <p>Upper surface covering of reinforced concrete.</p> <p><u>Overlying</u></p> <p>MADE GROUND: Brown gravelly to very gravelly fine to coarse sand with low cobble content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone. Cobbles are subangular of brick.</p> |
| <b>Indicative Glaciofluvial (Cohesive)</b> | 1.80 – 3.20<br>(31.81 – 29.52)        | 1.25 <sup>2</sup>      | 7.70 | <p>Soft brown slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is angular to subangular fine to medium of sandstone.</p> <p><u>Or</u></p> <p>Very stiff brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone and coal.</p>                                                                                                                                                                                                                                                                                                                                             |

| Stratum                             | Depth to top of strata, m bgl (m AOD) | Recorded Thickness (m) |     | Description                                                                                                                                                                                                                                                       |
|-------------------------------------|---------------------------------------|------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     |                                       | Min                    | Max |                                                                                                                                                                                                                                                                   |
| Indicative Glaciofluvial (Granular) |                                       |                        |     | Yellowish brown very clayey, fine to medium SAND.<br><i>Or</i><br>Dense to very brown and grey angular to rounded fine to coarse GRAVEL of sandstone and siltstone with clay inclusions and low coble content. Cobbles are subangular of sandstone and siltstone. |
| Chester Formation                   | 9.50 (24.11)                          | 21.00 <sup>1</sup>     |     | Interbedded very weak to medium strong reddish-brown fine to medium grained and medium to coarse grained SANDSTONE with gravel inclusions recorded frequently.<br>-<br>See Section 5.5 and Appendix B (exploratory hole logs) for details.                        |

<sup>1</sup> Base of stratum not proven.

<sup>2</sup> Base of stratum overlies weathered bedrock

## 5.2 Made Ground

### 5.2.1 External Positions

Made Ground was encountered in all external positions (RH01, WS01, WS02 and HD01) from ground level to depths between 0.10m and 3.20m bgl.

The Made Ground generally comprised an upper surface covering of brick paving (RH01 and WS01), concrete (HD01) or tarmacadam and reinforced concrete (WS02). Underlying this was a Made Ground of varied hues (brown, grey and reddish brown) comprising a gravelly to very gravelly fine to coarse sand. The gravel was angular to subangular fine to coarse of sandstone, brick and concrete. This was not encountered in HD01 where it was not possible to advance past the reinforced concrete.

In RH01, the Made Ground became slightly clayey between 0.35m and 1.80m bgl, and rebar fragments and subangular cobbles of brick were noted. A hydrocarbon odour was also recorded between 0.95m and 1.80m bgl (32.66m to 31.81m AOD).

In WS02 directly below the sand Made Ground an additional Made Ground consisting of a brown sandy gravelly clay was encountered. The sand is fine to coarse and the gravel angular to subangular fine to coarse of brick and sandstone.

### 5.2.2 Internal Positions

Made Ground was encountered in all internal positions (WS03, WS04, HD02, HD02A, HD02B, HD02C, HD02D and HD03) from ground level to depths between 0.50m and 3.45m bgl.

The Made Ground typically comprised an upper surface covering of reinforced concrete to a maximum depth of 0.50m bgl. Underlying the upper surface covering was a Made Ground comprising brown gravelly to very gravelly fine to coarse sand with low cobble content. The sand is fine to coarse, gravel is angular to subangular fine to coarse of brick, concrete and sandstone, and the cobbles are subangular of brick. This was not encountered in HD02, HD02B or HD03 where it was not possible to advance past the reinforced concrete.

In WS03, WS04 and HD02, directly below the reinforced concrete a gravelly cement layer was noted between 70 and 100mm thick.

In WS03, underlying the reinforced concrete and cement layer, a brown and reddish-brown sandy angular to subrounded fine to coarse gravel of brick, concrete and sandstone with a high cobble content was recorded. The sand is fine to coarse, and the cobbles are angular to subangular of brick.

### **5.3 Indicative Glaciofluvial Deposits**

Deposits indicative of Glaciofluvial Deposits were encountered below the Made Ground in two exploratory holes (RH01 and WS02 with all other boreholes terminating in made ground). BGS records do not show any superficial deposits on the site but show Glaciofluvial deposits within 250m of the site and it is possible that these soils extend across part or all of the site. RH01 recorded very poor recovery from 2.00m bgl (31.61m AOD) to 9.50m (24.11m AOD) as such there was limited material to base the descriptions, the classification of these strata is only indicative. Due to the fact only two exploratory holes across the site encountered natural soils, classification of superficial soils at this point is not conclusive and post demolition ground investigation will be able to further characterise these soils.

#### **5.3.1 Cohesive Glaciofluvial Deposits**

Indicative cohesive Glaciofluvial deposits were encountered in exploratory holes RH01 and WS02 to depths between 2.00m and 4.45m bgl (31.61m to 28.27m AOD). In RH01 it was recorded as a soft brown slightly sandy slightly gravelly silty Clay of 0.20m thickness. The sand is fine to medium, and the gravel is angular to subangular fine to medium of sandstone. While in WS02 it was recorded as a very stiff brown mottled grey slightly gravelly sandy silty Clay of 1.25m thickness. The sand is fine to coarse, and the gravel is angular to subangular fine to coarse of sandstone and coal.

#### **5.3.2 Granular Glaciofluvial Deposits**

Indicative granular Glaciofluvial deposits were encountered in the exploratory hole RH01 between 2.00m and 9.50m bgl (31.61m and 24.11m AOD). It comprised a dense to very dense brown and grey angular to rounded fine to coarse Gravel of sandstone and siltstone with clay inclusions and low cobble content. The cobbles are subangular of sandstone and siltstone. The

clay inclusions are recorded as stiff to very stiff in strength. WS02 recorded granular superficial deposits from 4.45m and 5.00m bgl (28.27m and 27.72m AOD) underlying cohesive deposits, comprising yellowish brown very clayey fine to medium sand.

## 5.4 Chester Formation (Bedrock)

The Chester Formation bedrock was encountered in one exploratory hole (RH01) from 9.50m to 30.50m (24.11m to 3.11m AOD). The bedrock comprised interbedded layers of very weak to weak reddish-brown fine to medium grained Sandstone, weak reddish-brown medium to coarse grained Sandstone with occasional gravel inclusions and medium strong reddish-brown medium to coarse grained Sandstone with occasional gravel inclusions.

Fracture spacing was variable across the site, generally ranging from closely spaced to medium spaced, with correlation between increasing depth and strength of the rock.

## 5.5 Observed Potential Contamination

Olfactory contamination was observed during the intrusive investigation works in one location only. RH01 encountered Made Ground deposits comprising slightly clayey gravelly sand from 0.95m to 1.80m bgl (32.66m to 31.81m AOD) in which a hydrocarbon odour was noted.

## 5.6 Obstructions Encountered

The following obstructions were encountered during site works detailed in *Table 5.7* below.

**Table 5.7 – Obstructions Encountered**

| Borehole Ref. | Obstruction                       | Depth (m bgl) | Depth (m AOD) |
|---------------|-----------------------------------|---------------|---------------|
| HD01          | Reinforced concrete slab          | 0.10          | 33.25         |
| HD02A         | Concrete slab with vertical rebar | 0.35          | 30.35         |
| HD02B         | Reinforced concrete slab          | 0.30          | 30.40         |
| HD03          | Reinforced concrete slab          | 0.50          | 30.20         |
| WS01          | Concrete                          | 0.90          | 32.63         |

## 5.7 Existing Foundations

Seven hand dug foundation pits were completed along the eastern boundary and northern extent of the site within the basement of the existing development to identify the as built foundations. The following details were encountered;

- HD01 encountered reinforced concrete to 0.10m bgl which could not be penetrated.

- HD02 encountered concrete column (0.45m wide) at 0.79m bgl which was 0.12m from the wall of the basement and extended down to 1.20m bgl within Made Ground soils.
- HD02A encountered reinforced concrete to 0.35m bgl which could not be penetrated.
- HD02B encountered reinforced concrete to 0.30m bgl which could not be penetrated.
- HD02C did not encounter any foundation substructures to 1.18m bgl and encountered Made Ground soils underlying reinforced concrete.
- HD02D did not encounter any substructures to 1.20m bgl and encountered Made Ground soils underlying reinforced concrete.
- HD03 encountered reinforced concrete to 0.50m bgl which could not be penetrated.

Cross section sketches are included in Appendix B.

Further ground investigation will be required to further investigate the geometry and extent of existing foundations to ensure clashes are avoided. Current geotechnical considerations are discussed in *Section 10.2*.

## 5.8 Groundwater

No groundwater was recorded in any of the window sample boreholes during drilling and due to the use of water flush during rotary cored drilling, groundwater was unable to be monitored during the investigation as any water strikes would be masked.

Six rounds of groundwater monitoring have been undertaken between 10<sup>th</sup> February and 13<sup>th</sup> April 2022, the results of which are presented in *Table 5.6b*.

**Table 5.6b – Groundwater Monitoring Results**

| Borehole Ref. | Installation Strata | Response Zone m bgl | Depth, m bgl (m AOD) |                |               |               |               |               |
|---------------|---------------------|---------------------|----------------------|----------------|---------------|---------------|---------------|---------------|
|               |                     |                     | 10/02/22             | 24/02/22       | 09/03/22      | 25/03/22      | 08/4/22       | 13/04/22      |
| RH01          | SANDSTONE           | 12.00 – 18.00       | – <sup>1</sup>       | – <sup>1</sup> | 10.96 (19.65) | 10.99 (19.62) | 10.62 (19.99) | 10.83 (19.78) |
| WS02          | MADE GROUND         | 1.00 – 3.00         | Dry                  | 3.00 (29.72)   | Dry           | Dry           | Dry           | Dry           |
| WS03          | MADE GROUND         | 0.50 – 2.00         | Dry                  | Dry            | Dry           | Dry           | Dry           | Dry           |
| WS04          | MADE GROUND         | 1.00 – 3.00         | Dry                  | Dry            | Dry           | Dry           | Dry           | Dry           |

<sup>1</sup> Borehole bung could not be removed and water levels could not be monitored.

Based upon groundwater elevations and the underlying geology, the following considerations are given to the underlying groundwater regime:

- A groundwater table appears to be present below the site being within the sandstone at an elevation range of between 19.62m and 19.99m AOD with minimal variation recorded. This is likely representative of the Principal aquifer and may be in hydraulic connectivity with the River Irwell.

- All shallow window sample wells were recorded as dry with the exception of a minimal volume at the base in WS02 on visit 2 likely to represent perched groundwater through granular made ground horizons.
- WS03 and WS04 were undertaken in the existing basement installed with a monitoring well to a depth of around 28.70m and 27.69m AOD respectively, this is below the proposed basement level of 29.140m AOD.
- Given the minimal volumes of groundwater recorded at shallow depth beneath the site including beneath the existing basement, and given the depth identified to the Principal aquifer, its considered unlikely that the proposals for the new basement will have considerable impact to the groundwater regime beneath the site. This should be confirmed following post demolition ground investigations which will further characterise the groundwater regime for the site.

## 6.0 Ground Model

### 6.1 Made Ground

#### 6.1.1 Made Ground

Made Ground was encountered in all exploratory holes. No parametric geotechnical analysis has been undertaken on this stratum due to its unsuitable properties for use as a founding stratum.

The geotechnical test results recorded within the Made Ground are summarised in *Table 6.1.2*.

**Table 6.1.2** – Summary of Made Ground geotechnical test results

| Parameter                     | No. of Tests | Results                                  |
|-------------------------------|--------------|------------------------------------------|
| In-Situ Tests                 |              |                                          |
| SPT 'N' Value                 | 10           | Min: 2<br>Max: 31<br>Average: 9.1        |
| Laboratory Tests - General    |              |                                          |
| Moisture Content (%)          | 11           | Min: 9.2<br>Max: 17<br>Average: 10       |
| pH                            | 11           | Min: 8.2<br>Max: 11.3<br>Average: 9.8    |
| Water Soluble Sulphate (mg/l) | 11           | Min: 81.5<br>Max: 1640<br>Average: 424.5 |

### 6.2 Indicative Glaciofluvial Deposits

The Made Ground is underlain by soils indicative of Glaciofluvial deposits and typically recorded as cohesive and granular strata which are described separately below. As stated in *Section 5.3*, only two exploratory holes across the site encountering natural soils, classification of superficial soils at this point is not conclusive and post demolition ground investigation will be able to further characterise these soils. At this point, the soils will be characterised based on their geotechnical parameters only.

#### 6.2.1 Cohesive Glaciofluvial Deposits

The geotechnical test results recorded within the cohesive Glaciofluvial deposits are summarised in *Table 6.2.1* on the next page.

**Table 6.2.1** – Summary of geotechnical test results – Cohesive Glaciofluvial

| Parameter                         |                                            | No. of Tests | Results                                |
|-----------------------------------|--------------------------------------------|--------------|----------------------------------------|
| <b>In-Situ Tests</b>              |                                            |              |                                        |
| SPT 'N' Value – Cohesive          |                                            | 2            | Min: 18<br>Max: 39<br>Average: 28.5    |
| <b>Laboratory Tests - General</b> |                                            |              |                                        |
| Atterberg Test <sup>1</sup>       | Liquid Limit (%)                           | 2            | Min: 25<br>Max: 25<br>Average: 25      |
|                                   | Plastic Limit (%)                          | 2            | Min: 14<br>Max: 15<br>Average: 14.5    |
|                                   | Plasticity Index (%)                       | 2            | Min: 10<br>Max: 11<br>Average: 10.5    |
|                                   | Modified Plasticity Index (%) <sup>2</sup> | 2            | Min: 9.57<br>Max: 9.6<br>Average: 9.59 |
| Moisture Content (%)              |                                            | 3            | Min: 17<br>Max: 18<br>Average: 17.3    |
| pH                                |                                            | 2            | Min: 8.1<br>Max: 8.3<br>Average: 8.2   |
| Water Soluble Sulphate (mg/l)     |                                            | 2            | Min: 15<br>Max: 19<br>Average: 17      |

(1) Granular material that appeared plastic was tested and is included in this table.

(2) Modified plasticity index is the plasticity of components <425µm.

A total of two Atterberg Tests were undertaken in the cohesive material indicating the soils behave as low plasticity clays with a low volume change potential in accordance with guidance from NHBC Standards Chapter 4.2 (2021) (Ref. 12). Due to the small cohort of results, only two samples, it is considered unnecessary to present a graph displaying the results. Again only two SPT N results were recorded in this strata, increasing with depth.

A moderately conservative Undrained Shear Strength,  $C_u$ , of cohesive soils can be estimated from the correlation between Plasticity Indices (PI) and SPT N values (Ref. 14) using Equation 1:

$$C_u = f_1 \times \text{SPT N} \quad \text{Equation 1}$$

Where:

$C_u$  is the Undrained Shear Strength

$f_1$  is the Stroud Factor determined from Figure 1.5 (Ref. 15)

SPT N is Characteristic Standard Penetration Test Result

Due to the limited cohort of results, a conservative  $f_1$  factor of 6 for an average plasticity index of 12%, with  $C_u$  values ranging between 234 kPa and 300 kPa in accordance with BS5930 (2015+2020). The estimated results indicate a strength of very high strength clay. There are not

enough results across the site over a range of depths to confirm there is an overall increase in strength with an increase in depth. No samples were taken for Triaxial Compression tests to present laboratory tested undrained shear strengths for comparison against derived values.

A moderately conservative unit weight of between 19 and 23 kN/m<sup>3</sup> is deemed suitable for very high strength cohesive soils from a review of the published values (Ref. 13).

A moderately conservative Coefficient of Consolidation,  $M_v$ , of the cohesive soils can be estimated from the correlation between Plasticity Indices (PI) and SPT N values (Ref. 14) described by Equation 2:

$$M_v = 1 / (f_2 \times \text{SPT } N) \quad \text{Equation 2}$$

Where:

$M_v$  is the coefficient of consolidation

$f_2$  is the Stroud Factor determined from Figure 1.5 (Ref. 15)

SPT N is Characteristic Standard Penetration Test Result

Using an  $f_2$  factor of 0.6 for an average plasticity index of 12%,  $M_v$  values range between 0.042 and 0.033 m<sup>2</sup>/MN. The results are variable, indicating a very low compressibility clay. Due to the small cohort of only two results, no graphical representation of the results is shown.

The Drained and Undrained Young's Modulus,  $E'$  and  $E_u$ , can be derived through the empirical relationship with Undrained Shear Strength ( $C_u$ ) (Ref. 17) described in Equation 3 and 4. An increasing with depth Young's modulus is proposed for design, according to the following relationships obtained from the ICE Manual of Geotechnical Engineering, 2012:

$$E_u = 330 \times C_u \quad \text{Equation 3}$$

$$E' = 200 \times C_u \quad \text{Equation 4}$$

It should be noted that care should be taken in using linear stiffness values derived from relationships as they do not necessarily reflect the non-linear nature of soil stiffness. The actual stiffness will be strain dependent and non-linear and should be considered in detailed design of sensitive structures.

Moderately conservative Drained and Undrained Young's Modulus,  $E'$  and  $E_u$ , are estimated to at 31MPa, and 26MPa respectively.

Due to the small cohort of results of cohesive soil tested and analysed in this section no graphs are considered necessary.

### 6.2.2 Granular Glaciofluvial Deposits

The geotechnical test results recorded within the granular Glaciofluvial Till deposits are summarised in *Table 6.2.2*.

**Table 6.2.2** – Summary of geotechnical test results – Granular Glaciofluvial

| Parameter                    | No. of Tests | Results                             |
|------------------------------|--------------|-------------------------------------|
| <b>In-Situ Tests</b>         |              |                                     |
| SPT 'N' Value <sup>(1)</sup> | 3            | Min: 18<br>Max: 40<br>Average: 26.6 |

(1) Only includes SPTs tests in which full penetration was achieved.

Due to limited recovery in the granular superficial material in RH01 from 2.00m to 9.50m bgl, there was not enough material to send for geotechnical testing. As such no parametric analysis has been undertaken on these soils.

SPT N results were recorded within the gravel strata in RH01; the results are as follows, 2.00m bgl (31.61m AOD) N = 18, 5.00m bgl (28.61m AOD) N = 22, 6.50m bgl (27.11m AOD) N = 40. As can be seen from the results, SPT N-value appears to increase with increased depth and decreased elevation. SPT refusals (N-value of 50) were recorded at 3.50m bgl (30.11m AOD) and 8.00m bgl (23.61m AOD).

## 6.3 Chester Formation

### 6.3.1 Chester Formation

The intact bedrock of the Chester Formation was encountered below the superficial soils at depths between 9.50m bgl and 30.50m bgl in RH01.

The bedrock comprised very weak to medium strong reddish-brown fine to coarse sandstone with occasional gravel inclusions. Fracture spacing was variable ranging from very closely spaced to medium spaced.

Some assumed zones of core loss were recorded likely due to high degree of local weathering of the strata and some zones of non-intact core are summarised in *Table 6.3.1a* and *Table 6.3.1b*.

**Table 6.3.1a** – Summary of Zones of Core Loss

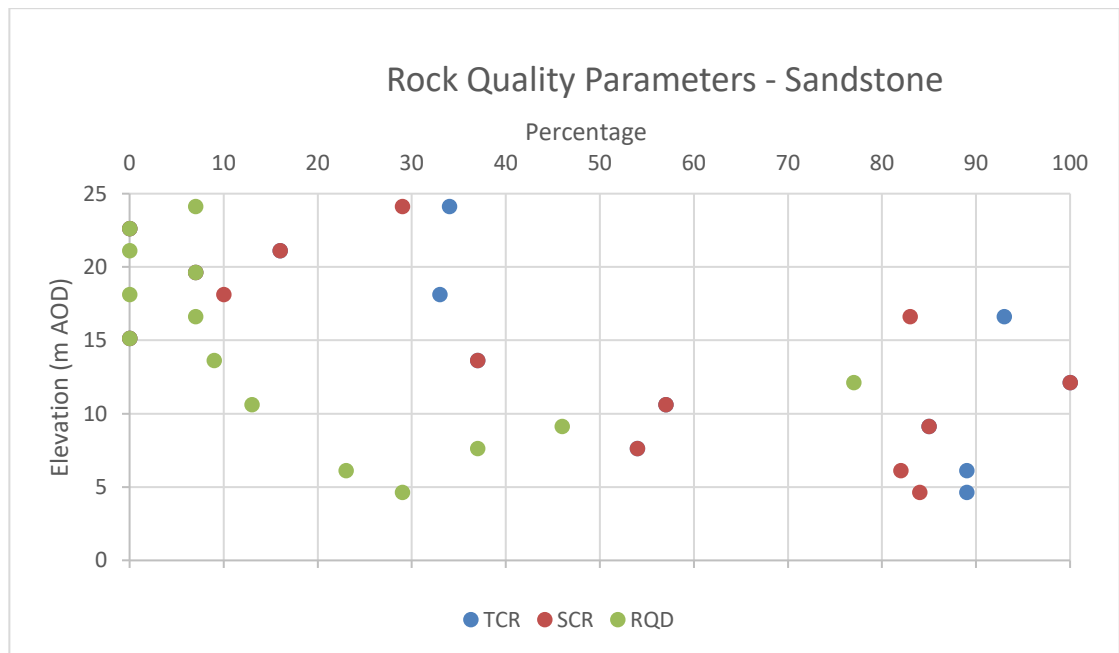
| Exploratory Hole ID | Core Loss Depth (m bgl) | Core Loss Depth (m AOD) |
|---------------------|-------------------------|-------------------------|
| RH01                | 10.01 to 12.50          | 23.51 – 21.11           |
|                     | 12.74 to 14.00          | 20.87 – 19.61           |

| Exploratory Hole ID | Core Loss Depth (m bgl) | Core Loss Depth (m AOD) |
|---------------------|-------------------------|-------------------------|
|                     | 14.10 to 15.50          | 19.51 – 18.11           |
|                     | 16.00 to 17.00          | 17.61 – 16.61           |
|                     | 18.39 to 18.50          | 15.22 – 15.11           |
|                     | 18.50 to 20.00          | 15.11 – 13.61           |
|                     | 20.56 to 21.50          | 13.05 – 12.11           |
|                     | 23.64 to 24.50          | 9.97 – 9.11             |
|                     | 25.77 to 26.00          | 7.84 – 7.61             |
|                     | 26.81 to 27.50          | 6.80 – 6.11             |
|                     | 28.84 to 29.00          | 4.77 – 4.61             |
|                     | 30.33 to 30.50          | 3.28 – 3.11             |

**Table 6.3.1b** – Summary of Non-Intact Core

| Exploratory Hole ID | Core Loss Depth (m bgl) | Core Loss Depth (m AOD) |
|---------------------|-------------------------|-------------------------|
| RH01                | 9.50 to 9.58            | 24.11 – 24.03           |
|                     | 15.50 to 15.84          | 18.11 – 17.77           |
|                     | 17.00 to 17.05          | 16.61 – 16.56           |
|                     | 17.74 to 17.79          | 15.87 – 15.82           |
|                     | 18.09 to 18.14          | 15.52 – 15.47           |
|                     | 20.07 to 20.11          | 13.54 – 13.50           |
|                     | 28.09 to 28.20          | 5.52 – 5.40             |
|                     | 30.19 to 30.26          | 3.42 – 3.35             |

Rock Quality Designation (RQD) recorded in the sandstone samples ranged from 0% to 77% (averaging 18%) which classifies it as very poor to good rock mass quality. Total Core Recovery (TCR) and Solid Core Recovery (SCR) vary between core runs but overall is highly variable but does appear to increase with depth. The Rock Quality Parameters are presented in *Figure 6.3.1a*.



**Figure 6.3.1a** – Summary of Rock Quality Parameters v. Elevation for Sandstone

A summary of the geotechnical testing results for the sandstone bedrock are presented in *Table 6.3.2c*. Full details of geotechnical testing are included in *Appendix D*.

**Table 6.3.1c** – Summary of geotechnical test results

|                         | Parameter                                  |             | No. of Tests | Summary of Results |      |
|-------------------------|--------------------------------------------|-------------|--------------|--------------------|------|
|                         |                                            |             |              | Min                | Max  |
| Laboratory Test Results | Point Load Indices (Is50) (MPa)            | Axial Plane | 14           | 0.07               | 0.31 |
|                         | Unconfined Compressive Strength, UCS (Mpa) |             | 1            | 20.7               |      |
|                         | pH                                         |             | 3            | 8.5                | 8.8  |
|                         | Water Soluble Sulphate (mg/l)              |             | 3            | 14                 | 20   |
| Derived Parameters      | Estimated UCS from Point Load Indices      | Axial Plane | 14           | 1.68               | 7.44 |

Overall, 14No. axial Point Load Tests (PLT) were undertaken on selected samples of sandstone from rotary cores. Axial plane PLT (Is(50)) results ranged from 0.07MPa and 0.31MPa.

An approximation of the unconfined compression strength (UCS) of the rock may be derived from the following relationship, described in *Equation 5*:

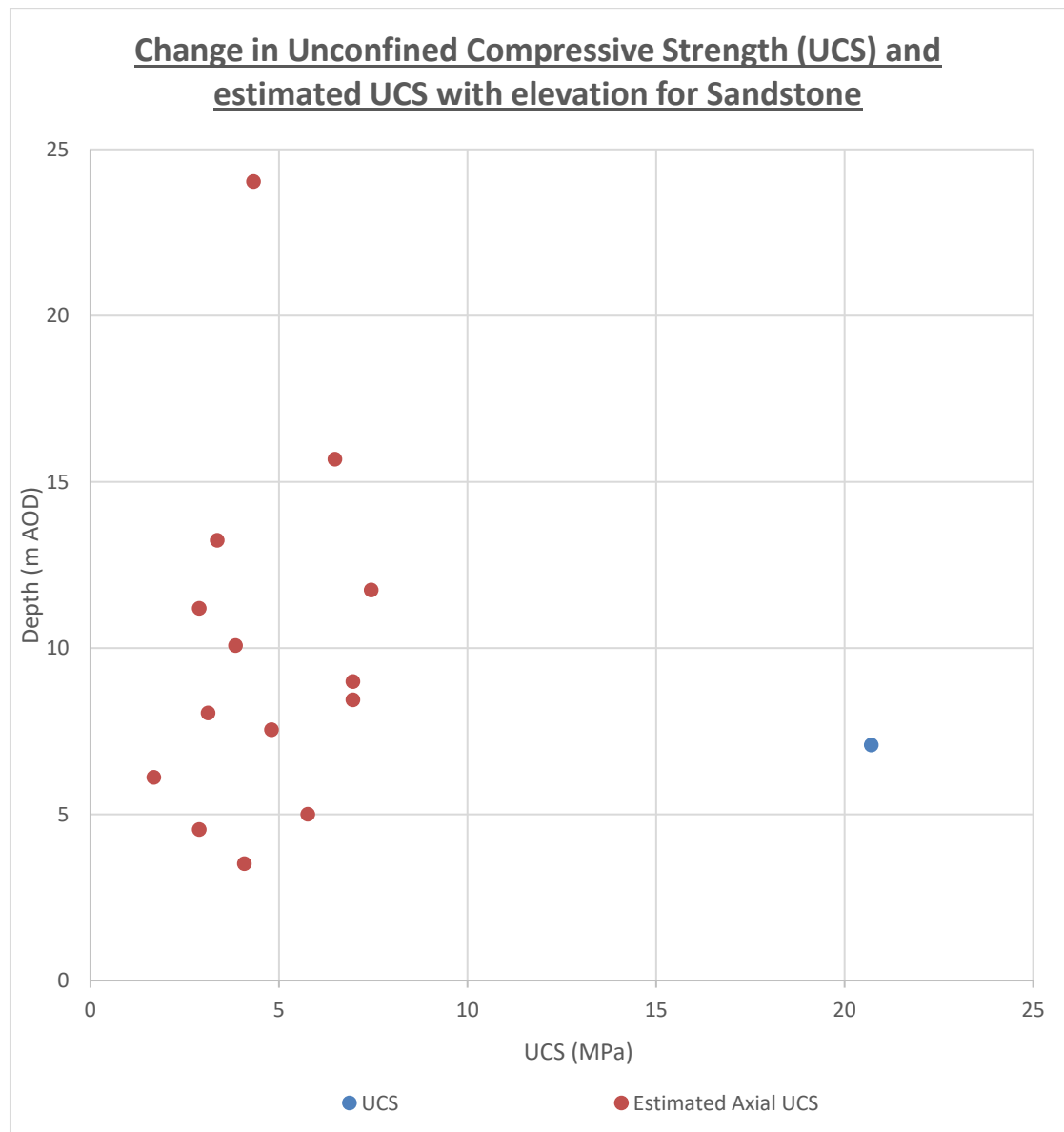
$$UCS = PLT \text{ Is}(50) \times f_1 \quad \text{Equation 5 (Tomlinson)}$$

Where  $f_1$  is derived from the correlation between PLT Is(50) and UCS Results

Due to the single UCS test conducted across the site, it was not possible to derive a correlation factor between  $I_s(50)$  and UCS values. In consideration of the correlation between  $I_s(50)$  and UCS values reported in published literature (Tomlinson et al), a factor of 24 has been considered suitable.

Based on this relationship, estimated UCS values for sandstone ranged between 1.68MPa and 7.44MPa for axial tests, indicating the rock strength is highly variable with the strength index indicating very weak to weak. The findings correlated with the strengths indicated during field descriptions generally. Field description strengths of strata below 26.04m bgl (7.57m AOD) when subjected to field strength tests behaved as a medium strong rock but when subjected to laboratory testing is classified as weak to very weak.

The estimated UCS values were all lower than the UCS test result which was 20.7MPa. The termination reason was recorded as multiple shear and axial cleavage. The UCS testing results indicate the intact rock is weak. The results are shown in *Figure 6.3.1b*.



**Figure 6.3.1b** – Variation of UCS Test and Estimated UCS Results

## 6.4 Aggressive Ground Conditions

The classification of the site in terms of concrete in aggressive ground is based on the guidance provided in Table C2 of the Building Research Establishment (BRE) Special Digest 1, 3<sup>rd</sup> edition of 2005 (Ref. 19). A summary of the results obtained as a part of the ground investigation are summarised in Table 6.4a below.

**Table 6.4a** –Aggressive Chemical Environment for Concrete (ACEC) Site Classification

| Stratum     | Test Type | Range        |
|-------------|-----------|--------------|
| Made Ground | pH        | 8.20 – 11.30 |

| Stratum           | Test Type                     | Range     |
|-------------------|-------------------------------|-----------|
|                   | Water Soluble Sulphate (mg/l) | 34 - 1640 |
| Glaciofluvial     | pH                            | 8.10      |
|                   | Water Soluble Sulphate (mg/l) | 234       |
| Sandstone Bedrock | pH                            | 8.6 - 8.8 |
|                   | Water Soluble Sulphate (mg/l) | 14 – 20   |

**Table 6.4b** –Aggressive Chemical Environment for Concrete (ACEC) Site Classification

| Stratum           | Design Sulphate Class | ACEC Class <sup>(1)</sup> |
|-------------------|-----------------------|---------------------------|
| Made Ground       | DS-2 <sup>(2)</sup>   | AC-2 <sup>(2)</sup>       |
| Glaciofluvial     | DS-1                  | AC-1 <sup>(3)</sup>       |
| Sandstone Bedrock | DS-1                  | AC-1                      |

(1) ACEC assessment was based on the *mobile* groundwater condition for a *brownfield* scheme area.

(2) Mean of highest 20% of sulphate values taken as characteristic value.

(3) Due to small cohort of results (only 1 value) worst case scenario has been used.

Based on the Curtins ground investigation, according to Table C2 of BRE Special Digest 1:2005 should be in accordance with Class DS-2 (AC-2) conditions assuming mobile groundwater for Made Ground, Class DS-1 (AC-1) conditions assuming mobile groundwater for the Glaciofluvial deposits, and Class DS-1 (AC-1) conditions assuming mobile groundwater for the Sandstone bedrock.

Post-demolition ground investigation will be undertaken, additional samples from the superficial soils across the site will need to be taken to further assess the chemical environment within these strata as one sample is not enough to conclusively designate Design Sulphate and ACEC Class.

## 7.0 Ground and Groundwater Contamination Assessment

This section of the report includes the assessment of the potential contamination, solid, liquid and gas, identified on the subject site which may present a risk to the proposed end-users, associated utilities and the wider environment.

In guidance published by the Environment Agency, the risk to human health or controlled waters is determined through an assessment of pollutant linkages between a source of contamination (within the ground or groundwater either on or off site) and a sensitive receptor such as end-users of the site, building materials, edible plants grown in gardens or groundwater abstracted for drinking. This is termed a source-pathway-receptor relationship. The same model is applied to the assessment of risk arising from ground gases as detailed within BS8576:2013 (Ref. 20).

These models have a common approach, which is one of a tiered assessment. At each stage of the assessment further detail can be applied to the conceptual site model to provide a detailed interpretation on a site by site basis. As part of the planning process this approach is adopted to establish either if the site is 'suitable for use' or whether additional work or else remedial work is required for the site to be deemed so.

The sub-sections hereafter therefore incorporate the first tier (Tier 1) of this approach otherwise referred to as the Generic Quantitative Risk Assessment (GQRA). The GQRA builds on the qualitative risk assessment presented in the Phase 1 Desk Study in conjunction with observations made during the ground investigation and is based solely on the results of the chemical and other testing data obtained as part of Curtins ground investigation. The GQRA is used to build/refine the Conceptual Site Model (CSM) for the site as detailed and presented in *Section 9.0* of this report.

The following sections present more detail on the risk assessment methodology rationale for the main receptors.

### 7.1 Human Health GQRA

The soil results will be screened against the relevant Generic Assessment Criteria (GAC) where available, including:

- i) **Soil Guideline Values (SGVs):** These have been published by the Environment Agency and are trigger values for screening out low risk areas of land contamination. SGV's give an indication of representative average concentrations of chemicals in soil, below which long-term health risks are likely to be minimal. SGVs have been published for several contaminants including arsenic, cadmium, mercury, nickel, selenium, BTEX, phenols and dioxins, furans and dioxin-like PCB substances for land uses including residential, allotments and commercial. The SGVs have been developed for a sandy loam soil with 6% soil organic matter (SOM) content;
- ii) **Supplementary Screening Values (SSVs):** In addition to the SGVs developed by the EA, other third party organisations have derived SSVs for a wider range of contaminants and land uses using the CLEA Model. Curtins have adopted these numbers where applicable, including

those developed by Atkins AtriskSoil™, the LQM/CIEH Suitable for Use Levels (S4UL) and EIC/AGS/CL:AIRE published thresholds;

- iii) **Category 4 Screening Levels (C4SLs):** In March 2014 Defra published C4SLs for arsenic, benzene, benzo(a)pyrene, cadmium, hexavalent chromium and lead. These values were derived to support the revised Part 2A Statutory Guidance issued in 2012 (Ref. 21) in which four categories of contaminated land are included, ranging from Category 1 (significant/high risk) to Category 4 (low risk). C4SLs are not representative of significant possibility of significant harm (SPoSH) and are low risk levels which, and therefore where the C4SLs are not exceeded, land can be demonstrated to be in Category 4 and cannot be determined as contaminated land.

#### 7.1.1 Adopted Soil Human Health GACs Screening Methodology

Current development proposals indicate the construction of a circa 17 storey mixed-use development of offices, event space, cafe and rooftop bar, restaurant, and spa.

Large proportions of the external space will be covered by hardstanding (car parking) with limited soft landscaping generally. Chemical analysis results have been compared against 'Commercial' end use scenario as the site will be mainly offices.

The assessment has been undertaken against the following GACs, in order of preference:

1. Environment Agency Soil Guideline Values,
2. CL:AIRE, AGS, EIC. Soil Generic Assessment Criteria for Human Health Risk Assessments,
3. LQM/CIEH 2015 S4ULs for Human Health Risk Assessment, and
4. DEFRA Category 4 Screening Levels.

Atkins At Risk derived Commercial thresholds have been used for supplemented for VOC and SVOC compounds where thresholds are not available in the GACs for listed above.

The soil organic matter (SOM) content has an influence on the volatilisation of organic contaminants (i.e. the higher the SOM, the lower the volatilisation rate and therefore inhalation exposure risk). Soil organic matter (SOM) values for soils ranged from <0.1% to 1.7% within Made Ground soils. WS04 at 1.50m bgl recorded the highest SOM value across the site.

With consideration for a calculated geometric average, soils from the Made Ground have a geomean SOM of 0.78%. As such, a comparison against Generic Assessment Criteria (GAC) thresholds for a conservative SOM of 1.0% for the identified end use thresholds have been adopted for the Made Ground soils, respectively. No environmental samples were taken from natural soils across the site. As such, post-demolition ground investigation will be undertaken, additional samples from the natural soils across the site will need to be taken to further assess the chemical environment within these strata.

The adopted GAC's can be referred to in *Appendix F*.

### 7.1.2 Generic Assessment Criteria Screening of Soil Laboratory Results

The results of the environmental testing can be referred to in *Appendix C*.

With respect to the conservative '*Commercial*' thresholds, no exceedances of GACs were recorded in any of the soil samples tested.

All soil samples tested were also screened for asbestos fibres, with no asbestos being positively identified in the laboratory. No suspected asbestos containing materials (ACMs) were identified within any of the exploratory holes excavated on site.

A model for assessing the potential for pollution of controlled waters and for deriving a safe concentration in ground and groundwater is the Environment Agency's publication 'Remedial Targets Methodology - Hydrogeological Risk Assessment for Land Contamination' (Ref. 26). In relation to the standards for controlled waters, there are currently no generic groundwater standards or surface water standards that are necessarily applicable to all sites.

### 7.1.3 Adopted Vapours within Groundwater Human Health GACs Screening Methodology

Volatile contaminants in groundwater have the potential to present a risk to human health through the volatilisation and mobilisation of vapours into overlying buildings, followed by inhalation. Detailed guidance for assessing risk presented to human health from volatile contaminants in groundwater is available within The Society of Brownfield Risk Assessment (SoBRA), Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater (Ref. 26).

A Generic Quantitative Risk Assessment (GQRA) has been carried out for the potential for the vaporisation of volatile contaminants within the groundwater, rising through porous superficial soils to cause potential chronic risk to human health. The SoBRA document is intended as a conservative screening tool and presents Generic Assessment Criteria (GAC<sub>gwvap</sub>) for two site end use scenarios, Residential and Commercial, for volatile compounds.

The proposed end use of the site is *Commercial*; therefore, the assessment has been undertaken in accordance with this against the GACs outlined in the SoBRA guidance.

The results of the environmental groundwater testing results can be referred to in *Appendix D*.

With respect to the proposed *Commercial* end-use of the site no exceedances are noted.

## 7.2 Controlled Waters GQRA

However, dependant on the receptor identified as being at risk, see Section 7.1.1, the UK Drinking Water Standards (UK DWS) (Ref. 27), and/or Water Framework Directive Environmental Quality Standards (WFD EQS) (Ref. 27) can be utilised as primary screening values in a Level 1 assessment.

These can also be supplemented by World Health Organisation (WHO) guidelines (Ref. 29), where WFD or DWS water quality standards (WQS) do not exist.

### 7.2.1 Adopted Water GACs Screening Methodology

The results of laboratory analysis of groundwater (obtained from 1 sampling visit) have been assessed against the Water Framework Directive Environmental Quality Standards (WFD EQS) due to the presence of the River Irwell 1m north of the site. Additionally, groundwater analysis has been compared to UK Drinking water Standards (DWS) as the site is underlain by the Chester Formation, which acts as a principal aquifer. In the absence of WFD EQS and UK DWS, a comparison against WHO standards has been used.

The adopted Level 1 Screening Values are listed in Appendix F.

### 7.2.2 Generic Assessment Criteria Screening of Water Laboratory Results

The results of the environmental testing can be referred to in Appendix C.

With respect to the both WFD EQS thresholds, no exceedances are recorded in the recovered water sample obtained from depth considered to be representative of the bedrock aquifer. However with respect to UK DWS thresholds one exceedance is noted as summarised in Table 7.2.2 below.

**Table 7.2.2 – Exceedances Recorded against Drinking Water Standards (DWS)**

| Determinand                                  | DWS Threshold (µg/l) | Concentration (µg/l) |
|----------------------------------------------|----------------------|----------------------|
|                                              |                      | RH01 at 12.00m bgl   |
| Sum of Tetrachloroethene and Trichloroethene | 10                   | 434                  |

Tetrachloroethene known as TCE is a halocarbon commonly used as an industrial solvent often used for degreasing. Both Tetrachloroethene and Trichloroethene were recorded below limits of detection in site soils where tested for, included within made ground soils of RH01. Furthermore, no evidence of gross contamination was encountered in the soils to date. It is therefore considered unlikely that the site soils are the source of this exceedance.

No shallow groundwater samples were obtained due to shallow wells being recorded as dry typically. The absence of shallow groundwater is likely to limit potential leaching of any contamination in the shallow soils.

## 8.0 Ground Gas Assessment

The assessment of risk presented by ground gases is assessed with reference to guidance published by CIRIA Assessing Risks Posed by Hazardous Ground Gases to Buildings, C665 (Ref. 22), BSI Publication code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings BS8485:2019 (Ref. 23) and other broadly accepted references such as the Ground Gas Handbook 2009 (Ref. 24).

The gas risk assessment adopts a tiered approach. In the first instance this involves a re-evaluation of the Conceptual Site Model described within the Phase 1 Desk Study (Ref. 1) and thereafter validating this conceptual model with the ground gas data, the semi-quantitative risk assessment.

### 8.1 Ground Gas Monitoring Results

To characterise the site's ground gas regime and validate the qualitative assessment of ground gas risk, standpipe installations were incorporated within three window sample boreholes and one rotary borehole as detailed in *Section 3.2*.

An initial programme of six gas monitoring visits over twelve weeks was proposed. Six gas monitoring visits have been undertaken between 10<sup>th</sup> February 2022 and 13<sup>th</sup> April 2022, with barometric pressure recorded between 998 mb and 1029 mb. Falling barometric pressure was recorded on the first (10<sup>th</sup> February), third (9<sup>th</sup> March), fourth (25<sup>th</sup> March), fifth (08<sup>th</sup> April) and sixth (13<sup>th</sup> April) monitoring visits.

The results log sheets are contained within *Appendix E* and summarised in *Table 8.1*.

**Table 8.1 – Summary of Ground Gas Monitoring Results**

| Exploratory Hole ID | Maximum Methane Concentration (%) | Maximum Steady Carbon Dioxide Concentration (%) | Minimum Steady Oxygen Concentration (%) | Maximum Peak Gas Flow (l/hr) | Maximum Steady State Gas Flow (l/hr) |
|---------------------|-----------------------------------|-------------------------------------------------|-----------------------------------------|------------------------------|--------------------------------------|
| RH01                | <0.1                              | 0.1<br>(All Visits)                             | 19.7                                    | 8.5<br>(Visit 3)             | <0.1                                 |
| WS02                | 1.4<br>(Visit 6)                  | 0.1<br>(All Visits)                             | 19.7                                    | 0.4<br>(Visit 5)             | 0.1                                  |
| WS03                | <0.1                              | 0.1<br>(All Visits)                             | 20.1                                    | -1.4<br>(Visit 3)            | -1.4                                 |
| WS04                | <0.1                              | 0.3<br>(Visit 1)                                | 20.1                                    | -1.2<br>(Visit 3)            | -1.2                                 |

The maximum recorded concentration of carbon dioxide of 0.4%  $v/v$  and was recorded in WS04 on the second monitoring visit.

Methane (CH<sub>4</sub>) was recorded below the limit of detection of the monitoring instrument throughout the monitoring period except for a maximum concentration of 1.4%  $v/v$  on the sixth monitoring visit. However, methane concentrations quickly stabilised below the detection limit after a period of 3 seconds.

Hydrogen sulphide and carbon monoxide were recorded below 20ppm throughout the monitoring period.

The highest peak gas flow rate was recorded in RH01 (8.5 l/hr) on the third monitoring visit. This reduced to a steady state of <0.1 l/hr within 1 minute.

## 8.2 Ground Gas Assessment

The Conceptual Site Model presented in *Section 2.7* highlighted potential Made Ground and natural soils organic / putrescible content as a potential source of ground gas generation.

Noxious and asphyxiate gases were attributed to include, but not limited to, carbon dioxide, carbon monoxide, methane and hydrogen sulphide.

Ground conditions across the site comprised surface cover of reinforced concrete or block paving or tarmacadam overlying Made Ground of generally clayey gravelly sand with occasional cobble content, and locally sandy gravel and sandy gravelly clay. This overlies soft to stiff sandy gravelly clay with variable silt content which overlies medium dense to dense gravels with low cobble content and clay inclusions being typical of Glacial Till. Bedrock of extremely weak to weak fine to medium grained sandstone was encountered immediately underlying the superficial soils. Through groundwater monitoring it has been determined that it is likely the water table is present between 10 to 11m bgl.

In accordance with BS8485:2015+A1:2019 (Ref. 22), consideration of the recorded soil gas flow rates, presented below, enables hazardous gas flow rates ( $Q_{hg}$ ) to be evaluated.  $Q_{hg}$  can be derived for both 'borehole' and 'worst case' scenarios and a comparison made in support of an appropriate assessment of ground gas risk. For a 'borehole' scenario steady state flow rates and maximum gas concentrations are adopted, whilst for a 'worst case' scenario (highest  $Q_{hg}$  across the entire dataset irrespective of location and discrete monitoring events) peak flows and gas concentrations are adopted.

Evaluation of the 'representative borehole' scenario recorded a maximum  $Q_{hg}$  of 0.0033 l/hr for carbon dioxide in WS04 on the first monitoring visit the maximum steady state gas flow reading is <1.1 l/hr, and a maximum gas concentration is 0.3% v/v.

Evaluation of the 'representative borehole' scenario recorded a maximum  $Q_{hg}$  of 0.0014 l/hr for methane where on the sixth monitoring visit where the maximum steady state gas flow reading is 0.1 l/hr, and a maximum gas concentration is 1.4% v/v is recorded. this assessment is considered conservative given the peak gas concentration reduced almost instantly to 0.1% v/v.

Additionally, gas monitoring data was also assessed using a 'worst-case' scenario, utilising maximum flow rates from any standpipe in a given strata and maximum gas concentrations from any standpipe in the same strata, but discounting any peak instantaneous readings and negative readings that have been judged as unrepresentative of the worst-case scenario. 'Worst-case' scenario evaluation for the made ground determined a maximum carbon dioxide concentration of 0.0056 l/hr and 0.0196 l/hr for methane.

The dataset obtained is considered to be representative of site conditions beneath the proposed development footprint. Monitoring was undertaken during both winter and spring months over a period of 6 visits, high and low atmospheric pressures and differing weather conditions have been assessed. As such, the 'representative borehole' scenario has been adopted, utilising steady state flow rates and maximum gas concentrations when determining the maximum borehole  $Q_{hg}$  which indicates a CS1 classification.

Where peak methane concentrations were recorded above 1% on one occasion, the peak methane concentration reduced almost instantly to 0.1%  $v/v$ , it is therefore not considered necessary to increase the Characteristic Situation classification to CS2 based on methane concentrations above 1%.

Based on the relatively low gas concentrations recorded with low flow rates, it is recommended that the site is characterised with CS1 classification with no requirement gas protection measures.

The potential risks from ground gases to the excavations are to be dealt with by the Contractor, in accordance with the Confined Space Regulations, during construction. Appropriate ground gas monitoring and safety measures should be in place during the works, as the potential presence of ground gases could pose a risk in any confined spaces of deep excavations.

## 9.0 Revised Conceptual Site Model

The Preliminary Conceptual Site Model (PCSM) presented *Section 2.8* and discussed in *Section 2.0* of this report has been revised following the GQRA in *Sections 7.0* and *8.0* above. The Revised Conceptual Site Model (CSM) is summarised in the table overleaf.

The CSM details the source-pathway-receptor linkages or potential pollutant linkages (PPL) that have been identified as relevant for the site. The GQRA details the associated level of risk relating to these potential pollutant linkages.

The CSM follows the framework outlined within CIRIA C552 (Ref. 25) which is summarised within *Appendix G*.

The 'risk rating' within the CSM refers to the risk that the source, pathway, receptor linkage or PPL is complete. Unless specifically stated it does not necessarily refer to an immediate risk and is intended to be used as a tool to assess the necessity for further assessment/investigation.

Risks presented by Unexploded Ordnance is discussed and assessed in *Section 2.5*.

Under current health and safety legislation, employers are required to carry out their own appropriate risk assessments and mitigation to protect themselves and their employees, other human receptors and the environment from potential contamination. Such risks must be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015 (Ref. 26) which require that potential risks to human health and the environment from construction activities are appropriately identified and all necessary steps taken to eliminate / manage that risk.

It has been assumed that any future construction works on site will be undertaken in compliance with these requirements. This assumption is factored into the conceptual site model. Reference should be given to the environmental testing results discussed within *Section 6.0* and presented within *Appendix C*.

Qualitative Risk  
AssessmentGeneric  
Quantitative Risk  
AssessmentDetailed  
Quantitative Risk  
Assessment or;  
Remedial Action

- The table below represents the Second stage in the land quality risk assessment process; the Revised Conceptual Site Model following the Quantitative Risk Assessment.
- For a development site to be deemed 'suitable for use' the level of risk needs to be brought down to acceptable levels, i.e. low to very low risk. The purpose of each stage of risk assessment is ultimately to establish if there is a requirement for additional levels of assessment to be made to have sufficient confidence to support a risk characterisation or management decision, e.g. remedial action.
- In the absence of specific site data, a Generic Quantitative Risk Assessment is invariably recommended.

| Conceptual Site Model                                                           |                                                                                                                                                             |                                                                                                                                                                                                                                                                                                         | Generic Qualitative Risk Assessment |                          |                     | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Action                                                                                       |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Identified Source                                                               | Pathway(s)                                                                                                                                                  | Receptor(s)                                                                                                                                                                                                                                                                                             | Consequence                         | Likelihood of Occurrence | Risk Rating         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                              |
| Limited potential sources of contamination identified within Made Ground Soils. | Direct contact and dermal uptake, soil and dust ingestion, dust and migration inhalation (indoor & outdoor air)                                             | <b>Site End Users</b><br>(Office block and amenity users)                                                                                                                                                                                                                                               | <b>Medium</b><br>Human Health Risk  | <b>Low</b>               | <b>Moderate/Low</b> | No exceedances identified in any of the soil samples tested above 'Commercial' GACs.<br><br>No exceedances for VOCs/SVOCs in soils/groundwater with respect to available 'Commercial' GACs.<br><br>No suspected asbestos containing materials (ACMs) were identified within any of the exploratory hole logs or laboratory screening.<br><br>No evidence of gross contamination identified in site soils.<br><br>Only pre demolition investigation undertaken to date with large areas currently inaccessible which should be investigated further given historical land uses. | Additional post-demolition chemical analysis to be undertaken to increase testing frequency. |
|                                                                                 |                                                                                                                                                             | <b>Construction and maintenance workers</b>                                                                                                                                                                                                                                                             |                                     |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                              |
|                                                                                 | Vertical and horizontal migration of soluble phase contamination through groundwater.                                                                       | <b>Controlled Waters (Surface Water)</b><br>River Irwell less than 5m north of the site.<br>No surface water abstraction points within 500m of the site.                                                                                                                                                | <b>Medium</b>                       | <b>Unlikely</b>          | <b>Low</b>          | No exceedances of WFD EQS thresholds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Additional groundwater monitoring post-demo.                                                 |
|                                                                                 | Vertical and horizontal migration of soluble phase contamination through superficial deposits and bedrock.                                                  | <b>Controlled Waters (Groundwater)</b><br><b>Superficial Soils:</b><br>Indicative Glaciofluvial Deposits<br><b>Bedrock:</b><br>Chester Formation (Principal Aquifers)<br>There are no potable groundwater abstraction points within 1km and the site is not within a designated Source Protection Zone. | <b>Medium</b>                       | <b>Low</b>               | <b>Moderate/Low</b> | Exceedance of UK DWS thresholds recorded for TCE in single groundwater sample obtained representative of bedrock aquifer. Site soils unlikely to be the source given no evidence of gross contamination was identified and TCE was recorded below LODs in soil samples obtained, however additional post- demolition should be undertaken given historical land uses.                                                                                                                                                                                                          |                                                                                              |
| Ground gas generating sources, including Made Ground on site.                   | Ground gas & vapour migration and inhalation. Vertical and horizontal migration through existing service corridors and the underlying superficial deposits. | <b>Site End Users</b><br>(Office block and amenity users)                                                                                                                                                                                                                                               | <b>Medium</b><br>Human Health Risk  | <b>Likely</b>            | <b>Low</b>          | Due to low carbon dioxide and methane concentrations recorded, Characteristic Gas Situation is assessed as CS1 with no need for specialist gas protection measures required in accordance with BS8485.                                                                                                                                                                                                                                                                                                                                                                         | No further gas protection measures required.                                                 |

## 9.1 Summary of Significant Pollutant Linkages

A **Moderate/Low** risk rating is identified to site end-users and construction workers, from soils and dust from inhalation and ingestion. No significant sources of contamination have been found to date however contamination may exist in areas which were not accessible during this ground investigation considering the sites historical industrial land uses. Additional post-demolition chemical analysis to be undertaken.

A **Low** and **Moderate/Low** risk rating is identified to controlled waters (Groundwater and Surface Waters) following the ground investigation. No exceedances of WFD EQS thresholds were identified. However an exceedance of UK DWS thresholds was recorded for TCE in single groundwater sample obtained from bedrock aquifer. The site soils are considered unlikely to be the source given no evidence of gross contamination was identified and the same halocarbon species were recorded below the laboratories limit of detection in soils. Additional post-demolition should be undertaken given historical land uses including further groundwater sampling.

A **Low** risk rating is identified to site end users from ground gases arising from site soils, migrating into buildings and subsequent inhalation by on-site staff and pupils. This corresponds to a Characteristic Gas Situation assessed as CS1; therefore, no specialist gas protection measures are required.

## 10.0 Geotechnical Assessment and Recommendations

### 10.1 Introduction

This section will discuss the ground and groundwater conditions encountered across the site and assess their associated risks for the proposed scope of the works. Development proposals include circa 19 storey mixed-use development of offices, event space, cafe and rooftop bar, restaurant, and spa. The proposed layout is included in *Appendix A*.

Any changes in the development of designs beyond the issue of this Ground Investigation Report to the client, should be further investigated by the Construction Designer.

### 10.2 Geotechnical Considerations

#### 10.2.1 Site Preparation

The Principal Designer and Principal Contractor should be informed of the site conditions and risk assessment undertaken to comply with the Construction Design Management (CDM) regulations. Site personnel are to be made aware of the site conditions prior to commencement on site.

#### 10.2.2 Presence of Existing Services

The presence of existing services may require detailed geotechnical design, capping and/or diversion associated with the development, which should be managed through the appropriate utility suppliers during the construction phase. The Principal Contractor should ensure that appropriate mitigation measures are put in place during the construction phase (i.e. during excavation of foundations) and designers must ensure that suitable geotechnical design is considered to avoid damage caused by issues such as settlement during both construction phase and design life of the proposed infrastructures.

#### 10.2.1 Obstructions

Several obstructions were encountered during the ground investigation which may pose risk to potential piling options.

Reinforced concrete within Made Ground to a maximum depth of 0.90m bgl was encountered in WS01. HD01, HD02A, HD02B and HD03 encountered reinforced concrete that could not be penetrated between 0.10m to 0.5m bgl.

### **10.2.2 Existing Foundations**

Various foundation hand pits were dug in three locations within the footprint of the existing building to identify the existing foundations. As the foundation types and geometries are still unknown further ground investigation is recommended to determine the geometry and extent of the existing foundations to determine the geotechnical constraints for the future development and ensure foundation clashes are avoided.

## **10.3 Foundation Design**

Development proposals include circa 19 storey mixed-use development of offices, event space, cafe and rooftop bar, restaurant, and spa.

The existing Made Ground and natural superficial soils will not be able to support shallow foundations due to the considerable loads.

It is therefore advised that a piled foundation solution is adopted, taking building loads to the underlying very weak to weak sandstone bedrock. Intact bedrock of the Chester Formation was encountered at depth of 9.50m bgl.

It is understood that current design proposals allow for the construction of a contiguous piled retaining walls around the perimeter of the building to allow basement construction and take perimeter column loads. Internal column loads will be supported by further piled foundations.

Pile design and installation are continually evolving processes, it is recommended that specialist piling contractors are contracted as to the suitability and carrying capacity of the piles in the ground conditions pertaining to the site.

The presence of groundwater within the bedrock should be considered during pile design.

A deep foundation/piling risk assessment is recommended to ensure that the proposed piling method will not have an adverse impact by creating new pathways for the migration of potential contamination, in relation to the protection of controlled waters.

## **10.4 Ground Floor Slabs**

Based on observations onsite, significant thickness of made ground of variable nature, together with the results of laboratory tests, it is recommended that consideration is given to a suspended ground floor slab.

Alternatively, a ground bearing slab for the basement may be feasible subject to removal of all made ground and any unsuitable natural deposits, forming on stiff clay or dense granular deposits.

The made ground thickness was not determined across the site in pre demolition investigation due to the presence of obstructions, this should be determined during post demolition investigation to further inform basement floor slab design.

### **10.5 Chemical Attack on Buried Concrete**

The site has been classified in accordance with BRE Special Digest 1 (Ref. 19) and laboratory testing undertaken accordingly in *Section 7.0*. Based on the laboratory test results obtained during the Curtins ground investigation, it is considered that a Design Sulphate Class may be taken as DS-2 with an ACEC class of AC-2 for Made Ground. For natural soils and bedrock a Design Sulphate Class may be taken as DS-1 with an ACEC class of AC-1.

Further chemical testing will be required during post demolition ground investigation to confirm the chemical environment of Made Ground soils and superficial natural soils within the footprint of the existing building with regards to Design Sulphate Class and ACEC Class. As such, the classification of the site may be subject to change.

### **10.6 Excavation and Support**

Based on observations on site, together with the results of in-situ and laboratory tests, it is considered that excavations to <1.20m bgl should stand unsupported in the short term. Side support for safety purposes should of course be provided to all excavations which appear unstable, and those >1.20m deep, in accordance with Health and Safety Regulations.

Suitable side slope angles must be checked and provided by a suitably qualified temporary works contractor for any excavations.

Perched groundwater may be encountered in shallow excavations for foundations or services. It is considered that groundwater inflows, if encountered, may be controlled by pumping from sumps.

Excavation through layers of Made Ground and superficial deposits encountered across the site should be feasible using conventional site plant, however consideration to specialist site plant if deep buried obstructions are encountered during post demolition ground investigation i.e. any infrastructure relating to historic gas works.

The chosen contractor should provide details on how they intend to ensure the safety and stability of proposed excavations.

## 11.0 Conclusions & Recommendations

### 11.1 Conclusions

#### 11.1.1 Ground and Groundwater Contamination

The environmental chemistry soil results have been compared with the Generic Assessment Criteria (GAC) for soils with respect to human health against the '*Commercial*' threshold.

No exceedances have been noted with respect to the '*Commercial*' GAC thresholds. No suspected asbestos containing materials (ACMs) were identified within any of the exploratory hole logs or during laboratory screening.

A **Moderate/Low** risk rating is identified to site end-users and construction workers, from soils and dust from inhalation and ingestion. No significant sources of contamination have been found to date however contamination may exist in areas which were not accessible during this ground investigation considering the sites historical industrial land uses. Additional post-demolition chemical analysis to be undertaken.

The environmental chemistry groundwater results have been compared with Generic Assessment Criteria (GAC) with respect to human health against the '*Commercial*' *SoBRA* thresholds for volatile organic compounds. No exceedances were recorded.

A **Low** risk rating is identified to site end-users, adjacent site users from vapour inhalation from groundwater.

The environmental chemistry groundwater results have been compared with Generic Assessment Criteria (GAC) with respect to Controlled Waters against the UK DWS and WFD EQS thresholds.

No exceedances of WFD EQS thresholds were identified. However an exceedance of UK DWS thresholds was recorded for TCE in single groundwater sample obtained from bedrock aquifer.

A **Low** and **Moderate/Low** risk rating is identified to controlled waters (Groundwater and Surface Waters respectively) following the ground investigation. The site soils are considered unlikely to be the source given no evidence of gross contamination was identified and TCE was recorded below the laboratories limit of detection in soils. An off site source is therefore likely to be responsible. Additional post-demolition should be undertaken given historical land uses including further groundwater sampling.

### 11.1.2 Ground Gas Assessment

Using the 'borehole  $Q_{hg}$  representative' scenario, due to results across various atmospheric pressures and weather conditions, the maximum calculated  $Q_{hg}$  for the site was 0.0033 l/hr l/hr for carbon dioxide and 0.014 l/hr for methane which are taken as the sites Gas Screening Values.

Considering the above, a Characteristic Gas Situation is assessed as CS1, with no specialist gas protection measures are required in accordance with BS8485.

A **Low** risk rating is identified to site end users from ground gases arising from site soils, migrating into buildings and subsequent inhalation by on-site staff and public. This corresponds to a Characteristic Gas Situation assessed as CS1, therefore no specialist gas protection measures are required.

The site is located within a Low Probability Radon Area (<1% of homes are above the radon action level).

## 11.2 Recommendations

Based on the findings of the ground investigation, the following recommendations are made:

- 1) Post-demolition ground investigation will be required to further characterise ground conditions in previously inaccessible areas; this should include obtaining additional soil and groundwater samples for chemical testing given the potential risks identified. Further rotary cored boreholes should be undertaken beneath the existing building footprint to obtain further rock cores for geotechnical analysis to inform pile design.
- 2) Further trial pitting is recommended to confirm extent and geometry of existing foundations which may be undertaken prior to or post demolition.
- 3) Should unexpected contamination be observed during demolition or construction advice should be obtained from a Geo-environmental Engineer.
- 4) It is recommended that construction workers are provided with appropriate PPE and sanitary facilities, with reference to the environmental testing results presented herein and within *Appendix C*.
- 5) Undertake deep foundation/piling risk assessment.

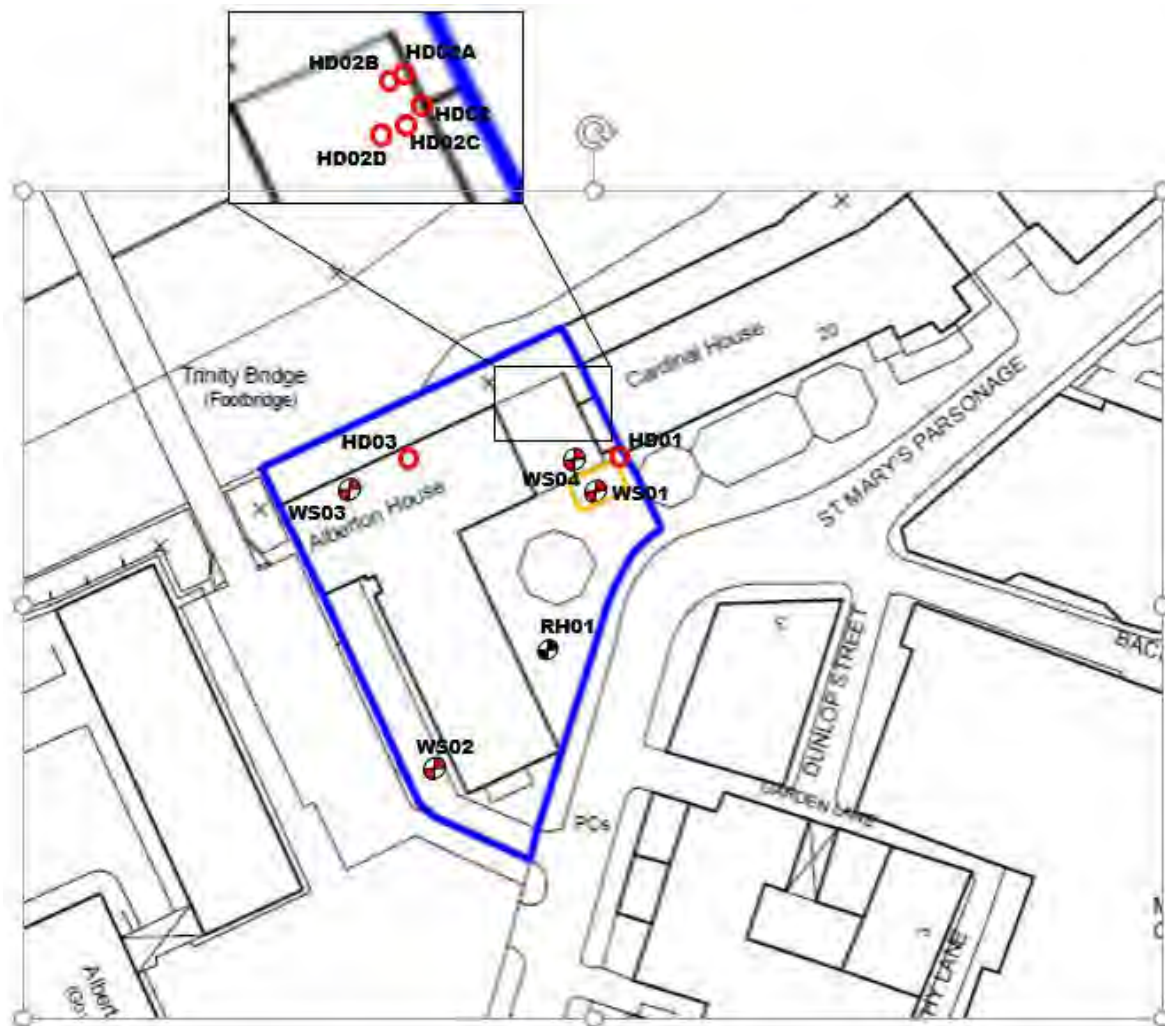
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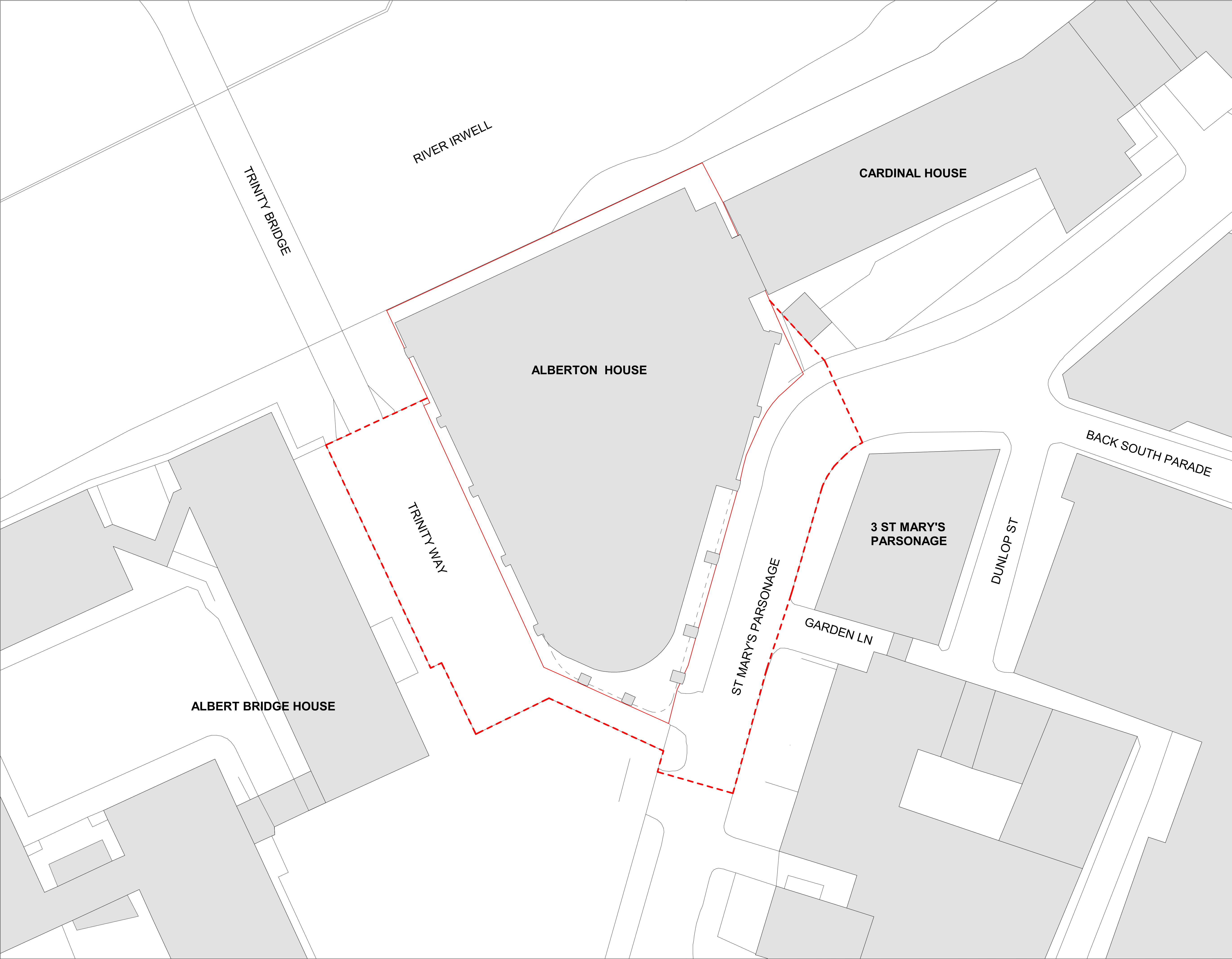
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## Appendix A – Drawings

- Curtins (2021), Exploratory Hole Location Plan, Ref. 077764-CUR-00-XX-DR-GE-004-V01.
- Development Plans



077764-CUR-00-XX-DR-GE-004-V01



Keyplan

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**KEY**

Alberton House Site Boundary

Alberton House Landscape proposal extents

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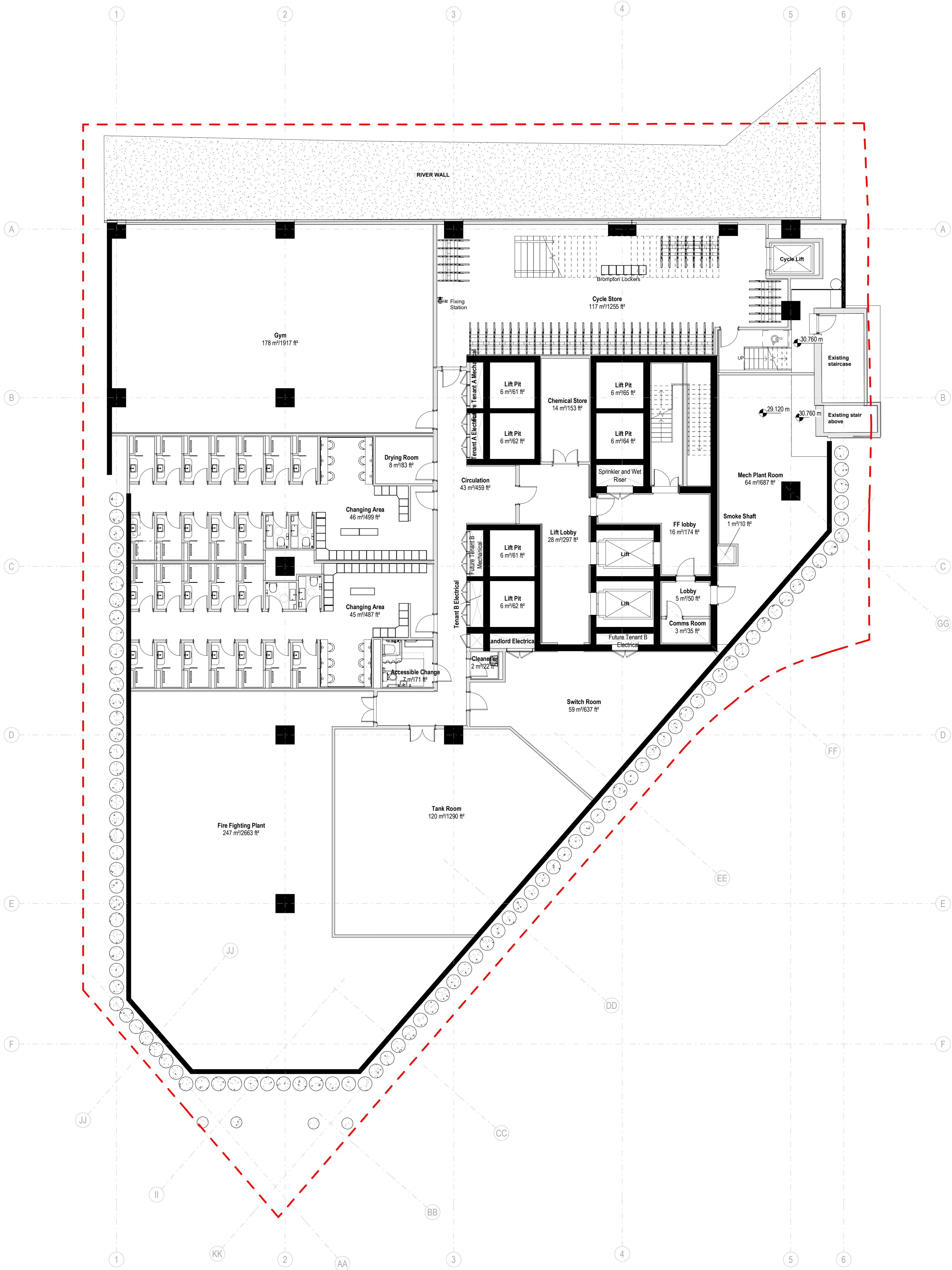
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St Mary's Parsonage, Manchester

Proposed Site Plan 1-200

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| 1 : 200   | Preliminary |             | <b>S1 - P01</b> |

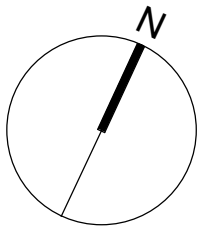
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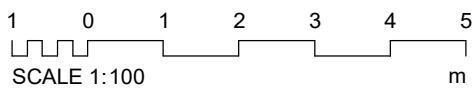


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| P10 | Stage 3 Issue for Information         | 31.03.22 | DH  | DS  |
| P09 | Core updated                          | 16.03.22 | DH  | DNB |
| P08 | Issued for Information                | 08.02.22 | DH  | DNB |
| P07 | Issue for Information                 | 02.12.21 | IS  | ELC |
| P06 | Stage 2 Issue for Information         | 18.10.21 | DH  | ELC |
| P05 | Issued for Information                | 08.10.21 | ELC |     |
| P04 | Interim Stage 2 Issue for Information | 17.09.21 | DH  | ELC |
| P03 | Issue for Coordination                | 06.09.21 | DH  | ELC |
| P02 | Draft Issue for Information           | 29.07.21 | DH  | ELC |
| P01 | Draft Issue for Information           | 25.05.21 | DH  | ELC |

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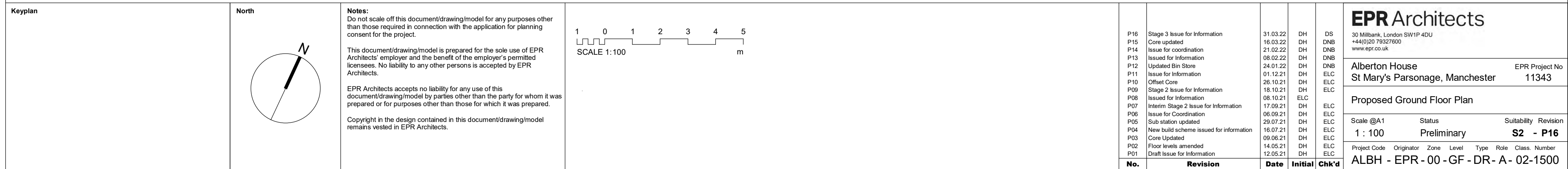
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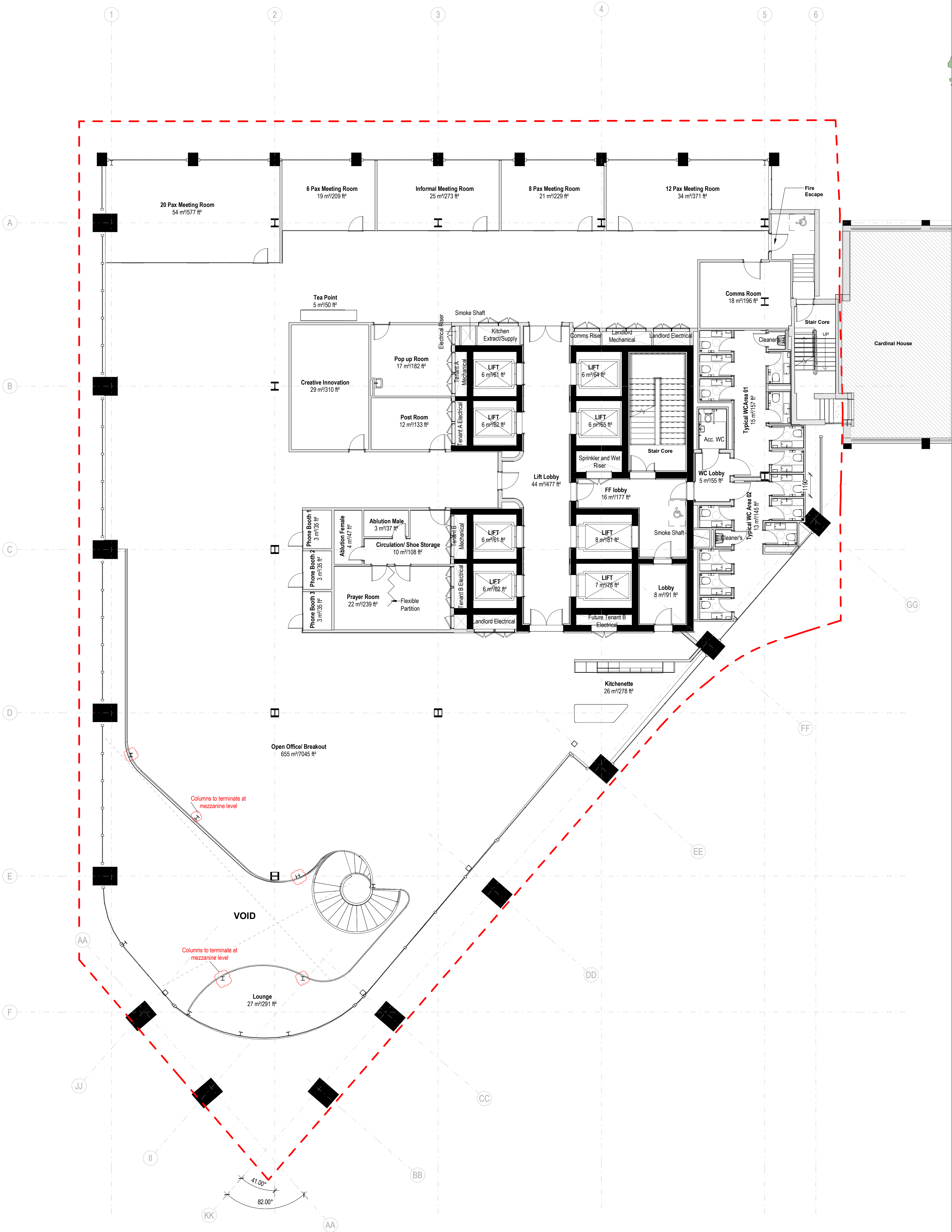
Proposed Basement Level Plan

Scale @A1 Status Preliminary Suitability Revision S2 - P10

Project Code ALBH - EPR - 00 - B1 - DR - A - 02-1530

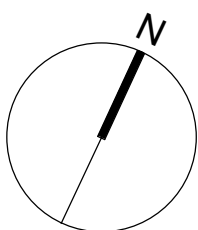


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| P16 | Stage 3 issue for Information             | 31.03.22 | DH      | DS   |
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| P14 | Issue for Information                     | 21.02.22 | DH      | DNB  |
| P13 | Issued for Information                    | 08.02.22 | DH      | DNB  |
| P12 | Updated Bin Store                         | 24.01.22 | DH      | DNB  |
| P11 | Issue for Information                     | 10.12.21 | DH      | ELC  |
| P10 | Offsite Cover                             | 18.10.21 | DH      | ELC  |
| P09 | Stage 2 Issue for Information             | 19.09.21 | DH      | ELC  |
| P08 | Issued for Information                    | 08.10.21 | ELC     | DS   |
| P07 | Interim Stage 2 Issue for Information     | 17.09.21 | DH      | ELC  |
|     | Issue for Coordination                    | 06.09.21 | DH      | ELC  |
| P06 | Site substation                           | 29.07.21 | DH      | ELC  |
| P04 | New building to be issued for information | 16.07.21 | DH      | ELC  |
|     | Cover Updated                             | 09.06.21 | DH      | ELC  |
|     | Drill levels amended                      | 14.05.21 | DH      | ELC  |
|     | Flow lines for Information                | 12.05.21 | DH      | ELC  |

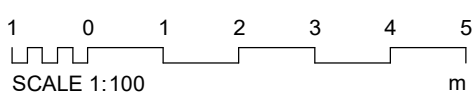


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| P12 | Core updated                            | 16.03.22 | DH | DNB |
| P11 | Issued for Information                  | 08.02.22 | DH | DNB |
| P10 | Issue for Information                   | 01.12.21 | DH | ELC |
| P09 | Office Core                             | 26.10.21 | DH | ELC |
| P08 | Stage 2 Issue for Information           | 18.10.21 | DH | ELC |
| P07 | Issued for Information                  | 08.10.21 | DH | ELC |
| P06 | Interim Stage 2 Issue for Information   | 17.09.21 | DH | ELC |
| P05 | Core updated                            | 25.08.21 | DH | ELC |
| P04 | New build scheme issued for information | 16.07.21 | DH | ELC |
| P03 | Core Updated                            | 09.06.21 | DH | ELC |
| P02 | Floor levels amended                    | 14.05.21 | DH | ELC |
| P01 | Draft Issue for Information             | 12.05.21 | DH | ELC |

| No. | Revision | Date | Initial | Chk'd |
|-----|----------|------|---------|-------|
|-----|----------|------|---------|-------|

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**Alberton House** EPR Project No 11343  
St Mary's Parsonage, Manchester

**Proposed Mezzanine Floor Plan**

Scale @A1 Status Suitability Revision  
**1 : 100 Preliminary S2 - P13**

|                                         |            |      |       |      |      |       |        |
|-----------------------------------------|------------|------|-------|------|------|-------|--------|
| Project Code                            | Originator | Zone | Level | Type | Role | Class | Number |
| ALBH - EPR - 00 - M1 - DR - A - 02-1501 |            |      |       |      |      |       |        |

## Appendix B – Exploratory Hole Logs

- Window Sample Borehole Logs, WS01 to WS04
- Rotary Cored Borehole Log, RH01
- Hand Excavated Trial Pit Logs and Cross-Sectional Sketches, HD01 to HD03



# Borehole Log

Borehole No.

**WS01**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764

Co-ords: 383503.00 - 398433.00

Hole Type  
WS

Location: Manchester

Level: 33.53

Scale  
1:25

Client: Bruntwood

Dates: 27/01/2022 - 28/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |         | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                    |   |
|------|---------------|-----------------------------|------|---------|-----------|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                   | Type | Results |           |           |        |                                                                                                                                                                        |   |
|      |               | 0.10                        |      |         | 0.10      | 33.43     |        | MADE GROUND: Red brick layer (decorative).                                                                                                                             | 1 |
|      |               | 0.65                        | ES   |         |           |           |        | MADE GROUND: Brown gravelly fine to coarse sand. Gravel is angular to subrounded of concrete, sandstone and brick.<br><i>From 0.15 to 0.25m gravelly cement layer.</i> |   |
|      |               | 0.90                        | ES   |         | 0.90      | 32.63     |        | End of borehole at 0.90 m                                                                                                                                              |   |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                        | 2 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                        | 3 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                        | 4 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                        | 5 |

**Remarks**

Service inspection pit hand excavated from GL to 0.90m. Exploratory hole terminated as unable to advance due to concrete at 0.90m. Unable to move position due to services in area. No groundwater encountered. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**WS02**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764

Co-ords: 383486.00 - 398396.00

Hole Type  
WS

Location: Manchester

Level: 32.72

Scale  
1:25

Client: Bruntwood

Dates: 27/01/2022 - 27/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |                          | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                     |   |
|------|---------------|-----------------------------|------|--------------------------|-----------|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                   | Type | Results                  |           |           |        |                                                                                                                                                                                                                         |   |
|      |               | 0.06                        |      |                          | 0.06      | 32.66     |        | MADE GROUND: Tarmacadam.<br>MADE GROUND: Reinforced concrete.                                                                                                                                                           |   |
|      |               | 0.25                        |      |                          | 0.25      | 32.47     |        | MADE GROUND: Reddish brown gravelly fine to coarse sand. Gravel is angular to subrounded fine to coarse of brick, concrete and sandstone. From 0.25 to 0.70m medium cobble content. Cobbles are subangular of concrete. |   |
|      |               | 0.40                        | ES   |                          |           |           |        |                                                                                                                                                                                                                         |   |
|      |               | 0.90                        | ES   |                          |           |           |        |                                                                                                                                                                                                                         |   |
|      |               | 1.20                        |      | N=2 (1,0/1,0,1,0)        |           |           |        |                                                                                                                                                                                                                         | 1 |
|      |               | 2.00                        |      | N=3 (1,0/2,0,1,0)        |           |           |        |                                                                                                                                                                                                                         | 2 |
|      |               | 2.50                        |      |                          | 2.50      | 30.22     |        | MADE GROUND: Brown gravelly sandy clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick and sandstone.                                                                                  |   |
|      |               | 3.00                        |      | N=21 (2,2/4,4,5,8)       |           |           |        |                                                                                                                                                                                                                         | 3 |
|      |               | 3.20                        |      |                          | 3.20      | 29.52     |        | Very stiff brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone and rare coal.                                                    |   |
|      |               | 4.00<br>4.00                | D    | N=39<br>(4,6/8,10,10,11) |           |           |        |                                                                                                                                                                                                                         | 4 |
|      |               | 4.50                        |      | 50 (11,14/50 for 35mm)   | 4.45      | 28.27     |        | Yellowish brown very clayey, fine to medium sand.                                                                                                                                                                       |   |
|      |               | 5.00                        | D    |                          | 5.00      | 27.72     |        | End of borehole at 5.00 m                                                                                                                                                                                               | 5 |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. No groundwater encountered. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**WS03**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764

Co-ords: 383472.00 - 398434.00

Hole Type  
WS

Location: Manchester

Level: 30.70

Scale  
1:25

Client: Bruntwood

Dates: 26/01/2022 - 27/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |                    | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                                                       |  |
|------|---------------|-----------------------------|------|--------------------|-----------|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|      |               | Depth (m)                   | Type | Results            |           |           |        |                                                                                                                                                                                                                                                                           |  |
|      |               |                             |      |                    | 0.26      | 30.44     |        | MADE GROUND: Reinforced concrete.                                                                                                                                                                                                                                         |  |
|      |               | 0.70                        | ES   |                    | 0.75      | 29.95     |        | MADE GROUND: Brown and reddish brown sandy angular to subrounded fine to coarse gravel of brick, concrete and sandstone with high cobble content. Sand is fine to coarse. Cobbles are angular to subangular of brick.<br><i>From 0.26 to 0.36m gravelly cement layer.</i> |  |
|      |               | 1.20                        |      | N=12 (1,1/1,1,5,5) |           |           |        | MADE GROUND: Brown very gravelly fine to coarse sand with low cobble content. Gravel is angular to subrounded fine to coarse of brick, concrete and sandstone. Cobbles are angular to subangular of brick.                                                                |  |
|      |               | 2.00<br>2.00                | ES   | N=4 (2,1/1,1,1,1)  |           |           |        |                                                                                                                                                                                                                                                                           |  |
|      |               | 3.00                        |      | N=15 (3,2/3,5,4,3) |           |           |        |                                                                                                                                                                                                                                                                           |  |
|      |               |                             |      |                    | 3.45      | 27.25     |        | End of borehole at 3.45 m                                                                                                                                                                                                                                                 |  |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Height of basement ceiling restricting drilling - exploratory hole terminated at maximum depth that can be reached. No groundwater encountered. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**WS04**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764

Co-ords: 383501.00 - 398438.00

Hole Type  
WS

Location: Manchester

Level: 30.69

Scale  
1:25

Client: Bruntwood

Dates: 26/01/2022 - 27/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |                    | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                                                         |   |
|------|---------------|-----------------------------|------|--------------------|-----------|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                   | Type | Results            |           |           |        |                                                                                                                                                                                                                                                                             |   |
|      |               |                             |      |                    | 0.30      | 30.39     |        | MADE GROUND: Reinforced concrete.                                                                                                                                                                                                                                           |   |
|      |               | 1.00                        | ES   |                    |           |           |        | MADE GROUND: Brown very gravelly fine to coarse sand with low cobble content. Gravel is angular to subrounded fine to coarse of brick, concrete and sandstone. Cobbles are angular to subangular of concrete and brick.<br><i>From 0.30 to 0.37m gravelly cement layer.</i> | 1 |
|      |               | 1.20                        |      | N=8 (4,4/3,2,2,1)  |           |           |        |                                                                                                                                                                                                                                                                             |   |
|      |               | 1.50                        | ES   |                    |           |           |        |                                                                                                                                                                                                                                                                             |   |
|      |               | 2.00                        |      | N=11 (1,2/4,4,2,1) |           |           |        |                                                                                                                                                                                                                                                                             | 2 |
|      |               | 3.00                        |      | N=15 (3,2/3,5,4,3) |           |           |        |                                                                                                                                                                                                                                                                             | 3 |
|      |               |                             |      |                    | 3.45      | 27.24     |        | End of borehole at 3.45 m                                                                                                                                                                                                                                                   | 4 |
|      |               |                             |      |                    |           |           |        |                                                                                                                                                                                                                                                                             | 5 |

## Remarks

Service inspection pit hand excavated from GL to 1.20m. Height of basement ceiling restricting drilling - exploratory hole terminated at maximum depth that can be reached. No groundwater encountered. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**RH01**

Sheet 1 of 4

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RO

Location: Manchester

Level: 33.61

Scale  
1:50

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |                              | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                                  |   |
|------|---------------|-----------------------------|------|------------------------------|-----------|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                   | Type | Results                      |           |           |        |                                                                                                                                                                                                                                                      |   |
| 1    |               |                             |      |                              | 0.10      | 33.51     |        | MADE GROUND: Brick paving.                                                                                                                                                                                                                           |   |
|      |               |                             |      |                              | 0.35      | 33.26     |        | MADE GROUND: Light brown very gravelly fine to coarse sand. Gravel is angular to subrounded fine to coarse of concrete and sandstone.                                                                                                                |   |
|      |               | 0.60                        | ES   |                              |           |           |        | MADE GROUND: Greyish brown very gravelly slightly clayey fine to coarse sand with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Cobbles are subangular of sandstone and brick. Rebar present. | 1 |
|      |               | 1.00                        | ES   |                              | 0.95      | 32.66     |        | MADE GROUND: Grey gravelly slightly clayey fine to coarse sand. Gravel is angular to subangular fine to coarse of concrete and brick. Hydrocarbon odour present.                                                                                     | 2 |
|      |               | 1.20                        |      | N=31<br>(9,10/11,10,9,1)     |           |           |        | Soft brown slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is angular to subangular fine to medium of sandstone.                                                                                                                   |   |
|      |               | 1.80                        | D    |                              | 1.80      | 31.81     |        | Brown and grey angular to rounded fine to coarse GRAVEL of sandstone and siltstone with firm to stiff grey clay inclusions and low cobble content. Cobbles are subangular of sandstone and siltstone. (Limited core recovery).                       | 3 |
|      |               | 2.00                        |      | N=18 (3,5/5,4,5,4)           | 2.00      | 31.61     |        |                                                                                                                                                                                                                                                      |   |
|      |               | 3.50                        |      | 50 (9,10/50 for 115mm)       |           |           |        |                                                                                                                                                                                                                                                      | 4 |
|      |               | 5.00                        |      | N=22 (4,5/6,6,5,5)           |           |           |        |                                                                                                                                                                                                                                                      | 5 |
|      |               | 6.50                        |      | N=40 (1,4/6,11,12,11)        |           |           |        |                                                                                                                                                                                                                                                      | 6 |
| 2    |               | 8.00                        |      | N=50 (4,3/50 for 245mm)      |           |           |        |                                                                                                                                                                                                                                                      | 7 |
|      |               | 9.50                        |      | 50 (25 for 75mm/50 for 35mm) | 9.50      | 24.11     |        | Very weak reddish brown fine to medium grained SANDSTONE.<br>From 9.50 to 9.58m recovered as non-intact core of sandy                                                                                                                                | 8 |
|      |               | Continued on next sheet     |      |                              |           |           |        |                                                                                                                                                                                                                                                      |   |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**RH01**

Sheet 2 of 4

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RO

Location: Manchester

Level: 33.61

Scale  
1:50

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |                              | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |
|------|---------------|-----------------------------|------|------------------------------|-----------|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|      |               | Depth (m)                   | Type | Results                      |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |
|      |               | 11.00                       |      | 50 (25 for 75mm/50 for 40mm) |           |           |        | <u>angular cobbles.</u><br>9.58 to 10.01m 0 to 10 degrees very closely spaced to closely spaced planar, rough.<br>From 10.01 to 12.50m no recovery.                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11 |
|      |               | 12.50                       |      | 50 (25 for 75mm/50 for 60mm) |           |           |        | 12.50 to 12.74m 0 to 10 degrees closely spaced planar, rough.<br>From 12.74 to 14.00m no recovery.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 12 |
|      |               | 14.00                       |      | 50 (25 for 75mm/50 for 25mm) |           |           |        | 14.00 to 14.10m 0 degrees closely spaced planar, rough.<br>From 14.10 to 15.50m no recovery.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13 |
|      |               |                             |      |                              |           |           |        | From 15.50 to 15.84m recovered as non-intact core of angular cobbles.<br>15.84 to 16.00m 10 degrees closely spaced planar, rough.<br>From 16.00 to 17.00m no recovery.                                                                                                                                                                                                                                                                                                                                                                                                                          | 14 |
|      |               | 17.00                       |      | 50 (25 for 75mm/50 for 20mm) | 17.00     | 16.61     |        | Weak reddish brown medium to coarse grained SANDSTONE with occasional gravel inclusions.<br>From 17.00 to 17.05m recovered as non-intact core of cobbles.<br>17.05 to 17.14m 0 to 10 degrees very closely spaced to closely spaced planar, rough.<br>From 17.14 to 17.79m recovered as non-intact core of cobbles.<br>17.79 to 18.09m 0 to 10 degrees closely spaced planar, rough.<br>From 18.09 to 18.14m recovered as non-intact core of cobbles.<br>18.14 to 18.50m 0 to 10 degrees closely spaced planar, rough.<br>From 18.39 to 18.50m no recovery.<br>From 18.50 to 20.00m no recovery. | 15 |
|      |               |                             |      |                              |           |           |        | Continued on next sheet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16 |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**RH01**

Sheet 3 of 4

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RO

Location: Manchester

Level: 33.61

Scale  
1:50

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |                              | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                        |    |
|------|---------------|-----------------------------|------|------------------------------|-----------|-----------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|      |               | Depth (m)                   | Type | Results                      |           |           |        |                                                                                                                                                                                            |    |
|      |               | 21.50                       |      | 50 (25 for 75mm/50 for 75mm) | 21.80     | 11.81     |        | From 20.07 to 20.11m recovered as non-intact core of cobbles.<br>20.11 to 20.56m 0 to 10 degrees very closely spaced to closely spaced planar, rough.<br>From 20.56 to 21.50m no recovery. | 21 |
|      |               |                             |      |                              |           |           |        | 21.50 to 21.80m 0 to 10 degrees closely spaced planar, rough.                                                                                                                              |    |
|      |               |                             |      |                              |           |           |        | Weak reddish brown fine grained SANDSTONE.<br>21.80 to 22.42m 0 to 10 degrees closely spaced to medium spaced, locally very closely spaced planar, rough.                                  | 22 |
|      |               |                             |      |                              |           |           |        | Medium strong reddish brown medium to coarse grained SANDSTONE with occasional gravel inclusions.<br>22.42 to 23.64m 0 to 10 degrees very closely spaced to closely spaced planar, rough.  | 23 |
|      |               |                             |      |                              |           |           |        | From 23.64 to 24.50m no recovery.                                                                                                                                                          | 24 |
|      |               | 24.50                       |      | 50 (25 for 75mm/50 for 15mm) | 26.04     | 7.57      |        | 24.50 to 25.77m 0 to 10 degrees closely to medium spaced, locally very closely spaced planar, rough.                                                                                       | 25 |
|      |               |                             |      |                              |           |           |        | From 25.77 to 26.00m no recovery.                                                                                                                                                          |    |
|      |               |                             |      |                              |           |           |        | 26.00 to 26.04m 0 to 10 degrees closely spaced planar, rough.                                                                                                                              | 26 |
|      |               |                             |      |                              |           |           |        | Medium strong reddish brown fine to medium grained SANDSTONE.<br>26.04 to 26.81m 0 to 10 degrees closely spaced to medium spaced planar, rough.<br>From 26.81 to 27.50m no recovery.       | 27 |
|      |               |                             |      |                              |           |           |        | Medium strong reddish brown medium to coarse SANDSTONE with occasional gravel inclusions.<br>27.50 to 28.09m 0 to 10 degrees very closely spaced to closely spaced planar, rough.          | 28 |
|      |               |                             |      |                              | 27.50     | 6.11      |        | From 28.09 to 28.20m recovered as non-intact core of cobbles.<br>28.20 to 28.84m 0 to 10 degrees closely spaced to medium spaced planar, rough.                                            |    |
|      |               |                             |      |                              |           |           |        | From 28.84 to 29.00m no recovery.                                                                                                                                                          |    |
|      |               |                             |      |                              |           |           |        | 29.00 to 30.19m 0 to 10 degrees very closely spaced to closely spaced planar, rough.                                                                                                       | 29 |
|      |               |                             |      |                              |           |           |        |                                                                                                                                                                                            |    |
|      |               |                             |      |                              |           |           |        |                                                                                                                                                                                            | 30 |

Continued on next sheet

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Borehole Log

Borehole No.

**RH01**

Sheet 4 of 4

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RO

Location: Manchester

Level: 33.61

Scale  
1:50

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Samples and In Situ Testing |      |         | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                  |    |
|------|---------------|-----------------------------|------|---------|-----------|-----------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|      |               | Depth (m)                   | Type | Results |           |           |        |                                                                                                                                                                                                                                      |    |
|      |               |                             |      |         | 30.50     | 3.11      |        | <div>From 30.19 to 30.26m recovered as non-intact core of cobbles.</div> <div>30.26 to 30.33m 0 to 10 degrees closely spaced planar, rough.</div> <div>From 30.33 to 30.50m no recovery.</div> <div>End of borehole at 30.50 m</div> | 31 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 32 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 33 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 34 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 35 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 36 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 37 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 38 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 39 |
|      |               |                             |      |         |           |           |        |                                                                                                                                                                                                                                      | 40 |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Rotary Core Log

Borehole No.

**RH01**

Sheet 1 of 8

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RC

Location: Manchester

Level: 33.61

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Depth (m) | Type / Fl | Coring |     |     | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                                  |   |
|------|---------------|-----------|-----------|--------|-----|-----|-----------|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               |           |           | TCR    | SCR | RQD |           |           |        |                                                                                                                                                                                                                                                      |   |
|      |               | 0.60      | ES        |        |     |     | 0.10      | 33.51     |        | MADE GROUND: Brick paving.                                                                                                                                                                                                                           | 1 |
|      |               |           |           |        |     |     | 0.35      | 33.26     |        | MADE GROUND: Light brown very gravelly fine to coarse sand. Gravel is angular to subrounded fine to coarse of concrete and sandstone.                                                                                                                |   |
|      |               |           |           |        |     |     |           |           |        | MADE GROUND: Greyish brown very gravelly slightly clayey fine to coarse sand with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Cobbles are subangular of sandstone and brick. Rebar present. |   |
|      |               | 1.00      | ES        |        |     |     | 0.95      | 32.66     |        | MADE GROUND: Grey gravelly slightly clayey fine to coarse sand. Gravel is angular to subangular fine to coarse of concrete and brick. Hydrocarbon odour present.                                                                                     |   |
|      |               |           |           |        |     |     |           |           |        | Soft brown slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is angular to subangular fine to medium of sandstone.                                                                                                                   |   |
|      |               | 1.80      | D         |        |     |     | 1.80      | 31.81     |        | Brown and grey angular to rounded fine to coarse GRAVEL of sandstone and siltstone with firm to stiff grey clay inclusions and low cobble content. Cobbles are subangular of sandstone and siltstone. (Limited core recovery).                       | 2 |
|      |               |           |           |        |     |     | 2.00      | 31.61     |        |                                                                                                                                                                                                                                                      | 3 |
|      |               |           |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                      | 4 |

Continued on next sheet

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





## RH01

Project Name: Alberton House

Co-ords: 383495.00 - 398418.00

Location: Manchester

|        |       |
|--------|-------|
| Level: | 33.61 |
|--------|-------|

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

[illegible]

Continued on next sheet

|         |  |
|---------|--|
| Remarks |  |
|---------|--|

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.







# Rotary Core Log

Borehole No.

**RH01**

Sheet 4 of 8

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RC

Location: Manchester

Level: 33.61

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Depth (m)     | Type / FI | Coring |     |     | Depth (m) | Level (m) | Legend | Stratum Description                                                   |    |
|------|---------------|---------------|-----------|--------|-----|-----|-----------|-----------|--------|-----------------------------------------------------------------------|----|
|      |               |               |           | TCR    | SCR | RQD |           |           |        |                                                                       |    |
|      |               |               |           |        |     |     |           |           |        |                                                                       |    |
|      |               |               | 13        |        |     |     |           |           |        | 12.50 to 12.74m 0 to 10 degrees closely spaced planar, rough.         |    |
|      |               |               |           |        |     |     |           |           |        | From 12.74 to 14.00m no recovery.                                     |    |
|      |               | 12.50 - 14.00 | NR        | 16     | 16  | 0   |           |           |        |                                                                       | 13 |
|      |               |               | 10        |        |     |     |           |           |        | 14.00 to 14.10m 0 degrees closely spaced planar, rough.               |    |
|      |               |               |           |        |     |     |           |           |        | From 14.10 to 15.50m no recovery.                                     |    |
|      |               | 14.00 - 15.50 | NR        | 7      | 7   | 7   |           |           |        |                                                                       | 14 |
|      |               |               | NI        |        |     |     |           |           |        | From 15.50 to 15.84m recovered as non-intact core of angular cobbles. |    |
|      |               |               | 13        |        |     |     |           |           |        | 15.84 to 16.00m 10 degrees closely spaced planar, rough.              |    |
|      |               |               |           |        |     |     |           |           |        | Continued on next sheet                                               | 16 |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Rotary Core Log

Borehole No.

**RH01**

Sheet 5 of 8

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RC

Location: Manchester

Level: 33.61

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Depth (m)     | Type / FI | Coring |     |     | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                               |    |  |
|------|---------------|---------------|-----------|--------|-----|-----|-----------|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--|
|      |               |               |           | TCR    | SCR | RQD |           |           |        |                                                                                                                                                                                                                                                   |    |  |
|      |               | 15.50 - 17.00 | NR        | 33     | 10  | 0   | 17.00     | 16.61     |        | From 16.00 to 17.00m no recovery.                                                                                                                                                                                                                 | 17 |  |
|      |               | 17.00 - 18.50 | NI        | 93     | 83  | 7   |           |           |        | Weak reddish brown medium to coarse grained SANDSTONE with occasional gravel inclusions.<br>From 17.00 to 17.05m recovered as non-intact core of cobbles.<br>17.05 to 17.14m 0 to 10 degrees very closely spaced to closely spaced planar, rough. |    |  |
|      |               |               | 16        |        |     |     |           |           |        |                                                                                                                                                                                                                                                   |    |  |
|      |               |               | NI        |        |     |     |           |           |        |                                                                                                                                                                                                                                                   |    |  |
|      |               |               | 13        |        |     |     |           |           |        |                                                                                                                                                                                                                                                   |    |  |
|      |               |               | NI        |        |     |     |           |           |        |                                                                                                                                                                                                                                                   |    |  |
|      |               |               | 14        |        |     |     |           |           |        |                                                                                                                                                                                                                                                   |    |  |
|      |               | 18.50 - 20.00 | NR        | 0      | 0   | 0   |           |           |        | From 17.74 to 17.79m recovered as non-intact core of cobbles.<br>17.79 to 18.09m 0 to 10 degrees closely spaced planar, rough.                                                                                                                    |    |  |
|      |               |               |           |        |     |     |           |           |        | From 18.09 to 18.14m recovered as non-intact core of cobbles.<br>18.14 to 18.50m 0 to 10 degrees closely spaced planar, rough.                                                                                                                    |    |  |
|      |               |               |           |        |     |     |           |           |        | From 18.39 to 18.50m no recovery.<br>From 18.50 to 20.00m no recovery.                                                                                                                                                                            |    |  |
|      |               |               |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                   |    |  |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Rotary Core Log

Borehole No.

**RH01**

Sheet 6 of 8

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RC

Location: Manchester

Level: 33.61

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well          | Water Strikes | Depth (m)     | Type / FI | Coring |                                                                                     |                                                                                                                                                                         | Depth (m) | Level (m) | Legend                                                                                                                                                                                                  | Stratum Description                                                                                                                                                 |                                                                                     |                                                                      |    |
|---------------|---------------|---------------|-----------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|----|
|               |               |               |           | TCR    | SCR                                                                                 | RQD                                                                                                                                                                     |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               | 20.00 - 21.50 | >25       | 37     | 37                                                                                  | 9                                                                                                                                                                       | 21.80     | 11.81     |                                                                                                                        | <u>From 20.07 to 20.11m recovered as non-intact core of cobbles.</u><br><u>20.11 to 20.56m 0 to 10 degrees very closely spaced to closely spaced planar, rough.</u> | 21                                                                                  |                                                                      |    |
|               |               |               | NI        |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               | 11        |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               | NR        |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               | 21.50 - 23.00 | 7         | 100    | 100                                                                                 | 77                                                                                                                                                                      |           |           | 22.42                                                                                                                                                                                                   | 11.19                                                                                                                                                               |  | <u>21.50 to 21.80m 0 to 10 degrees closely spaced planar, rough.</u> | 22 |
|               |               |               | 6         |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
| 23.00 - 24.50 | 13            | 57            | 57        | 13     |  | <u>Weak reddish brown fine grained SANDSTONE.</u><br><u>21.80 to 22.42m 0 to 10 degrees closely spaced to medium spaced, locally very closely spaced planar, rough.</u> | 23        |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           |                                                                                                                                                                                                         |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           | <u>Medium strong reddish brown medium to coarse grained SANDSTONE with occasional gravel inclusions.</u><br><u>22.42 to 23.64m 0 to 10 degrees very closely spaced to closely spaced planar, rough.</u> |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           | <u>From 23.64 to 24.50m no recovery.</u>                                                                                                                                                                |                                                                                                                                                                     |                                                                                     |                                                                      |    |
|               |               |               |           |        |                                                                                     |                                                                                                                                                                         |           |           | Continued on next sheet                                                                                                                                                                                 | 24                                                                                                                                                                  |                                                                                     |                                                                      |    |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Rotary Core Log

Borehole No.

**RH01**

Sheet 7 of 8

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RC

Location: Manchester

Level: 33.61

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Depth (m)     | Type / FI | Coring |     |     | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                              |    |
|------|---------------|---------------|-----------|--------|-----|-----|-----------|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|      |               |               |           | TCR    | SCR | RQD |           |           |        |                                                                                                                                                                                                                  |    |
|      |               |               | NR        |        |     |     |           |           |        |                                                                                                                                                                                                                  |    |
|      |               | 24.50 - 26.00 | 11        | 85     | 85  | 46  |           |           |        | 24.50 to 25.77m 0 to 10 degrees closely to medium spaced, locally very closely spaced planar, rough.                                                                                                             | 25 |
|      |               |               | NR        |        |     |     |           |           |        | From 25.77 to 26.00m no recovery.                                                                                                                                                                                |    |
|      |               | 26.00 - 27.50 | 8         | 54     | 54  | 37  | 26.04     | 7.57      |        | 26.00 to 26.04m 0 to 10 degrees closely spaced planar, rough.<br>Medium strong reddish brown fine to medium grained SANDSTONE.<br>26.04 to 26.81m 0 to 10 degrees closely spaced to medium spaced planar, rough. | 26 |
|      |               |               | NR        |        |     |     |           |           |        | From 26.81 to 27.50m no recovery.                                                                                                                                                                                | 27 |
|      |               |               | 12        |        |     |     | 27.50     | 6.11      |        | Medium strong reddish brown medium to coarse SANDSTONE with occasional gravel inclusions.<br>27.50 to 28.09m 0 to 10 degrees very closely spaced to closely spaced planar, rough.                                | 28 |

Continued on next sheet

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Rotary Core Log

Borehole No.

**RH01**

Sheet 8 of 8

Project Name: Alberton House

Project No.  
077764

Co-ords: 383495.00 - 398418.00

Hole Type  
RC

Location: Manchester

Level: 33.61

Scale  
1:20

Client: Bruntwood

Dates: 14/01/2022 - 17/01/2022

Logged By  
ZH

| Well | Water Strikes | Depth (m)     | Type / FI | Coring |     |     | Depth (m) | Level (m) | Legend | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |  |  |  |  |    |
|------|---------------|---------------|-----------|--------|-----|-----|-----------|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|--|--|--|--|----|
|      |               |               |           | TCR    | SCR | RQD |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               | 27.50 - 29.00 |           | 89     | 82  | 23  | 30.50     | 3.11      |        | <div><div>From 28.09 to 28.20m recovered as non-intact core of cobbles.</div><div>28.20 to 28.84m 0 to 10 degrees closely spaced to medium spaced planar, rough.</div><div>From 28.84 to 29.00m no recovery.</div><div>29.00 to 30.19m 0 to 10 degrees very closely spaced to closely spaced planar, rough.</div><div>From 30.19 to 30.26m recovered as non-intact core of cobbles.</div><div>30.26 to 30.33m 0 to 10 degrees closely spaced planar, rough.</div><div>From 30.33 to 30.50m no recovery.</div><div>End of borehole at 30.50 m</div></div> | 29 |    |  |  |  |  |    |
|      |               |               | NI        |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               | 14        |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               | 29.00 - 30.50 | NR        | 89     | 84  | 29  |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    | 30 |  |  |  |  |    |
|      |               |               | 11        |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               | NI        |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               | 14        |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               | NR        |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  | 31 |
|      |               |               |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |
|      |               |               |           |        |     |     |           |           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |  |  |  |  |    |

**Remarks**

Service inspection pit hand excavated from GL to 1.20m. Drilled from 1.20 to 30.50m by Geobore S drilling methods. Groundwater unable to be recorded due to water flush. Elevation and borehole locations surveyed or estimated from topo. Ground level and co-ordinates estimated from the topographical surveys provided.





# Trial Pit Log

Trialpit No

**HD01**

Sheet 1 of 1

|               |                |
|---------------|----------------|
| Project Name: | Alberton House |
|---------------|----------------|

|             |
|-------------|
| Project No. |
| 077764      |

|          |                       |
|----------|-----------------------|
| Co-ords: | 383507.00 - 398435.00 |
|----------|-----------------------|

Level: 33.35

Date \_\_\_\_\_

27/01/2022

Location: Manchester

Dimensions  
(m):

11

Scale

1:20

Logged  
ZH

Client: Bruntwood

Depth  
0.10

| Water<br>Strike | Samples and In Situ Testing |      |         | Depth<br>(m) | Level<br>(m) | Legend                                                                            | Stratum Description                                                |
|-----------------|-----------------------------|------|---------|--------------|--------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|
|                 | Depth                       | Type | Results |              |              |                                                                                   |                                                                    |
|                 |                             |      |         | 0.10         | 33.25        |  | MADE GROUND: Reinforced concrete.<br>-----<br>End of pit at 0.10 m |

|          |                                                                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remarks: | Borehole terminated at 0.10m due to unable to progress through concrete block. Ground level and co-ordinates estimated from the topographical surveys provided. |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

Stability: Stable.





# Trial Pit Log

Trialpit No

**HD02**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764Co-ords: 383502.00 - 398441.00  
Level: 30.70Date  
26/01/2022

Location: Manchester

Dimensions  
(m):Depth  
1.20Scale  
1:20Logged  
ZH

Client: Bruntwood

| Water<br>Strike | Samples and In Situ Testing |      |         | Depth<br>(m) | Level<br>(m) | Legend | Stratum Description                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------|------|---------|--------------|--------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Depth                       | Type | Results |              |              |        |                                                                                                                                                                                                                                                                             |
|                 | 0.80                        | ES   |         | 0.35         | 30.35        |        | MADE GROUND: Reinforced concrete.                                                                                                                                                                                                                                           |
|                 |                             |      |         |              |              |        | MADE GROUND: Brown very gravelly fine to coarse sand with low cobble content. Gravel is angular to subrounded fine to coarse of brick, concrete and sandstone. Cobbles are angular to subangular of concrete and brick.<br><i>From 0.35 to 0.40m gravelly cement layer.</i> |
|                 |                             |      |         | 1.20         | 29.50        |        | End of pit at 1.20 m                                                                                                                                                                                                                                                        |

Remarks: Concrete cored from GL to 0.35m. Concrete foundation encountered at 1.20m. Concrete slab encountered at 0.79m. Refer to the Foundation Pit Cross-section HD02 for details. Ground level and co-ordinates estimated from the topographical surveys provided.

Stability: Stable.









# Trial Pit Log

Trialpit No

**HD02C**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764Co-ords: 383502.00 - 398441.00  
Level: 30.70Date  
28/01/2022

Location: Manchester

Dimensions  
(m):Depth  
1.18Scale  
1:20Logged  
ZH

Client: Bruntwood

| Water<br>Strike | Samples and In Situ Testing |      |         | Depth<br>(m) | Level<br>(m) | Legend | Stratum Description                                                                                                                                                                                   |
|-----------------|-----------------------------|------|---------|--------------|--------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Depth                       | Type | Results |              |              |        |                                                                                                                                                                                                       |
|                 |                             |      |         | 0.32         | 30.38        |        | MADE GROUND: Reinforced concrete.                                                                                                                                                                     |
|                 |                             |      |         | 1.18         | 29.52        |        | MADE GROUND: Brown gravelly fine to coarse sand with low cobble content. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone. Cobbles are angular to subangular of brick. |
|                 |                             |      |         |              |              |        | End of pit at 1.18 m                                                                                                                                                                                  |

1

2

3

4

Remarks: Concrete cored from GL to 0.32m. Exploratory hole positioned 1m in front of HD02. Refer to the Foundation Pit Cross-section HD02C for details. Ground level and co-ordinates estimated from the topographical surveys provided.

Stability: Stable.





# Trial Pit Log

Trialpit No

**HD02D**

Sheet 1 of 1

Project Name: Alberton House

Project No.  
077764

Co-ords: 383501.00 - 398441.00

Level: 30.70

Date

28/01/2022

Location: Manchester

Dimensions  
(m):Depth  
1.20Scale  
1:20Logged  
ZH

Client: Bruntwood

| Water<br>Strike | Samples and In Situ Testing |      |         | Depth<br>(m) | Level<br>(m) | Legend | Stratum Description                                                                                                                                                                                   |
|-----------------|-----------------------------|------|---------|--------------|--------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Depth                       | Type | Results |              |              |        |                                                                                                                                                                                                       |
|                 |                             |      |         | 0.32         | 30.38        |        | MADE GROUND: Reinforced concrete.                                                                                                                                                                     |
|                 |                             |      |         | 1.20         | 29.50        |        | MADE GROUND: Brown gravelly fine to coarse sand with low cobble content. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone. Cobbles are angular to subangular of brick. |
|                 |                             |      |         |              |              |        | End of pit at 1.20 m                                                                                                                                                                                  |

1

2

3

4

Remarks: Concrete cored from GL to 0.32m. Exploratory hole positioned 1m in front of HD02C. Refer to the Foundation Pit Cross-section HD02D for details. Ground level and co-ordinates estimated from the topographical surveys provided.

Stability: Stable.





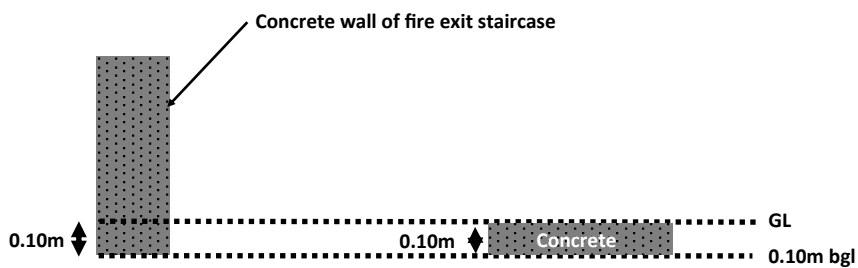
077764-CUR-00-XX-DR-GE-001-P01



Alberton House

Foundation Pit Cross Sectional Sketches

HD01



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD01.

Terminated at 0.10m bgl as unable to advance in concrete.

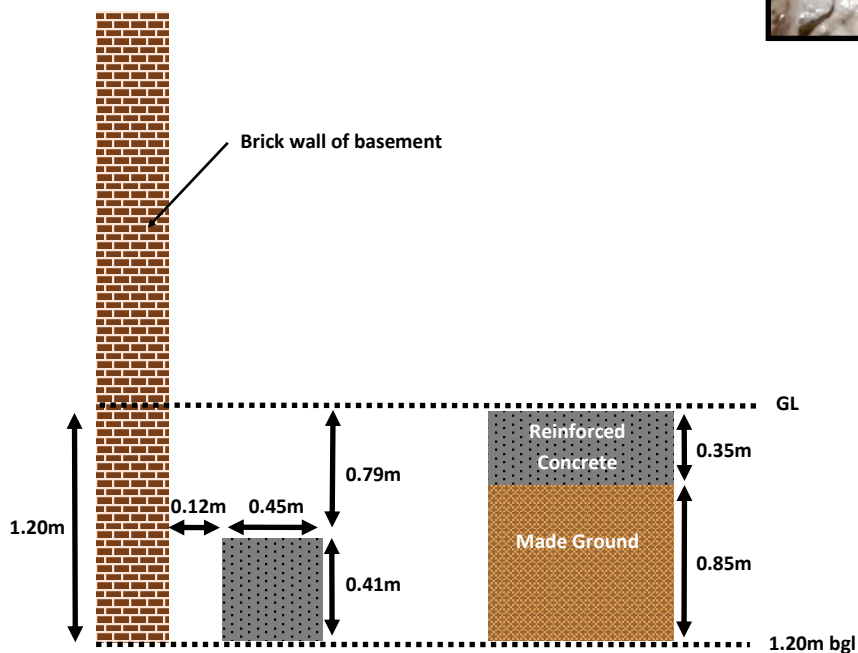
077764-CUR-00-XX-DR-GE-002-P01



Alberton House

Foundation Pit Cross Sectional Sketches

HD02



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD02.

Terminated at 1.20m bgl as unable to advance to a further depth.

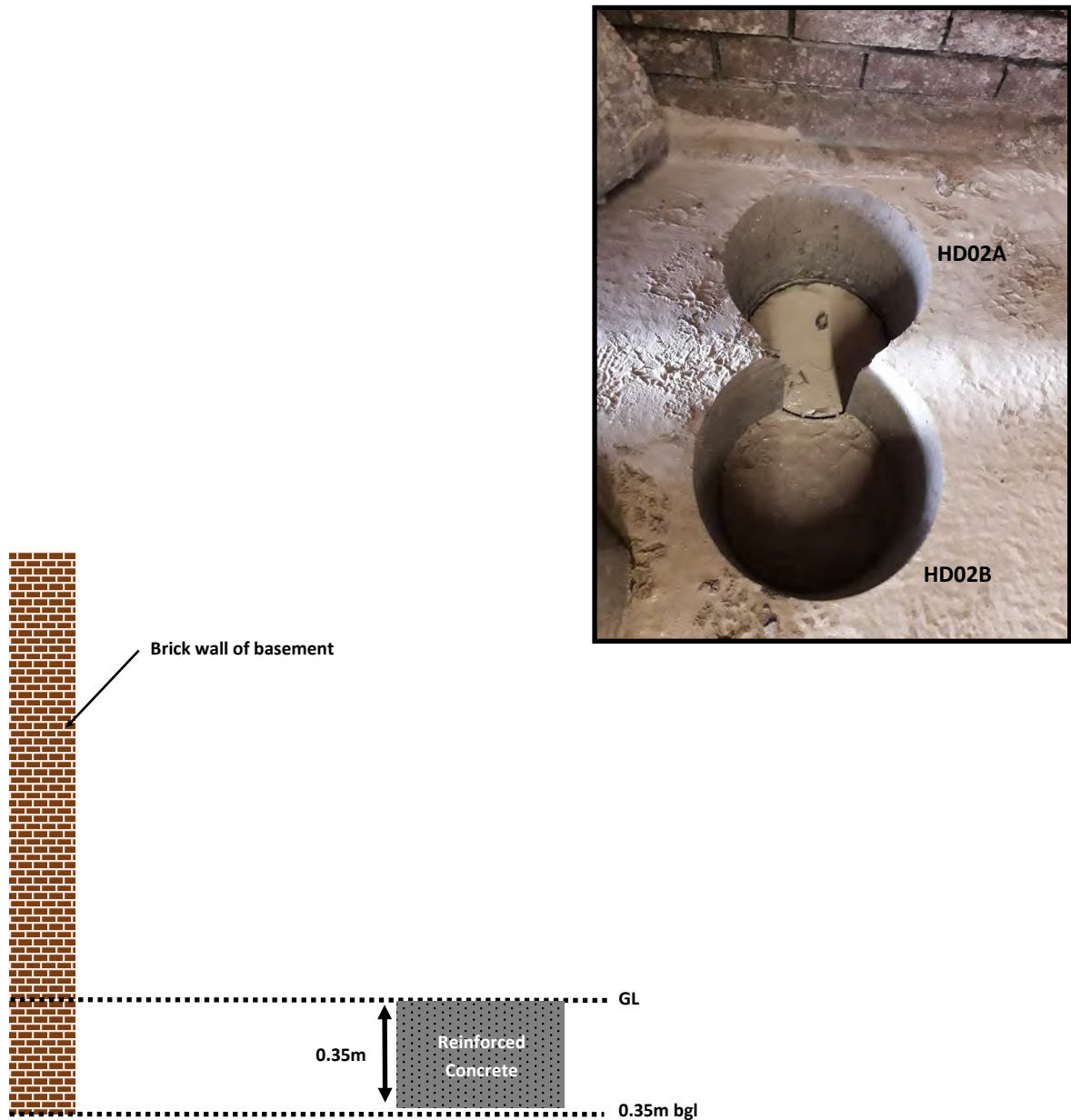
077764-CUR-00-XX-DR-GE-003-P01



Alberton House

Foundation Pit Cross Sectional Sketches

**HD02A**



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD02A.

Terminated at 0.35m bgl as unable to advance in concrete.

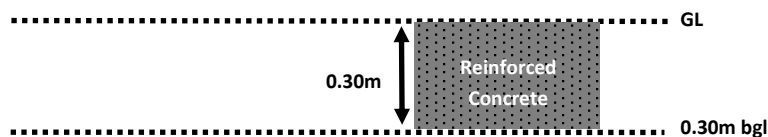
077764-CUR-00-XX-DR-GE-004-P01



Alberton House

Foundation Pit Cross Sectional Sketches

**HD02B**



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD02B.

Terminated at 0.30m bgl as unable to advance in concrete.

Foundation pit not undertaken against wall.

Positioned adjacent to HD02A.

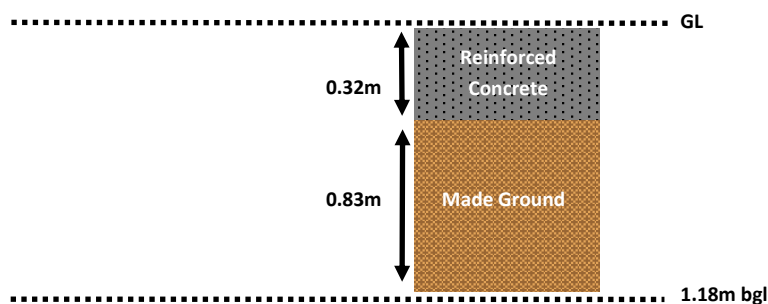
077764-CUR-00-XX-DR-GE-005-P01



Alberton House

Foundation Pit Cross Sectional Sketches

HD02C



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD02C.

Terminated at 1.18m bgl as unable to advance to a further depth.

Foundation pit not undertaken against wall.

No foundations encountered.

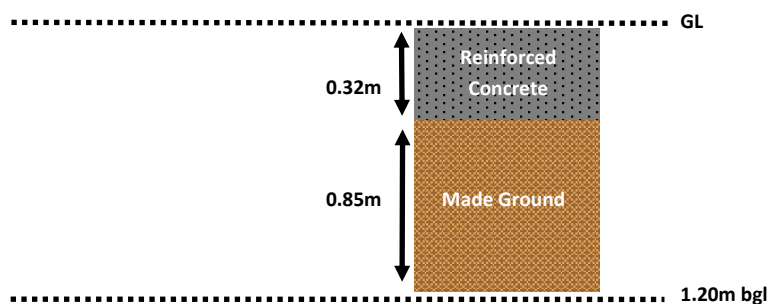
077764-CUR-00-XX-DR-GE-006-P01



Alberton House

Foundation Pit Cross Sectional Sketches

**HD02D**



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD02D.

Terminated at 1.20m bgl as unable to advance to a further depth.

Foundation pit not undertaken against wall.

No foundations encountered.

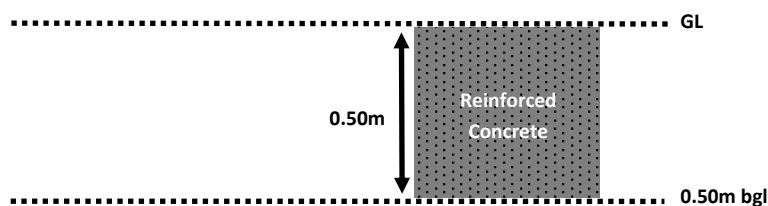
077764-CUR-00-XX-DR-GE-007-P01



Alberton House

Foundation Pit Cross Sectional Sketches

**HD03**



**Comments:**

Not to scale.

Groundwater not encountered.

Further detailed information in log HD03.

Terminated at 0.50m bgl as unable to advance in concrete.

Foundation pit not undertaken against wall.

Possible pile cap at the base of the pit.

## Appendix C – Chemical Laboratory Testing Results

- Envirolab, Environmental Chemistry Analysis Results, Soils
  - I2 Analytical Test Report Ref. 22-33573-1
  - I2 Analytical Test Report Ref. 22-36851-1
  
- Envirolab, Environmental Chemistry Analysis Results, Waters
  - Envirolab Final Analytical Test Report Ref. 22-03739-1



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## **Analytical Report Number : 22-33573**

|                             |                |                                                        |            |
|-----------------------------|----------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Alberton House | <b>Samples received on:</b>                            | 17/01/2022 |
| <b>Your job number:</b>     | B077764        | <b>Samples instructed on/<br/>Analysis started on:</b> | 18/01/2022 |
| <b>Your order number:</b>   | EBMA3195       | <b>Analysis completed by:</b>                          | 27/01/2022 |
| <b>Report Issue Number:</b> | 1              | <b>Report issued on:</b>                               | 27/01/2022 |
| <b>Samples Analysed:</b>    | 2 soil samples |                                                        |            |

**Signed:**

Izabela Wójcik  
Technical Reviewer (Reporting Team)  
**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 |

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.  
Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-33573  
Project / Site name: Alberton House  
Your Order No: EBMA3195

| Lab Sample Number                       |       |                    |                         | 2139895       | 2139896       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | RH01          | RH01          |
| Sample Number                           |       |                    |                         | 0.60          | 1.00          |
| Depth (m)                               |       |                    |                         | None Supplied | None Supplied |
| Date Sampled                            |       |                    |                         | 14/01/2022    | 14/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |
| Stone Content                           | %     | 0.1                | NONE                    | < 0.1         | < 0.1         |
| Moisture Content                        | %     | 0.01               | NONE                    | 11            | 12            |
| Total mass of sample received           | kg    | 0.001              | NONE                    | 1.0           | 1.0           |

|                     |      |     |           |              |              |
|---------------------|------|-----|-----------|--------------|--------------|
| Asbestos in Soil    | Type | N/A | ISO 17025 | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A  | N/A | N/A       | SFS          | SFS          |

#### General Inorganics

|                                                                         |          |         |        |       |       |
|-------------------------------------------------------------------------|----------|---------|--------|-------|-------|
| pH - Automated                                                          | pH Units | N/A     | MCERTS | 11.0  | 11.2  |
| Total Cyanide                                                           | mg/kg    | 1       | MCERTS | < 1.0 | < 1.0 |
| Complex Cyanide                                                         | mg/kg    | 1       | MCERTS | -     | < 1.0 |
| Free Cyanide                                                            | mg/kg    | 1       | MCERTS | -     | < 1.0 |
| Thiocyanate as SCN                                                      | mg/kg    | 5       | NONE   | -     | < 5.0 |
| Water Soluble Sulphate as SO <sub>4</sub> 16hr extraction (2:1)         | mg/kg    | 2.5     | MCERTS | 480   | 590   |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.24  | 0.30  |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | mg/l     | 1.25    | MCERTS | 240   | 297   |
| Ammoniacal Nitrogen as NH <sub>4</sub>                                  | mg/kg    | 0.5     | MCERTS | -     | < 0.5 |
| Organic Matter (automated)                                              | %        | 0.1     | MCERTS | 0.8   | 0.8   |

#### Total Phenols

|                            |       |   |        |       |       |
|----------------------------|-------|---|--------|-------|-------|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
|----------------------------|-------|---|--------|-------|-------|

#### Speciated PAHs

|                        |       |      |        |      |        |
|------------------------|-------|------|--------|------|--------|
| Naphthalene            | mg/kg | 0.05 | MCERTS | 1.9  | < 0.05 |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS | 0.45 | < 0.05 |
| Acenaphthene           | mg/kg | 0.05 | MCERTS | 0.54 | < 0.05 |
| Fluorene               | mg/kg | 0.05 | MCERTS | 0.69 | < 0.05 |
| Phenanthrene           | mg/kg | 0.05 | MCERTS | 5.0  | 0.63   |
| Anthracene             | mg/kg | 0.05 | MCERTS | 0.87 | < 0.05 |
| Fluoranthene           | mg/kg | 0.05 | MCERTS | 5.3  | 1.0    |
| Pyrene                 | mg/kg | 0.05 | MCERTS | 5.3  | 0.98   |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS | 3.2  | 0.59   |
| Chrysene               | mg/kg | 0.05 | MCERTS | 2.4  | 0.56   |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | MCERTS | 2.7  | 0.81   |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | MCERTS | 1.3  | 0.27   |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS | 2.1  | 0.58   |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.85 | 0.24   |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS | 0.31 | < 0.05 |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS | 1.0  | 0.31   |

#### Total PAH

|                             |       |     |        |      |      |
|-----------------------------|-------|-----|--------|------|------|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | 33.9 | 5.97 |
|-----------------------------|-------|-----|--------|------|------|

Analytical Report Number: 22-33573  
Project / Site name: Alberton House  
Your Order No: EBMA3195

|                                         |               |                                               |
|-----------------------------------------|---------------|-----------------------------------------------|
| Lab Sample Number                       | 2139895       | 2139896                                       |
| Sample Reference                        | RH01          | RH01                                          |
| Sample Number                           | 0.60          | 1.00                                          |
| Depth (m)                               | None Supplied | None Supplied                                 |
| Date Sampled                            | 14/01/2022    | 14/01/2022                                    |
| Time Taken                              | None Supplied | None Supplied                                 |
| Analytical Parameter<br>(Soil Analysis) | Units         | Limit of detection<br>Accreditation<br>Status |

#### Heavy Metals / Metalloids

|                                   |       |     |        |       |       |
|-----------------------------------|-------|-----|--------|-------|-------|
| Arsenic (aqua regia extractable)  | mg/kg | 1   | MCERTS | 6.3   | 8.3   |
| Boron (water soluble)             | mg/kg | 0.2 | MCERTS | 1.2   | 2.3   |
| Cadmium (aqua regia extractable)  | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 |
| Chromium (hexavalent)             | mg/kg | 1.2 | NONE   | < 1.2 | < 1.2 |
| Chromium (aqua regia extractable) | mg/kg | 1   | MCERTS | 13    | 17    |
| Copper (aqua regia extractable)   | mg/kg | 1   | MCERTS | 34    | 32    |
| Lead (aqua regia extractable)     | mg/kg | 1   | MCERTS | 71    | 40    |
| Mercury (aqua regia extractable)  | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable)   | mg/kg | 1   | MCERTS | 11    | 13    |
| Selenium (aqua regia extractable) | mg/kg | 1   | MCERTS | < 1.0 | < 1.0 |
| Zinc (aqua regia extractable)     | mg/kg | 1   | MCERTS | 82    | 62    |

#### Monoaromatics & Oxygenates

|                                    |       |   |        |       |       |
|------------------------------------|-------|---|--------|-------|-------|
| Benzene                            | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
| Toluene                            | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
| Ethylbenzene                       | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
| p & m-xylene                       | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
| o-xylene                           | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 |

#### Petroleum Hydrocarbons

|                                                 |       |       |        |         |         |
|-------------------------------------------------|-------|-------|--------|---------|---------|
| TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL        | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL    | mg/kg | 1     | MCERTS | 2.2     | 5.3     |
| TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL    | mg/kg | 2     | MCERTS | 19      | 120     |
| TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL    | mg/kg | 8     | MCERTS | 54      | 180     |
| TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL    | mg/kg | 8     | MCERTS | 110     | 200     |
| TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL | mg/kg | 10    | MCERTS | 190     | 510     |

|                                                |       |       |        |         |         |
|------------------------------------------------|-------|-------|--------|---------|---------|
| TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR        | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR    | mg/kg | 1     | MCERTS | 5.5     | 1.5     |
| TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR    | mg/kg | 2     | MCERTS | 14      | 43      |
| TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR    | mg/kg | 10    | MCERTS | 50      | 95      |
| TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR    | mg/kg | 10    | MCERTS | 110     | 110     |
| TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR | mg/kg | 10    | MCERTS | 170     | 250     |

Analytical Report Number: 22-33573  
Project / Site name: Alberton House  
Your Order No: EBMA3195

|                                         |               |                                               |
|-----------------------------------------|---------------|-----------------------------------------------|
| Lab Sample Number                       | 2139895       | 2139896                                       |
| Sample Reference                        | RH01          | RH01                                          |
| Sample Number                           | 0.60          | 1.00                                          |
| Depth (m)                               | None Supplied | None Supplied                                 |
| Date Sampled                            | 14/01/2022    | 14/01/2022                                    |
| Time Taken                              | None Supplied | None Supplied                                 |
| Analytical Parameter<br>(Soil Analysis) | Units         | Limit of detection<br>Accreditation<br>Status |

#### VOCs

|                                       |       |   |           |   |       |
|---------------------------------------|-------|---|-----------|---|-------|
| Chloromethane                         | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Chloroethane                          | µg/kg | 1 | NONE      | - | < 1.0 |
| Bromomethane                          | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Vinyl Chloride                        | µg/kg | 1 | NONE      | - | < 1.0 |
| Trichlorofluoromethane                | µg/kg | 1 | NONE      | - | < 1.0 |
| 1,1-Dichloroethene                    | µg/kg | 1 | NONE      | - | < 1.0 |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Cis-1,2-dichloroethene                | µg/kg | 1 | MCERTS    | - | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether)    | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,1-Dichloroethane                    | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 2,2-Dichloropropane                   | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Trichloromethane                      | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,1,1-Trichloroethane                 | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,2-Dichloroethane                    | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,1-Dichloropropene                   | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Trans-1,2-dichloroethene              | µg/kg | 1 | NONE      | - | < 1.0 |
| Benzene                               | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Tetrachloromethane                    | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,2-Dichloropropane                   | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Trichloroethene                       | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Dibromomethane                        | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Bromodichloromethane                  | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Cis-1,3-dichloropropene               | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Trans-1,3-dichloropropene             | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Toluene                               | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,1,2-Trichloroethane                 | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,3-Dichloropropane                   | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Dibromochloromethane                  | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Tetrachloroethene                     | µg/kg | 1 | NONE      | - | < 1.0 |
| 1,2-Dibromoethane                     | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| Chlorobenzene                         | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,1,1,2-Tetrachloroethane             | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Ethylbenzene                          | µg/kg | 1 | MCERTS    | - | < 1.0 |
| p & m-Xylene                          | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Styrene                               | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Tribromomethane                       | µg/kg | 1 | NONE      | - | < 1.0 |
| o-Xylene                              | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,1,2,2-Tetrachloroethane             | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Isopropylbenzene                      | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Bromobenzene                          | µg/kg | 1 | MCERTS    | - | < 1.0 |
| n-Propylbenzene                       | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| 2-Chlorotoluene                       | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 4-Chlorotoluene                       | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,3,5-Trimethylbenzene                | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| tert-Butylbenzene                     | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,2,4-Trimethylbenzene                | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| sec-Butylbenzene                      | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,3-Dichlorobenzene                   | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| p-Isopropyltoluene                    | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| 1,2-Dichlorobenzene                   | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,4-Dichlorobenzene                   | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Butylbenzene                          | µg/kg | 1 | MCERTS    | - | < 1.0 |
| 1,2-Dibromo-3-chloropropane           | µg/kg | 1 | ISO 17025 | - | < 1.0 |
| 1,2,4-Trichlorobenzene                | µg/kg | 1 | MCERTS    | - | < 1.0 |
| Hexachlorobutadiene                   | µg/kg | 1 | MCERTS    | - | < 1.0 |

Analytical Report Number: 22-33573  
Project / Site name: Alberton House  
Your Order No: EBMA3195

| Lab Sample Number                       |       |                    |                         | 2139895       | 2139896       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | RH01          | RH01          |
| Sample Number                           |       |                    |                         | 0.60          | 1.00          |
| Depth (m)                               |       |                    |                         | None Supplied | None Supplied |
| Date Sampled                            |       |                    |                         | 14/01/2022    | 14/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |
| 1,2,3-Trichlorobenzene                  | µg/kg | 1                  | ISO 17025               | -             | < 1.0         |

#### SVOCs

|                             |       |      |           |   |        |
|-----------------------------|-------|------|-----------|---|--------|
| Aniline                     | mg/kg | 0.1  | NONE      | - | < 0.1  |
| Phenol                      | mg/kg | 0.2  | ISO 17025 | - | < 0.2  |
| 2-Chlorophenol              | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| Bis(2-chloroethyl)ether     | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| 1,3-Dichlorobenzene         | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| 1,2-Dichlorobenzene         | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| 1,4-Dichlorobenzene         | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| Bis(2-chloroisopropyl)ether | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| 2-Methylphenol              | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Hexachloroethane            | mg/kg | 0.05 | MCERTS    | - | < 0.05 |
| Nitrobenzene                | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| 4-Methylphenol              | mg/kg | 0.2  | NONE      | - | < 0.2  |
| Isophorone                  | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| 2-Nitrophenol               | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| 2,4-Dimethylphenol          | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Bis(2-chloroethoxy)methane  | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| 1,2,4-Trichlorobenzene      | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Naphthalene                 | mg/kg | 0.05 | MCERTS    | - | < 0.05 |
| 2,4-Dichlorophenol          | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| 4-Chloroaniline             | mg/kg | 0.1  | NONE      | - | < 0.1  |
| Hexachlorobutadiene         | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| 4-Chloro-3-methylphenol     | mg/kg | 0.1  | NONE      | - | < 0.1  |
| 2,4,6-Trichlorophenol       | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| 2,4,5-Trichlorophenol       | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| 2-Methylnaphthalene         | mg/kg | 0.1  | NONE      | - | < 0.1  |
| 2-Chloronaphthalene         | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| Dimethylphthalate           | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| 2,6-Dinitrotoluene          | mg/kg | 0.1  | MCERTS    | - | < 0.1  |
| Acenaphthylene              | mg/kg | 0.05 | MCERTS    | - | < 0.05 |
| Acenaphthene                | mg/kg | 0.05 | MCERTS    | - | < 0.05 |
| 2,4-Dinitrotoluene          | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| Dibenzofuran                | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| 4-Chlorophenyl phenyl ether | mg/kg | 0.3  | ISO 17025 | - | < 0.3  |
| Diethyl phthalate           | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| 4-Nitroaniline              | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| Fluorene                    | mg/kg | 0.05 | MCERTS    | - | < 0.05 |
| Azobenzene                  | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Bromophenyl phenyl ether    | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| Hexachlorobenzene           | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Phenanthrene                | mg/kg | 0.05 | MCERTS    | - | 0.63   |
| Anthracene                  | mg/kg | 0.05 | MCERTS    | - | < 0.05 |
| Carbazole                   | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Dibutyl phthalate           | mg/kg | 0.2  | MCERTS    | - | < 0.2  |
| Anthraquinone               | mg/kg | 0.3  | MCERTS    | - | < 0.3  |
| Fluoranthene                | mg/kg | 0.05 | MCERTS    | - | 1.0    |
| Pyrene                      | mg/kg | 0.05 | MCERTS    | - | 0.98   |
| Butyl benzyl phthalate      | mg/kg | 0.3  | ISO 17025 | - | < 0.3  |
| Benzo(a)anthracene          | mg/kg | 0.05 | MCERTS    | - | 0.59   |
| Chrysene                    | mg/kg | 0.05 | MCERTS    | - | 0.56   |
| Benzo(b)fluoranthene        | mg/kg | 0.05 | MCERTS    | - | 0.81   |
| Benzo(k)fluoranthene        | mg/kg | 0.05 | MCERTS    | - | 0.27   |
| Benzo(a)pyrene              | mg/kg | 0.05 | MCERTS    | - | 0.58   |
| Indeno(1,2,3-cd)pyrene      | mg/kg | 0.05 | MCERTS    | - | 0.24   |



Analytical Report Number: 22-33573  
 Project / Site name: Alberton House  
 Your Order No: EBMA3195

| Lab Sample Number                       |       |                    |                         | 2139895       | 2139896       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | RH01          | RH01          |
| Sample Number                           |       |                    |                         | 0.60          | 1.00          |
| Depth (m)                               |       |                    |                         | None Supplied | None Supplied |
| Date Sampled                            |       |                    |                         | 14/01/2022    | 14/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |
| Dibenz(a,h)anthracene                   | mg/kg | 0.05               | MCERTS                  | -             | < 0.05        |
| Benzo(ghi)perylene                      | mg/kg | 0.05               | MCERTS                  | -             | 0.31          |

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



**Analytical Report Number : 22-33573**  
**Project / Site name: Alberton House**

\* 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 *             |
|-------------------|------------------|---------------|---------------|----------------------------------|
| 2139895           | RH01             | 0.6           | None Supplied | Brown loam and clay with gravel. |
| 2139896           | RH01             | 1             | None Supplied | Brown loam and clay with gravel. |

**Analytical Report Number : 22-33573**

**Project / Site name: Alberton House**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name                               | Analytical Method Description                                                                                                                                                   | Analytical Method Reference                                                                                     | Method number | Wet / Dry Analysis | Accreditation Status |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| 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               |
| 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.                                                                                                | L038-PL       | D                  | MCERTS               |
| 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               |
| Complex Cyanide in soil                            | Determination of complex cyanide by calculation.                                                                                                                                | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL       | W                  | MCERTS               |
| Hexavalent chromium in soil (Lower Level)          | 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                  | NONE                 |
| Free cyanide in soil                               | Determination of free 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               |
| Moisture Content                                   | Moisture content, determined gravimetrically. (30 oC)                                                                                                                           | In house method.                                                                                                | 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               |
| 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               |
| pH in soil (automated)                             | Determination of pH in soil by addition of water followed by automated electrometric measurement.                                                                               | In house method.                                                                                                | L099-PL       | D                  | MCERTS               |
| Thiocyanate in soil                                | Determination of thiocyanate in soil by extraction in water followed by acidification followed by addition of ferric nitrate followed by discrete analyser (spectrophotometer). | In-house method                                                                                                 | L082-PL       | D                  | NONE                 |
| 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                 |
| 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               |
| 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               |
| 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               |
| 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               |

**Analytical Report Number : 22-33573**  
**Project / Site name: Alberton House**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name               | Analytical Method Description                                                                                                                             | Analytical Method Reference                                                                            | Method number | Wet / Dry Analysis | Accreditation Status |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Ammonium as NH4 in soil            | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.                        | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL       | W                  | MCERTS               |
| TPHCWG (Soil)                      | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.                                                                                 | In-house method with silica gel split/clean up.                                                        | L088/76-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.                             | In house method.                                                                                       | L009-PL       | D                  | MCERTS               |
| Sulphate, water soluble, in soil   | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In house method.                                                                                       | L038-PL       | D                  | 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.**

**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions                                                           |
|---------|------------------------------------------------------------------------|
| HS      | Headspace Analysis                                                     |
| MS      | Mass spectrometry                                                      |
| FID     | Flame Ionisation Detector                                              |
| GC      | Gas Chromatography                                                     |
| EH      | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU      | Clean-up - e.g. by Florisil®, silica gel                               |
| 1D      | GC - Single coil/column gas chromatography                             |
| 2D      | GC-GC - Double coil/column gas chromatography                          |
| Total   | Aliphatics & Aromatics                                                 |
| AL      | Aliphatics                                                             |
| AR      | Aromatics                                                              |
| #1      | EH_2D_Total but with humics mathematically subtracted                  |
| #2      | EH_2D_Total but with fatty acids mathematically subtracted             |
| -       | Operator - understore to separate acronyms (exception for +)           |
| +       | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total     |

**EBMA Testing**

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## **Analytical Report Number : 22-36851**

|                             |                |                                                        |            |
|-----------------------------|----------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Alberton House | <b>Samples received on:</b>                            | 27/01/2022 |
| <b>Your job number:</b>     | B077764        | <b>Samples instructed on/<br/>Analysis started on:</b> | 01/02/2022 |
| <b>Your order number:</b>   | EBMA3212       | <b>Analysis completed by:</b>                          | 18/02/2022 |
| <b>Report Issue Number:</b> | 1              | <b>Report issued on:</b>                               | 18/02/2022 |
| <b>Samples Analysed:</b>    | 9 soil samples |                                                        |            |

**Signed:**

*Izabela Wójcik*  
Izabela Wójcik  
Technical Reviewer (Reporting Team)  
**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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-36851  
Project / Site name: Alberton House  
Your Order No: EBMA3212

| Lab Sample Number                       |       |                    |                         | 2157504       | 2157505       | 2157506       | 2157507       | 2157508       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | WS02          | WS02          | WS03          | WS03          | WS04          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 0.40          | 1.10          | 0.70          | 2.00          | 1.00          |
| Date Sampled                            |       |                    |                         | 27/01/2022    | 27/01/2022    | 27/01/2022    | 27/01/2022    | 26/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |               |
| Stone Content                           | %     | 0.1                | NONE                    | < 0.1         | < 0.1         | 45            | 38            | < 0.1         |
| Moisture Content                        | %     | 0.01               | NONE                    | 12            | 11            | 12            | 9.3           | 17            |
| Total mass of sample received           | kg    | 0.001              | NONE                    | 1.1           | 1.1           | 1.1           | 1.1           | 1.1           |

|                     |      |     |           |              |              |              |              |              |
|---------------------|------|-----|-----------|--------------|--------------|--------------|--------------|--------------|
| Asbestos in Soil    | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A  | N/A | N/A       | DSA          | DSA          | DSA          | DSA          | DSA          |

#### General Inorganics

|                                                                         |          |         |        |       |       |       |      |       |
|-------------------------------------------------------------------------|----------|---------|--------|-------|-------|-------|------|-------|
| pH - Automated                                                          | pH Units | N/A     | MCERTS | 9.2   | 8.9   | 10.1  | 8.2  | 10.1  |
| Total Cyanide                                                           | mg/kg    | 1       | MCERTS | < 1.0 | < 1.0 | < 1.0 | 1.5  | < 1.0 |
| Complex Cyanide                                                         | mg/kg    | 1       | MCERTS | < 1.0 | < 1.0 | -     | -    | -     |
| Free Cyanide                                                            | mg/kg    | 1       | MCERTS | < 1.0 | < 1.0 | -     | -    | -     |
| Thiocyanate as SCN                                                      | mg/kg    | 5       | NONE   | < 5.0 | < 5.0 | -     | -    | -     |
| Water Soluble Sulphate as SO <sub>4</sub> 16hr extraction (2:1)         | mg/kg    | 2.5     | MCERTS | 160   | 460   | 3300  | 2000 | 930   |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.082 | 0.23  | 1.6   | 0.98 | 0.47  |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | mg/l     | 1.25    | MCERTS | 81.5  | 231   | 1640  | 985  | 467   |
| Ammoniacal Nitrogen as NH <sub>4</sub>                                  | mg/kg    | 0.5     | MCERTS | < 0.5 | < 0.5 | -     | -    | -     |
| Organic Matter (automated)                                              | %        | 0.1     | MCERTS | 0.6   | 0.9   | 1.6   | 1.5  | 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 | 0.31   | < 0.05 | 0.46   |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene           | mg/kg | 0.05 | MCERTS | < 0.05 | 0.44   | 1.2    | < 0.05 | 0.46   |
| Fluorene               | mg/kg | 0.05 | MCERTS | < 0.05 | 0.25   | 0.70   | < 0.05 | 0.38   |
| Phenanthrene           | mg/kg | 0.05 | MCERTS | 0.73   | 4.8    | 7.7    | 0.52   | 3.1    |
| Anthracene             | mg/kg | 0.05 | MCERTS | < 0.05 | 0.73   | 1.7    | < 0.05 | 0.57   |
| Fluoranthene           | mg/kg | 0.05 | MCERTS | 1.3    | 6.6    | 11     | 0.91   | 4.4    |
| Pyrene                 | mg/kg | 0.05 | MCERTS | 1.4    | 5.9    | 9.6    | 0.93   | 4.2    |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS | 0.82   | 3.2    | 5.1    | 0.54   | 2.3    |
| Chrysene               | mg/kg | 0.05 | MCERTS | 0.80   | 3.1    | 4.6    | 0.48   | 2.1    |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | MCERTS | 0.82   | 3.0    | 6.0    | 0.64   | 2.1    |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | MCERTS | 0.32   | 1.2    | 1.4    | 0.20   | 1.1    |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS | 0.73   | 2.7    | 4.6    | 0.53   | 2.1    |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.38   | 1.4    | 2.3    | 0.31   | 1.0    |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS | < 0.05 | 0.44   | 0.74   | < 0.05 | 0.31   |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS | 0.50   | 1.7    | 2.8    | 0.38   | 1.4    |

#### Total PAH

|                             |       |     |        |      |      |      |      |      |
|-----------------------------|-------|-----|--------|------|------|------|------|------|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | 7.83 | 35.4 | 59.8 | 5.44 | 25.9 |
|-----------------------------|-------|-----|--------|------|------|------|------|------|

Analytical Report Number: 22-36851  
Project / Site name: Alberton House  
Your Order No: EBMA3212

| Lab Sample Number                       | 2157504       | 2157505            | 2157506                 | 2157507       | 2157508       |
|-----------------------------------------|---------------|--------------------|-------------------------|---------------|---------------|
| Sample Reference                        | WS02          | WS02               | WS03                    | WS03          | WS04          |
| Sample Number                           | None Supplied | None Supplied      | None Supplied           | None Supplied | None Supplied |
| Depth (m)                               | 0.40          | 1.10               | 0.70                    | 2.00          | 1.00          |
| Date Sampled                            | 27/01/2022    | 27/01/2022         | 27/01/2022              | 27/01/2022    | 26/01/2022    |
| Time Taken                              | None Supplied | None Supplied      | None Supplied           | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units         | Limit of detection | Accreditation<br>Status |               |               |

#### Heavy Metals / Metalloids

|                                   |       |     |        |       |       |       |       |       |
|-----------------------------------|-------|-----|--------|-------|-------|-------|-------|-------|
| Arsenic (aqua regia extractable)  | mg/kg | 1   | MCERTS | 7.8   | 6.2   | 16    | 14    | 11    |
| Boron (water soluble)             | mg/kg | 0.2 | MCERTS | < 0.2 | 0.2   | 1.5   | 1.1   | 0.8   |
| Cadmium (aqua regia extractable)  | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | 0.8   | 0.5   | < 0.2 |
| Chromium (hexavalent)             | mg/kg | 1.2 | NONE   | < 1.2 | < 1.2 | < 1.2 | < 1.2 | < 1.2 |
| Chromium (aqua regia extractable) | mg/kg | 1   | MCERTS | 13    | 12    | 96    | 20    | 31    |
| Copper (aqua regia extractable)   | mg/kg | 1   | MCERTS | 22    | 19    | 170   | 360   | 260   |
| Lead (aqua regia extractable)     | mg/kg | 1   | MCERTS | 390   | 190   | 460   | 670   | 280   |
| Mercury (aqua regia extractable)  | mg/kg | 0.3 | MCERTS | 1.5   | < 0.3 | 0.7   | 1.0   | 1.2   |
| Nickel (aqua regia extractable)   | mg/kg | 1   | MCERTS | 11    | 11    | 15    | 13    | 15    |
| Selenium (aqua regia extractable) | mg/kg | 1   | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Zinc (aqua regia extractable)     | mg/kg | 1   | MCERTS | 54    | 55    | 180   | 210   | 130   |

#### Monoaromatics & Oxygenates

|                                    |       |   |        |       |       |       |       |       |
|------------------------------------|-------|---|--------|-------|-------|-------|-------|-------|
| Benzene                            | µg/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 <sub>HS,1D,AL</sub>         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 <sub>HS,1D,AL</sub>         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 <sub>HS,1D,AL</sub>        | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 <sub>EH,CU,1D,AL</sub>    | mg/kg | 1     | MCERTS | < 1.0   | < 1.0   | < 1.0   | < 1.0   | < 1.0   |
| TPH-CWG - Aliphatic >EC12 - EC16 <sub>EH,CU,1D,AL</sub>    | mg/kg | 2     | MCERTS | < 2.0   | < 2.0   | 3.1     | < 2.0   | < 2.0   |
| TPH-CWG - Aliphatic >EC16 - EC21 <sub>EH,CU,1D,AL</sub>    | mg/kg | 8     | MCERTS | < 8.0   | < 8.0   | < 8.0   | < 8.0   | < 8.0   |
| TPH-CWG - Aliphatic >EC21 - EC35 <sub>EH,CU,1D,AL</sub>    | mg/kg | 8     | MCERTS | < 8.0   | < 8.0   | 27      | < 8.0   | < 8.0   |
| TPH-CWG - Aliphatic (EC5 - EC35) <sub>EH,CU+HS,1D,AL</sub> | mg/kg | 10    | MCERTS | < 10    | < 10    | 36      | < 10    | < 10    |

|                                                           |       |       |        |         |         |         |         |         |
|-----------------------------------------------------------|-------|-------|--------|---------|---------|---------|---------|---------|
| TPH-CWG - Aromatic >EC5 - EC7 <sub>HS,1D,AR</sub>         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 <sub>HS,1D,AR</sub>         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 <sub>HS,1D,AR</sub>        | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 <sub>EH,CU,1D,AR</sub>    | mg/kg | 1     | MCERTS | < 1.0   | < 1.0   | < 1.0   | < 1.0   | < 1.0   |
| TPH-CWG - Aromatic >EC12 - EC16 <sub>EH,CU,1D,AR</sub>    | mg/kg | 2     | MCERTS | < 2.0   | < 2.0   | 8.7     | < 2.0   | < 2.0   |
| TPH-CWG - Aromatic >EC16 - EC21 <sub>EH,CU,1D,AR</sub>    | mg/kg | 10    | MCERTS | 16      | 30      | 29      | < 10    | < 10    |
| TPH-CWG - Aromatic >EC21 - EC35 <sub>EH,CU,1D,AR</sub>    | mg/kg | 10    | MCERTS | 23      | 31      | 46      | 13      | 21      |
| TPH-CWG - Aromatic (EC5 - EC35) <sub>EH,CU+HS,1D,AR</sub> | mg/kg | 10    | MCERTS | 40      | 61      | 83      | 17      | 30      |

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| Lab Sample Number                       |  |  |  | 2157504       | 2157505            | 2157506              | 2157507       | 2157508       |
|-----------------------------------------|--|--|--|---------------|--------------------|----------------------|---------------|---------------|
| Sample Reference                        |  |  |  | WS02          | WS02               | WS03                 | WS03          | WS04          |
| Sample Number                           |  |  |  | None Supplied | None Supplied      | None Supplied        | None Supplied | None Supplied |
| Depth (m)                               |  |  |  | 0.40          | 1.10               | 0.70                 | 2.00          | 1.00          |
| Date Sampled                            |  |  |  | 27/01/2022    | 27/01/2022         | 27/01/2022           | 27/01/2022    | 26/01/2022    |
| Time Taken                              |  |  |  | None Supplied | None Supplied      | None Supplied        | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) |  |  |  | Units         | Limit of detection | Accreditation Status |               |               |

#### VOCs

|                                       |       |   |           |       |       |   |   |   |
|---------------------------------------|-------|---|-----------|-------|-------|---|---|---|
| Chloromethane                         | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Chloroethane                          | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| Bromomethane                          | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Vinyl Chloride                        | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| Trichlorofluoromethane                | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| 1,1-Dichloroethene                    | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Cis-1,2-dichloroethene                | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| MTBE (Methyl Tertiary Butyl Ether)    | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,1-Dichloroethane                    | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 2,2-Dichloropropane                   | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Trichloromethane                      | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,1,1-Trichloroethane                 | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,2-Dichloroethane                    | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,1-Dichloropropene                   | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Trans-1,2-dichloroethene              | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| Benzene                               | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Tetrachloromethane                    | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,2-Dichloropropane                   | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Trichloroethene                       | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Dibromomethane                        | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Bromodichloromethane                  | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Cis-1,3-dichloropropene               | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Trans-1,3-dichloropropene             | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Toluene                               | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,1,2-Trichloroethane                 | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,3-Dichloropropane                   | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Dibromochloromethane                  | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Tetrachloroethene                     | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| 1,2-Dibromoethane                     | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| Chlorobenzene                         | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,1,1,2-Tetrachloroethane             | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Ethylbenzene                          | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| p & m-Xylene                          | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Styrene                               | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Tribromomethane                       | µg/kg | 1 | NONE      | < 1.0 | < 1.0 | - | - | - |
| o-Xylene                              | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,1,2,2-Tetrachloroethane             | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Isopropylbenzene                      | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Bromobenzene                          | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| n-Propylbenzene                       | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| 2-Chlorotoluene                       | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 4-Chlorotoluene                       | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,3,5-Trimethylbenzene                | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| tert-Butylbenzene                     | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,2,4-Trimethylbenzene                | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| sec-Butylbenzene                      | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,3-Dichlorobenzene                   | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| p-Isopropyltoluene                    | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | - | - | - |
| 1,2-Dichlorobenzene                   | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| 1,4-Dichlorobenzene                   | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |
| Butylbenzene                          | µg/kg | 1 | MCERTS    | < 1.0 | < 1.0 | - | - | - |

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|                                         |       |                    |                         |               |               |               |               |               |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|
| Lab Sample Number                       |       |                    |                         | 2157504       | 2157505       | 2157506       | 2157507       | 2157508       |
| Sample Reference                        |       |                    |                         | WS02          | WS02          | WS03          | WS03          | WS04          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 0.40          | 1.10          | 0.70          | 2.00          | 1.00          |
| Date Sampled                            |       |                    |                         | 27/01/2022    | 27/01/2022    | 27/01/2022    | 27/01/2022    | 26/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |               |
| 1,2-Dibromo-3-chloropropane             | µg/kg | 1                  | ISO 17025               | < 1.0         | < 1.0         | -             | -             | -             |
| 1,2,4-Trichlorobenzene                  | µg/kg | 1                  | MCERTS                  | < 1.0         | < 1.0         | -             | -             | -             |
| Hexachlorobutadiene                     | µg/kg | 1                  | MCERTS                  | < 1.0         | < 1.0         | -             | -             | -             |
| 1,2,3-Trichlorobenzene                  | µg/kg | 1                  | ISO 17025               | < 1.0         | < 1.0         | -             | -             | -             |

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| Lab Sample Number                       |  |  |  | 2157504       | 2157505            | 2157506              | 2157507       | 2157508       |
|-----------------------------------------|--|--|--|---------------|--------------------|----------------------|---------------|---------------|
| Sample Reference                        |  |  |  | WS02          | WS02               | WS03                 | WS03          | WS04          |
| Sample Number                           |  |  |  | None Supplied | None Supplied      | None Supplied        | None Supplied | None Supplied |
| Depth (m)                               |  |  |  | 0.40          | 1.10               | 0.70                 | 2.00          | 1.00          |
| Date Sampled                            |  |  |  | 27/01/2022    | 27/01/2022         | 27/01/2022           | 27/01/2022    | 26/01/2022    |
| Time Taken                              |  |  |  | None Supplied | None Supplied      | None Supplied        | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) |  |  |  | Units         | Limit of detection | Accreditation Status |               |               |

#### SVOCs

|                             |       |      |           |        |        |   |   |   |
|-----------------------------|-------|------|-----------|--------|--------|---|---|---|
| Aniline                     | mg/kg | 0.1  | NONE      | < 0.1  | < 0.1  | - | - | - |
| Phenol                      | mg/kg | 0.2  | ISO 17025 | < 0.2  | < 0.2  | - | - | - |
| 2-Chlorophenol              | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| Bis(2-chloroethyl)ether     | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| 1,3-Dichlorobenzene         | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| 1,2-Dichlorobenzene         | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| 1,4-Dichlorobenzene         | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| Bis(2-chloroisopropyl)ether | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| 2-Methylphenol              | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Hexachloroethane            | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 | - | - | - |
| Nitrobenzene                | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| 4-Methylphenol              | mg/kg | 0.2  | NONE      | < 0.2  | < 0.2  | - | - | - |
| Isophorone                  | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| 2-Nitrophenol               | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| 2,4-Dimethylphenol          | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Bis(2-chloroethoxy)methane  | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| 1,2,4-Trichlorobenzene      | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Naphthalene                 | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 | - | - | - |
| 2,4-Dichlorophenol          | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| 4-Chloroaniline             | mg/kg | 0.1  | NONE      | < 0.1  | < 0.1  | - | - | - |
| Hexachlorobutadiene         | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| 4-Chloro-3-methylphenol     | mg/kg | 0.1  | NONE      | < 0.1  | < 0.1  | - | - | - |
| 2,4,6-Trichlorophenol       | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| 2,4,5-Trichlorophenol       | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| 2-Methylnaphthalene         | mg/kg | 0.1  | NONE      | < 0.1  | < 0.1  | - | - | - |
| 2-Chloronaphthalene         | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| Dimethylphthalate           | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| 2,6-Dinitrotoluene          | mg/kg | 0.1  | MCERTS    | < 0.1  | < 0.1  | - | - | - |
| Acenaphthylene              | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 | - | - | - |
| Acenaphthene                | mg/kg | 0.05 | MCERTS    | < 0.05 | 0.44   | - | - | - |
| 2,4-Dinitrotoluene          | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| Dibenzofuran                | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| 4-Chlorophenyl phenyl ether | mg/kg | 0.3  | ISO 17025 | < 0.3  | < 0.3  | - | - | - |
| Diethyl phthalate           | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| 4-Nitroaniline              | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| Fluorene                    | mg/kg | 0.05 | MCERTS    | < 0.05 | 0.25   | - | - | - |
| Azobenzene                  | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Bromophenyl phenyl ether    | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| Hexachlorobenzene           | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Phenanthrene                | mg/kg | 0.05 | MCERTS    | 0.73   | 4.8    | - | - | - |
| Anthracene                  | mg/kg | 0.05 | MCERTS    | < 0.05 | 0.73   | - | - | - |
| Carbazole                   | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Dibutyl phthalate           | mg/kg | 0.2  | MCERTS    | < 0.2  | < 0.2  | - | - | - |
| Anthraquinone               | mg/kg | 0.3  | MCERTS    | < 0.3  | < 0.3  | - | - | - |
| Fluoranthene                | mg/kg | 0.05 | MCERTS    | 1.3    | 6.6    | - | - | - |
| Pyrene                      | mg/kg | 0.05 | MCERTS    | 1.4    | 5.9    | - | - | - |
| Butyl benzyl phthalate      | mg/kg | 0.3  | ISO 17025 | < 0.3  | < 0.3  | - | - | - |
| Benzo(a)anthracene          | mg/kg | 0.05 | MCERTS    | 0.82   | 3.2    | - | - | - |
| Chrysene                    | mg/kg | 0.05 | MCERTS    | 0.80   | 3.1    | - | - | - |
| Benzo(b)fluoranthene        | mg/kg | 0.05 | MCERTS    | 0.82   | 3.0    | - | - | - |
| Benzo(k)fluoranthene        | mg/kg | 0.05 | MCERTS    | 0.32   | 1.2    | - | - | - |
| Benzo(a)pyrene              | mg/kg | 0.05 | MCERTS    | 0.73   | 2.7    | - | - | - |



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|                                         |  |  |  |               |                    |                         |               |               |
|-----------------------------------------|--|--|--|---------------|--------------------|-------------------------|---------------|---------------|
| Lab Sample Number                       |  |  |  | 2157504       | 2157505            | 2157506                 | 2157507       | 2157508       |
| Sample Reference                        |  |  |  | WS02          | WS02               | WS03                    | WS03          | WS04          |
| Sample Number                           |  |  |  | None Supplied | None Supplied      | None Supplied           | None Supplied | None Supplied |
| Depth (m)                               |  |  |  | 0.40          | 1.10               | 0.70                    | 2.00          | 1.00          |
| Date Sampled                            |  |  |  | 27/01/2022    | 27/01/2022         | 27/01/2022              | 27/01/2022    | 26/01/2022    |
| Time Taken                              |  |  |  | None Supplied | None Supplied      | None Supplied           | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) |  |  |  | Units         | Limit of detection | Accreditation<br>Status |               |               |
| Indeno(1,2,3-cd)pyrene                  |  |  |  | mg/kg         | 0.05               | MCERTS                  | 0.38          | 1.4           |
| Dibenz(a,h)anthracene                   |  |  |  | mg/kg         | 0.05               | MCERTS                  | < 0.05        | 0.44          |
| Benzo(ghi)perylene                      |  |  |  | mg/kg         | 0.05               | MCERTS                  | 0.50          | 1.7           |

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

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 Your Order No: EBMA3212

| Lab Sample Number                       |       |                    |                      | 2157509       | 2157510       | 2157738       | 2157739       |
|-----------------------------------------|-------|--------------------|----------------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                      | WS04          | HD02          | WS01          | WS01          |
| Sample Number                           |       |                    |                      | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                      | 1.50          | 0.80          | 0.65          | 0.90          |
| Date Sampled                            |       |                    |                      | 27/01/2022    | 26/01/2022    | 28/01/2022    | 28/01/2022    |
| Time Taken                              |       |                    |                      | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation Status |               |               |               |               |
| Stone Content                           | %     | 0.1                | NONE                 | < 0.1         | 44            | < 0.1         | 21            |
| Moisture Content                        | %     | 0.01               | NONE                 | 15            | 11            | 14            | 9.2           |
| Total mass of sample received           | kg    | 0.001              | NONE                 | 1.1           | 1.1           | 1.1           | 1.1           |

|                     |      |     |           |              |              |              |              |
|---------------------|------|-----|-----------|--------------|--------------|--------------|--------------|
| Asbestos in Soil    | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A  | N/A | N/A       | DSA          | DSA          | DSA          | DSA          |

#### General Inorganics

|                                                                         |          |         |        |       |       |       |       |
|-------------------------------------------------------------------------|----------|---------|--------|-------|-------|-------|-------|
| pH - Automated                                                          | pH Units | N/A     | MCERTS | 8.6   | 8.6   | 10.7  | 11.3  |
| Total Cyanide                                                           | mg/kg    | 1       | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Complex Cyanide                                                         | mg/kg    | 1       | MCERTS | -     | -     | < 1.0 | -     |
| Free Cyanide                                                            | mg/kg    | 1       | MCERTS | -     | -     | < 1.0 | -     |
| Thiocyanate as SCN                                                      | mg/kg    | 5       | NONE   | -     | -     | < 5.0 | -     |
| Water Soluble Sulphate as SO <sub>4</sub> 16hr extraction (2:1)         | mg/kg    | 2.5     | MCERTS | 340   | 730   | 180   | 210   |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.17  | 0.37  | 0.089 | 0.10  |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | mg/l     | 1.25    | MCERTS | 170   | 367   | 88.6  | 103   |
| Ammoniacal Nitrogen as NH <sub>4</sub>                                  | mg/kg    | 0.5     | MCERTS | -     | -     | < 0.5 | -     |
| Organic Matter (automated)                                              | %        | 0.1     | MCERTS | 1.7   | 1.5   | < 0.1 | 0.3   |

#### 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 | 0.79 | 0.93 | < 0.05 | < 0.05 |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS | 0.62 | 0.93 | < 0.05 | < 0.05 |
| Acenaphthene           | mg/kg | 0.05 | MCERTS | 0.92 | 1.1  | < 0.05 | < 0.05 |
| Fluorene               | mg/kg | 0.05 | MCERTS | 1.1  | 1.7  | < 0.05 | < 0.05 |
| Phenanthrene           | mg/kg | 0.05 | MCERTS | 11   | 15   | < 0.05 | 1.1    |
| Anthracene             | mg/kg | 0.05 | MCERTS | 2.1  | 3.1  | < 0.05 | 0.26   |
| Fluoranthene           | mg/kg | 0.05 | MCERTS | 11   | 14   | < 0.05 | 2.0    |
| Pyrene                 | mg/kg | 0.05 | MCERTS | 11   | 14   | < 0.05 | 1.8    |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS | 5.5  | 7.9  | < 0.05 | 0.84   |
| Chrysene               | mg/kg | 0.05 | MCERTS | 5.0  | 5.4  | < 0.05 | 0.90   |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | MCERTS | 4.7  | 6.8  | < 0.05 | 0.89   |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | MCERTS | 2.0  | 1.7  | < 0.05 | 0.43   |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS | 4.5  | 5.9  | < 0.05 | 0.80   |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 2.1  | 2.6  | < 0.05 | 0.34   |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS | 0.68 | 0.93 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS | 2.7  | 3.4  | < 0.05 | 0.50   |

#### Total PAH

|                             |       |     |        |      |      |        |      |
|-----------------------------|-------|-----|--------|------|------|--------|------|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | 65.9 | 85.0 | < 0.80 | 9.75 |
|-----------------------------|-------|-----|--------|------|------|--------|------|

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| Lab Sample Number                       |       |                    |                         | 2157509       | 2157510       | 2157738       | 2157739       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | WS04          | HD02          | WS01          | WS01          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 1.50          | 0.80          | 0.65          | 0.90          |
| Date Sampled                            |       |                    |                         | 27/01/2022    | 26/01/2022    | 28/01/2022    | 28/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |
| <b>Heavy Metals / Metalloids</b>        |       |                    |                         |               |               |               |               |
| Arsenic (aqua regia extractable)        | mg/kg | 1                  | MCERTS                  | 14            | 12            | 3.6           | 3.7           |
| Boron (water soluble)                   | mg/kg | 0.2                | MCERTS                  | 0.6           | 0.6           | 0.3           | 0.8           |
| Cadmium (aqua regia extractable)        | mg/kg | 0.2                | MCERTS                  | < 0.2         | < 0.2         | 0.2           | 0.4           |
| Chromium (hexavalent)                   | mg/kg | 1.2                | NONE                    | < 1.2         | < 1.2         | < 1.2         | < 1.2         |
| Chromium (aqua regia extractable)       | mg/kg | 1                  | MCERTS                  | 45            | 16            | 7.5           | 11            |
| Copper (aqua regia extractable)         | mg/kg | 1                  | MCERTS                  | 560           | 37            | 11            | 25            |
| Lead (aqua regia extractable)           | mg/kg | 1                  | MCERTS                  | 480           | 820           | 210           | 120           |
| Mercury (aqua regia extractable)        | mg/kg | 0.3                | MCERTS                  | 1.4           | 0.8           | < 0.3         | < 0.3         |
| Nickel (aqua regia extractable)         | mg/kg | 1                  | MCERTS                  | 18            | 15            | 6.1           | 8.5           |
| Selenium (aqua regia extractable)       | mg/kg | 1                  | MCERTS                  | < 1.0         | < 1.0         | < 1.0         | < 1.0         |
| Zinc (aqua regia extractable)           | mg/kg | 1                  | MCERTS                  | 510           | 71            | 50            | 56            |

#### Monoaromatics & Oxygenates

|                                    |       |   |        |       |       |       |       |
|------------------------------------|-------|---|--------|-------|-------|-------|-------|
| Benzene                            | µg/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 HS_1D_AL         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL        | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL    | mg/kg | 1     | MCERTS | < 1.0   | < 1.0   | < 1.0   | < 1.0   |
| TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL    | mg/kg | 2     | MCERTS | < 2.0   | < 2.0   | < 2.0   | < 2.0   |
| TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL    | mg/kg | 8     | MCERTS | < 8.0   | < 8.0   | < 8.0   | < 8.0   |
| TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL    | mg/kg | 8     | MCERTS | < 8.0   | < 8.0   | < 8.0   | < 8.0   |
| TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL | mg/kg | 10    | MCERTS | < 10    | < 10    | < 10    | < 10    |

|                                                |       |       |        |         |         |         |         |
|------------------------------------------------|-------|-------|--------|---------|---------|---------|---------|
| TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR         | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR        | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR    | mg/kg | 1     | MCERTS | 2.1     | 2.8     | < 1.0   | < 1.0   |
| TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR    | mg/kg | 2     | MCERTS | 12      | 17      | < 2.0   | < 2.0   |
| TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR    | mg/kg | 10    | MCERTS | 54      | 62      | < 10    | < 10    |
| TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR    | mg/kg | 10    | MCERTS | 69      | 69      | < 10    | < 10    |
| TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR | mg/kg | 10    | MCERTS | 140     | 150     | < 10    | 17      |

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Your Order No: EBMA3212

| Lab Sample Number                       |       |                    |                         | 2157509       | 2157510       | 2157738       | 2157739       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | WS04          | HD02          | WS01          | WS01          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 1.50          | 0.80          | 0.65          | 0.90          |
| Date Sampled                            |       |                    |                         | 27/01/2022    | 26/01/2022    | 28/01/2022    | 28/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |
| <b>VOCs</b>                             |       |                    |                         |               |               |               |               |
| Chloromethane                           | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Chloroethane                            | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| Bromomethane                            | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Vinyl Chloride                          | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| Trichlorofluoromethane                  | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| 1,1-Dichloroethene                      | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane   | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Cis-1,2-dichloroethene                  | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| MTBE (Methyl Tertiary Butyl Ether)      | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,1-Dichloroethane                      | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 2,2-Dichloropropane                     | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Trichloromethane                        | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,1,1-Trichloroethane                   | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,2-Dichloroethane                      | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,1-Dichloropropene                     | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Trans-1,2-dichloroethene                | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| Benzene                                 | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Tetrachloromethane                      | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,2-Dichloropropane                     | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Trichloroethene                         | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Dibromomethane                          | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Bromodichloromethane                    | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Cis-1,3-dichloropropene                 | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Trans-1,3-dichloropropene               | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Toluene                                 | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,1,2-Trichloroethane                   | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,3-Dichloropropane                     | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Dibromochloromethane                    | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Tetrachloroethene                       | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| 1,2-Dibromoethane                       | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| Chlorobenzene                           | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,1,1,2-Tetrachloroethane               | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Ethylbenzene                            | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| p & m-Xylene                            | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Styrene                                 | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Tribromomethane                         | µg/kg | 1                  | NONE                    | -             | -             | < 1.0         | -             |
| o-Xylene                                | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,1,2,2-Tetrachloroethane               | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Isopropylbenzene                        | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Bromobenzene                            | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| n-Propylbenzene                         | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| 2-Chlorotoluene                         | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 4-Chlorotoluene                         | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,3,5-Trimethylbenzene                  | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| tert-Butylbenzene                       | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,2,4-Trimethylbenzene                  | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| sec-Butylbenzene                        | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,3-Dichlorobenzene                     | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| p-Isopropyltoluene                      | µg/kg | 1                  | ISO 17025               | -             | -             | < 1.0         | -             |
| 1,2-Dichlorobenzene                     | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| 1,4-Dichlorobenzene                     | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |
| Butylbenzene                            | µg/kg | 1                  | MCERTS                  | -             | -             | < 1.0         | -             |



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|                                         |       |                    |                      |               |               |               |               |
|-----------------------------------------|-------|--------------------|----------------------|---------------|---------------|---------------|---------------|
| Lab Sample Number                       |       |                    |                      | 2157509       | 2157510       | 2157738       | 2157739       |
| Sample Reference                        |       |                    |                      | WS04          | HD02          | WS01          | WS01          |
| Sample Number                           |       |                    |                      | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                      | 1.50          | 0.80          | 0.65          | 0.90          |
| Date Sampled                            |       |                    |                      | 27/01/2022    | 26/01/2022    | 28/01/2022    | 28/01/2022    |
| Time Taken                              |       |                    |                      | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation Status |               |               |               |               |
|                                         | µg/kg | 1                  | ISO 17025            | -             | -             | < 1.0         | -             |
|                                         | µg/kg | 1                  | MCERTS               | -             | -             | < 1.0         | -             |
|                                         | µg/kg | 1                  | MCERTS               | -             | -             | < 1.0         | -             |
|                                         | µg/kg | 1                  | ISO 17025            | -             | -             | < 1.0         | -             |

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Your Order No: EBMA3212

| Lab Sample Number                       |       |                    |                         | 2157509       | 2157510       | 2157738       | 2157739       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | WS04          | HD02          | WS01          | WS01          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 1.50          | 0.80          | 0.65          | 0.90          |
| Date Sampled                            |       |                    |                         | 27/01/2022    | 26/01/2022    | 28/01/2022    | 28/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |
| <b>SVOCs</b>                            |       |                    |                         |               |               |               |               |
| Aniline                                 | mg/kg | 0.1                | NONE                    | -             | -             | < 0.1         | -             |
| Phenol                                  | mg/kg | 0.2                | ISO 17025               | -             | -             | < 0.2         | -             |
| 2-Chlorophenol                          | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| Bis(2-chloroethyl)ether                 | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| 1,3-Dichlorobenzene                     | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| 1,2-Dichlorobenzene                     | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| 1,4-Dichlorobenzene                     | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| Bis(2-chloroisopropyl)ether             | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| 2-Methylphenol                          | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Hexachloroethane                        | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Nitrobenzene                            | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| 4-Methylphenol                          | mg/kg | 0.2                | NONE                    | -             | -             | < 0.2         | -             |
| Isophorone                              | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| 2-Nitrophenol                           | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| 2,4-Dimethylphenol                      | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Bis(2-chloroethoxy)methane              | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| 1,2,4-Trichlorobenzene                  | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Naphthalene                             | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| 2,4-Dichlorophenol                      | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| 4-Chloroaniline                         | mg/kg | 0.1                | NONE                    | -             | -             | < 0.1         | -             |
| Hexachlorobutadiene                     | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| 4-Chloro-3-methylphenol                 | mg/kg | 0.1                | NONE                    | -             | -             | < 0.1         | -             |
| 2,4,6-Trichlorophenol                   | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| 2,4,5-Trichlorophenol                   | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| 2-Methylnaphthalene                     | mg/kg | 0.1                | NONE                    | -             | -             | < 0.1         | -             |
| 2-Chloronaphthalene                     | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| Dimethylphthalate                       | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| 2,6-Dinitrotoluene                      | mg/kg | 0.1                | MCERTS                  | -             | -             | < 0.1         | -             |
| Acenaphthylene                          | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Acenaphthene                            | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| 2,4-Dinitrotoluene                      | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| Dibenzofuran                            | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| 4-Chlorophenyl phenyl ether             | mg/kg | 0.3                | ISO 17025               | -             | -             | < 0.3         | -             |
| Diethyl phthalate                       | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| 4-Nitroaniline                          | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| Fluorene                                | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Azobenzene                              | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Bromophenyl phenyl ether                | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| Hexachlorobenzene                       | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Phenanthrene                            | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Anthracene                              | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Carbazole                               | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Dibutyl phthalate                       | mg/kg | 0.2                | MCERTS                  | -             | -             | < 0.2         | -             |
| Anthraquinone                           | mg/kg | 0.3                | MCERTS                  | -             | -             | < 0.3         | -             |
| Fluoranthene                            | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Pyrene                                  | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Butyl benzyl phthalate                  | mg/kg | 0.3                | ISO 17025               | -             | -             | < 0.3         | -             |
| Benzo(a)anthracene                      | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Chrysene                                | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Benzo(b)fluoranthene                    | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Benzo(k)fluoranthene                    | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Benzo(a)pyrene                          | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |



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| Lab Sample Number                       |       |                    |                         | 2157509       | 2157510       | 2157738       | 2157739       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | WS04          | HD02          | WS01          | WS01          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 1.50          | 0.80          | 0.65          | 0.90          |
| Date Sampled                            |       |                    |                         | 27/01/2022    | 26/01/2022    | 28/01/2022    | 28/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |
| Indeno(1,2,3-cd)pyrene                  | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Dibenz(a,h)anthracene                   | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |
| Benzo(ghi)perylene                      | mg/kg | 0.05               | MCERTS                  | -             | -             | < 0.05        | -             |

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



**Analytical Report Number : 22-36851**

**Project / Site name: Alberton House**

\* 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 *                     |
|-------------------|------------------|---------------|-----------|------------------------------------------|
| 2157504           | WS02             | None Supplied | 0.4       | Brown sand.                              |
| 2157505           | WS02             | None Supplied | 1.1       | Brown sand with gravel.                  |
| 2157506           | WS03             | None Supplied | 0.7       | Brown sandy loam with gravel and stones. |
| 2157507           | WS03             | None Supplied | 2         | Brown sand with stones and brick.        |
| 2157508           | WS04             | None Supplied | 1         | Brown clay and sand with gravel.         |
| 2157509           | WS04             | None Supplied | 1.5       | Brown clay and sand with gravel.         |
| 2157510           | HD02             | None Supplied | 0.8       | Brown sandy loam with gravel and stones. |
| 2157738           | WS01             | None Supplied | 0.65      | Brown sand with gravel.                  |
| 2157739           | WS01             | None Supplied | 0.9       | Brown sand with stones.                  |

Analytical Report Number : 22-36851

Project / Site name: Alberton House

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

| Analytical Test Name                               | Analytical Method Description                                                                                                                                                   | Analytical Method Reference                                                                                     | Method number | Wet / Dry Analysis | Accreditation Status |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| 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.                                                                                                | L038-PL       | D                  | 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               |
| 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               |
| Complex Cyanide in soil                            | Determination of complex cyanide by calculation.                                                                                                                                | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL       | W                  | MCERTS               |
| Hexavalent chromium in soil (Lower Level)          | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.                           | In-house method                                                                                                 | L080-PL       | W                  | NONE                 |
| Free cyanide in soil                               | Determination of free 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               |
| Moisture Content                                   | Moisture content, determined gravimetrically. (30 oC)                                                                                                                           | In house method.                                                                                                | 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               |
| 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               |
| pH in soil (automated)                             | Determination of pH in soil by addition of water followed by automated electrometric measurement.                                                                               | In house method.                                                                                                | L099-PL       | D                  | MCERTS               |
| Thiocyanate in soil                                | Determination of thiocyanate in soil by extraction in water followed by acidification followed by addition of ferric nitrate followed by discrete analyser (spectrophotometer). | In-house method                                                                                                 | L082-PL       | D                  | NONE                 |
| 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                 |
| 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               |
| 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               |
| 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               |
| 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               |

Analytical Report Number : 22-36851  
Project / Site name: Alberton House

**Water matrix abbreviations:**

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

| Analytical Test Name                | Analytical Method Description                                                                                                                             | Analytical Method Reference                                                                            | Method number | Wet / Dry Analysis | Accreditation Status |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Ammonium as NH <sub>4</sub> in soil | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.                        | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL       | W                  | MCERTS               |
| TPHCWG (Soil)                       | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.                                                                                 | In-house method with silica gel split/clean up.                                                        | L088/76-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.                             | In house method.                                                                                       | L009-PL       | D                  | MCERTS               |
| Sulphate, water soluble, in soil    | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In house method.                                                                                       | L038-PL       | D                  | 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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions                                                           |
|---------|------------------------------------------------------------------------|
| HS      | Headspace Analysis                                                     |
| MS      | Mass spectrometry                                                      |
| FID     | Flame Ionisation Detector                                              |
| GC      | Gas Chromatography                                                     |
| EH      | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU      | Clean-up - e.g. by Florisil®, silica gel                               |
| 1D      | GC - Single coil/column gas chromatography                             |
| 2D      | GC-GC - Double coil/column gas chromatography                          |
| Total   | Aliphatics & Aromatics                                                 |
| AL      | Aliphatics                                                             |
| AR      | Aromatics                                                              |
| #1      | EH_2D_Total but with humics mathematically subtracted                  |
| #2      | EH_2D_Total but with fatty acids mathematically subtracted             |
| -       | Operator - understore to separate acronyms (exception for +)           |
| +       | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total     |

## FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 22/03739  
**Issue Number:** 1

**Date:** 26 April, 2022

**Client:** Curtins Consulting (Manchester)  
Merchant Exchange  
17-19 Whitworth Street  
Manchester  
UK  
M1 5WG

**Project Manager:** Russell Taylor  
**Project Name:** Alberton House  
**Project Ref:** 77764  
**Order No:** EBMA3338  
**Date Samples Received:** 14/04/22  
**Date Instructions Received:** 19/04/22  
**Date Analysis Completed:** 26/04/22

**Approved by:**



Holly Neary-King  
Client Services Supervisor

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

|                                                |            |  |  |  |  |  |  |                         |                    |             |
|------------------------------------------------|------------|--|--|--|--|--|--|-------------------------|--------------------|-------------|
| Lab Sample ID                                  | 22/03739/1 |  |  |  |  |  |  | Units                   | Limit of Detection | Method ref  |
| Client Sample No                               |            |  |  |  |  |  |  |                         |                    |             |
| Client Sample ID                               | WS07       |  |  |  |  |  |  |                         |                    |             |
| Depth to Top                                   | 12.00      |  |  |  |  |  |  |                         |                    |             |
| Depth To Bottom                                |            |  |  |  |  |  |  |                         |                    |             |
| Date Sampled                                   | 13-Apr-22  |  |  |  |  |  |  |                         |                    |             |
| Sample Type                                    | Water - EW |  |  |  |  |  |  |                         |                    |             |
| Sample Matrix Code                             | N/A        |  |  |  |  |  |  |                         |                    |             |
| pH (w) <sub>A</sub> <sup>#</sup>               | 7.36       |  |  |  |  |  |  | pH                      | 0.01               | A-T-031w    |
| Hardness Total <sub>A</sub> <sup>#</sup>       | 422        |  |  |  |  |  |  | mg/l Ca CO <sub>3</sub> | 2                  | A-T-049w    |
| Sulphate (w) <sub>A</sub> <sup>#</sup>         | 182        |  |  |  |  |  |  | mg/l                    | 1                  | A-T-026w    |
| Cyanide (total) (w) <sub>A</sub> <sup>#</sup>  | 0.019      |  |  |  |  |  |  | mg/l                    | 0.005              | A-T-042wTCN |
| Phenols - Total by HPLC (w) <sub>A</sub>       | <0.01      |  |  |  |  |  |  | mg/l                    | 0.01               | A-T-050w    |
| Sulphide (w) <sub>A</sub>                      | 0.1        |  |  |  |  |  |  | mg/l                    | 0.1                | A-T-043-w   |
| DOC (w) <sub>A</sub> <sup>#</sup>              | 5.8        |  |  |  |  |  |  | mg/l                    | 2                  | A-T-032w    |
| Arsenic (dissolved) <sub>A</sub> <sup>#</sup>  | <1         |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |
| Boron (dissolved) <sub>A</sub> <sup>#</sup>    | 288        |  |  |  |  |  |  | µg/l                    | 10                 | A-T-025w    |
| Cadmium (dissolved) <sub>A</sub> <sup>#</sup>  | <0.2       |  |  |  |  |  |  | µg/l                    | 0.2                | A-T-025w    |
| Calcium (dissolved) <sub>A</sub> <sup>#</sup>  | 116        |  |  |  |  |  |  | mg/l                    | 1                  | A-T-049w    |
| Copper (dissolved) <sub>A</sub> <sup>#</sup>   | <1         |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |
| Chromium (dissolved) <sub>A</sub> <sup>#</sup> | <1         |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |
| Lead (dissolved) <sub>A</sub> <sup>#</sup>     | <1         |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |
| Mercury (dissolved) <sub>A</sub> <sup>#</sup>  | <0.1       |  |  |  |  |  |  | µg/l                    | 0.1                | A-T-025w    |
| Nickel (dissolved) <sub>A</sub> <sup>#</sup>   | 4          |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |
| Selenium (dissolved) <sub>A</sub> <sup>#</sup> | <1         |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |
| Zinc (dissolved) <sub>A</sub> <sup>#</sup>     | 3          |  |  |  |  |  |  | µg/l                    | 1                  | A-T-025w    |

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

|                                                     |            |  |  |  |  |  |  |       |                    |            |
|-----------------------------------------------------|------------|--|--|--|--|--|--|-------|--------------------|------------|
| Lab Sample ID                                       | 22/03739/1 |  |  |  |  |  |  | Units | Limit of Detection | Method ref |
| Client Sample No                                    |            |  |  |  |  |  |  |       |                    |            |
| Client Sample ID                                    | WS07       |  |  |  |  |  |  |       |                    |            |
| Depth to Top                                        | 12.00      |  |  |  |  |  |  |       |                    |            |
| Depth To Bottom                                     |            |  |  |  |  |  |  |       |                    |            |
| Date Sampled                                        | 13-Apr-22  |  |  |  |  |  |  |       |                    |            |
| Sample Type                                         | Water - EW |  |  |  |  |  |  |       |                    |            |
| Sample Matrix Code                                  | N/A        |  |  |  |  |  |  |       |                    |            |
| PAH 16MS (w)                                        |            |  |  |  |  |  |  |       |                    |            |
| Acenaphthene (w) <sub>A</sub> <sup>#</sup>          | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Acenaphthylene (w) <sub>A</sub> <sup>#</sup>        | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Anthracene (w) <sub>A</sub> <sup>#</sup>            | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Benzo(a)anthracene (w) <sub>A</sub> <sup>#</sup>    | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Benzo(a)pyrene (w) <sub>A</sub> <sup>#</sup>        | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Benzo(b)fluoranthene (w) <sub>A</sub> <sup>#</sup>  | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Benzo(ghi)perylene (w) <sub>A</sub> <sup>#</sup>    | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Benzo(k)fluoranthene (w) <sub>A</sub> <sup>#</sup>  | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Chrysene (w) <sub>A</sub> <sup>#</sup>              | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Dibenzo(ah)anthracene (w) <sub>A</sub> <sup>#</sup> | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Fluoranthene (w) <sub>A</sub> <sup>#</sup>          | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Fluorene (w) <sub>A</sub> <sup>#</sup>              | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Indeno(123-cd)pyrene (w) <sub>A</sub> <sup>#</sup>  | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Naphthalene (w) <sub>A</sub> <sup>#</sup>           | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Phenanthrene (w) <sub>A</sub> <sup>#</sup>          | <0.01      |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Pyrene (w) <sub>A</sub> <sup>#</sup>                | 0.01       |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |
| Total PAH 16MS (w) <sub>A</sub> <sup>#</sup>        | 0.01       |  |  |  |  |  |  | µg/l  | 0.01               | A-T-019w   |

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

|                                                    |            |  |  |  |  |  |  |      |    |          |
|----------------------------------------------------|------------|--|--|--|--|--|--|------|----|----------|
| Lab Sample ID                                      | 22/03739/1 |  |  |  |  |  |  |      |    |          |
| Client Sample No                                   |            |  |  |  |  |  |  |      |    |          |
| Client Sample ID                                   | WS07       |  |  |  |  |  |  |      |    |          |
| Depth to Top                                       | 12.00      |  |  |  |  |  |  |      |    |          |
| Depth To Bottom                                    |            |  |  |  |  |  |  |      |    |          |
| Date Sampled                                       | 13-Apr-22  |  |  |  |  |  |  |      |    |          |
| Sample Type                                        | Water - EW |  |  |  |  |  |  |      |    |          |
| Sample Matrix Code                                 | N/A        |  |  |  |  |  |  |      |    |          |
| TPH CWG (w) with Clean Up *C1                      |            |  |  |  |  |  |  |      |    |          |
| Ali >C5-C6 (w) <sub>A</sub> <sup>#</sup>           | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| Ali >C6-C8 (w) <sub>A</sub> <sup>#</sup>           | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| Ali >C8-C10 (w) <sub>A</sub> <sup>#</sup>          | 20         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Ali >C10-C12 (w) <sub>A</sub> <sup>#</sup>         | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Ali >C12-C16 (w) <sub>A</sub> <sup>#</sup>         | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Ali >C16-C21 (w) <sub>A</sub> <sup>#</sup>         | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Ali >C21-C35 (w) <sub>A</sub> <sup>#</sup>         | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Total Aliphatics (w) <sub>A</sub> <sup>#</sup>     | 20         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Aro >C5-C7 (w) <sub>A</sub> <sup>#</sup>           | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| Aro >C7-C8 (w) <sub>A</sub> <sup>#</sup>           | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| Aro >C8-C10 (w) <sub>A</sub>                       | 291        |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Aro >C10-C12 (w) <sub>A</sub> <sup>#</sup>         | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Aro >C12-C16 (w) <sub>A</sub> <sup>#</sup>         | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Aro >C16-C21 (w) <sub>A</sub> <sup>#</sup>         | 7          |  |  |  |  |  |  | µg/l | 5  | A-T-055w |
| Aro >C21-C35 (w) <sub>A</sub>                      | <10        |  |  |  |  |  |  | µg/l | 10 | A-T-055w |
| Total Aromatics (w) <sub>A</sub>                   | 298        |  |  |  |  |  |  | µg/l | 10 | A-T-055w |
| TPH (Ali & Aro >C5-C35) (w) <sub>A</sub>           | 318        |  |  |  |  |  |  | µg/l | 10 | A-T-055w |
| BTEX - Benzene (w) <sub>A</sub> <sup>#</sup>       | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| BTEX - Toluene (w) <sub>A</sub> <sup>#</sup>       | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| BTEX - Ethyl Benzene (w) <sub>A</sub> <sup>#</sup> | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| BTEX - m & p Xylene (w) <sub>A</sub> <sup>#</sup>  | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| BTEX - o Xylene (w) <sub>A</sub> <sup>#</sup>      | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |
| MTBE (w) <sub>A</sub> <sup>#</sup>                 | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-022w |

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

|                                          |            |  |  |  |  |  |  |      |    |          |
|------------------------------------------|------------|--|--|--|--|--|--|------|----|----------|
| Lab Sample ID                            | 22/03739/1 |  |  |  |  |  |  |      |    |          |
| Client Sample No                         |            |  |  |  |  |  |  |      |    |          |
| Client Sample ID                         | WS07       |  |  |  |  |  |  |      |    |          |
| Depth to Top                             | 12.00      |  |  |  |  |  |  |      |    |          |
| Depth To Bottom                          |            |  |  |  |  |  |  |      |    |          |
| Date Sampled                             | 13-Apr-22  |  |  |  |  |  |  |      |    |          |
| Sample Type                              | Water - EW |  |  |  |  |  |  |      |    |          |
| Sample Matrix Code                       | N/A        |  |  |  |  |  |  |      |    |          |
| SVOC (excluding PAH-16) (w)              |            |  |  |  |  |  |  |      |    |          |
| 2,4,5-Trichlorophenol <sub>A</sub>       | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2,4,6-Trichlorophenol (w) <sub>A</sub>   | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2,4-Dichlorophenol <sub>A</sub>          | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2,4-Dimethylphenol <sub>A</sub>          | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2,4-Dinitrotoluene <sub>A</sub>          | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2,6-Dinitrotoluene <sub>A</sub>          | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2-Chloronaphthalene <sub>A</sub>         | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2-Chlorophenol <sub>A</sub>              | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2-Methylnaphthalene <sub>A</sub>         | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2-Methylphenol <sub>A</sub>              | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 2-Nitrophenol <sub>A</sub>               | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 4-Bromophenyl phenyl ether <sub>A</sub>  | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 4-Chloro-3-methylphenol <sub>A</sub>     | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Bis(2-chloroisopropyl)ether <sub>A</sub> | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 3+4-Methylphenol <sub>A</sub>            | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| 4-Nitrophenol <sub>A</sub>               | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Bis(2-chloroethyl)ether <sub>A</sub>     | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Bis(2-chloroethoxy)methane <sub>A</sub>  | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Bis(2-ethylhexyl)phthalate <sub>A</sub>  | <20        |  |  |  |  |  |  | µg/l | 10 | A-T-052w |
| Butylbenzyl phthalate <sub>A</sub>       | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Carbazole <sub>A</sub>                   | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Dibenzofuran <sub>A</sub>                | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| n-Dibutylphthalate <sub>A</sub>          | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| n-Dioctylphthalate <sub>A</sub>          | <20        |  |  |  |  |  |  | µg/l | 10 | A-T-052w |
| n-Nitroso-n-dipropylamine <sub>A</sub>   | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Diethyl phthalate <sub>A</sub>           | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Dimethyl phthalate <sub>A</sub>          | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Hexachlorobenzene <sub>A</sub>           | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Pentachlorophenol (SVOC) <sub>A</sub>    | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Phenol <sub>A</sub>                      | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Hexachloroethane <sub>A</sub>            | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |
| Nitrobenzene <sub>A</sub>                | <2         |  |  |  |  |  |  | µg/l | 1  | A-T-052w |

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

|                                        |            |  |  |  |  |  |  |       |                    |            |
|----------------------------------------|------------|--|--|--|--|--|--|-------|--------------------|------------|
| Lab Sample ID                          | 22/03739/1 |  |  |  |  |  |  | Units | Limit of Detection | Method ref |
| Client Sample No                       |            |  |  |  |  |  |  |       |                    |            |
| Client Sample ID                       | WS07       |  |  |  |  |  |  |       |                    |            |
| Depth to Top                           | 12.00      |  |  |  |  |  |  |       |                    |            |
| Depth To Bottom                        |            |  |  |  |  |  |  |       |                    |            |
| Date Sampled                           | 13-Apr-22  |  |  |  |  |  |  |       |                    |            |
| Sample Type                            | Water - EW |  |  |  |  |  |  |       |                    |            |
| Sample Matrix Code                     | N/A        |  |  |  |  |  |  |       |                    |            |
| Isophorone <sub>A</sub>                | <2         |  |  |  |  |  |  | µg/l  | 1                  | A-T-052w   |
| Hexachlorocyclopentadiene <sub>A</sub> | <2         |  |  |  |  |  |  | µg/l  | 1                  | A-T-052w   |
| Perylene <sub>A</sub>                  | <2         |  |  |  |  |  |  | µg/l  | 1                  | A-T-052w   |

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

| Lab Sample ID                                       | 22/03739/1 |  |  |  |  |  |  |      |    |          |
|-----------------------------------------------------|------------|--|--|--|--|--|--|------|----|----------|
| Client Sample No                                    |            |  |  |  |  |  |  |      |    |          |
| Client Sample ID                                    | WS07       |  |  |  |  |  |  |      |    |          |
| Depth to Top                                        | 12.00      |  |  |  |  |  |  |      |    |          |
| Depth To Bottom                                     |            |  |  |  |  |  |  |      |    |          |
| Date Sampled                                        | 13-Apr-22  |  |  |  |  |  |  |      |    |          |
| Sample Type                                         | Water - EW |  |  |  |  |  |  |      |    |          |
| Sample Matrix Code                                  | N/A        |  |  |  |  |  |  |      |    |          |
| VOC (w)                                             |            |  |  |  |  |  |  |      |    |          |
| Dichlorodifluoromethane <sub>A</sub>                | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Chloromethane <sub>A</sub>                          | <10        |  |  |  |  |  |  | µg/l | 10 | A-T-006w |
| Vinyl Chloride <sub>A</sub> <sup>#</sup>            | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Bromomethane <sub>A</sub> <sup>#</sup>              | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Chloroethane <sub>A</sub> <sup>#</sup>              | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Trichlorofluoromethane <sub>A</sub> <sup>#</sup>    | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| trans 1,2-Dichloroethene <sub>A</sub> <sup>#</sup>  | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Dichloromethane <sub>A</sub>                        | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-006w |
| Carbon Disulphide <sub>A</sub> <sup>#</sup>         | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,1-Dichloroethene <sub>A</sub> <sup>#</sup>        | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,1-Dichloroethane <sub>A</sub> <sup>#</sup>        | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| cis 1,2-Dichloroethene <sub>A</sub> <sup>#</sup>    | 54         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Bromochloromethane <sub>A</sub> <sup>#</sup>        | <5         |  |  |  |  |  |  | µg/l | 5  | A-T-006w |
| Chloroform <sub>A</sub> <sup>#</sup>                | 1          |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 2,2-Dichloropropane <sub>A</sub> <sup>#</sup>       | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,2-Dichloroethane <sub>A</sub> <sup>#</sup>        | <2         |  |  |  |  |  |  | µg/l | 2  | A-T-006w |
| 1,1,1-Trichloroethane <sub>A</sub> <sup>#</sup>     | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,1-Dichloropropene <sub>A</sub> <sup>#</sup>       | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Benzene <sub>A</sub> <sup>#</sup>                   | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Carbon Tetrachloride <sub>A</sub> <sup>#</sup>      | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Dibromomethane <sub>A</sub> <sup>#</sup>            | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,2-Dichloropropane <sub>A</sub> <sup>#</sup>       | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Bromodichloromethane <sub>A</sub> <sup>#</sup>      | <10        |  |  |  |  |  |  | µg/l | 10 | A-T-006w |
| Trichloroethene <sub>A</sub> <sup>#</sup>           | 11         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| cis 1,3-Dichloropropene <sub>A</sub> <sup>#</sup>   | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| trans 1,3-Dichloropropene <sub>A</sub> <sup>#</sup> | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,1,2-Trichloroethane <sub>A</sub> <sup>#</sup>     | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Toluene <sub>A</sub> <sup>#</sup>                   | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| 1,3-Dichloropropane <sub>A</sub> <sup>#</sup>       | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Dibromochloromethane <sub>A</sub> <sup>#</sup>      | <3         |  |  |  |  |  |  | µg/l | 3  | A-T-006w |
| 1,2-Dibromoethane <sub>A</sub> <sup>#</sup>         | <1         |  |  |  |  |  |  | µg/l | 1  | A-T-006w |
| Tetrachloroethene <sub>A</sub>                      | 423        |  |  |  |  |  |  | µg/l | 1  | A-T-006w |

Envirolab Job Number: 22/03739

Client Project Name: Alberton House

Client Project Ref: 77764

| Lab Sample ID                                         | 22/03739/1 |  |  |  |  |  |  | Units | Limit of Detection | Method ref |
|-------------------------------------------------------|------------|--|--|--|--|--|--|-------|--------------------|------------|
| Client Sample No                                      |            |  |  |  |  |  |  |       |                    |            |
| Client Sample ID                                      | WS07       |  |  |  |  |  |  |       |                    |            |
| Depth to Top                                          | 12.00      |  |  |  |  |  |  |       |                    |            |
| Depth To Bottom                                       |            |  |  |  |  |  |  |       |                    |            |
| Date Sampled                                          | 13-Apr-22  |  |  |  |  |  |  |       |                    |            |
| Sample Type                                           | Water - EW |  |  |  |  |  |  |       |                    |            |
| Sample Matrix Code                                    | N/A        |  |  |  |  |  |  |       |                    |            |
| 1,1,1,2-Tetrachloroethane <sub>A</sub>                | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| Chlorobenzene <sub>A</sub> <sup>#</sup>               | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| Ethylbenzene <sub>A</sub> <sup>#</sup>                | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| m & p Xylene <sub>A</sub> <sup>#</sup>                | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| Bromoform <sub>A</sub> <sup>#</sup>                   | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| Styrene <sub>A</sub> <sup>#</sup>                     | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,1,2,2-Tetrachloroethane <sub>A</sub>                | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| o-Xylene <sub>A</sub> <sup>#</sup>                    | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,2,3-Trichloropropane <sub>A</sub> <sup>#</sup>      | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| Isopropylbenzene <sub>A</sub> <sup>#</sup>            | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| Bromobenzene <sub>A</sub> <sup>#</sup>                | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 2-Chlorotoluene <sub>A</sub> <sup>#</sup>             | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| n-propylbenzene <sub>A</sub> <sup>#</sup>             | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 4-Chlorotoluene <sub>A</sub> <sup>#</sup>             | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,2,4-Trimethylbenzene <sub>A</sub> <sup>#</sup>      | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 4-Isopropyltoluene <sub>A</sub> <sup>#</sup>          | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,3,5-Trimethylbenzene <sub>A</sub> <sup>#</sup>      | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,2-Dichlorobenzene <sub>A</sub> <sup>#</sup>         | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,4-Dichlorobenzene <sub>A</sub> <sup>#</sup>         | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| sec-Butylbenzene <sub>A</sub> <sup>#</sup>            | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| tert-Butylbenzene <sub>A</sub> <sup>#</sup>           | <2         |  |  |  |  |  |  | µg/l  | 2                  | A-T-006w   |
| 1,3-Dichlorobenzene <sub>A</sub> <sup>#</sup>         | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| n-butylbenzene <sub>A</sub> <sup>#</sup>              | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |
| 1,2-Dibromo-3-chloropropane <sub>A</sub> <sup>#</sup> | <2         |  |  |  |  |  |  | µg/l  | 2                  | A-T-006w   |
| 1,2,4-Trichlorobenzene <sub>A</sub> <sup>#</sup>      | <3         |  |  |  |  |  |  | µg/l  | 3                  | A-T-006w   |
| 1,2,3-Trichlorobenzene <sub>A</sub> <sup>#</sup>      | <3         |  |  |  |  |  |  | µg/l  | 3                  | A-T-006w   |
| Hexachlorobutadiene <sub>A</sub> <sup>#</sup>         | <1         |  |  |  |  |  |  | µg/l  | 1                  | A-T-006w   |

## **REPORT NOTES**

### **General**

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

### **Soil chemical analysis:**

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

### **TPH analysis of water by method A-T-007:**

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

### **Electrical Conductivity of water by Method A-T-037:**

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

### **Asbestos:**

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

### **Predominant Matrix Codes:**

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

### **Secondary Matrix Codes:**

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

### **Key:**

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

### **EPH CWG GCxGC ID from TPH CWG**

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

## Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR  
Tel. 0161 368 4921 email. ask@envlab.co.uk

|                            |                                                                                                        |                                    |                 |
|----------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------|-----------------|
| <b>Client:</b>             | Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street ,<br>Manchester, UK, M1 5WG | <b>Project No:</b>                 | 22/03739        |
| <b>Project:</b>            | Alberton House                                                                                         | <b>Date Received:</b>              | 19/04/2022 (am) |
| <b>Clients Project No:</b> | 77764                                                                                                  | <b>Cool Box Temperatures (°C):</b> | 10.4            |

### NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

## Envirolab Analysis Dates

|                               |                |
|-------------------------------|----------------|
| <b>Lab Sample ID</b>          | 22/03739/1     |
| <b>Client Sample No</b>       |                |
| <b>Client Sample ID/Depth</b> | WS07<br>12.00m |
| <b>Date Sampled</b>           | 13/04/22       |
| A-T-006w                      | 21/04/2022     |
| A-T-019w                      | 21/04/2022     |
| A-T-022w                      | 21/04/2022     |
| A-T-025w                      | 25/04/2022     |
| A-T-026w                      | 26/04/2022     |
| A-T-031w                      | 21/04/2022     |
| A-T-032w                      | 21/04/2022     |
| A-T-042wTCN                   | 21/04/2022     |
| A-T-043-w                     | 22/04/2022     |
| A-T-049w                      | 21/04/2022     |
| A-T-050w                      | 25/04/2022     |
| A-T-052w                      | 25/04/2022     |
| A-T-055w                      | 22/04/2022     |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

## Appendix D – Geotechnical Analysis Results

- i2 Analytical Ltd, Environmental Geotechnical Analysis Results
  - Final Analytical Test Report Ref. 21-33716
  - Final Analytical Test Report Ref. 21-33725
  - Final Analytical Test Report Ref. 21-37065
  - Final Analytical Test Report Ref. 21-37071



4041

Client: CURTINS  
 Client Address: 17-19 Whitworth Street West, Manchester,  
 M1 5WG

Contact: Zoe Henderson  
 Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

## SUMMARY REPORT

### DETERMINATION OF POINT LOAD STRENGTH

Tested in Accordance with: ISRM: 2007, pages 125-132

i2 Analytical Ltd  
 Unit 8 Harrowden Road  
 Brackmills Industrial Estate  
 Northampton NN4 7EB



Environmental Science

Client Reference: B077764  
 Job Number: 22-33716  
 Date Sampled: 17/01/2022  
 Date Received: 17/01/2022  
 Date Tested: 04/02/2022  
 Sampled By: Not Given

### Test results

| Laboratory Reference | Hole No. | Sample    |                |                 |      | Description     | Remarks #<br>(including water content if measured) | Specimen Reference | Test Type<br>see ISRM |                          | Failure Valid<br>(Y/N) | Dimensions |         |           |            | Force P<br>kN | Equivalent diameter, De<br>mm | Point Load Strength Index |               |
|----------------------|----------|-----------|----------------|-----------------|------|-----------------|----------------------------------------------------|--------------------|-----------------------|--------------------------|------------------------|------------|---------|-----------|------------|---------------|-------------------------------|---------------------------|---------------|
|                      |          | Reference | Depth Top<br>m | Depth Base<br>m | Type |                 |                                                    |                    | Type<br>(D, A, I, B)  | Direction<br>(L, P or U) |                        | Lne<br>mm  | W<br>mm | Dps<br>mm | Dps'<br>mm |               |                               | Is<br>MPa                 | Is(50)<br>MPa |
| 2140634              | RH01     | Not Given | 9.58           | 9.69            | C    | Brown SANDSTONE | WC = 10.6%                                         | 1                  | D                     | U                        | YES                    | 55.4       | 99.4    | 99.0      | 96.0       | 1.3           | 97.7                          | 0.13                      | 0.18          |
| 2140635              | RH01     | Not Given | 17.93          | 18.03           | C    | Brown SANDSTONE | WC = 10.6%                                         | 1                  | A                     | U                        | YES                    | -          | 98.6    | 64.0      | 60.0       | 1.6           | 86.8                          | 0.21                      | 0.27          |
| 2140636              | RH01     | Not Given | 20.37          | 20.49           | C    | Brown SANDSTONE | WC = 11.9%                                         | 1                  | D                     | U                        | YES                    | 59.4       | 98.8    | 28.0      | 93.0       | 1.0           | 95.9                          | 0.10                      | 0.14          |
| 2140637              | RH01     | Not Given | 21.87          | 22.11           | C    | Brown SANDSTONE | WC = 7.3%                                          | 1                  | D                     | U                        | YES                    | 72.2       | 99.3    | 99.0      | 94.0       | 2.2           | 96.6                          | 0.23                      | 0.31          |
| 2140638              | RH01     | Not Given | 22.42          | 22.57           | C    | Brown SANDSTONE | WC = 10.6%                                         | 1                  | D                     | U                        | YES                    | 69.4       | 98.4    | 98.0      | 94.0       | 0.8           | 96.2                          | 0.09                      | 0.12          |
| 2140639              | RH01     | Not Given | 23.54          | 23.64           | C    | Brown SANDSTONE | WC = 12.8%                                         | 1                  | D                     | U                        | YES                    | 52.9       | 99.2    | 98.0      | 95.0       | 1.2           | 97.1                          | 0.12                      | 0.16          |
| 2140640              | RH01     | Not Given | 24.62          | 24.82           | C    | Brown SANDSTONE | WC = 8.2%                                          | 1                  | D                     | U                        | YES                    | 52.3       | 100.2   | 100.0     | 95.0       | 2.1           | 97.6                          | 0.22                      | 0.29          |
| 2140641              | RH01     | Not Given | 25.17          | 25.30           | C    | Brown SANDSTONE | WC = 11.2%                                         | 1                  | A                     | U                        | YES                    | -          | 98.8    | 91.0      | 84.0       | 2.3           | 102.8                         | 0.21                      | 0.29          |
| 2140642              | RH01     | Not Given | 25.57          | 25.68           | C    | Brown SANDSTONE | WC = 11.1%                                         | 1                  | D                     | U                        | YES                    | 54.9       | 98.9    | 98.0      | 94.0       | 0.9           | 96.4                          | 0.10                      | 0.13          |
| 2140643              | RH01     | Not Given | 26.07          | 26.24           | C    | Brown SANDSTONE | WC = 11.3%                                         | 1                  | D                     | U                        | YES                    | 55.9       | 100.2   | 100.0     | 96.0       | 1.5           | 98.1                          | 0.15                      | 0.20          |

Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;  
 Dimensions: Dps - Distance between platens (platen separation), Dps' - at failure (see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;  
 Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Comments:

Signed:

*Dudzinska Anna*

Anna Dudzinska  
 Deputy Head of Geo Office Section  
 for and on behalf of i2 Analytical Ltd

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4041

Client: CURTINS  
 Client Address: 17-19 Whitworth Street West, Manchester,  
 M1 5WG

Contact: Zoe Henderson  
 Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

## SUMMARY REPORT

### DETERMINATION OF POINT LOAD STRENGTH

Tested in Accordance with: ISRM: 2007, pages 125-132

i2 Analytical Ltd  
 Unit 8 Harrowden Road  
 Brackmills Industrial Estate  
 Northampton NN4 7EB



Environmental Science

Client Reference: B077764  
 Job Number: 22-33716  
 Date Sampled: 17/01/2022  
 Date Received: 17/01/2022  
 Date Tested: 04/02/2022  
 Sampled By: Not Given

### Test results

| Laboratory Reference | Hole No. | Sample    |                |                 |      | Description     | Remarks #<br>(including water content if measured) | Specimen Reference | Test Type<br>see ISRM |                          | Failure Valid<br>(Y/N) | Dimensions |         |           |            | Force P<br>kN | Equivalent diameter, De<br>mm | Point Load Strength Index |               |
|----------------------|----------|-----------|----------------|-----------------|------|-----------------|----------------------------------------------------|--------------------|-----------------------|--------------------------|------------------------|------------|---------|-----------|------------|---------------|-------------------------------|---------------------------|---------------|
|                      |          | Reference | Depth Top<br>m | Depth Base<br>m | Type |                 |                                                    |                    | Type<br>(D, A, I, B)  | Direction<br>(L, P or U) |                        | Lne<br>mm  | W<br>mm | Dps<br>mm | Dps'<br>mm |               |                               | Is<br>MPa                 | Is(50)<br>MPa |
| 2140645              | RH01     | Not Given | 27.50          | 27.61           | C    | Brown SANDSTONE | WC = 6.9%                                          | 1                  | D                     | U                        | YES                    | 57.3       | 98.5    | 98.0      | 93.0       | 0.5           | 95.7                          | 0.05                      | 0.07          |
| 2140646              | RH01     | Not Given | 28.61          | 28.76           | C    | Brown SANDSTONE | WC = 10.9%                                         | 1                  | D                     | U                        | YES                    | 54.2       | 99.5    | 99.0      | 96.0       | 1.7           | 97.7                          | 0.18                      | 0.24          |
| 2140647              | RH01     | Not Given | 29.07          | 29.27           | C    | Brown SANDSTONE | WC = 13.2%                                         | 1                  | D                     | U                        | YES                    | 55.4       | 98.3    | 97.0      | 94.0       | 0.9           | 96.1                          | 0.09                      | 0.12          |
| 2140648              | RH01     | Not Given | 30.10          | 30.19           | C    | Brown SANDSTONE | WC = 13.0%                                         | 1                  | D                     | U                        | YES                    | 54.0       | 98.7    | 98.0      | 95.0       | 1.2           | 96.8                          | 0.13                      | 0.17          |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |
|                      |          |           |                |                 |      |                 |                                                    |                    |                       |                          |                        |            |         |           |            |               |                               |                           |               |

Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;  
 Dimensions: Dps - Distance between platens ( platen separation ), Dps' - at failure ( see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;  
 Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Comments:

Signed:

*Dudzinska Anna*

Anna Dudzinska  
 Deputy Head of Geo Office Section  
 for and on behalf of i2 Analytical Ltd

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4041

Client: CURTINS

Client Address: 17-19 Whitworth Street West, Manchester,  
M1 5WG

Contact: Zoe Henderson

Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

**SUMMARY REPORT****DETERMINATION OF UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS**

Tested in Accordance with: ISRM, 2007, p153, part 1

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB

Environmental Science

Client Reference: B077764

Job Number: 22-33716

Date Sampled: 17/01/2022

Date Received: 17/01/2022

Date Tested: 04/02/2022

Sampled By: Not Given

**Test results**

| Laboratory Reference | Hole No. | Sample    |           |            |      | Description     | Remarks | Specimen Dimensions (2) |        |     |                       | Bulk density (2)<br>Mg/m3 | Water Content (1)<br>% | Uniaxial Compression (3) |             |                 |      |
|----------------------|----------|-----------|-----------|------------|------|-----------------|---------|-------------------------|--------|-----|-----------------------|---------------------------|------------------------|--------------------------|-------------|-----------------|------|
|                      |          | Reference | Depth Top | Depth Base | Type |                 |         | Diameter                | Length | H/D | Orientation of sample |                           |                        | Condition                | Stress Rate | Mode of failure | UCS  |
|                      |          |           | m         | m          |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
| 2140644              | RH01     | Not Given | 26.53     | 26.61      | C    | Brown SANDSTONE |         | 98.9                    | 260.7  | 2.6 | Vertical              | 2.31                      | 9.2                    | as received              | 0.0391      | MS + AC         | 20.7 |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |
|                      |          |           |           |            |      |                 |         |                         |        |     |                       |                           |                        |                          |             |                 |      |

Note: 1 - ISRM p87 test 1, water content at 105 ± 3 °C, specimen as tested for UCS, 2 - ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density, 3 - ISRM p153 part 1, determination of Uniaxial Compressive Strength ( UCS ) of Rock Materials, above notes apply unless annotated otherwise in the remarks. Compaction machine: VJ Tech AUTOCON - VJT 51-3011; Mode of failure legend: S - Single shear, MS - multiple shear, AC - Axial cleavage, F - Fragmented

Comments:

Signed:

 Anna Dudzinska  
 Deputy Head of Geo Office Section  
 for and on behalf of i2 Analytical Ltd

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**Zoe Henderson**

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## **Analytical Report Number : 22-33725**

|                             |                |                                                        |            |
|-----------------------------|----------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Alberton House | <b>Samples received on:</b>                            | 17/01/2022 |
| <b>Your job number:</b>     | B077764        | <b>Samples instructed on/<br/>Analysis started on:</b> | 18/01/2022 |
| <b>Your order number:</b>   | EBMA3196       | <b>Analysis completed by:</b>                          | 03/02/2022 |
| <b>Report Issue Number:</b> | 1              | <b>Report issued on:</b>                               | 03/02/2022 |
| <b>Samples Analysed:</b>    | 4 soil samples |                                                        |            |

**Signed:**

Karolina Marek  
PL Head of Reporting Team  
**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

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.  
Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 22-33725  
 Project / Site name: Alberton House  
 Your Order No: EBMA3196

| Lab Sample Number                       |       |                    |                         | 2140708       | 2140709       | 2140710       | 2140711       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|---------------|
| Sample Reference                        |       |                    |                         | RH01          | RH01          | RH01          | RH01          |
| Sample Number                           |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m)                               |       |                    |                         | 1.80          | 21.87-22.11   | 25.17-25.30   | 28.61-28.76   |
| Date Sampled                            |       |                    |                         | 14/01/2022    | 17/01/2022    | 17/01/2022    | 17/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |               |
| Stone Content                           | %     | 0.1                | NONE                    | < 0.1         | < 0.1         | < 0.1         | < 0.1         |
| Moisture Content                        | %     | 0.01               | NONE                    | 17            | 2.3           | 5.1           | 5.1           |
| Total mass of sample received           | kg    | 0.001              | NONE                    | 0.40          | 0.10          | 0.10          | 0.10          |

#### General Inorganics

|                                                                         |          |         |        |       |       |         |       |
|-------------------------------------------------------------------------|----------|---------|--------|-------|-------|---------|-------|
| pH - Automated                                                          | pH Units | N/A     | MCERTS | 8.3   | 8.6   | 8.5     | 8.8   |
| Total Sulphate as SO <sub>4</sub>                                       | %        | 0.005   | MCERTS | 0.013 | 0.019 | 0.015   | 0.015 |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.034 | 0.014 | 0.017   | 0.020 |
| Water Soluble Chloride (2:1) (leachate equivalent)                      | mg/l     | 0.5     | MCERTS | 15    | 5.4   | 4.7     | 5.6   |
| Total Sulphur                                                           | %        | 0.005   | MCERTS | 0.005 | 0.006 | < 0.005 | 0.008 |
| Water Soluble Nitrate (2:1) as N (leachate equivalent)                  | mg/l     | 2       | NONE   | 3.4   | < 2.0 | < 2.0   | < 2.0 |

#### Heavy Metals / Metalloids

|                                 |       |     |      |       |     |     |     |
|---------------------------------|-------|-----|------|-------|-----|-----|-----|
| Magnesium (water soluble)       | mg/kg | 5   | NONE | < 5.0 | 5.3 | 5.9 | 5.4 |
| Magnesium (leachate equivalent) | mg/l  | 2.5 | NONE | < 2.5 | 2.7 | 3.0 | 2.7 |

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



**Analytical Report Number : 22-33725**  
**Project / Site name: Alberton House**

\* 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 *             |
|-------------------|------------------|---------------|-------------|----------------------------------|
| 2140708           | RH01             | None Supplied | 1.8         | Brown clay and loam with gravel. |
| 2140709           | RH01             | None Supplied | 21.87-22.11 | Brown clay and sand.             |
| 2140710           | RH01             | None Supplied | 25.17-25.30 | Brown clay and sand.             |
| 2140711           | RH01             | None Supplied | 28.61-28.76 | Brown clay and sand.             |



**Analytical Report Number : 22-33725**  
**Project / Site name: Alberton House**

**Water matrix abbreviations:**  
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name                               | Analytical Method Description                                                                                                                             | Analytical Method Reference                                                                                             | Method number | Wet / Dry Analysis | Accreditation Status |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| 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.                                                                                                        | L038-PL       | D                  | MCERTS               |
| Magnesium, water soluble, in soil                  | Determination of water soluble magnesium by extraction with water followed by ICP-OES.                                                                    | In-house method based on TRL 447                                                                                        | L038-PL       | D                  | NONE                 |
| Moisture Content                                   | Moisture content, determined gravimetrically. (30 oC)                                                                                                     | In house method.                                                                                                        | L019-UK/PL    | W                  | NONE                 |
| pH in soil (automated)                             | Determination of pH in soil by addition of water followed by automated electrometric measurement.                                                         | In house method.                                                                                                        | L099-PL       | D                  | MCERTS               |
| 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                 |
| Total Sulphate in soil as %                        | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.                                                                   | In house method.                                                                                                        | L038-PL       | D                  | MCERTS               |
| Total Sulphur in soil as %                         | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.                                      | In house method.                                                                                                        | L038-PL       | D                  | MCERTS               |
| Water Soluble Nitrate (2:1) as N in soil           | Determination of nitrate by reaction with sodium salicylate and colorimetry.                                                                              | In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction. | L078-PL       | W                  | NONE                 |
| Chloride, water soluble, in soil                   | Determination of Chloride colorimetrically by discrete analyser.                                                                                          | In house method.                                                                                                        | L082-PL       | D                  | 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.**

**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

**Zoe Henderson**

Curtins  
17-19 Whitworth Street West  
Manchester  
M1 5WG

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## **Analytical Report Number : 22-37065**

|                             |                |                                                        |            |
|-----------------------------|----------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Alberton House | <b>Samples received on:</b>                            | 01/02/2022 |
| <b>Your job number:</b>     | B077764        | <b>Samples instructed on/<br/>Analysis started on:</b> | 01/02/2022 |
| <b>Your order number:</b>   | EBMA3213       | <b>Analysis completed by:</b>                          | 22/02/2022 |
| <b>Report Issue Number:</b> | 1              | <b>Report issued on:</b>                               | 22/02/2022 |
| <b>Samples Analysed:</b>    | 1 soil sample  |                                                        |            |

**Signed:**

Joanna Wawrzeczko  
Technical Reviewer (Reporting Team)  
**For & on behalf of i2 Analytical Ltd.**

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

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

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Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 22-37065  
 Project / Site name: Alberton House  
 Your Order No: EBMA3213

| Lab Sample Number                       |       |                    |                         | 2158607       |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|
| Sample Reference                        |       |                    |                         | WS02          |
| Sample Number                           |       |                    |                         | None Supplied |
| Depth (m)                               |       |                    |                         | 5.00          |
| Date Sampled                            |       |                    |                         | 27/01/2022    |
| Time Taken                              |       |                    |                         | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |
| Stone Content                           | %     | 0.1                | NONE                    | < 0.1         |
| Moisture Content                        | %     | 0.01               | NONE                    | 13            |
| Total mass of sample received           | kg    | 0.001              | NONE                    | 0.50          |

#### General Inorganics

|                                                                         |          |         |        |       |
|-------------------------------------------------------------------------|----------|---------|--------|-------|
| pH - Automated                                                          | pH Units | N/A     | MCERTS | 8.1   |
| Total Sulphate as SO <sub>4</sub>                                       | %        | 0.005   | MCERTS | 0.080 |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.23  |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | mg/l     | 1.25    | MCERTS | 234   |
| Water Soluble Chloride (2:1) (leachate equivalent)                      | mg/l     | 0.5     | MCERTS | 19    |
| Total Sulphur                                                           | %        | 0.005   | MCERTS | 0.093 |
| Ammoniacal Nitrogen as NH <sub>4</sub>                                  | mg/kg    | 0.5     | MCERTS | 0.9   |
| Ammonium as NH <sub>4</sub> (10:1 leachate equivalent)                  | mg/l     | 0.05    | MCERTS | 0.09  |
| Water Soluble Nitrate (2:1) as N (leachate equivalent)                  | mg/l     | 2       | NONE   | < 2.0 |

#### Heavy Metals / Metalloids

|                                 |       |     |      |    |
|---------------------------------|-------|-----|------|----|
| Magnesium (water soluble)       | mg/kg | 5   | NONE | 44 |
| Magnesium (leachate equivalent) | mg/l  | 2.5 | NONE | 22 |

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



**Analytical Report Number : 22-37065**  
**Project / Site name: Alberton House**

\* 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 *             |
|-------------------|------------------|---------------|-----------|----------------------------------|
| 2158607           | WS02             | None Supplied | 5         | Brown loam and clay with gravel. |



**Analytical Report Number : 22-37065**  
**Project / Site name: Alberton House**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name                               | Analytical Method Description                                                                                                                             | Analytical Method Reference                                                                                             | Method number | Wet / Dry Analysis | Accreditation Status |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| 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.                                                                                                        | L038-PL       | D                  | MCERTS               |
| Magnesium, water soluble, in soil                  | Determination of water soluble magnesium by extraction with water followed by ICP-OES.                                                                    | In-house method based on TRL 447                                                                                        | L038-PL       | D                  | NONE                 |
| Moisture Content                                   | Moisture content, determined gravimetrically. (30 oC)                                                                                                     | In house method.                                                                                                        | L019-UK/PL    | W                  | NONE                 |
| pH in soil (automated)                             | Determination of pH in soil by addition of water followed by automated electrometric measurement.                                                         | In house method.                                                                                                        | L099-PL       | D                  | MCERTS               |
| 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                 |
| Ammonium as NH4 in soil                            | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.                        | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton                  | L082-PL       | W                  | MCERTS               |
| Total Sulphate in soil as %                        | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.                                                                   | In house method.                                                                                                        | L038-PL       | D                  | MCERTS               |
| Total Sulphur in soil as %                         | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.                                      | In house method.                                                                                                        | L038-PL       | D                  | MCERTS               |
| Water Soluble Nitrate (2:1) as N in soil           | Determination of nitrate by reaction with sodium salicylate and colorimetry.                                                                              | In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction. | L078-PL       | W                  | NONE                 |
| Chloride, water soluble, in soil                   | Determination of Chloride colorimetrically by discrete analyser.                                                                                          | In house method.                                                                                                        | L082-PL       | D                  | MCERTS               |
| Sulphate, water soluble, in soil                   | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In house method.                                                                                                        | L038-PL       | D                  | 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.**

**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

# TEST CERTIFICATE

## DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB

Client: CURTINS  
Client Address: 17-19 Whitworth Street West, Manchester,  
M1 5WG

Contact: Zoe Henderson  
Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: B077764  
Job Number: 22-37071  
Date Sampled: 27/01/2022  
Date Received: 01/02/2022  
Date Tested: 11/02/2022  
Sampled By: Client

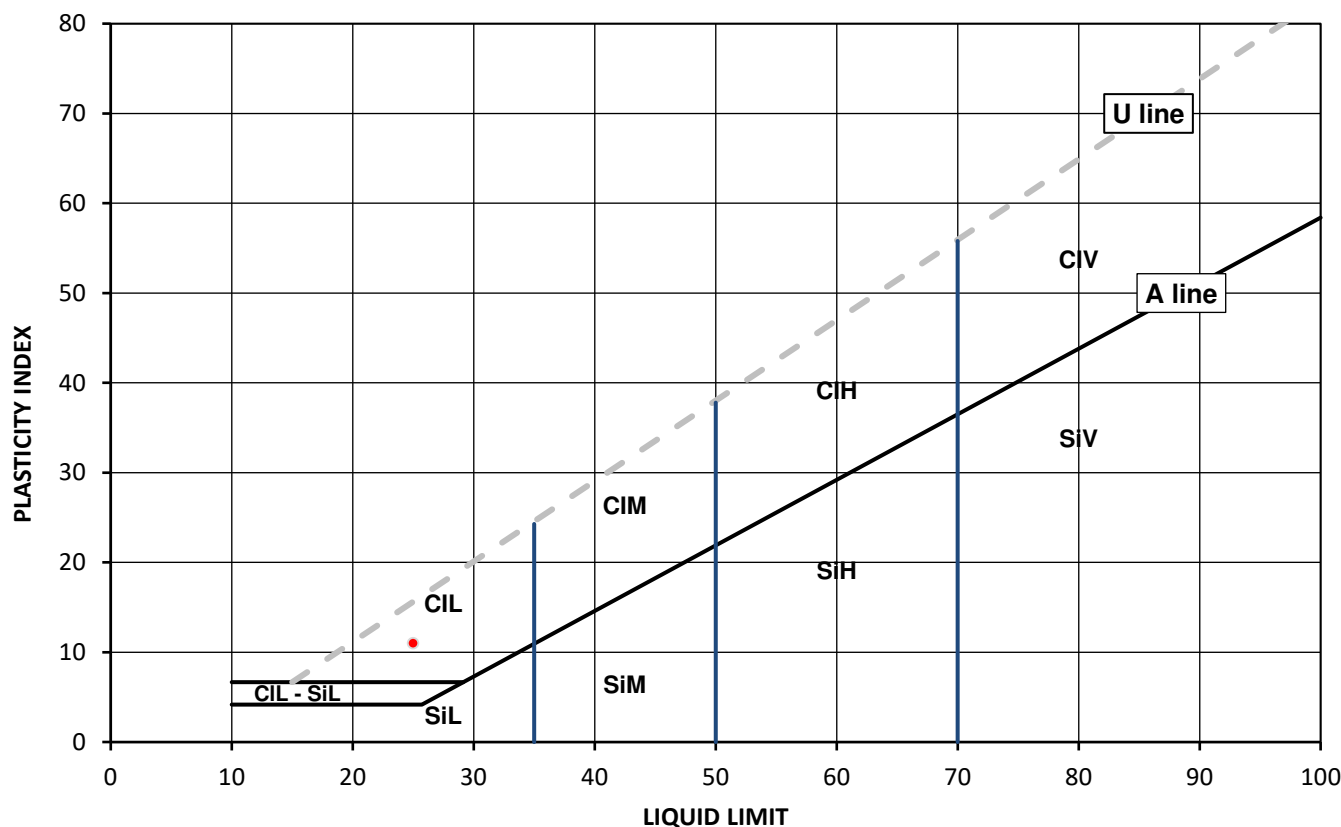
### Test Results:

Laboratory Reference: 2158656  
Hole No.: WS02  
Sample Reference: Not Given  
Sample Description: Brownish grey slightly gravelly clayey SAND

Depth Top [m]: 4.00  
Depth Base [m]: Not Given  
Sample Type: D

Sample Preparation: Tested after &gt;425um removed by hand

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|-----------------------------------|-----------------------|------------------------|---------------------------|-------------------------------|
| 17                                | 25                    | 14                     | 11                        | 87                            |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|    |      |            |   |           |              |                                                           |
|----|------|------------|---|-----------|--------------|-----------------------------------------------------------|
| Cl | Clay | Plasticity | L | Low       | Liquid Limit | below 35                                                  |
| Si | Silt |            | M | Medium    |              | 35 to 50                                                  |
|    |      |            | H | High      |              | 50 to 70                                                  |
|    |      |            | V | Very high |              | exceeding 70                                              |
|    |      |            | O | Organic   |              | append to classification for organic material ( eg CIHO ) |

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek  
PL Deputy Geotechnical Laboratory Manager  
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

Date Reported: 22/02/2022

GF 236.12

# TEST CERTIFICATE

## DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB

Client: CURTINS  
Client Address: 17-19 Whitworth Street West, Manchester,  
M1 5WG

Contact: Zoe Henderson  
Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: B077764  
Job Number: 22-37071  
Date Sampled: 27/01/2022  
Date Received: 01/02/2022  
Date Tested: 11/02/2022  
Sampled By: Client

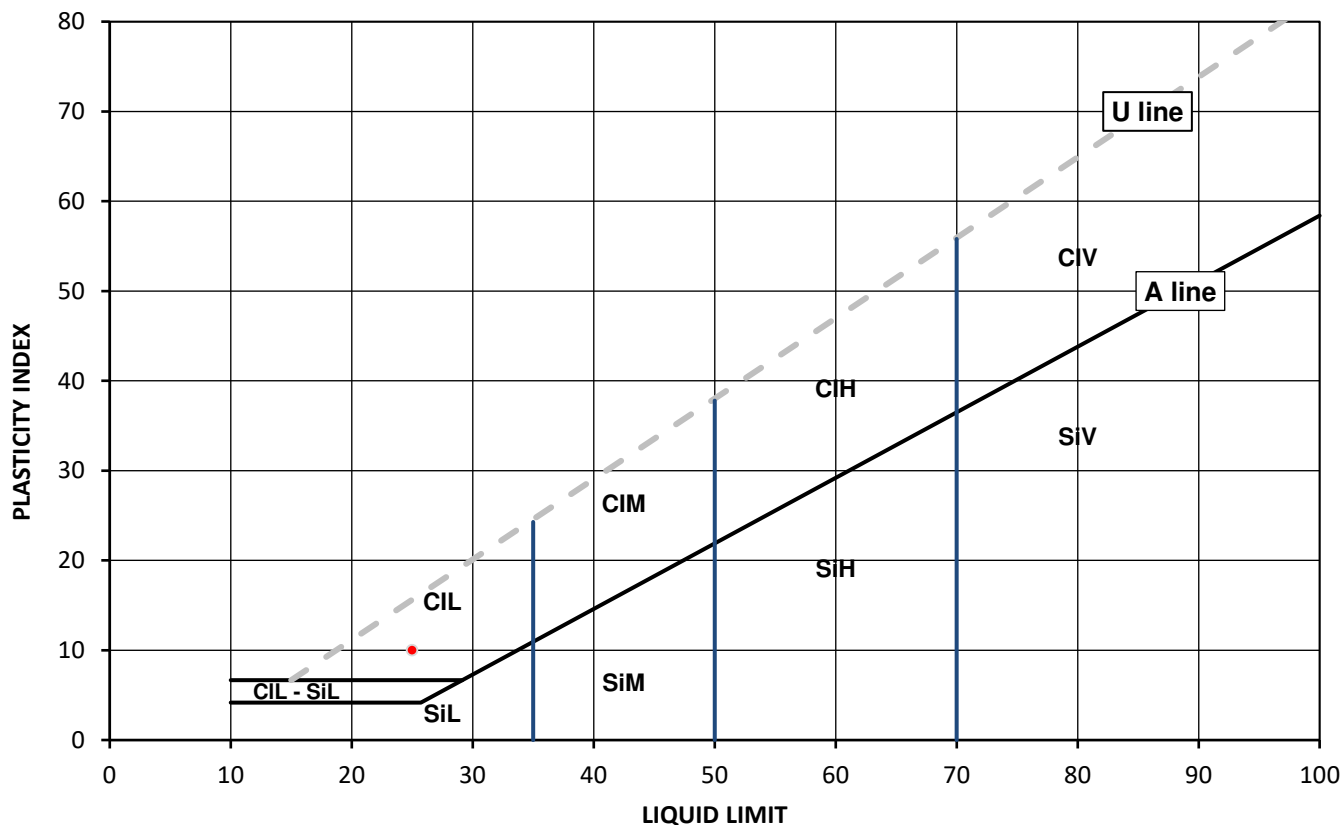
### Test Results:

Laboratory Reference: 2158657  
Hole No.: WS02  
Sample Reference: Not Given  
Sample Description: Brownish grey slightly gravelly clayey SAND

Depth Top [m]: 5.00  
Depth Base [m]: Not Given  
Sample Type: D

Sample Preparation: Tested after &gt;425um removed by hand

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|-----------------------------------|-----------------------|------------------------|---------------------------|-------------------------------|
| 18                                | 25                    | 15                     | 10                        | 96                            |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|         | Plasticity  | Liquid Limit                                              |
|---------|-------------|-----------------------------------------------------------|
| Cl Clay | L Low       | below 35                                                  |
| Si Silt | M Medium    | 35 to 50                                                  |
|         | H High      | 50 to 70                                                  |
|         | V Very high | exceeding 70                                              |
|         | O Organic   | append to classification for organic material ( eg CIHO ) |

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek  
PL Deputy Geotechnical Laboratory Manager  
for and on behalf of i2 Analytical Ltd

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4041

Client: CURTINS

Client Address: 17-19 Whitworth Street West, Manchester,  
M1 5WG

Contact: Zoe Henderson

Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

## SUMMARY REPORT

### SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990:  
Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2:  
1990: Clause 8.2i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB

Environmental Science

Client Reference: B077764

Job Number: 22-37071

Date Sampled: 27/01/2022

Date Received: 01/02/2022

Date Tested: 11/02/2022

Sampled By: Client

### Test results

| Laboratory Reference | Hole No. | Sample    |                   |                    |      | Description                                 | Remarks           | Water Content<br>BS 1377-2 [ W ]<br>% | Water Content<br>BS EN ISO 17892-2<br>[ W ]<br>% | Atterberg             |         |         |         | Density       |              |             | Total<br>Porosity#<br>% |  |  |
|----------------------|----------|-----------|-------------------|--------------------|------|---------------------------------------------|-------------------|---------------------------------------|--------------------------------------------------|-----------------------|---------|---------|---------|---------------|--------------|-------------|-------------------------|--|--|
|                      |          | Reference | Depth<br>Top<br>m | Depth<br>Base<br>m | Type |                                             |                   |                                       |                                                  | %<br>Passing<br>425um | WL<br>% | Wp<br>% | Ip<br>% | bulk<br>Mg/m3 | dry<br>Mg/m3 | PD<br>Mg/m3 |                         |  |  |
| 2158656              | WS02     | Not Given | 4.00              | Not Given          | D    | Brownish grey slightly gravelly clayey SAND | Atterberg 4 Point | 17                                    |                                                  | 87                    | 25      | 14      | 11      |               |              |             |                         |  |  |
| 2158657              | WS02     | Not Given | 5.00              | Not Given          | D    | Brownish grey slightly gravelly clayey SAND | Atterberg 4 Point | 18                                    |                                                  | 96                    | 25      | 15      | 10      |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |
|                      |          |           |                   |                    |      |                                             |                   |                                       |                                                  |                       |         |         |         |               |              |             |                         |  |  |

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek  
PL Deputy Geotechnical Laboratory Manager  
for and on behalf of i2 Analytical Ltd

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4041

Client: CURTINS  
Client Address: 17-19 Whitworth Street West, Manchester,  
M1 5WG

Contact: Zoe Henderson  
Site Address: Alberton House

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

## SUMMARY REPORT

### DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB



Environmental Science

Client Reference: B077764  
Job Number: 22-37071  
Date Sampled: 27/01/2022  
Date Received: 01/02/2022  
Date Tested: 11/02/2022  
Sampled By: Client

### Test results

| Laboratory Reference | Hole No. | Sample    |                |                 |      | Description                                 | Remarks | WC | Sample preparation / Oven temperature at the time of testing |  |  |  |
|----------------------|----------|-----------|----------------|-----------------|------|---------------------------------------------|---------|----|--------------------------------------------------------------|--|--|--|
|                      |          | Reference | Depth Top<br>m | Depth Base<br>m | Type |                                             |         |    |                                                              |  |  |  |
| 2158656              | WS02     | Not Given | 4.00           | Not Given       | D    | Brownish grey slightly gravelly clayey SAND |         | 17 | Sample was quartered, oven dried at 107.9 °C                 |  |  |  |
| 2158657              | WS02     | Not Given | 5.00           | Not Given       | D    | Brownish grey slightly gravelly clayey SAND |         | 18 | Sample was quartered, oven dried at 107.9 °C                 |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |
|                      |          |           |                |                 |      |                                             |         |    |                                                              |  |  |  |

Comments:

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Signed:

Monika Janoszek  
PL Deputy Geotechnical Laboratory Manager  
for and on behalf of i2 Analytical Ltd

## Appendix E – Ground Gas and Groundwater Monitoring Results

- Curtins Gas Monitoring Results Visits 1 – 6

**Curtins**

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



|                                 |
|---------------------------------|
| <b>GAS MONITORING LOG SHEET</b> |
|---------------------------------|

|                          |                |                           |            |
|--------------------------|----------------|---------------------------|------------|
| <b>Project:</b>          | Alberton House | <b>Date:</b>              | 10/02/2022 |
| <b>Job Number:</b>       | B077764        | <b>Visit:</b>             | 1          |
| <b>Client:</b>           | Bruntwood      | <b>Weather:</b>           | Sunny      |
| <b>Barometric State:</b> | Falling        | <b>Ground Conditions:</b> | Dry        |

| Borehole Reference | Barometric Pressure<br>mb | Flow<br>l/hr |     | Methane<br>% |     | Carbon Dioxide<br>% |     | Oxygen<br>% | Hydrogen Sulphide<br>ppm | Carbon Monoxide<br>ppm | Water Level<br>m bgl | Borehole Base<br>m bgl | Note |
|--------------------|---------------------------|--------------|-----|--------------|-----|---------------------|-----|-------------|--------------------------|------------------------|----------------------|------------------------|------|
|                    |                           | Max          | SS  | Max          | SS  | Max                 | SS  |             |                          |                        |                      |                        |      |
| BH01               | 1021                      | 0.0          | 0.1 | 0.0          | 0.1 | 0.1                 | 0.1 | 20.7        | 1                        | 6                      | -                    | -                      | 1    |
| WS02               | 1017                      | 0.0          | 0.1 | 0.0          | 0.1 | 0.1                 | 0.1 | 20.7        | 0                        | 1                      | Dry                  | 3.09                   |      |
| WS03               | 1016                      | 1.2          | 0.1 | 0.0          | 0.1 | 0.0                 | 0.1 | 20.6        | 0                        | 0                      | Dry                  | 1.54                   |      |
| WS04               | 1018                      | 1.2          | 1.1 | 0.0          | 0.1 | 0.3                 | 0.3 | 20.4        | 0                        | 0                      | Dry                  | 2.67                   |      |

**Notes**

1 - Unable to undo bung, no groundwater level readings taken.

**Logged by**

ZH

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

**Curtins**

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



|                                 |
|---------------------------------|
| <b>GAS MONITORING LOG SHEET</b> |
|---------------------------------|

|                          |                |                           |            |
|--------------------------|----------------|---------------------------|------------|
| <b>Project:</b>          | Alberton House | <b>Date:</b>              | 24/02/2022 |
| <b>Job Number:</b>       | B077764        | <b>Visit:</b>             | 2          |
| <b>Client:</b>           | Bruntwood      | <b>Weather:</b>           | Hail       |
| <b>Barometric State:</b> | Rising         | <b>Ground Conditions:</b> | Wet        |

| Borehole Reference | Barometric Pressure<br>mb | Flow<br>l/hr |     | Methane<br>% |     | Carbon Dioxide<br>% |     | Oxygen<br>% | Hydrogen Sulphide<br>ppm | Carbon Monoxide<br>ppm | Water Level<br>m bgl | Borehole Base<br>m bgl | Note |
|--------------------|---------------------------|--------------|-----|--------------|-----|---------------------|-----|-------------|--------------------------|------------------------|----------------------|------------------------|------|
|                    |                           | Max          | SS  | Max          | SS  | Max                 | SS  |             |                          |                        |                      |                        |      |
| BH01               | 1001                      | 0.0          | 0.1 | 0.0          | 0.1 | 0.0                 | 0.1 | 20.0        | 1                        | 4                      | -                    | -                      | 1    |
| WS02               | 998                       | 0.0          | 0.1 | 0.0          | 0.1 | 0.2                 | 0.1 | 20.5        | 0                        | 1                      | 3.00                 | 3.10                   |      |
| WS03               | 999                       | 1.0          | 0.2 | 0.0          | 0.1 | 0.0                 | 0.1 | 20.5        | 1                        | 0                      | Dry                  | 1.56                   |      |
| WS04               | 998                       | 0.8          | 0.2 | 0.0          | 0.1 | 0.4                 | 0.2 | 20.1        | 0                        | 0                      | Dry                  | 2.67                   |      |

**Notes**

1 - Unable to undo bung, no groundwater level readings taken.

**Logged by**

ZH

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

## GAS MONITORING LOG SHEET

|                          |                |                           |            |
|--------------------------|----------------|---------------------------|------------|
| <b>Project:</b>          | Alberton House | <b>Date:</b>              | 09/03/2022 |
| <b>Job Number:</b>       | B077764        | <b>Visit:</b>             | 3          |
| <b>Client:</b>           | Bruntwood      | <b>Weather:</b>           | Cloudy     |
| <b>Barometric State:</b> | Falling        | <b>Ground Conditions:</b> | Dry        |

| Borehole Reference | Barometric Pressure<br>mb | Flow |     | Methane |     | Carbon Dioxide |     | Oxygen<br>% | Hydrogen Sulphide<br>ppm | Carbon Monoxide<br>ppm | Water Level<br>m bgl | Borehole Base<br>m bgl | Note |
|--------------------|---------------------------|------|-----|---------|-----|----------------|-----|-------------|--------------------------|------------------------|----------------------|------------------------|------|
|                    |                           | l/hr |     | %       |     | %              |     |             |                          |                        |                      |                        |      |
|                    |                           | Max  | SS  | Max     | SS  | Max            | SS  |             |                          |                        |                      |                        |      |
| BH01               | 1006                      | 8.5  | 0.1 | 0.0     | 0.1 | 0.2            | 0.1 | 20.3        | 0                        | 14                     | 10.96                | 15.96                  | 1    |
| WS02               | 1005                      | 0.0  | 0.1 | 0.0     | 0.1 | 0.0            | 0.1 | 20.5        | 5                        | 0                      | DRY                  | 3.01                   |      |
| WS03               | 1005                      | 1.4  | 1.4 | 0.0     | 0.1 | 0.1            | 0.1 | 20.1        | 0                        | 0                      | DRY                  | 1.51                   |      |
| WS04               | 1005                      | -1.2 | 1.2 | 0.0     | 0.1 | 0.2            | 0.2 | 20.7        | 0                        | 0                      | DRY                  | 2.64                   |      |

## Notes

1 Flow reduced to 0l/hr after 3 minutes

**Logged by**

PN

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.  
All other gases recorded at 'steady state' unless otherwise stated

## GAS MONITORING LOG SHEET

|                          |                |                           |            |
|--------------------------|----------------|---------------------------|------------|
| <b>Project:</b>          | Alberton House | <b>Date:</b>              | 25/03/2022 |
| <b>Job Number:</b>       | B077764        | <b>Visit:</b>             | 4          |
| <b>Client:</b>           | Bruntwood      | <b>Weather:</b>           | Sunny      |
| <b>Barometric State:</b> | Falling        | <b>Ground Conditions:</b> | Dry        |

| Borehole Reference | Barometric Pressure<br>mb | Flow |     | Methane |     | Carbon Dioxide |     | Oxygen<br>% | Hydrogen Sulphide<br>ppm | Carbon Monoxide<br>ppm | Water Level<br>m bgl | Borehole Base<br>m bgl | Note |
|--------------------|---------------------------|------|-----|---------|-----|----------------|-----|-------------|--------------------------|------------------------|----------------------|------------------------|------|
|                    |                           | l/hr |     | %       |     | %              |     |             |                          |                        |                      |                        |      |
|                    |                           | Max  | SS  | Max     | SS  | Max            | SS  |             |                          |                        |                      |                        |      |
| BH01               | 1028                      | 0.0  | 0.1 | 0.0     | 0.1 | 0.0            | 0.1 | 21.2        | 0                        | 10                     | 10.99                | 18.97                  |      |
| WS02               | 1028                      | 0.0  | 0.1 | 0.0     | 0.1 | 0.0            | 0.1 | 21.3        | 0                        | 10                     | dry                  | 3.20                   |      |
| WS03               | 1029                      | 0.0  | 0.1 | 0.0     | 0.1 | 0.1            | 0.1 | 21.5        | 0                        | 0                      | dry                  | 1.51                   |      |
| WS04               | 1028                      | 0.0  | 0.1 | 0.0     | 0.1 | 0.1            | 0.1 | 21.4        | 0                        | 10                     | dry                  | 2.63                   |      |

## Notes

**Logged by**

RT

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.  
All other gases recorded at 'steady state' unless otherwise stated

**Curtins**

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



|                                 |
|---------------------------------|
| <b>GAS MONITORING LOG SHEET</b> |
|---------------------------------|

|                          |                |                           |            |
|--------------------------|----------------|---------------------------|------------|
| <b>Project:</b>          | Alberton House | <b>Date:</b>              | 08/04/2022 |
| <b>Job Number:</b>       | B077764        | <b>Visit:</b>             | 5          |
| <b>Client:</b>           | Bruntwood      | <b>Weather:</b>           | mild       |
| <b>Barometric State:</b> | Falling        | <b>Ground Conditions:</b> | dry        |

| Borehole Reference | Barometric Pressure<br>mb | Flow<br>l/hr |     | Methane<br>% |     | Carbon Dioxide<br>% |     | Oxygen<br>% | Hydrogen Sulphide<br>ppm | Carbon Monoxide<br>ppm | Water Level<br>m bgl | Borehole Base<br>m bgl | Note |
|--------------------|---------------------------|--------------|-----|--------------|-----|---------------------|-----|-------------|--------------------------|------------------------|----------------------|------------------------|------|
|                    |                           | Max          | SS  | Max          | SS  | Max                 | SS  |             |                          |                        |                      |                        |      |
| BH01               | 998                       | 0.4          | 0.1 | 0.0          | 0.1 | 0.0                 | 0.1 | 19.7        | 0                        | 10                     | 10.62                | 18.97                  | 1    |
| WS02               | 1000                      | 0.4          | 0.1 | 0.0          | 0.1 | 0.1                 | 0.1 | 19.7        | 0                        | 0                      | dry                  | 3.01                   | 2    |
| WS03               | 1000                      | 0.1          | 0.1 | 0.0          | 0.1 | 0.1                 | 0.1 | 20.4        | 0                        | 0                      | dry                  | 1.52                   | 3    |
| WS04               | 999                       | 0.1          | 0.1 | 0.0          | 0.1 | 0.0                 | 0.1 | 20.4        | 0                        | 0                      | dry                  | 2.62                   | 4    |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |

**Notes**

- 1 flow monitored for 4mins
- 2 flow monitored for 3mins
- 3 flow monitored for 5mins
- 4 flow monitored for 2mins

**Logged by**

RT

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

**Curtins**

Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Tel: 0161 236 2394

Fax: 0161 228 7902



|                                 |
|---------------------------------|
| <b>GAS MONITORING LOG SHEET</b> |
|---------------------------------|

|                          |                |                           |            |
|--------------------------|----------------|---------------------------|------------|
| <b>Project:</b>          | Alberton House | <b>Date:</b>              | 13/04/2022 |
| <b>Job Number:</b>       | B077764        | <b>Visit:</b>             | 6          |
| <b>Client:</b>           | Bruntwood      | <b>Weather:</b>           | sunny      |
| <b>Barometric State:</b> | Falling        | <b>Ground Conditions:</b> | dry        |

| Borehole Reference | Barometric Pressure<br>mb | Flow<br>l/hr |     | Methane<br>% |     | Carbon Dioxide<br>% |     | Oxygen<br>% | Hydrogen Sulphide<br>ppm | Carbon Monoxide<br>ppm | Water Level<br>m bgl | Borehole Base<br>m bgl | Note |
|--------------------|---------------------------|--------------|-----|--------------|-----|---------------------|-----|-------------|--------------------------|------------------------|----------------------|------------------------|------|
|                    |                           | Max          | SS  | Max          | SS  | Max                 | SS  |             |                          |                        |                      |                        |      |
| BH01               | 1013                      | 0.0          | 0.1 | 0.0          | 0.1 | 0.3                 | 0.1 | 20.6        | 0                        | 10                     | 10.83                | 18.96                  | 1    |
| WS02               | 1014                      | 0.0          | 0.1 | 1.4          | 0.1 | 0.1                 | 0.1 | 21.0        | 0                        | 0                      | dry                  | 3.03                   | 2    |
| WS03               | 1014                      | 0.0          | 0.1 | 0.0          | 0.1 | 0.0                 | 0.1 | 20.9        | 0                        | 0                      | dry                  | 1.51                   | 3    |
| WS04               | 1014                      | 0.0          | 0.1 | 0.0          | 0.1 | 0.0                 | 0.1 | 20.5        | 0                        | 0                      | dry                  | 2.62                   | 4    |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |
| 0                  |                           |              |     |              |     |                     |     |             |                          |                        |                      |                        |      |

**Notes**

- Flow monitored for 3mins
- Flow monitored for 2mins
- Flow monitored for 4mins
- Flow monitored for 2mins

**Logged by**

RT

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

## Appendix F – GAC Screening Thresholds

- Curtins GAC Thresholds for 1.0% SOM.
- Curtins GAC Thresholds for 6.0% SOM.

**Adopted Soil Generic Assessment Criteria**  
**Sandy loam with 6% SOM**



| Contaminants                                              | Residential <u>with</u><br>home grown<br>produce | Residential <u>without</u><br>home grown<br>produce | Allotments                  | Commercial                         | Public open space<br>near residential<br>housing POS <sub>resi</sub> | Public park<br>POS <sub>park</sub> |
|-----------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------|-----------------------------|------------------------------------|----------------------------------------------------------------------|------------------------------------|
| <b>Metals</b>                                             |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Beryllium                                                 | 1.7                                              | 1.7                                                 | 35                          | 12                                 | 2.2                                                                  | 63                                 |
| Boron                                                     | 290                                              | 11,000                                              | 45                          | 240,000                            | 21,000                                                               | 46,000                             |
| Cadmium                                                   | <b>10<sup>(13)</sup> 22</b>                      | <b>85<sup>(13)</sup> 150</b>                        | <b>1.8 3.9</b>              | <b>230 410</b>                     | <b>120 220</b>                                                       | <b>560 880</b>                     |
| Chromium III                                              | 910                                              | 910                                                 | 18,000                      | 8,600                              | 1,500                                                                | 33,000                             |
| Chromium VI                                               | <b>6 21</b>                                      | <b>6 21</b>                                         | <b>1.8 170</b>              | <b>33 49</b>                       | <b>7.7 21</b>                                                        | <b>220 250</b>                     |
| Lead                                                      | <b>200</b>                                       | <b>310</b>                                          | <b>80</b>                   | <b>2,300</b>                       | <b>630</b>                                                           | <b>1,300</b>                       |
| Mercury ( <i>elemental</i> )                              | 1                                                | 1                                                   | 26                          | 26                                 | 16                                                                   | <b>26<sup>(8)</sup> [30]</b>       |
| Mercury ( <i>inorganic</i> )                              | <b>170</b>                                       | <b>240</b>                                          | <b>80</b>                   | <b>3600</b>                        | 120                                                                  | 240                                |
| Nickel                                                    | <b>130<sup>(10)</sup></b>                        | <b>180<sup>(10)</sup></b>                           | <b>53<sup>(11)</sup></b>    | <b>980<sup>(10)</sup></b>          | 230                                                                  | 800                                |
| Vanadium                                                  | 410                                              | 1200                                                | 91                          | 9000                               | 2000                                                                 | 5000                               |
| Copper                                                    | 2400                                             | 7100                                                | 520                         | 68000                              | 12000                                                                | 44000                              |
| Zinc                                                      | 3700                                             | 40000                                               | 620                         | 730000                             | 81000                                                                | 170000                             |
| <b>Semi-Metals and non-metals</b>                         |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Arsenic                                                   | <b>32<sup>(12)</sup> 37</b>                      | <b>35<sup>(12)</sup> 40</b>                         | <b>43<sup>(12)</sup> 49</b> | <b>640<sup>(12)</sup> 640</b>      | <b>79 79</b>                                                         | <b>170 170</b>                     |
| Antimony                                                  |                                                  | <b>550</b>                                          |                             | <b>7500</b>                        | <b>1500</b>                                                          | <b>3300</b>                        |
| Selenium                                                  | <b>350</b>                                       | <b>600</b>                                          | <b>120</b>                  | <b>13000</b>                       | 1100                                                                 | 1800                               |
| <b>Inorganic chemicals</b>                                |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Cyanide                                                   | 34                                               | 34                                                  | 34                          | 34                                 | 34                                                                   | 34                                 |
| <b>Organic contaminants</b>                               |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| <i>Aliphatic risk banded hydrocarbons - TPHCWG method</i> |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| EC <sub>5-5</sub> - EC <sub>6</sub>                       | 160                                              | 160                                                 | 3900                        | 12000                              | 600000                                                               | 180000                             |
| EC <sub>5-6</sub> - EC <sub>8</sub>                       | 530                                              | 530                                                 | 13000                       | 40000                              | 620000                                                               | 320000                             |
| EC <sub>5-8</sub> - EC <sub>10</sub>                      | 150                                              | 150                                                 | 1700                        | 11000                              | 13000                                                                | 21000                              |
| EC <sub>10-10</sub> - EC <sub>12</sub>                    | 760                                              | 770                                                 | 7300                        | 47000                              | 13000                                                                | 24000                              |
| EC <sub>12-12</sub> - EC <sub>16</sub>                    | 4300                                             | 4400                                                | 13000                       | 90000                              | 13000                                                                | 26000                              |
| EC <sub>5-16</sub> - EC <sub>35</sub>                     | 110000                                           | 110000                                              | 270000                      | 1800000                            | 250000                                                               | 490000                             |
| EC <sub>35-35</sub> - EC <sub>44</sub>                    | 110000                                           | 110000                                              | 270000                      | 1800000                            | 250000                                                               | 490000                             |
| <i>Aromatic risk banded hydrocarbons - TPHCWG method</i>  |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| EC <sub>5-5</sub> - EC <sub>7</sub>                       | 300                                              | 1400                                                | 57                          | 86000                              | 56000                                                                | 92000                              |
| EC <sub>5-7</sub> - EC <sub>8</sub>                       | 660                                              | 3900                                                | 120                         | 180000                             | 56000                                                                | 100000                             |
| EC <sub>5-8</sub> - EC <sub>10</sub>                      | 190                                              | 270                                                 | 51                          | 17000                              | 5000                                                                 | 9300                               |
| EC <sub>10-10</sub> - EC <sub>12</sub>                    | 380                                              | 1200                                                | 74                          | 34000                              | 5000                                                                 | 10000                              |
| EC <sub>12-12</sub> - EC <sub>16</sub>                    | 660                                              | 2500                                                | 130                         | 38000                              | 5000                                                                 | 10000                              |
| EC <sub>5-16</sub> - EC <sub>21</sub>                     | 930                                              | 1900                                                | 260                         | 28000                              | 3800                                                                 | 7800                               |
| EC <sub>21-21</sub> - EC <sub>35</sub>                    | 1700                                             | 1900                                                | 1600                        | 28000                              | 3800                                                                 | 7900                               |
| EC <sub>35-35</sub> - EC <sub>44</sub>                    | 1700                                             | 1900                                                | 1600                        | 28000                              | 3800                                                                 | 7900                               |
| Aliph + Arom EC >44-70                                    | 1900                                             | 1900                                                | 3000                        | 28000                              | 3800                                                                 | 7900                               |
| <b>Aromatic</b>                                           |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Benzene                                                   | <b>0.33 0.87</b>                                 | <b>1.0 3.3</b>                                      | <b>0.07 0.18</b>            | <b>95 98</b>                       | <b>73 140</b>                                                        | <b>110 230</b>                     |
| Ethyl benzene                                             | <b>350</b>                                       | <b>840</b>                                          | <b>90</b>                   | <b>2800<sup>(8)</sup> [66000]</b>  | <b>2800<sup>(8)</sup> [25000]</b>                                    | <b>2800<sup>(8)</sup> [27000]</b>  |
| Toluene                                                   | <b>610</b>                                       | <b>2700</b>                                         | <b>120</b>                  | <b>4400<sup>(8)</sup> [190000]</b> | <b>4400<sup>(8)</sup> [56000]</b>                                    | <b>4400<sup>(8)</sup> [100000]</b> |
| Xylene <sup>(9)</sup>                                     | <b>230</b>                                       | <b>290</b>                                          | <b>160</b>                  | <b>2600<sup>(8)</sup> [32000]</b>  | <b>2600<sup>(8)</sup> [43000]</b>                                    | <b>2600<sup>(8)</sup> [31000]</b>  |
| Phenol                                                    | <b>420</b>                                       | <b>520</b>                                          | <b>280</b>                  | <b>3200<sup>(14)</sup> (38000)</b> | <b>3200<sup>(14)</sup> (10000)</b>                                   | <b>3200<sup>(14)</sup> (9300)</b>  |
| <b>Polycyclic Aromatic Hydrocarbons (PAH)</b>             |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Naphthalene                                               | 13                                               | 13                                                  | 24                          | 1100                               | 4900                                                                 | 3000                               |
| Acenaphthylene                                            | 920                                              | 6000                                                | 160                         | 100000                             | 15000                                                                | 30000                              |
| Acenaphthene                                              | 1100                                             | 6000                                                | 200                         | 100000                             | 15000                                                                | 30000                              |
| Fluorene                                                  | 860                                              | 4500                                                | 160                         | 71000                              | 9900                                                                 | 20000                              |
| Phenanthrene                                              | 440                                              | 1500                                                | 90                          | 23000                              | 3100                                                                 | 6300                               |
| Anthracene                                                | 11000                                            | 37000                                               | 2200                        | 540000                             | 74000                                                                | 150000                             |
| Fluoranthene                                              | 890                                              | 1600                                                | 290                         | 23000                              | 3100                                                                 | 6400                               |
| Pyrene                                                    | 2000                                             | 3800                                                | 620                         | 54000                              | 7400                                                                 | 15000                              |
| Benz(a)anthracene                                         | 13                                               | 15                                                  | 13                          | 180                                | 29                                                                   | 62                                 |
| Chrysene                                                  | 27                                               | 32                                                  | 19                          | 350                                | 57                                                                   | 120                                |
| Benzo(b)fluoranthene                                      | 3.7                                              | 4.0                                                 | 3.9                         | 45                                 | 7.2                                                                  | 16.0                               |
| Benzo(k)fluoranthene                                      | 100                                              | 110                                                 | 130                         | 1200                               | 190                                                                  | 440                                |
| Benzo(a)pyrene                                            | <b>3.0 5.0</b>                                   | <b>3.2 5.3</b>                                      | <b>3.5 5.7</b>              | <b>36 77</b>                       | <b>5.7 10</b>                                                        | <b>13 21</b>                       |
| Indeno(123cd)pyrene                                       | 41                                               | 46                                                  | 39                          | 510                                | 82                                                                   | 180                                |
| Dibenzo(ah)anthracene                                     | 0.3                                              | 0.32                                                | 0.43                        | 3.6                                | 0.58                                                                 | 1.4                                |
| Benzo(ghi)perylene                                        | 350                                              | 360                                                 | 640                         | 4000                               | 640                                                                  | 1600                               |
| <b>Chlorinated Aliphatic Hydrocarbons</b>                 |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Vinyl chloride                                            | 0.0014                                           | 0.0015                                              | 0.0018                      | 0.12                               | 3.5                                                                  | 5.4                                |
| Trichloroethene (TCE)                                     | 0.075                                            | 0.08                                                | 0.21                        | 5.7                                | 120                                                                  | 120                                |
| 1,1,1,2 Tetrachlorethane                                  | 6.4                                              | 8.2                                                 | 4.4                         | 560                                | 1400                                                                 | 2100                               |
| Tetrachlorethane (PCE)                                    | 0.90                                             | 0.92                                                | 3.6                         | 95                                 | 1400                                                                 | 1500                               |
| 1,1,1 Trichlorethane                                      | 39                                               | 40                                                  | 240                         | 3000                               | 140000                                                               | 100000                             |

**Notes**

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 6% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m<sup>-3</sup>
- Based on vapour saturation limit as suggested by EA / [ ] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

**Adopted Soil Generic Assessment Criteria**  
**Sandy loam with 2.5% SOM**



| Contaminants                                              | Residential <u>with</u><br>home grown<br>produce | Residential <u>without</u><br>home grown<br>produce | Allotments                  | Commercial                         | Public open space<br>near residential<br>housing POS <sub>resi</sub> | Public park<br>POS <sub>park</sub> |
|-----------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------|-----------------------------|------------------------------------|----------------------------------------------------------------------|------------------------------------|
| <b>Metals</b>                                             |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Beryllium                                                 | 1.7                                              | 1.7                                                 | 35                          | 12                                 | 2.2                                                                  | 63                                 |
| Boron                                                     | 290                                              | 11,000                                              | 45                          | 240,000                            | 21,000                                                               | 46,000                             |
| Cadmium                                                   | <b>10<sup>(13)</sup> 22</b>                      | <b>85<sup>(13)</sup> 150</b>                        | <b>1.8 3.9</b>              | <b>230 410</b>                     | <b>120 220</b>                                                       | <b>560 880</b>                     |
| Chromium III                                              | 910                                              | 910                                                 | 18,000                      | 8,600                              | 1,500                                                                | 33,000                             |
| Chromium VI                                               | 6 <u>21</u>                                      | 6 <u>21</u>                                         | 1.8 <u>170</u>              | 33 <u>49</u>                       | 7.7 <u>21</u>                                                        | 220 <u>250</u>                     |
| Lead                                                      | <u>200</u>                                       | <u>310</u>                                          | <u>80</u>                   | <u>2,300</u>                       | <u>630</u>                                                           | <u>1,300</u>                       |
| Mercury (elemental)                                       | 1                                                | 1                                                   | 26                          | 26                                 | 16                                                                   | 26 <sup>(8)</sup> [30]             |
| Mercury (inorganic)                                       | 170                                              | 240                                                 | 80                          | 3600                               | 120                                                                  | 240                                |
| Nickel                                                    | 130 <sup>(10)</sup>                              | 180 <sup>(10)</sup>                                 | 53 <sup>(11)</sup>          | 980 <sup>(10)</sup>                | 230                                                                  | 800                                |
| Vanadium                                                  | 410                                              | 1200                                                | 91                          | 9000                               | 2000                                                                 | 5000                               |
| Copper                                                    | 2400                                             | 7100                                                | 520                         | 68000                              | 12000                                                                | 44000                              |
| Zinc                                                      | 3700                                             | 40000                                               | 620                         | 730000                             | 81000                                                                | 170000                             |
| <b>Semi-Metals and non-metals</b>                         |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Arsenic                                                   | <b>32<sup>(12)</sup> 37</b>                      | <b>35<sup>(12)</sup> 40</b>                         | <b>43<sup>(12)</sup> 49</b> | <b>640<sup>(12)</sup> 640</b>      | 79 <u>79</u>                                                         | 170 <u>170</u>                     |
| Antimony                                                  |                                                  | <b>550</b>                                          |                             | <b>7500</b>                        | <b>1500</b>                                                          | <b>3300</b>                        |
| Selenium                                                  | <b>350</b>                                       | <b>600</b>                                          | <b>120</b>                  | <b>13000</b>                       | 1100                                                                 | 1800                               |
| <b>Inorganic chemicals</b>                                |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Cyanide                                                   | 34                                               | 34                                                  | 34                          | 34                                 | 34                                                                   | 34                                 |
| <b>Organic contaminants</b>                               |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| <i>Aliphatic risk banded hydrocarbons - TPHCWG method</i> |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| EC <sub>5</sub> - EC <sub>6</sub>                         | 78                                               | 78                                                  | 1700                        | 5900                               | 590000                                                               | 130000                             |
| EC <sub>6</sub> - EC <sub>8</sub>                         | 230                                              | 230                                                 | 5600                        | 17000                              | 610000                                                               | 220000                             |
| EC <sub>8</sub> - EC <sub>10</sub>                        | 65                                               | 65                                                  | 770                         | 4800                               | 13000                                                                | 18000                              |
| EC <sub>10</sub> - EC <sub>12</sub>                       | 330                                              | 330                                                 | 4400                        | 23000                              | 13000                                                                | 23000                              |
| EC <sub>12</sub> - EC <sub>16</sub>                       | 2400                                             | 2400                                                | 13000                       | 82000                              | 13000                                                                | 25000                              |
| EC <sub>16</sub> - EC <sub>35</sub>                       | 92000                                            | 92000                                               | 270000                      | 1700000                            | 250000                                                               | 480000                             |
| EC <sub>35</sub> - EC <sub>44</sub>                       | 92000                                            | 92000                                               | 270000                      | 1700000                            | 250000                                                               | 480000                             |
| <i>Aromatic risk banded hydrocarbons - TPHCWG method</i>  |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| EC <sub>5</sub> - EC <sub>7</sub>                         | 140                                              | 690                                                 | 27                          | 46000                              | 56000                                                                | 84000                              |
| EC <sub>7</sub> - EC <sub>8</sub>                         | 290                                              | 1800                                                | 51                          | 110000                             | 56000                                                                | 95000                              |
| EC <sub>8</sub> - EC <sub>10</sub>                        | 83                                               | 110                                                 | 21                          | 8100                               | 5000                                                                 | 8500                               |
| EC <sub>10</sub> - EC <sub>12</sub>                       | 180                                              | 590                                                 | 31                          | 28000                              | 5000                                                                 | 9700                               |
| EC <sub>12</sub> - EC <sub>16</sub>                       | 330                                              | 2300                                                | 57                          | 37000                              | 5100                                                                 | 10000                              |
| EC <sub>16</sub> - EC <sub>21</sub>                       | 540                                              | 1900                                                | 110                         | 28000                              | 3800                                                                 | 7700                               |
| EC <sub>21</sub> - EC <sub>35</sub>                       | 1500                                             | 1900                                                | 820                         | 28000                              | 3800                                                                 | 7800                               |
| EC <sub>35</sub> - EC <sub>44</sub>                       | 1500                                             | 1900                                                | 820                         | 28000                              | 3800                                                                 | 7800                               |
| Aliph + Arom EC >44-70                                    | 1800                                             | 1900                                                | 2100                        | 28000                              | 3800                                                                 | 7800                               |
| <i>Aromatic</i>                                           |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Benzene                                                   | <b>0.16</b>                                      | <b>0.49</b>                                         | <b>0.035</b>                | <b>50</b>                          | 72                                                                   | 100                                |
| Ethyl benzene                                             | <b>150</b>                                       | <b>380</b>                                          | <b>39</b>                   | <b>1200<sup>(8)</sup> [35000]</b>  | <b>1200<sup>(8)</sup> [24000]</b>                                    | <b>1200<sup>(8)</sup> [22000]</b>  |
| Toluene                                                   | <b>270</b>                                       | <b>1300</b>                                         | <b>51</b>                   | <b>1900<sup>(8)</sup> [110000]</b> | <b>1900<sup>(8)</sup> [56000]</b>                                    | <b>1900<sup>(8)</sup> [95000]</b>  |
| Xylene <sup>(9)</sup>                                     | <b>98</b>                                        | <b>120</b>                                          | <b>70</b>                   | <b>1200<sup>(8)</sup> [14000]</b>  | <b>1200<sup>(8)</sup> [42000]</b>                                    | <b>1200<sup>(8)</sup> [23000]</b>  |
| Phenol                                                    | <b>290</b>                                       | <b>420</b>                                          | <b>140</b>                  | <b>1500<sup>(14)</sup> (35000)</b> | <b>1500<sup>(14)</sup> (10000)</b>                                   | <b>1500<sup>(14)</sup> (8300)</b>  |
| <i>Polycyclic Aromatic Hydrocarbons (PAH)</i>             |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Naphthalene                                               | 5.6                                              | 5.6                                                 | 10                          | 460                                | 4900                                                                 | 1900                               |
| Acenaphthylene                                            | 420                                              | 4600                                                | 69                          | 97000                              | 15000                                                                | 30000                              |
| Acenaphthene                                              | 510                                              | 4700                                                | 85                          | 97000                              | 15000                                                                | 30000                              |
| Fluorene                                                  | 400                                              | 3800                                                | 67                          | 68000                              | 9900                                                                 | 20000                              |
| Phenanthrene                                              | 220                                              | 1500                                                | 38                          | 22000                              | 3100                                                                 | 6200                               |
| Anthracene                                                | 5400                                             | 35000                                               | 950                         | 540000                             | 74000                                                                | 150000                             |
| Fluoranthene                                              | 560                                              | 1600                                                | 130                         | 23000                              | 3100                                                                 | 6300                               |
| Pyrene                                                    | 1200                                             | 3800                                                | 270                         | 54000                              | 7400                                                                 | 15000                              |
| Benz(a)anthracene                                         | 11                                               | 14                                                  | 6.5                         | 170                                | 29                                                                   | 56                                 |
| Chrysene                                                  | 22                                               | 31                                                  | 9.4                         | 350                                | 57                                                                   | 110                                |
| Benzo(b)fluoranthene                                      | 3.3                                              | 4.0                                                 | 2.1                         | 44                                 | 7.2                                                                  | 15                                 |
| Benzo(k)fluoranthene                                      | 93                                               | 110                                                 | 75                          | 1200                               | 190                                                                  | 410                                |
| Benzo(a)pyrene                                            | 2.7                                              | 3.2                                                 | 2                           | 35                                 | 5.7                                                                  | 12                                 |
| Indeno(123cd)pyrene                                       | 36                                               | 46                                                  | 21                          | 510                                | 82                                                                   | 170                                |
| Dibenzo(ah)anthracene                                     | 0.28                                             | 0.32                                                | 0.27                        | 3.6                                | 0.57                                                                 | 1.3                                |
| Benzo(ghi)perylene                                        | 340                                              | 360                                                 | 470                         | 4000                               | 640                                                                  | 1500                               |
| <b>Chlorinated Aliphatic Hydrocarbons</b>                 |                                                  |                                                     |                             |                                    |                                                                      |                                    |
| Vinyl chloride                                            | 0.00087                                          | 0.001                                               | 0.001                       | 0.077                              | 3.5                                                                  | 5                                  |
| Trichloroethene (TCE)                                     | 0.034                                            | 0.036                                               | 0.091                       | 2.6                                | 120                                                                  | 91                                 |
| 1,1,1,2 Tetrachlorethane                                  | 2.8                                              | 3.5                                                 | 1.9                         | 250                                | 1400                                                                 | 1800                               |
| Tetrachlorethane (PCE)                                    | 0.39                                             | 0.4                                                 | 1.5                         | 42                                 | 1400                                                                 | 1100                               |
| 1,1,1 Trichlorethane                                      | 18                                               | 18                                                  | 110                         | 1300                               | 140000                                                               | 76000                              |

**Notes**

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs
- Soil organic matter (SOM) is assumed to be 2.5% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m<sup>-3</sup>
- Based on vapour saturation limit as suggested by EA / [ ] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

**Adopted Soil Generic Assessment Criteria**  
**Sandy loam with 1% SOM**



| Contaminants                                              | Residential <u>with</u><br>home grown<br>produce | Residential <u>without</u><br>home grown<br>produce | Allotments                  | Commercial                        | Public open space<br>near residential<br>housing POS <sub>resi</sub> | Public park<br>POS <sub>park</sub> |
|-----------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------|-----------------------------|-----------------------------------|----------------------------------------------------------------------|------------------------------------|
| <b>Metals</b>                                             |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| Beryllium                                                 | 1.7                                              | 1.7                                                 | 35                          | 12                                | 2.2                                                                  | 63                                 |
| Boron                                                     | 290                                              | 11,000                                              | 45                          | 240,000                           | 21,000                                                               | 46,000                             |
| Cadmium                                                   | <b>10<sup>(13)</sup> 22</b>                      | <b>85<sup>(13)</sup> 150</b>                        | <b>1.8 3.9</b>              | <b>230 410</b>                    | <b>120 220</b>                                                       | <b>560 880</b>                     |
| Chromium III                                              | 910                                              | 910                                                 | 18,000                      | 8,600                             | 1,500                                                                | 33,000                             |
| Chromium VI                                               | 6 <b>21</b>                                      | 6 <b>21</b>                                         | 1.8 <b>170</b>              | 33 <b>49</b>                      | 7.7 <b>21</b>                                                        | 220 <b>250</b>                     |
| Lead                                                      | <b>200</b>                                       | <b>310</b>                                          | <b>80</b>                   | <b>2,300</b>                      | <b>630</b>                                                           | <b>1,300</b>                       |
| Mercury ( <i>elemental</i> )                              | <b>1</b>                                         | <b>1</b>                                            | <b>26</b>                   | <b>26</b>                         | 16                                                                   | <b>26<sup>(8)</sup> [30]</b>       |
| Mercury ( <i>inorganic</i> )                              | <b>170</b>                                       | <b>240</b>                                          | <b>80</b>                   | <b>3600</b>                       | 120                                                                  | 240                                |
| Nickel                                                    | 130 <sup>(10)</sup>                              | 180 <sup>(10)</sup>                                 | 53 <sup>(11)</sup>          | 980 <sup>(10)</sup>               | 230                                                                  | 800                                |
| Vanadium                                                  | 410                                              | 1200                                                | 91                          | 9000                              | 2000                                                                 | 5000                               |
| Copper                                                    | 2400                                             | 7100                                                | 520                         | 68000                             | 12000                                                                | 44000                              |
| Zinc                                                      | 3700                                             | 40000                                               | 620                         | 730000                            | 81000                                                                | 170000                             |
| <b>Semi-Metals and non-metals</b>                         |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| Arsenic                                                   | <b>32<sup>(12)</sup> 37</b>                      | <b>35<sup>(12)</sup> 40</b>                         | <b>43<sup>(12)</sup> 49</b> | <b>640<sup>(12)</sup> 640</b>     | 79 <b>79</b>                                                         | 170 <b>170</b>                     |
| Antimony                                                  |                                                  | <b>550</b>                                          |                             | <b>7500</b>                       | <b>1500</b>                                                          | <b>3300</b>                        |
| Selenium                                                  | <b>350</b>                                       | <b>600</b>                                          | <b>120</b>                  | <b>13000</b>                      | 1100                                                                 | 1800                               |
| <b>Inorganic chemicals</b>                                |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| Cyanide                                                   | 34                                               | 34                                                  | 34                          | 34                                | 34                                                                   | 34                                 |
| <b>Organic contaminants</b>                               |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| <b>Aliphatic risk banded hydrocarbons - TPHCWG method</b> |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| EC <sub>5-5</sub> - EC <sub>6</sub>                       | 42                                               | 42                                                  | 730                         | 3200                              | 570000                                                               | 95000                              |
| EC <sub>6-6</sub> - EC <sub>8</sub>                       | 100                                              | 100                                                 | 2300                        | 7800                              | 600000                                                               | 150000                             |
| EC <sub>8-8</sub> - EC <sub>10</sub>                      | 27                                               | 27                                                  | 320                         | 2000                              | 13000                                                                | 14000                              |
| EC <sub>10-10</sub> - EC <sub>12</sub>                    | 130                                              | 130                                                 | 2200                        | 9700                              | 13000                                                                | 21000                              |
| EC <sub>12-12</sub> - EC <sub>16</sub>                    | 1100                                             | 1100                                                | 11000                       | 59000                             | 13000                                                                | 25000                              |
| EC <sub>16-16</sub> - EC <sub>35</sub>                    | 65000                                            | 65000                                               | 260000                      | 1600000                           | 250000                                                               | 450000                             |
| EC <sub>35-35</sub> - EC <sub>44</sub>                    | 65000                                            | 65000                                               | 260000                      | 1600000                           | 250000                                                               | 450000                             |
| <b>Aromatic risk banded hydrocarbons - TPHCWG method</b>  |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| EC <sub>5-5</sub> - EC <sub>7</sub>                       | 70                                               | 370                                                 | 13                          | 26000                             | 56000                                                                | 76000                              |
| EC <sub>7-7</sub> - EC <sub>8</sub>                       | 130                                              | 860                                                 | 22                          | 56000                             | 56000                                                                | 87000                              |
| EC <sub>8-8</sub> - EC <sub>10</sub>                      | 34                                               | 47                                                  | 8.6                         | 3500                              | 5000                                                                 | 7200                               |
| EC <sub>10-10</sub> - EC <sub>12</sub>                    | 74                                               | 250                                                 | 13                          | 16000                             | 5000                                                                 | 9200                               |
| EC <sub>12-12</sub> - EC <sub>16</sub>                    | 140                                              | 1800                                                | 23                          | 36000                             | 5100                                                                 | 10000                              |
| EC <sub>16-16</sub> - EC <sub>21</sub>                    | 260                                              | 1900                                                | 46                          | 28000                             | 3800                                                                 | 7600                               |
| EC <sub>21-21</sub> - EC <sub>35</sub>                    | 1100                                             | 1900                                                | 370                         | 28000                             | 3800                                                                 | 7800                               |
| EC <sub>35-35</sub> - EC <sub>44</sub>                    | 1100                                             | 1900                                                | 370                         | 28000                             | 3800                                                                 | 7800                               |
| Aliph + Arom EC >44-70                                    | 1600                                             | 1900                                                | 1200                        | 28000                             | 3800                                                                 | 7800                               |
| <b>Aromatic</b>                                           |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| Benzene                                                   | <b>0.08</b>                                      | <b>0.3</b>                                          | <b>0.017</b>                | <b>28</b>                         | 72                                                                   | 90                                 |
| Ethyl benzene                                             | <b>65</b>                                        | <b>170</b>                                          | <b>16</b>                   | <b>520<sup>(8)</sup> [17000]</b>  | <b>520<sup>(8)</sup> [24000]</b>                                     | <b>520<sup>(8)</sup> [17000]</b>   |
| Toluene                                                   | <b>120</b>                                       | <b>610</b>                                          | <b>22</b>                   | <b>860<sup>(8)</sup> [59000]</b>  | <b>860<sup>(8)</sup> [56000]</b>                                     | <b>860<sup>(8)</sup> [87000]</b>   |
| Xylene <sup>(9)</sup>                                     | <b>41</b>                                        | <b>53</b>                                           | <b>28</b>                   | <b>480<sup>(8)</sup> [69000]</b>  | <b>480<sup>(8)</sup> [41000]</b>                                     | <b>480<sup>(8)</sup> [17000]</b>   |
| Phenol                                                    | <b>180</b>                                       | <b>310</b>                                          | <b>66</b>                   | <b>760<sup>(14)</sup> (31000)</b> | <b>760<sup>(14)</sup> (10000)</b>                                    | <b>760<sup>(14)</sup> (7600)</b>   |
| <b>Polycyclic Aromatic Hydrocarbons (PAH)</b>             |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| Naphthalene                                               | 2.3                                              | 2.3                                                 | 4.1                         | 190                               | 4900                                                                 | 1200                               |
| Acenaphthylene                                            | 170                                              | 2900                                                | 28                          | 83000                             | 15000                                                                | 29000                              |
| Acenaphthene                                              | 210                                              | 3000                                                | 34                          | 84000                             | 15000                                                                | 29000                              |
| Fluorene                                                  | 170                                              | 2800                                                | 27                          | 63000                             | 9900                                                                 | 20000                              |
| Phenanthrene                                              | 95                                               | 1300                                                | 15                          | 22000                             | 3100                                                                 | 6200                               |
| Anthracene                                                | 2400                                             | 31000                                               | 380                         | 520000                            | 74000                                                                | 150000                             |
| Fluoranthene                                              | 280                                              | 1500                                                | 52                          | 23000                             | 3100                                                                 | 6300                               |
| Pyrene                                                    | 620                                              | 3700                                                | 110                         | 54000                             | 7400                                                                 | 15000                              |
| Benz(a)anthracene                                         | 7.2                                              | 11                                                  | 2.9                         | 170                               | 29                                                                   | 49                                 |
| Chrysene                                                  | 15                                               | 30                                                  | 4.1                         | 350                               | 57                                                                   | 93                                 |
| Benzo(b)fluoranthene                                      | 2.6                                              | 3.9                                                 | 0.99                        | 44                                | 7.1                                                                  | 13                                 |
| Benzo(k)fluoranthene                                      | 77                                               | 110                                                 | 37                          | 1200                              | 190                                                                  | 370                                |
| Benzo(a)pyrene                                            | 2.2                                              | 3.2                                                 | 0.97                        | 35                                | 5.7                                                                  | 11                                 |
| Indeno(123cd)pyrene                                       | 27                                               | 45                                                  | 9.5                         | 500                               | 82                                                                   | 150                                |
| Dibenzo(ah)anthracene                                     | 0.24                                             | 0.31                                                | 0.14                        | 3.5                               | 0.57                                                                 | 1.1                                |
| Benzo(ghi)perylene                                        | 320                                              | 360                                                 | 290                         | 3900                              | 640                                                                  | 1400                               |
| <b>Chlorinated Aliphatic Hydrocarbons</b>                 |                                                  |                                                     |                             |                                   |                                                                      |                                    |
| Vinyl chloride                                            | 0.00064                                          | 0.00077                                             | 0.00055                     | 0.059                             | 3.5                                                                  | 4.8                                |
| Trichloroethene (TCE)                                     | 0.016                                            | 0.017                                               | 0.041                       | 1.2                               | 120                                                                  | 70                                 |
| 1,1,1,2 Tetrachlorethane                                  | 1.2                                              | 1.5                                                 | 0.79                        | 110                               | 1400                                                                 | 1500                               |
| Tetrachlorethane (PCE)                                    | 0.18                                             | 0.18                                                | 0.65                        | 19                                | 1400                                                                 | 810                                |
| 1,1,1 Trichlorethane                                      | 8.8                                              | 9                                                   | 48                          | 660                               | 140000                                                               | 57000                              |

**Notes**

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 1% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m<sup>-3</sup>
- Based on vapour saturation limit as suggested by EA / [ ] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable

## Appendix G – Risk Assessment Methodology

The site-specific risk assessment, presented in this report, follows the principle of establishing whether there is a viable linkage between a contaminant source to a potential receptor, via an exposure pathway.

The risk assessment corresponds with the total site area and incorporates both descriptive (qualitative) and, where available, numerical (quantitative) lines of evidence.

Risk assessment is the process of collating known information on a hazard or set of hazards to estimate actual or potential risk to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected to the source by one or several exposure pathways such as direct contact for example. Risks are generally managed by isolating the receptor or intercepting the exposure pathway or by isolating or removing the hazard.

Without the three essential components of a source, pathway and receptor there can be no risk. Therefore, the presence of contaminant source on a site does not necessarily mean there is a risk.

The risk assessment considers the likelihood of an event taking place (accounting for the presence of the source and receptor and the viability of the exposure pathway) in conjunction with the severity of the potential consequence (accounting for the potential severity of the hazard and the sensitivity of the receptor).

In the risk assessment, the consequence of the hazard has been classified as severe or medium or mild or minor and the probability (likelihood) of the circumstances occurring classified as high likelihood or likely or low likelihood or unlikely.

The consequences and probabilities are subsequently cross-correlated to give a qualitative estimation of the risk using Department of the Environment risk classifications as detailed in the table below and as referenced in CIRIA C552.

|                             |                 | Consequence       |                   |                   |                   |
|-----------------------------|-----------------|-------------------|-------------------|-------------------|-------------------|
|                             |                 | Severe            | Medium            | Mild              | Minor             |
| Probability<br>(Likelihood) | High Likelihood | Very High Risk    | High Risk         | Moderate Risk     | Moderate/Low Risk |
|                             | Likely          | High Risk         | Moderate Risk     | Moderate/Low Risk | Low Risk          |
|                             | Low Likelihood  | Moderate Risk     | Moderate/Low Risk | Low Risk          | Very Low Risk     |
|                             | Unlikely        | Moderate/Low Risk | Low Risk          | Very Low Risk     | Very Low Risk     |

In accordance with DoE guidance, the following categorisation of **consequence** has been developed.

| Classification | Definition                                                                                                                                                                                                                                                                                                                         | Examples                                                                                                                                                                                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to an ecosystem or organisation forming part of such ecosystem. | <p>High concentrations of cyanide on the surface of an informal recreation area.</p> <p>Major spillage of contaminants from site into controlled water.</p> <p>Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).</p>                |
| Medium         | Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in an ecosystem or organism forming part of such ecosystem.                                                                                                                                                                           | <p>Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria.</p> <p>Leaching of contaminants from a site to a Principal or Secondary A aquifer.</p> <p>Death of a species within a designated nature reserve.</p> <p>Lesser toxic and asphyxiate effects</p> |
| Mild           | Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.                                                                                                                                                 | <p>Pollution of non-classified groundwater (inc. Secondary B aquifers).</p> <p>Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).</p>                                                                                                                |
| 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.                    | <p>The presence of contaminants at such concentrations that protective equipment is required during site works.</p> <p>The loss of plants in a landscaping scheme.</p> <p>Discoloration of concrete.</p>                                                                                              |

In accordance with DoE guidance, the following categorisation of **probability** has been developed.

| Classification  | Definition                                                                                                                                                                                                                                                            |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High Likelihood | 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 pollution 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 Likelihood  | 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 such event would take place, and is 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.                                                                                                                                   |

In accordance with DoE guidance, the following categorisation of **risk** has been developed.

| Classification | Definition                                                                                                                                                                                                                                                                                           |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very High Risk | There is a <i>high probability</i> that <i>severe harm</i> could arise to a designated receptor from an identified hazard at the site without appropriate further action.                                                                                                                            |
| High Risk      | <i>Harm is likely to arise</i> to a designated receptor from an identified hazard at the site without appropriate further action.                                                                                                                                                                    |
| Moderate Risk  | <i>It is possible</i> that without appropriate further action <i>harm could arise</i> to a designated receptor. It is relatively <i>unlikely</i> that any such harm would be <i>severe</i> , and if any harm were to occur it is <i>more likely</i> that such harm would be <i>relatively mild</i> . |
| Low Risk       | <i>It is possible</i> that <i>harm could arise</i> to a designated receptor from an identified hazard. It is <i>likely</i> that, at worst, if any harm was realised any effects would be <i>mild</i> .                                                                                               |
| Very Low Risk  | The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.                                                                                                                                                                                     |

The term 'risk' in this instance refers to the risk that the source, pathway, receptor linkage for a given source of contamination is complete. It does not refer to immediate risk to individuals or features present on the site from potential contaminants and is intended to be used as a tool to assess the necessity of further investigation.

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