PHASE 2 GEO-ENVIRONMENTAL AND GEOTECHNICAL SITE INVESTIGATION REPORT

Land off Welcomb St, Openshaw, Manchester M11 2NJ



JER9536
Phase 2 Geo-Environmental and Geotechnical Site Investigation Report
01
05 August 2022

rpsgroup.com

Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
1	Draft	Tom Ford / Abi Ameli	Karen Dale / Paul Jeffery	David Gemmell	5th August 2022

Approval for issue

David Gemmel	Technical Director	5 August 2022

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EXECUTIVE SUMMARY

RPS Consulting Services Ltd (RPS) was commissioned by Network Space to undertake a Phase 2 Geo-Environmental and Geotechnical Site Investigation of Land off Welcomb Street, Openshaw, Manchester, M11 2NJ. The report has been commissioned prior to the proposed redevelopment of the site.

The site currently comprises an area of vacant land within a business/light industrial park. The site currently comprises two adjoining light industrial units in the eastern portion of the site, and a row of smaller workshops and light industrial units across the southern portion of the site, with smaller auxiliary buildings located in the centre and west of the site.

The proposed development comprises demolition of the existing smaller units in the south and the auxiliary buildings in the centre and the construction of light industrial units, which will potentially be subdivided into several smaller units. Each unit will have a loading bay and associated car parking. The units in the east of the site are to remain and will be refurbished.

RPS has previously produced a Phase 1 Preliminary Geo-Environmental and Geotechnical Risk Assessment for the site which should be read in conjunction with this report. The report identified a number of potential contamination sources, and recommended that the potential for pollutant linkages identified by the CSM to be active upon completion of the redevelopment is assessed through a development specific geo-environmental site investigation. The report also recommended that the site investigation incorporate geotechnical assessment to facilitate preliminary foundation design and pavement design.

The site investigation was carried out between the 6th and 9th June 2022 and comprised; the drilling of four boreholes to depths of up to a maximum of approximately 15.00m below ground level (bgl) using cable percussion techniques (CP01 to CP04b); drilling of 12 boreholes to depths of up to a maximum of approximately 4.00m bgl using window sample techniques (WS01 to WS08, including some redrills annotated as a&b); in situ geotechnical testing throughout the depth of all boreholes; and installation of groundwater and ground gas monitoring standpipes in all deep cable percussive boreholes, and in shallow boreholes WS02a, WS03a, WS04, WS05a, WS07 and WS08.

Six rounds of ground gas monitoring and one round of groundwater sampling was carried out with groundwater samples collected from wells where encountered. Falling Head Testing was carried out at three locations during one monitoring visit.

Ground conditions comprised Topsoil or Hardstanding over Made Ground, which was underlain in turn by Glacial Till, and the Chester Formation.

Groundwater data during drilling and on subsequent monitoring visits indicate that there is limited shallow groundwater within the Made Ground and Glacial Till. Deeper groundwater is present within the Chester Formation Aquifer.

The potential risk to human health receptors from concentrations of contaminants of concern identified within soil and groundwater sampled from beneath the site upon completion of the development would not be considered to be significant. The potential risk to groundwater resources and surface water receptors from contaminants of concern originating from the site is also not considered to be significant.

Based on ground gas monitoring undertaken on site as part of the current investigation, CIRIA CS2 is considered applicable to a zone in the south west of the site including units 3 and 4. For the wider site, CIRIA CS1 is applicable.

The Made Ground is not considered to be a suitable founding stratum. The Glacial Till is a suitable bearing stratum for lightly to moderately loaded structures.

Ground improvement would be required to densify shallow soils beneath proposed structures in order to achieve suitable allowable bearing pressures and reduce the potential for differential settlement beneath traditional foundations and ground bearing floor slabs. Should the ground improvement options mentioned above not prove suitable at the site then recourse to a piled foundation solution may be required.

Pavements carried on a suitable depth of capping/sub-base should prove adequate provided the exposed made ground deposits are compacted by a heavy smooth wheeled roller and any soft or degradable materials removed and replaced with compacted granular fill.

Due to the variable Made Ground at formation level suspended ground floor slabs are recommended, unless ground improvement is carried out.

It is considered that a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-1 would be appropriate for all buried concrete structures.

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1 INTRODUCTION

1.1 Preamble

1.1.1 RPS Consulting Services Ltd (RPS) was commissioned by Network Space to undertake a Phase 2 Geo-Environmental and Geotechnical Site Investigation of Land off Welcomb Street, Openshaw, Manchester, M11 2NJ. The report has been commissioned prior to the proposed redevelopment of the site. A site location plan is provided as Figure 1.

1.1.2 The site covers approximately 1.53 hectares and currently comprises an area of land within a business/light industrial park. The site is currently vacant with two adjoining light industrial units in the eastern portion of the site, and a row of smaller workshops and light industrial units across the southern portion of the site, with smaller auxiliary buildings located in the centre and west of the site. A site boundary plan is provided as Figure 2.

1.1.3 RPS have previously prepared a Phase 1 Preliminary Geo-Environmental and Geotechnical Risk Assessment (220518 R JER9536 Welcomb Street Phase 1 Preliminary Risk Assessment V1 R0), the desk study element of which is based upon a review of published information available from local, regional, and national agencies. The preliminary risk assessment produced an outline Conceptual Site Model (CSM) detailing how any contamination could impact the identified receptors via pollutant linkages.

1.1.4 The Phase 1 PRA included a preliminary geotechnical risk assessment to identify potential geotechnical constraints associated with the development, enabling the design of the Phase 2 Site Investigation.

1.2 Objectives

1.2.1 The principal objectives of this assessment were as follows:

- To determine the contamination status of soil and/or groundwater beneath the site;
- To assess whether contamination is present within soil and/or groundwater beneath the site at concentrations which could impact future site uses/occupiers and the wider environment;
- To assess the suitability of the site for its proposed use in the context of the National Planning Policy Frameworks (NPPF) in support the anyplanning application for redevelopment of the site; and
- To determine the engineering properties of the underlying soils and to provide geotechnical parameters to assist preliminary foundation, ground slab and external hard-standing design.

1.3 Legislation and Guidance

1.3.1 The assessment has been undertaken in general accordance with British Standard BS EN ISO 21365:2020 and is considered suitable to meet the initial requirements of planning as outlined within the National Planning Policy Framework (NPPF). The assessment also reflects the recommendations of Environmental Agency guidance, Land Contamination: Risk Management, (LCRM 2020).

1.3.2 This report has been produced in general accordance with:

- Contaminated Land (England) Regulations 2006 (as amended);
- DEFRA Environmental Protection Act 1990: Part 2A - *Contaminated Land Statutory Guidance (2012);*
- Environment Agency (2020) Land Contaminated: Risk Management (LCRM 2020);

- National Planning Policy Framework (2021);
- CIRIA Document C665: *Assessing Risks Posed by Hazardous Ground Gases to Buildings*;
- British Standard requirements for the *'Investigation of potentially contaminated sites - Code of practice'* (ref. BS10175:2011+A2:2017);
- British Standard requirements for the *'Code of practice for ground investigations'* (ref. BS5930:2015+A1:2020);
- British Standard requirements for the *'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'* (ref BS8485:2015+A1:2019);
- EN 1997-1 (2004): Eurocode 7: *Geotechnical design - Part 1: General rules*
- EN 1997-2 (2007): Eurocode 7: *Geotechnical design - Part 2: Ground investigation and testing*

1.3.3 Details of the limitations of this type of assessment are described in Appendix A.

2 PHASE 1 PRELIMINARY RISK ASSESSMENT

2.1 Summary

Environmental Setting

2.1.1 The PRA identified the site to be underlain by a Secondary Undifferentiated Aquifer relating to the Devensian Glacial Till, which itself is underlain by a Principal Aquifer relating to the Chester Formation. The site is not indicated to be located in a groundwater Source Protection Zone (SPZ) and there are no sensitive groundwater abstractions in the vicinity of the site. The nearest mapped surface water feature is Corn Brook which is located 200m south-west.

Site History

2.1.2 A review of historical maps indicates the site was part of the large adjacent engineering works, with auxiliary buildings, railway networks and tanks present from the late 1800s until 1938. There was a period of vacancy from 1938 to approximately 1950 after which the site played a similar role in associated buildings and railway sidings for the adjacent foundry. Due to its complex history a number of inorganic and organic contaminants were considered likely to be present within the Made Ground.

2.1.3 Off-site historical potential sources of contaminants of concern that were identified include the adjacent heavy industry linked to the adjacent extensive railway network and the engineering works-turned-foundry to the north of the site. The infrastructure associated with the railway network dominated the land to the south of the site from the late 1800s to the early 2000s with Ashburys sidings adjacent to the site boundary from 1906 to 2010. In the place of the sidings now resides an asphalt plant, an aggregate supplier and a sand and gravel supplier. Various other smaller works were present for shorter periods of time in the wider vicinity, including a chemical works (1893 to 1985) approximately 230m south, bleach works (1848 to 1891) approximately 245m south and an instrument works (1950 to 2001) approximately 130m west. Outside of the 250m radius are a gas plant works and a gas and oil engine works. These have also been considered due to the widespread nature of their potential contamination.

2.2 Preliminary Conceptual Site Model

2.2.1 A preliminary CSM was developed on the basis of the site reconnaissance and desk study. The CSM is used to identify potential sources, pathways and receptors (i.e. potential pollutant linkages) on site. The desk study identified the potential for contamination to be present across the site associated with the present and historical use of the site. Made Ground was shown to be mapped as being present in the south of the site and therefore was considered to potentially be present at significant thicknesses. It was therefore recommended that the potential for these linkages to be active is assessed through an intrusive Phase 2 Site Investigation.

2.2.2 It was recommended to combine the site investigation undertaken for geo-environmental purposes with geotechnical testing, to facilitate preliminary foundation and pavement design.

2.2.3 Other issues identified during the preliminary assessment included the retaining walls that form the southern site boundary. These showed possible signs of movement and cracking which may potentially indicate movement of the slope. Further assessment into the stability of the retaining structures was recommended.

Table 2.1: Preliminary Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating	Notes
On site – current: Made Ground, electrical substation, infilled ground **On site – historical:** Railway sidings and auxiliary building to former engineering works, tanks	Metals, hydrocarbons, solvents, asbestos and Polychlorinated biphenyls (PCBs)	Soil	Direct contact/ingestion	✓	Future site users	Low to moderate	There is potential for contamination to be present associated with the sites historical use. Post development risks minimised by the buildings, hardstanding and manged landscaping. Residual risk in areas of existing soft landscaping, if soils are exposed or disturbed.
			Inhalation of volatiles	✓		Low	
			Airborne migration of soil or dust	✓	Off-site users	Low	
			Leaching of mobile contaminants	✓	Principal Aquifer	Low	Potential for soil leaching and vertical and lateral migration of contaminants (if present) in shallow groundwater to impact the controlled water receptors. It is envisaged that the cohesive nature of the superficial deposits will act as a relatively impermeable barrier, affording some protection to the underlying Principal Aquifer.
		Groundwater	Direct contact/ingestion	✓ ✓	Future site users Off-site users	Low	Limited potential for shallow groundwater to be present.
			Inhalation of volatiles	✓ ✓	Future site users Off-site users	Low	There is potential for contamination to be present in any shallow groundwater, which may potentially include volatile contaminants.
			Vertical and lateral migration in permeable strata	✓ × ×	Secondary Undifferentiated Aquifer Principal Aquifer Corn brook	Low to moderate	There is potential for vertical and lateral migration of contaminants (if present) in shallow groundwater to impact the controlled water receptors. It is envisaged that the cohesive nature of the superficial deposits will creating a relatively impermeable barrier, affording some protection to the underlying Principal Aquifer.

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating	Notes
Off-site – current: Made ground, asphalt plant **Off site – historical:** Bleach works, garage, instrument works, engineering works	Metals, hydrocarbons, solvent and Polychlorinated biphenyls (PCBs)	Groundwater	Direct contact/ingestion	×	Future site users	Low	There is a potential for contaminants to migrate beneath the site from off-site sources in any shallow groundwater present in the Made Ground or granular soils within the superficial deposits.
			Inhalation of volatiles	✓	Future site users	Low	
On and off-site – Made Ground / natural strata, landfills, mine gas or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓ ✓	Future site users Off-site users	Low to moderate	There is potential for contamination and infilled land associated with the site's historical uses. Where present however, there is potential for ingress and build-up within indoor areas.
			Explosive risks	✓ ✓	Future site users Off-site users Future and off-site Structures	Low to moderate	

2.2.4 Based on the identified potential sources and the site setting there is not considered to be a significant risk to ecological receptors, crops/vegetation or archaeological receptors.

3 INTRUSIVE SITE INVESTIGATION

3.1 Introduction

3.1.1 A number of potential pollutant linkages have been identified as associated with the site within the outline CSM presented as Table 2.1. An intrusive site investigation has been carried out in order to provide preliminary assessment of whether pollutant linkages identified within the outline CSM are currently active or will be made active upon redevelopment of the site.

3.1.2 The investigation also provided information on ground conditions and data for the assessment of geotechnical properties of strata underlying the site.

3.2 Description of Works

3.2.1 The site investigation was carried out between the 6th and 9th June 2022 and comprised:

- Drilling of four boreholes to depths of up to a maximum of approximately 15.00m below ground level (bgl) using cable percussion techniques (CP01 to CP04b);
- Drilling of 12 boreholes to depths of up to a maximum of approximately 4.00m bgl using window sample techniques (WS01 to WS08, including redrills annotated with a&b);
- In situ geotechnical testing throughout the depth of all boreholes;
- Installation of groundwater and ground gas monitoring standpipes in all deep cable percussive boreholes, and in shallow boreholes WS02a, WS03a, WS04, WS05a, WS07 and WS08. Boreholes without monitoring wells were backfilled with uncompacted arisings.

3.2.2 Selected photographs of the site investigation works are included as Appendix B.

3.2.3 It should be noted that due to site restrictions and unforeseen ground construction/obstruction a number of the positions were not advanced to their target depth. This is discussed further in Section 3.4.

3.2.4 An exploratory hole location plan is provided as Figure 3.

3.2.5 The soil arisings from each exploratory hole were carefully examined for visual and olfactory evidence of contamination. Headspace testing was undertaken on site for ionisable volatile organic compounds (iVOCs) using a portable Photo-Ionisation Detector (PID).

3.2.6 A return visit for groundwater sampling was carried out on 5th July 2022. The monitoring wells were inspected for the presence of free-phase hydrocarbon product using an oil/water interface probe and the depth to groundwater was recorded prior to sampling. Grab groundwater samples were taken from WS03a where well recharge was insufficient.

3.2.7 Ground gas monitoring was undertaken on six occasions, over a period between 16th June to 22nd July 2022. Installations were monitored for concentrations of methane, carbon dioxide, carbon monoxide, hydrogen sulphide, oxygen and iVOCs. In addition, the flow rate and barometric pressure were recorded.

3.3 Investigation Rationale

3.3.1 The rationale behind each of the site investigation locations is summarised in the table below.

Table 3.1: Exploratory Location Rationale

Exploratory Location ID	Location on Site	Rationale
CP01	South west of site	To obtain geo-environmental and geotechnical information to assist with the design of the respective proposed units on or near to their location, and to enable the installation of a deep ground gas and groundwater monitoring well within the Chester Sandstone Formation.
CP02	South and centre of site	
CP03	South and east of site	
CP04/a/b	North east of site	
WS01 to WS08	Spread across the site	To obtain geo-environmental and geotechnical information of the shallow soils across the site, assisting with the design of the respective proposed units on or near to their location, and enabling the installation of shallow ground gas and groundwater monitoring wells within the Made Ground and underlying Glacial Till.
WS02, WS03	South of the site	As well as providing general coverage of the site, the window sample boreholes in the south of the site targeted the location of former tanks identified on historical mapping.

3.4 Site Restrictions

3.4.1 Information supplied to RPS identified the presence of a 750mm combined sewer running east/west beneath the middle of the site. A 10-metre easement above the sewer limited potential investigations in the middle of the site within proximity to this feature.

3.4.2 RPS were unable to gain access to existing units on site, limiting areas of investigation to outdoor areas only.

3.4.3 During the investigation a number of in ground obstructions were encountered which prevented drilling of Borehole CP04, CP04a and CP04b. In addition, obstructions in window sample boreholes WS01, WS02, WS02a, WS02b, WS03, WS05, WS06, WS07 and WS08 prevented them reaching their target depth in the proposed locations. The as drilled locations of the various attempts to penetrate the ground are shown on Figure 3.

3.4.4 It should be recognised that investigation to the north east area of the site was severely restricted by shallow inground obstructions, and as such further investigation to these areas will be required in due course once such in ground obstructions have been cleared, or utilising specialist drilling methods.

3.5 Laboratory Testing

Geo-Environmental Laboratory Testing - Soil

3.5.1 Twelve samples of Made Ground were submitted to a UKAS/MCERTS accredited laboratory and analysed for a number of determinands including:

Inorganic Determinands:

3.5.2 pH, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, sulphide, total cyanide, sulphate, sulphur, selenium, zinc and asbestos.

Organic Determinands:

3.5.3 Speciated polyaromatic hydrocarbons (PAH), speciated total petroleum hydrocarbons (TPH CWG) including benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl tert-butyl ether (MTBE), volatile organic compounds (VOCs), and monohydric phenol.

Geo-Environmental Laboratory Testing - Groundwater

3.5.4 Two groundwater samples were collected during the fourth monitoring visit to site. Due to insufficient well recharge at WS03a, groundwater was grab sampled. Samples were submitted to a UKAS/MCERTS accredited laboratory and analysed for a number of determinands:

Inorganic Determinands:

3.5.5 pH, organic matter, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, sulphide, sulphate and total cyanide.

Organic Determinands:

3.5.6 Speciated PAH, TPH CWG including BTEX and MTBE, VOC, SVOC and monohydric phenol.

Leachate testing

3.5.7 Due to limited groundwater within monitoring wells, where groundwater samples could not be obtained, soil samples from two locations were submitted for leachate testing.

WAC Testing

Three samples of Made Ground were scheduled for Waste Acceptance Criteria analysis.

Geotechnical Laboratory Testing

3.5.8 Samples of the Made Ground, Glacial Till and Chester Sandstone Formation were submitted to a UKAS accredited geotechnical testing laboratory and analysed for Moisture Content, Atterberg Limit, Particle Size Distribution (wet sieve and sedimentation), Quick Undrained triaxial compression, BRE Suite, pH and water-soluble sulphate content, BRE Suite SD-1.

4 SITE INVESTIGATION FINDINGS

4.1 Geology

4.1.1 The strata encountered during the intrusive investigation are summarised in the table below, and described in the following section.

Table 4.1: Encountered Strata

Strata	Depth to top of strata m BGL / (m AOD)	Thickness (m)
Asphalt	Ground level (59.99 to 59.72)	0.05 to 0.10
Concrete	Ground level (59.96)	0.25
Made Ground	Ground level to 0.30 (60.29 to 59.42)	1.20 to 3.55 (where proven*)
Glacial Till	1.20 to 3.60 (58.84 to 56.35)	7.90 to 9.00 (where proven**)
Chester Formation	10.50 to 12.20 (49.22 to 47.95)	Not fully penetrated at any location.

* Boreholes CP04, CP04a, CP04b, WS01, WS02, WS02a, WS02b, WS03, WS05, WS06, WS07 and WS08 were terminated upon refusals within Made Ground.

** Boreholes WS03a, WS04 and WS05a were terminated within the Glacial Till upon completion.

4.1.2 External areas of the site were generally covered by tarmac hardstanding. In the north east of the site, at the locations of WS08, CP04 and CP04a, the surface was grassed. At the location of CP04b, concrete was encountered underlying asphalt. Areas of hardstanding were generally in good or fair condition. Some localised areas of hardstanding had minor defects including deflection and cracking.

4.1.3 A void was encountered between 1.00m and 2.30m bgl at WS01, identified by the sample barrel dropping quickly with no arisings recovered. A brick cobble at 0.90m bgl indicated the potential presence of a historical sewer or other buried substructure.

4.1.4 Due to shallow refusals, a number of boreholes were re-positioned up to a metre away from their original proposed location. CP04, and then CP04a in the north east of the site near to the substation met shallow refusals during hand tool excavation at 0.60m bgl, possibly on concrete. In this location there was limited space on the grass verge, and a number of buried services were identified nearby. CP04b was therefore positioned approximately 10 metres to the south east within the car park in this area. WS06, located due south of CP04b refused at 1.00m bgl.

4.1.5 Window sample boreholes also met refusal at shallow depths in the following locations, suspected due to the presence of inground obstructions:

- WS01 – Voided ground and terminated at 2.5mbgl due to possible concrete substructure
- WS02 – Terminated at 0.5m bgl due to possible concrete substructure
- WS02a – Terminated at 0.9m bgl due to refusal
- WS03 – Terminated at 0.9m bgl due to possible concrete substructure
- WS05 – Terminated at 1.0m bgl due to refusal
- WS06 – Terminated at 1.0m bgl due to refusal
- WS07 – Terminated at 1.5m bgl due to refusal
- WS08 – Terminated at 2.7m bgl due to refusal

4.1.6 General descriptions of the strata encountered during the intrusive investigation are summarised below. Reference should be made to the exploratory hole logs within Appendix D of this report for full descriptions of ground conditions underlying the site.

4.1.7 Geotechnical laboratory results are provided as Appendix F.

Made Ground

4.1.8 Made Ground was generally present beneath tarmac and concrete, ranging in thickness from approximately 1.20m to 3.55m, where proven. It is noted that in some areas of the site the full thickness of the Made Ground was not proven and as such may extend to greater depths. Significant in-ground obstructions were also encountered which prevented full penetration of the Made Ground.

4.1.9 The stratum was variable in nature, generally consisting of a granular upper layer predominantly comprising historical building and industry materials, and a lower cohesive layer comprising reworked Glacial Till, featuring a small proportion of anthropogenic materials.

4.1.10 Granular Made Ground generally comprised a red and brown sandy angular to very angular fine to coarse gravel of brick and concrete, clinker, coal, mudstone, sandstone and quartzite, with fine to coarse sand including ash, and occasionally with cobble content of whole and half brick, and concrete.

4.1.11 Cohesive Made Ground generally comprised a brown mottled grey slightly gravelly clay, with angular to sub-rounded fine to medium gravel of brick, coal, mudstone and sandstone.

4.1.12 It should be noted that some of the Made Ground may be infill to former substructures

4.1.13 Atterberg Limit testing was undertaken on one soil sample collected from the Made Ground in CP01 at a depth of 3.0 m bgl. This testing was undertaken to determine values for Liquid Limit (LL), Plastic Limit (PL) and Plasticity Index (PI) gave the results for LL of 36%, for PL of 18% and a corresponding calculated PI of 18%. This is indicative of intermediate to high plasticity clay. Based on the variable nature of this sample a lower modified Plasticity Index value of 17%, indicates that this sample has a medium volume change potential. The natural moisture content of this sample was 18%, which is not indicative of the sample tested being desiccated.

4.1.14 Additional natural moisture content testing was undertaken on three soil samples collected from the Made Ground at depths ranged from 1.2 m to 2.5 m bgl which ranged from 18% to 23%.

4.1.15 13 Standard Penetration Tests (SPTs) undertaken within the granular Made Ground at depths ranging from approximately 0.9 m to 2.5 m bgl gave N_{60} values in the range of 3 to 53, which is indicative of a very loose to very dense material. The N_{60} values have been calculated from SPT N values using an energy ratio of 61% and 64% (depend on SPT hammer see Appendix D). A graph showing SPT N_{60} vs depth is presented as Figure 5.

4.1.16 Three SPTs undertaken within the cohesive Made Ground at depths ranging from 1.2 m to 2.0 m bgl gave N_{60} values in the range of 14 to 57.

4.1.17 These values should however be treated with caution as they may reflect the variable nature of the fill and higher values reflecting the presence of rubble material within the matrix. Interpretation of relative density or shear strength determination from such SPT results values should therefore be treated with extreme caution and should ideally be discounted.

4.1.18 Particle Size Distribution (PSD) testing was undertaken on one sample collected from the granular Made Ground at depth 1.20 m bgl. The constituents of the sample are summarised below:

- Cobbles: 18%
- Gravel: 59%;
- Sand: 17%; and
- Silt/Clay 6%

4.1.19 This result illustrates a well graded gravel which generally agrees with the field description of this sample. Again, such a description should be treated with caution given the variable nature of the materials encountered within the various locations.

Glacial Till

4.1.20 Glacial Till was encountered underlying Made Ground in all locations where Made Ground was fully penetrated. The top of the stratum ranged from approximately 1.20m to 3.60m bgl (58.84m to 56.35m AOD). The thickness of the stratum ranged from approximately 7.90m to 9.00m.

4.1.21 The Glacial Till was variable in nature, but generally comprised a firm to stiff brown mottled grey slightly gravelly clay. The gravel was well rounded to sub-rounded, fine to medium of mudstone, sandstone, quartzite and occasionally coal. The stratum occasionally featured thin bands of dark grey silt and relic plant rootlets.

4.1.22 Atterberg Limit testing was undertaken on five soil samples collected from the Glacial Till at depths ranging from approximately 2.0 m to 7.5 m bgl. The results for LL ranged from 33% to 47%. The results for PL ranged from 17% to 22%. The results for PI ranged from 16% to 25%. This is indicative of a highly variable material, comprising low to intermediate plasticity clay. Modified Plasticity Index values ranged between 16 to 22%, which indicates that these samples have a low to moderate volume change potential. The natural moisture content of these samples ranged from 12% to 27%, which is indicative of only one sample, collected from CP01 at 7.5 m bgl, as being potentially desiccated.

4.1.23 25 SPTs were undertaken within the Glacial Till at depths ranging from 2.0 m to 12.0 m bgl gave N_{60} values of 7 to 53.

4.1.24 Using the correlation by Stroud, whereby undrained shear strength Cu = f_1 x N_{60} an f_1 = 4.5 is considered appropriate based on the Plasticity Index results. This corresponds approximately to undrained shear strength values in the range of 32N/m^2 to 240N/m^2, which is indicative of a low to very high strength cohesive material. A graph of calculated equivalent Cu values versus depth below ground level is shown in Figure 6.

4.1.25 Four quick undrained triaxial compression tests were undertaken on samples collected from the Glacial Till at depths ranging from approximately 4.0 m to 7.5 m bgl. These gave results ranging from 84N/m^2 to 204kN/m^2. This is indicative of a low to high strength material. The results indicate a close correlation with the converted SPT results. The natural moisture content of the samples ranged from 16% to 24% whilst the bulk density ranged from 1.92Mg/m^3 to 2.1Mg/m^3 and the dry density ranged from 1.55Mg/m^3 to 1.81Mg/m^3.

4.1.26 Three oedometer consolidation tests were undertaken on samples collected from the Glacial Till at depths ranging from approximately 4.0 m to 7.5 m bgl. Between a pressure range of loading from 50kN/m^2 to 400kN/m^2 and unloading from 400kN/m^2 to 50kN/m^2 gave coefficient of compression (m_v) values ranged from 0.08 m^2/MN to 0.11m^2/MN for loading step of 200kN/m^2 to 400kN/m^2 and 0.08 m^2/MN to 0.04m^2/MN for unloading step of 400kN/m^2 to 50kN/m^2 respectively. Such results are indicative of a moderately compressible material.

4.1.27 The coefficient of consolidation (C_v) values ranged from 3.91m^2/yr to 4.49m^2/yr for loading steps of 200kN/m^2 to 400kN/m^2 and 2.73m^2/yr to 6.23m^2/yr for unloading steps of 400kN/m^2 to 50kN/m^2 were obtained respectively.

Chester Formation

4.1.28 The Chester Formation was encountered beneath the Glacial Till at depths ranging from approximately 10.50m to 12.00m bgl (59.99m to 57.52m AOD). The maximum proven thickness of the stratum was 4.50m bgl at CP03.

4.1.29 The stratum was recovered as a fine to coarse red sand or sandy sub-angular to very angular gravel of sandstone, occasionally conglomerate, indicating an extremely weak to weak, highly to completely weathered red fine-grained sandstone.

4.1.30 Six SPTs undertaken within the Chester Formation at depths ranging from 10.5m to 15m bgl gave N_{60} values >100.

4.2 Groundwater

4.2.1 During drilling, no groundwater was encountered within the Made Ground or Natural Strata.

4.2.2 Groundwater levels recorded during subsequent monitoring visits to site are summarised in the table below:

Table 4.2: Groundwater Level Data

Monitoring Well ID	Well Screen Depth (m bgl) [m AOD]	Strata	Depth to Water (m bgl) [m AOD]					
			16/06/22	21/06/22	29/06/22	06/07/22	14/07/22	21/07/22
WS02a	0.30 to 0.90 (59.99 to 59.39)	Made Ground	Dry (59.29)	Dry (59.29)	Dry (59.29)	Dry (59.29)	1.00 (59.29)	0.98 (59.31)
WS03a	1.00 to 3.00 (59.0 to 57.04)	Made Ground and Glacial Till	2.54 (57.50)	2.37 (57.67)	2.18 (57.86)	2.07 (57.97)	2.71 (57.33)	Dry (57.50)
WS04	1.00 to 5.00 (58.68 to 54.68)	Made Ground and Glacial Till	4.84 (54.84)	4.70 (54.98)	4.44 (55.24)	4.23 (55.45)	1.24 (58.44)	1.30 (58.38)
WS05a	0.50 to 2.00 (59.25 to 57.75)	Made Ground and Glacial Till	1.27 (58.48)	1.29 (58.46)	1.29 (58.46)	1.28 (58.47)	1.30 (58.45)	1.32 (58.43)
WS07	0.50 to 1.00 (58.92 to 57.92)	Made Ground	Dry (58.17)	Dry (58.17)	Dry (58.17)	Dry (58.17)	1.25 (58.17)	1.23 (58.19)
WS08	0.70 to 2.70 (59.38 to 57.38)	Made Ground	1.78 (58.30)	1.80 (58.28)	1.81 (58.27)	1.83 (58.25)	1.83 (58.25)	1.84 (58.24)
CP01	10.10 to 12.10 (49.85 to 47.85)	Glacial Till and Chester Formation	10.63 (49.32)	10.55 (49.40)	10.35 (49.60)	10.88 (49.07)	10.30 (49.65)	10.75 (49.20)
CP02	10.30 to 12.30 (49.69 to 47.69)	Glacial Till and Chester Formation	11.97 (48.02)	11.93 (48.06)	11.92 (48.07)	11.96 (48.03)	11.92 (48.07)	11.94 (48.05)
CP03	11.00 to 15.00 (48.72 to 44.72)	Glacial Till and Chester Formation	13.05 (46.67)	13.07 (46.65)	13.00 (46.72)	13.10 (46.62)	13.10 (46.62)	13.09 (46.63)

4.2.3 Groundwater data during drilling and on subsequent monitoring visits indicate that there is limited shallow groundwater within the Made Ground and Glacial Till which is considered to be reflected of various perched bodies that may be contained within more granular horizons or impounded by in ground obstructions and former buried structures.

4.2.4 Deeper groundwater is present within the Chester Formation Aquifer as shown in CP01 to CP03. The hydraulic gradient of the groundwater is shown from east to west with a fall of between 2.5 – 3.0m between CP01 and CP03.

4.2.5 Falling head tests were undertaken in three boreholes, WS04, WS05 and WS07 during the monitoring visit on the 06/07/2022, therefore the increase in groundwater levels recorded during subsequent monitoring visit in WS05 and WS07 maybe reflective of residual water from that test, rather than a change in water level.

4.3 Falling Head Tests

Methodology

4.3.1 Falling Head Tests were undertaken on the 4th round of gas and groundwater monitoring on the 6th July 2022. Three monitoring wells were selected for testing, WS02a, WS04 and WS07 to determine the permeability of the shallow soils on site.

4.3.2 In accordance with BS EN ISO 22282, a volume of water was added to the monitoring standpipe to a known level and shut off. As the water column stabilised, the depth to water was recorded over time.

Results

4.3.3 The results of the falling head tests at each of the three locations are included within Appendix E.

4.3.4 At WS02a, the water level dropped steadily, returning to pre-test levels within approximately 30 minutes. An infiltration rate of K = 4.11E-06 was calculated.

4.3.5 At WS04, the water level dropped by 60mm over 3.5 hours, and did not return to pre-test levels. It was therefore not possible to determine a rate of infiltration for this test.

4.3.6 At WS07, the water level dropped by 60mm initially, and then by 20mm over 45 minutes, effectively levelling off. It was not possible to interpolate a rate of water level drop and to therefore determine a rate of infiltration for this test.

Summary

4.3.7 In summary, the falling head tests demonstrated a range of permeability within the shallow soils on site. Monitoring well WS02a, installed within granular made ground, demonstrated the only calculable infiltration rate within the time of testing. WS07, also installed within made ground, demonstrated very limited infiltration within the time of testing. WS04, installed within the largely cohesive Glacial Till, demonstrated no infiltration within the time of testing.

4.4 Field Evidence of Contamination

Visual and Olfactory Evidence of Contamination

4.4.1 No visual or olfactory evidence of contamination was noted within soil or groundwater during the intrusive investigation.

Photo-Ionisation Detector (PID) Readings

4.4.2 Soil arisings from each exploratory hole were screened for the presence of iVOCs using a PID. No elevated concentrations of volatile contaminants (>100 parts per million (ppm)) were recorded.

4.4.3 PID readings from soil samples collected from the boreholes ranged from below limit of detection (<0.1ppm) and 5.7ppm.

4.4.4 Full records of PID readings are presented on the exploratory logs within Appendix D.

4.4.5 During subsequent ground gas and groundwater monitoring visits, PID readings generally ranged from below limit of detection (<0.1ppm) and 7.3ppm. PID readings exceeded 10ppm on four occasions, detailed in the table below.

Table 4.3: Monitoring Well PID readings

Monitoring Well ID	Elevated PID reading (ppm)	Date
WS02a	67.6	21/06/2022
WS08	19.2	21/06/2022
CP01	46.6	06/07/2022
CP02	11.6	06/07/2022

4.4.6 During the subsequent monitoring, all readings were below the instrument limit of detection (<0.1ppm).

4.5 Ground Gas Monitoring

4.5.1 Ground gas monitoring has been undertaken on six occasions between 16th June and 21st July 2022. Installations were monitored for concentrations of methane, carbon dioxide and oxygen. In addition, the flow rate and barometric pressure were recorded. The results of the ground gas monitoring are presented in Appendix F.

5 SOIL CONTAMINATION ASSESSMENT

5.1 Human Health

5.1.1 The following Section summarises the soil analytical data and provides a comparison to published assessment criteria (AC) derived to support the assessment of chronic risk to human health receptors.

5.1.2 The selected AC are Suitable 4 Use Levels (S4UL) published by Land Quality Management: Chartered Institute of Environmental Health (LQM:CIEH) in 2015. *In accordance with the copyright notice, the Publication Number for RPS Group is S4UL3177.*

5.1.3 Given the proposed use of the site for the development of light industrial units, the assessment has been based on a commercial end-use.

5.1.4 Soil Organic Matter (SOM) for samples of Made Ground ranged from 2.30% to 92.90%, with all except one sample above 2.5% SOM. Concentrations of contaminants of concern have therefore been compared to S4UL AC derived for an SOM value of 2.5%.

5.1.5 A notable exclusion from the S4ULs is lead. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been selected, published by DEFRA in 2014. It is noted that the C4SL are based on the acceptance of a low level of toxicological concern, rather than the more conservative standard adopted in the derivation of S4ULs, which are based on a tolerable or minimal level of risk.

5.1.6 The potential risk posed to controlled waters from contaminants of concern within soils beneath the site is not addressed by these screening criteria. Please refer to later Sections of this report for comment on the risk to controlled waters receptors.

5.2 Comparison of Soil Analyses to Assessment Criteria

5.2.1 Chemical analysis by a UKAS/MCERTS accredited laboratory was undertaken on 12 samples of Made Ground. A comparison of soil analyses to the relevant AC is summarised below and presented as Appendix H. Analytical certificates for soils are presented in Appendix I.

5.2.2 The table below provides a summary of the contaminants of concern recorded at concentrations above their respective AC within the soil samples collected from the Made Ground.

Table 5.1: Contaminants in Made Ground at Concentrations Exceeding the AC

Contaminant of Concern	Location and Depth (m)	Assessment Criteria (mg/kg)	Concentration (mg/kg)
Lead	WS04 @ 0.50 to 0.60	2300	5081
Benzo(a)anthrene	WS07 @0.40 to 0.50	170	343.95
Benzo(a)pyrene	WS07 @0.40 to 0.50	35	224.99
Dibenz(a,h)anthrene	WS07 @0.40 to 0.50	3.6	44.79
	WS04 @0.50 to 0.60		7.24
Benzo(b)fluoranthene	WS07 @0.40 to 0.50	365.16	44

5.2.3 SVOCs including 2-Methylphenol, 2,4-Dimethylphenol and 4-Methylphenol were recorded at concentrations above their LOD at WS05a. SVOCs including 2-Methylnaphthalene, Carbazole, Dibenzofuran were recorded at concentrations above the LOD in WS05a, WS02a and WS03a.

5.2.4 Eleven samples of Made Ground were submitted for asbestos screening to determine the presence of free asbestos fibre bundles or Asbestos Containing Materials (ACMs) such as insulation. Asbestos was identified in six of the eleven samples submitted for screening. Three of

the samples containing asbestos fibres were then scheduled for gravimetric and Phase Contrast Optical Microscopy (PCOM) asbestos quantification. A summary of identified asbestos and results of the testing are provided in the table below.

Table 5.2: Asbestos identified in Made Ground

Asbestos type	Fibres or ACM	Location and Depth (m)	Total Gravimetric and PCOM Quantification %
Chrysotile	Fibre bundles	CP02 @ 0.50 to 1.20	N/A
Chrysotile	Fibre bundles	WS07 @0.40 to 0.50	0.001%
Chrysotile	Fibre bundles and Insulation	CP04b @0.40 to 1.20	N/A
Chrysotile Amosite Crocidolite	Fibre bundles and ACM debris	WS04 @ 0.50 to 0.60	0.996%
Amosite	Fibre bundles	WS03 @ 0.50 to 0.60	N/A
Chrysotile Amosite Crocidolite	Fibre budles	WS03a @ 0.50 to 0.60	0.013%

5.1 Summary of Soil Contamination

5.1.1 An exceedance of lead was identified above its respective C4SL criteria within a sample from WS04 at 0.50 to 0.60m bgl.

5.1.2 Exceedances of a number of PAHs were identified above their respective AC within a sample from WS07 at 0.40 to 0.50m bgl. A slight exceedance of Dibenz(a,h)anthrene was also recorded in WS04 at 0.50 to 0.60m bgl.

5.1.3 Asbestos fibres and/or ACMs were identified within samples of the Made Ground at CP02, WS07, CP04b, WS04, WS03 and WS03a.

6 GROUNDWATER CONTAMINATION ASSESSMENT

6.1 Controlled Waters

6.1.1 The following Section summarises the groundwater analytical data and provides a comparison to published assessment criteria (AC).

6.1.2 Based on the outline conceptual site model, the primary controlled waters receptor is considered to be the underlying Principal Aquifer relating to the Chester Formation. Whilst there are three groundwater abstractions within 1km of the site, these relate to processes, irrigation, and cooling, with none relating to potable water abstraction.

6.1.3 Therefore, the groundwater analytical data have been compared to the Environmental Quality Standards (EQS) for freshwater values. Where such values are not available, UK Drinking Water Standards (DWS) have been used.

6.1.4 For a number of chemicals of concern the EQS is less than the laboratory limit of detection. For the purpose of this preliminary assessment, where all samples are recorded at less than the laboratory limit of detection no further assessment is considered necessary.

6.1.5 The potential risk to on site human health receptors from contaminants of concern in groundwater is not addressed by these screening criteria.

Comparison of Groundwater Analyses to Controlled Waters Assessment Criteria

6.1.6 Chemical analysis was undertaken on two groundwater samples collected from the Glacial Till/Chester Formation, and one from the Made Ground. A comparison of groundwater analyses to the relevant assessment criteria is presented as Appendix G. Analytical certificates for groundwater samples are presented in Appendix H.

6.1.7 No exceedances of the relevant assessment criteria were identified within the groundwater samples.

Comparison of Soil Leachate Analyses to Controlled Waters Assessment Criteria

6.1.8 As described in section 3.5 of this report, due to limited groundwater within monitoring wells, additional leachate testing was undertaken on two soil samples taken from the Made Ground.

6.1.9 The table below summarises identified exceedances.

Table 6.1: Leachable Contaminants within Soil Samples at Concentrations Exceeding the AC

Contaminant of Concern	Location	Assessment Criteria (µg/l)	Concentration (µg/l)
Chromium (Dissolved)	WS07	4.7 (EQS)	18.8
Anthracene	CP02	0.1 (EQS)	0.14
	WS07		4.94
Benzo(a)pyrene	CP02	0.05 (EQS)	0.275
	WS07		0.69
Benzo(b)fluoranthene	CP02	0.03 (EQS)	0.361
	WS07		1.335
Benzo(ghi)perylene	CP02	0.002 (EQS)	0.096
	WS07		0.112

Contaminant of Concern	Location	Assessment Criteria (µg/l)	Concentration (µg/l)
Benzo(k)fluoranthene	CP02	0.03 (EQS)	0.14
	WS07		0.519
Fluoranthene	CP02	0.1 (EQS)	0.715
	WS07		18.729
Indeno(1,2,3-cd)pyrene	CP02	0.002	0.17
	WS07		0.353
Sum Benzo(a)-pyrene + Benzo(bk)fluoranthene + Benzo(ghi)perylene + Indeno(123cd)pyrene	CP02	0.002 (EQS)	0.17
	WS07		0.353

6.2 Human Health

6.2.1 In order to assess risks to future site users via the inhalation of vapours arising from groundwater, potentially volatile concentrations of contaminants of concern within groundwater sampled from beneath the site have been compared to generic assessment criteria (GACgwvap) published by the Society of Brownfield Risk Assessment (SoBRA) in February 2017. The GACgwvap based upon a commercial end-use have been utilised in this assessment.

6.2.2 No exceedances of the SoBRA GACgwvap criteria were identified within the groundwater samples.

Comparison of Groundwater Analyses to Human Health Assessment Criteria

6.2.3 A comparison of groundwater analyses to the relevant human health assessment criteria is summarised below and presented as Appendix F. Analytical certificates for groundwater samples are presented in Appendix G.

6.2.4 No contaminants of concern were recorded at concentrations above their respective Human Health AC within the collected groundwater samples.

6.3 Summary

6.3.1 Leachate analysis recorded an exceedance of chromium within WS07 at 0.40 to 0.50m, as well as a number of speciated PAH exceedances in this sample and in a sample from CP02 at 0.50 to 1.20m.

6.3.2 No exceedances of the relevant assessment criteria were identified within the groundwater samples.

6.3.3 No exceedances of the SoBRA GACgwvap criteria were identified within the groundwater samples.

7 GROUND GAS RISK ASSESSMENT

7.1 Ground Gas Monitoring Data

7.1.1 Ground gas monitoring was undertaken on six occasions between 16th June and 21st July 2022. Monitoring wells were monitored for concentrations of methane, carbon dioxide and oxygen. In addition, the flow rate and barometric pressure were recorded. The results of the ground gas monitoring are presented in Appendix G.

7.1.2 Methane was not recorded at detectable concentrations in any monitoring well, on any visit. Carbon dioxide was recorded at a maximum concentration of 11.1% v/v within monitoring well screened within the Made Ground at WS02a on 21st July 2022.

7.1.3 The maximum recorded peak ground gas flow rate was 0.1l/hr, recorded at all monitoring wells.

7.1.4 The lowest recorded oxygen concentration was 3.5% v/v within monitoring well CP03 on 29th June 2022. Atmospheric pressure ranged from 1018mb to 1001mb across the period of the six monitoring visits.

7.1.5 The ground gas monitoring data is presented in full as part of Appendix G.

7.2 Ground Gas Risk Assessment

7.2.1 CIRIA Report C665 '*Assessing risks posed by hazardous ground gases to buildings'* outlines indicative guideline concentrations for carbon dioxide and methane in association with gas flow rates for which gas protection measures may be required in new residential or commercial developments. The methodology is based on the Modified Wilson and Card approach that characterises the gas regime into a series of Characteristic Situations (1 to 5), with corresponding indicative gas protection measures.

7.2.2 BS8485:2015+A1:2019 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*' recommends calculation of borehole hazardous gas flow rates (Borehole Qhg) for each individual borehole and for each monitoring event multiplying the maximum recorded stabilised flow in any standpipe in a strata with the maximum peak gas concentration. BS8485 also indicates that the worst case Qhg should be calculated for each hazardous gas by multiplying the maximum recorded stabilised flow in any standpipe in a strata (and zone) with the maximum peak gas concentration in any other standpipe in that strata (and zone).

7.2.3 Based on the ground gas monitoring associated with this site investigation, the maximum Borehole Qhg for methane is 0.0001 l/hr and for carbon dioxide is 0.0111 l/hr.

7.2.4 The calculated worst case Qhg, combining the characteristic steady flow rate from any standpipe (0.1/hr) with the highest gas concentrations from any borehole (carbon dioxide of 11.1%) is 0.0111 l/hr. This is within the gas screening value range indicative of Characteristic Situation 1 (CS1, Qhg <0.07), whereby no gas protection measures are required.

7.2.5 Further consideration to additional factors in the Modified Wilson and Card approach requires consideration to increase the regime classification to Characteristic Situation 2 (CS2) where typical concentrations of methane and/or carbon dioxide exceed 1% and 5% respectively. Given that carbon dioxide concentrations consistently exceeded 5% in the location of WS02a (installed within the Made Ground), for nearby structures (Units 3 and 4) it is recommended to classify this zone of the site as CS2, whereby basic gas protection measures are required.

7.2.6 Further investigation and subsequent confirmatory gas monitoring within this zone of the site may eliminate the requirement to classify this zone of the site as CS2. Additional monitoring could be combined with further ground investigation of the north eastern area of the site, where more

information is needed. It is recommended that investigation in the north eastern area includes installation of monitoring wells and subsequent gas monitoring, in order to refresh the ground gas risk assessment for the wider site.

7.2.7 Gas protection measures should be designed and implemented in accordance with the requirements of BS 8485:2015+A1:2019 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*'.

8 REVISED CONCEPTUAL SITE MODEL

8.1 Introduction

8.1.1 An outline conceptual site model (CSM) consists of an appraisal of the *source-pathway-receptor* 'contaminant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination (Hazard).
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** (Target) that could be affected by the contaminant(s).

8.1.2 Receptors include human beings, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. Further details on the Part 2A regime are presented within Appendix C.

8.1.3 As part of the assessment the potential risks to receptors for potential source is given one of the following classifications:

- **Low risk** - it is considered unlikely that issues within the category will give rise to significant harm to identified receptors
- **Moderate risk** - it is possible, but not certain that issues within the category will give rise to significant harm to receptors
- **High risk** - there is a high potential that issues within the category will give rise to significant harm to identified receptors

8.1.4 The potential pollutant linkages identified as part of the outline CSM have been assessed in light of the findings of the site investigation and are discussed below for each of the potential post development individual receptors identified by the Outline Conceptual Model.

8.2 Human Health Receptors

Future Site Users

8.2.1 Lead was recorded at a concentration in excess of the adopted screening criteria in a sample of Made Ground from WS04 at 0.50 to 0.60m bgl. Exceedances of a number of speciated PAHs were identified above their respective AC within a sample from WS07 at 0.40 to 0.50m bgl.

8.2.2 Asbestos fibres and/or ACMs were identified within samples of the Made Ground at CP02, WS07, CP04b, WS04, WS03 and WS03a.

8.2.3 During drilling and subsequent monitoring, groundwater was identified to be limited or not present at all at shallow depths.

8.2.4 No contaminants of concern were recorded at concentrations above their respective Human Health AC within the collected groundwater samples.

8.2.5 No potentially volatile compounds were detected at concentrations considered to represent a potential risk to future site users via the volatilisation pathway.

8.2.6 It is considered highly unlikely that future site users will be exposed to groundwater beneath the site given the sites proposed use and the limited presence of any shallow groundwater.

8.2.7 According to current development plans, building cover and hardstanding are proposed in areas of the site where these exceedances have been identified, therefore mitigating potential risk to future site users from these contaminants of concern. There is the potential for residual risk in areas of existing soft landscaping, if soils are exposed or disturbed.

8.2.8 On the basis of the above, the potential risk to future site users from concentrations of contaminants of concern identified within soil and groundwater sampled from beneath the site is considered to be **LOW**.

Off-site Human Heath Receptors

8.2.9 Following redevelopment, for areas of the site covered by building footprint or hardstanding there is limited potential for the air-borne migration of soil or dust to impact neighbouring receptors. Clean topsoil cover should be provided to break this pathway in soft landscaped areas.

8.2.10 Concentrations of contaminants of concern considered to represent a significant risk to human health receptors were not recorded within groundwater samples analysed from beneath the site.

8.2.11 The presence of impermeable Glacial Till will restrict the migration of potential contaminants towards off-site receptors.

8.2.12 The potential risk to off-site human health receptors from these concentrations of contaminants of concern is therefore considered to be **LOW**.

Construction/ Maintenance Workers

8.2.13 S4ULs or C4SLs cannot be used to assess the acute (short term exposure) risk that personnel in close contact with exposed soils may experience during demolition, redevelopment or site maintenance duties.

8.2.14 Potential risks to construction workers can easily be controlled in most site areas by the use of appropriate personal protective equipment (disposable coveralls, gloves, and particulate/vapour masks) and by adopting high levels of personal hygiene.

8.2.15 Asbestos fibres and asbestos containing materials (ACMs) were detected in six samples of Made Ground collected from locations across the site. An asbestos management plan should be implemented for the proposed redevelopment. Should significant quantities of asbestos be detected in soils during any site redevelopment, a specialist contractor should be approached to advise on removal and disposal.

8.2.16 Providing contractors undertake and implement a site-specific risk assessment and resulting mitigation measures are taken, based on the available information, the potential risk to ground workers is considered to be **LOW**.

8.3 Controlled Waters Receptors

Groundwater

8.3.1 During drilling and subsequent monitoring, groundwater was identified to be limited or not present at all at shallow depths. Following limited groundwater sample recovery, Leachate analysis was undertaken on two samples of Made Ground.

8.3.2 No contaminants of concern have been recorded within groundwater samples at concentrations in excess of their respective AC. Leachate analysis recorded an exceedance of chromium within WS07 at 0.40 to 0.50m, as well as a number of speciated PAH exceedances in this sample and in a sample from CP02 at 0.50 to 1.20m.

8.3.3 The potential for the leaching of these PAH contaminants from within shallow soils to groundwater is considered to be very limited given the impermeable nature of the underlying Till and building/hardstanding cover which will limit infiltration.

8.3.4 EA mapping indicates that the site lies above a secondary undifferentiated aquifer relating to the Glacial Till, which is considered to represent an impermeable barrier to the more vulnerable underlying principal aquifer relating to the Chester Formation. The site is not located within a Groundwater SPZ, and there are no sensitive groundwater abstractions within close proximity to the site. Shallow groundwater encountered beneath the site is considered likely to be representative of discontinuous perched pockets within the Made Ground.

8.3.5 On the basis of the above, the potential risk to groundwater from contaminants of concern originating from the site is considered to be **LOW**.

Surface Water

8.3.6 The preliminary assessment identified the nearest surface water feature is Corn Brook, which is located approximately 200m to the south-west of the site. Given the distance to the brook and the low permeability of the near surface soils, the outline conceptual model did not consider that there is an active linkage between the site and the brook. The limited presence of shallow groundwater encountered during investigation and monitoring will further limit the potential for leaching and migration of contaminants within the Made Ground off site.

8.3.7 The potential for detected concentrations of contaminants of concern to pose a significant risk to surface water receptors is considered to be **LOW**, particularly when the dilution factor or the water body is also taken into account.

8.4 Structures and Infrastructure

Buildings (on site and off site)

8.4.1 Further consideration to additional factors in the Modified Wilson and Card approach requires the consideration of increasing classification to Characteristic Situation 2 (CS2) where typical concentrations of methane and/or carbon dioxide exceed 1% and 5% respectively. Given that carbon dioxide concentrations consistently exceeded 5% in the location of WS02a (installed within the Made Ground), for nearby structures (Units 3 and 4) it is recommended to classify this zone of the site as CS2, whereby basic gas protection measures are required.

8.4.2 Based on ground gas monitoring undertaken on site as part of the current investigation, CIRIA CS2 is considered applicable to a zone in the south west of the site including units 3 and 4, whereby basic gas protection measures are required for these buildings. Further investigation and subsequent confirmatory gas monitoring within this zone of the site may eliminate the requirement to classify this zone of the site as CS2.

8.4.3 For the wider site, CIRIA CS1 is applicable, where no ground gas protection measures are considered necessary for new structures.

8.4.4 Further investigation and subsequent confirmatory gas monitoring within this zone of the site may eliminate the requirement to classify this zone of the site as CS2. Additional monitoring could be combined with further ground investigation of the north eastern area of the site, where more information is needed. It is recommended that investigation in the north eastern area includes installation of monitoring wells and subsequent gas monitoring, in order to refresh the ground gas risk assessment for the wider site.

8.4.5 Assuming appropriate mitigation measures are adopted, the risk posed by ground gas to human health receptors and infrastructure is considered to be **LOW**.

Polymeric Utility Pipes

8.4.6 Elevated concentrations of PAH contaminants were recorded upon leachate analysis on soil samples collected from site. Standard polymeric utility pipes may therefore be unsuitable for the proposed development. Barriers may be required for new underground utilities, or service pipes laid in dedicated trenches and backfilled with clean, inert material.

8.4.7 Requirements for buried utility pipes should be discussed with service providers before the development stage. Provided the recommended mitigation measures are adopted, the risk posed to buried services is not considered to be significant.

8.5 Revised Conceptual Model

8.5.1 The potential source-pathway-receptor linkages and associated risks upon completion of the proposed development at the site, as identified following completion of the assessment, are summarised in the revised CSM below.

8.5.2 The risk assessment is based upon the available information relating to the site and recommended mitigation measures being implemented. Should ground conditions inconsistent with those outlined in this report be encountered RPS should be contacted to enable further assessment.

Table 8.1: Revised Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating	Notes
On site – current: Made Ground, electrical substation, infilled ground **On site – historical:** Railway sidings and auxiliary building to former engineering works, tanks	Metals, PAHs, and asbestos	Soil	Direct contact/ingestion	×	Future site users	Low	No chemical exceedances within sampled soils. Asbestos identified within soil samples is unlikely to be mobilised post development once covered by buildings, hardstanding, and manged landscaping.
			Inhalation of volatiles	×		Low	No volatile contamination exceedances recorded.
			Airborne migration of soil or dust	×	Off-site users	Low	Post development cover will prevent airborne migration of potential contaminants.
			Leaching of mobile contaminants	×	Principal Aquifer	Low	Significant thickness of impermeable Glacial Till beneath the Made Ground will mitigate vertical migration to the more sensitive aquifer below. Presence of hardstanding across the site will reduce rainfall infiltration into the shallow soils across the site.
		Groundwater	Direct contact/ingestion	× ×	Future site users Off-site users	Low	Limited shallow groundwater present.
			Inhalation of volatiles	× ×	Future site users Off-site users	Low	No volatile contamination exceedances recorded.
			Vertical and lateral migration in permeable strata	× × × ×	Principal Aquifer Secondary Undifferentiated Aquifer Surface watercourse Ecological receptors	Low	Significant thickness of impermeable Glacial Till beneath the Made Ground will mitigate vertical migration to the more sensitive aquifer below.

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating	Notes
Off-site – Current: Made ground, asphalt plant **Off site – historical:** Made Ground, Bleach works, garage, instrument works, engineering works	Metals, hydrocarbons, solvents and Polychlorinated biphenyls (PCBs)	Groundwater	Direct contact/ingestion	×	Future site users	Low	Post development cover will prevent exposure. Limited shallow groundwater present.
			Inhalation of volatiles	×	Future site users	Low	No volatile contamination exceedances recorded.
On and off-site – Made Ground / natural strata, landfills, mine gas or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓ ✓	Future site users Off-site users	Low to Moderate	Elevated CO_2 concentrations identified at a location within south west of the site require further assessment or basic gas protection measures at units 3 and 4. Wider site is classified as CIRIA CS1 whereby no gas protection is required.
			Explosive risks	× ×	Future site users Off-site users Future and off-site Structures	Low	No explosive gases recorded during monitoring.

8.5.3 The risk assessment is based upon the available information relating to the site and recommended mitigation measures being implemented. Should ground conditions inconsistent with those outlined in this report be encountered RPS should be contacted to enable further assessment.

9 GEOTECHNICAL ASSESSMENT

9.1 Introduction

9.1.1 The demolition or extension of existing buildings and construction of new commercial/industrial units is proposed throughout the site. A proposed development plan is provided as Figure 3.

9.1.2 As can be seen in Figure 3 a storm water drainage culvert is running from the west to the east of the site and we understood the existing buildings over the storm water culvert are to be refurbished and new development will only be constructed in the southern and the northeast sections of the site as indicated the proposed units 3, 4 ,5 and 6 in Figure 3.

9.1.3 No preliminary structural loads have been received. Therefore, the preliminary recommendations below will need to be reviewed in light of subsequent detailed design.

9.2 Preliminary Geotechnical Risk Register

9.2.1 The table below summarises the potential geotechnical hazards associated with the development. The table provides an assessment of whether the site is likely to be affected by the hazard and the possible consequences and engineering considerations.

Table 9.1: Geotechnical Risk Register

Hazard Description	Potential for Hazard	Comments / Possible Engineering Requirements
Sudden lateral / vertical changes in ground conditions	M/H	The ground conditions from existing ground level are generally consistent with Made Ground of variable depth overlying the Glacial Till which in turn overlying the Chester Formation. It is noted that there are numerous in ground obstruction encountered during the investigation and as such sudden changes and increased thicknesses of made ground may result. The Glacial Till will provide a suitable bearing stratum for low to moderate loads, where this is at least medium strength clay. For more heavily loaded structures, piled foundations, terminating in the deeper layers of the Glacial Till or socketed within the sandstone of the Chester Formation should be considered.
Highly compressible / low bearing capacity soils, (including peat and soft clay)	M	A variable thickness of Made Ground proven up to 3.6 m was encountered across the site. The nature of these materials is variable and with in-ground obstruction and buried structures, the relative density of the material may be variable and loose in some areas.
Ground dissolution features / natural cavities	L	Ground conditions beneath the site are not consistent with these conditions.
Shrinking and swelling clays	L	Based on the Atterberg Test results and the consolidation characteristics the Glacial Till is considered a material subject to moderate volume change potential. Based on the moisture content results there does not appear to be evidence of a desiccation zone in the upper horizons of the Glacial Till. Mature trees have been identified adjacent to the site. The potential effect of these on the depth required for foundations should be assessed in accordance with the NHBC Manual guidelines.
Slope stability issues	M	Whilst no significant slopes are present on the site, the existing brick retaining wall and benching at the south of the site is an indication of the differential ground level with the adjacent site in the south. The site visit indicated that the retaining wall is in poor condition and some structural damage was observed. It is recommended that a detailed structural survey of the wall be undertaken, and where necessary further geotechnical and structural investigation of the existing retaining wall should be undertaken whereby an appropriate geotechnical assessment of the slope and retaining wall stability should be undertaken.

Hazard Description	Potential for Hazard	Comments / Possible Engineering Requirements
		Any temporary slopes created as part of the development should be subject to appropriate geotechnical design based on site-specific site investigation information.
High groundwater table (including waterlogged ground)	M	Perched groundwater was encountered at shallow depths from 0.98m to 2.71 within the Made Ground and Glacial Till. Slight seepages were also noted during the site works. Therefore, for shallow excavations groundwater exclusion and control measures may be required, however it is anticipated that any water ingress into excavations should not be excessive and likely to be controllable via localised sump and pumping. Groundwater also was encountered at depths of 10.30 m bgl within Chester Formation during subsequent monitoring visits. Should piled foundations be considered for the redevelopment of the site, a Piling Risk Assessment should be undertaken and agreed with the Environment Agency to minimise the potential for contaminant migration from the shallow made ground. Should CFA or bored piles be considered to be installed within the Chester Formation, adequate dewatering techniques should be adopted to protect the drilling shaft against instability due to water seepage.
Filled and Made Ground (including embankments)	H	Made Ground was encountered to a maximum proven depth of up to 3.6 m bgl beneath the site and was generally of variable consistency and thickness.
Obstructions (including foundations, services, basements, tunnels and adjacent sub-structures)	M	The site has had a substantial development history thus relic structures could be encountered within the footprint of former structures, which may require removal to enable the construction of the proposed development. It is likely these obstructions, if encountered may be removed using standard construction plant. During the intrusive site investigation, it was attempted to drill boreholes in several locations in the northeast section of the site by means of cable percussion and dynamic probing (window sample) techniques, however, all efforts were unsuccessful due to the refusal at the shallow depths. Therefore, it's high likely that northeast section of the site contents relic structures (possible concrete rafts) which need to be identified and possibly removed prior to construction activities.
Underground mining	L	Ground conditions beneath the site are not consistent with these conditions.
Concrete classification	L	Testing has indicated a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-1 would be appropriate for all buried concrete structures.
Seismic Activity	L	The Eurocode 8 seismic hazard zoning maps for the UK (Musson and Sargeant, 2007) indicate that horizontal Peak Ground Acceleration (PGA) values with 10% probability of being exceeded in 50 years (475-year return period) are between 0.00 and 0.02g, which is considered very low.

The potential risks are given one of the following classifications:

- **Low risk** - it is considered unlikely that issues within the category will give rise to significant damage in relation to the proposed development.
- **Moderate risk** - it is possible, but not certain that issues within the category will give rise to significant damage in relation to the proposed development.
- **High risk** - there is a high potential that issues within the category will give rise to significant damage in relation to the proposed development.
- **N/A -** The anticipated ground conditions are not consistent with this hazard.

9.3 Preliminary Geotechnical Parameters

9.1 The following table shows the preliminary anticipated ground model and geotechnical parameters based of the findings of the intrusive investigation and subsequent testing.

9.2 It should be noted that with using the cable percussion techniques the penetration within the Chester Formation was highly limited so that the maximum penetration within this stratum was only 3.5 meters in CP03. Thus, the geotechnical parameters provided in the below table should be used with caution with regards to the Chester Formation.

9.3 Moreover, due to the failure of all borehole drilling attempts in the northeast section of the site, the following geotechnical parameters should be treated with extreme caution in the northeast section of the site and should be confirmed as necessary with further ground investigation once such inground obstructions have been cleared.

Table 9.2: Preliminary Ground Model and Geotechnical Parameters

Stratum	Depth to Top of Stratum (m bgl) [m AOD]	Bulk Unit Weight, γ_b (kN/m^3)	Undrained Shear Strength, Cu (kPa)	Effective Friction Angle, φ' (°)	Undrained Young's Modulus, Eu (MPa)	Undrained Young's Modulus, E' (MPa)
Made Ground - Granular	Ground Level to 0.25 [60.29 to 59.42]	18(1)	-	29(1)	-	10
Made Ground - Cohesive	2.0 [57.99 to 57.95]	19(1)	40	-	10	-
Glacial Till	1.2 to 3.6 [58.84 to 56.35]	20	75+17.5Z(2)	22(3)	30+7Z(2)(4)	22.5+5.25Z(2)(4)
Chester Formation	10.5 to 12.2 [49.22 to 47.95]	20(1)	-	42(5)	-	100(6)

1) Conservative estimate
2) z = depth below surface of the Glacial Till at 3.5 m bgl.
3) BS8004 - Code of Practice for Foundations (2015).
4) J.M.Duncan and A.L.Buchignani (1976): An Engineering Manual for Settlement Studies. Eu/Cu=400 and E'=0.75Eu
5) Carter M and Bentley S - Soil Properties and their Correlations 2nd Ed, 2016
6) C.R.I.Clayton (1995) -The Standard Penetration Test, SPT: Method and Use CIRIA R143. E'=N(MPa)

9.4 Foundation Solutions

9.1 It should be noted that, since the intrusive ground investigations failed in the northeast section of the site due to the presence of the relic structures, recommendations, assessments, and comments presented in the following sections should be treated with extreme caution for the northeast section of the site.

9.2 Also, it should be noted due to the lack of sufficient penetration into the Chester Formation, the provided pile capacities within this stratum should be taken into account cautiously. Should higher pile capacity will be anticipated, additional site investigations with adopting rotary techniques should be considered to fulfil the requirements of pile design in accordance with EC7.

Traditional Foundations

9.4.1 Due to the inherent textural, compositional variability and compressibility of the Made Ground, this is considered unsuitable as a bearing stratum for shallow foundations.

9.4.2 Based on SPT and quick undrained triaxial test results, the Glacial Till is likely to provide a suitable bearing stratum for shallow foundations supporting light to moderated loaded structures it is considered that strip or pad foundations may be adopted to support the structural loads.

9.4.3 In accordance with the guidance set out in Eurocode 7, a 1.00m concrete square pad foundation or 1m strip foundation placed at a typical depth of 2.5m bgl (or at least 300mm into the Glacial Till) should be capable of supporting building loads of up to 110kN/m^2 where the stratum is at least medium strength of cohesive material.

9.4.4 In accordance with the guidance set out in Eurocode 7 to satisfy Ultimate Limit State (ULS) and Serviceability Limit State (SLS) design, settlement underlying a 1.00m concrete square pad foundation, loaded at 110N/m^2, bearing within the Glacial Till is anticipated to be within acceptable limits (<25mm). Settlements within the Glacial Till would be expected to be complete within a few years following completion of the construction of the building.

9.4.5 The foundation excavations should be inspected before placing foundation concrete. If Made Ground, low strength cohesive material or loose granular material is encountered at the target bearing depth, foundations should be taken deeper to an appropriate formation level, or the unsuitable material should be excavated and replaced with compacted granular fill.

Ground Improvement

9.4.6 Ground improvement would be required to densify shallow soils beneath proposed structures in order to achieve suitable allowable bearing pressures and reduce the potential for differential settlement beneath traditional foundations and ground bearing floor slabs. Suggested ground improvement options may include Vibro Stone Columns (VSCs), Vibro Concrete Columns (VCCs), rigid inclusions, dynamic compaction using a dynamic roller, or soil mixing.

9.4.7 VSCs, VCCs or Rigid Inclusions improve the near surface ground conditions by creating a column of material to laterally displace or replace the near surface soils to thereby stiffening the soil mass and reducing post construction settlements. These columns would need to be installed on a closely spaced grid, within and partially beyond the footprint of the proposed structures to be supported and extend down to the Glacial Till (4.0 m bgl). If VCC stone columns are considered the effects of contaminant and land gas migrating should be considered as the technique may provide preferential pathways.

9.4.8 Where the Made Ground is of limited thickness dynamic compaction using an offer weighted roller may prove effective in more granular made ground soils. The effective depth of such techniques should be evaluated by a specialist contractor as would be the potential damaging effects of such techniques on existing structures and infrastructure, where ground impact may be detrimental to stability or cause damage

9.4.9 Due to potential deleterious or high organic material contents within the Made Ground, ground improvement via soil mixing in not recommended in this site, as extensive processing may be required before such techniques are considered viable. However, further investigation and consultation with a specialist contractor could be useful.

9.4.10 Due to variations in installation technique, it is recommended that a ground improvement contractor be consulted to determine suitability of the ground conditions, the nature of the most suitable improvement technique, and the likely improvement which may be achieved and costs for the differing techniques.

9.4.11 It should be noted that both dynamic compaction, and VCC/rigid inclusions have difficulty in overcoming soils which have significant obstructions within them. Such obstructions can affect the depth of treatment and the performance of the improved soil/concrete column for VSC/VCC techniques. For VSC and VCC scenarios each position may have to be pre-drilled/probed to ensure it is free from obstruction. Similarly, both techniques rely on some inherent strength within the host soil to prevent the finished soil/concrete column from “barrelling” which may result in lower

column performance and onerous long-term settlements. Such issues would need to be discussed in advance of any detailed design work to ensure the proposed improvement technique is feasible.

9.3 For VCC /VSC techniques an appropriate working platform should be designed and constructed in accordance with BRE Digest 470 (Working Platforms for Tracked Plant) if such techniques are to be employed.

Piled Foundations

9.4.1 The proposed development is supposed to be for light industrial use, comprising, new warehouse unit in the south and north and refurbishment of the existing units at the centre of the site.

9.4.2 Consideration should be given to the limitation of ground investigation within the Chester Formation so provided pile capacity where the pile is assumed to be socketed within this stratum should be taken into account with caution.

9.4.3 Should the ground improvement options mentioned above not prove suitable at the site then recourse to a piled foundation solution may be required. Based on the setting of the site and ground conditions, it is anticipated that bored or rotary bored or Continuous Flight Auger (CFA) piles, terminating in the underlying Glacial Till or Chester Formation would be most suitable on the subject site from a geotechnical viewpoint.

9.4.4 Consideration should be given to the presence of potential obstructions across the site and early consultation with an appropriate piling contractor is recommended to confirm adopted pile techniques.

9.4.5 Preliminary pile capacities for a range of pile diameters between 300mm and 600mm are presented in the table below based on CFA or bored cast in place piles constructed on site.

Table 9.3: Preliminary Total Design Resistance (kN) of CFA/Bored Piles (No Pile Tests)

Pile Diameter (mm)	Pile Toe Level (m bgl)		
	8 (Within Glacial Till)	10 (Within Glacial Till)	12 (within Chester Formation)
300	156 *86*	242 *144*	1561 *209*
450	265 *129*	402 *216*	3302 *314*
600	395 *173*	586 *288*	5684 *419*

Tensile resistances shown in italics.

9.4.6 The preliminary pile capacities provided are based on the parameters outlined in Table 9.2 and the following:

- No contribution from ground level to 3.50m bgl in the region of the Made Ground and;
- No consideration of negative skin friction induced from any settlement of the overlying cohesive Made Ground;
- An adhesion value of 0.50 in the Glacial Till;
- Groundwater at 10.3 m bgl.
- Piles terminating within three pile diameters of the depth of the investigation.

9.4.7 Partial safety factors have been applied to the calculated pile capacities above in accordance with Design Approach 1: Combination 2, as detailed within Tables A.6, A.7 and A.8 of Annex A in BS EN 1997-1. The capacities provided assume a model factor of 1.4. Should preliminary pile tests be carried out, a reduced model factor of 1.2 can be adopted.

9.4.8 The loads provided should be compared against appropriately factored actions.

9.4.9 Loads are based on single piles only and do not take into account the action of groups of piles. This should be considered at the detailed design stage. The pile capacity estimates presented above are preliminary and are based on a conservative soil profile derived from exploratory holes undertaken on site.

9.4.10 Should a ground bearing floor slab be adopted, or the build-up of site levels be undertaken, the potential for this to load the near surface soils and induce negative skin friction on foundation piles would need to be assessed.

9.4.11 Consideration should be given to the presence of perched groundwater at approximately 1.0 m to 2.7 m bgl and the underlying groundwater aquifer at circa 10.3 m bgl during pile construction. A Piling Risk Assessment should be undertaken to confirm that any contamination migration risks are considered. Furthermore, it should be recognised that the groundwater may cause instability with an open bored hole, therefore, a CFA method of drilling may be deemed more appropriate or, alternatively, casing installed during drilling.

9.4.12 Early consultation with an appropriate piling contractor is recommended to confirm pile working capacities and to ensure the contractor can achieve the required depths and capacities. Specialist piling contractors may potentially show greater load capacities than those shown above based on specific knowledge of their piling equipment, supported by testing evidence that may be acceptable to the Local Authority and Environment agency.

9.4.13 An appropriate piling platform should be designed and constructed in accordance with BRE Digest 470 (Working Platforms for Tracked Plant).

9.5 Floor Slabs

9.5.1 Variable Made Ground is anticipated to be present at floor slab formation level beneath the proposed development, as such ground bearing floor slabs are not considered to be suitable for the proposed development, without prior ground improvement.

9.5.2 If ground improvement is not feasible to support a ground bearing floor slab, then suspended floor slabs would be considered to prevent excessive total and differential settlement, whereby settlement beneath the slab would be controlled by the foundations of the building. Additional loads from suspended floor slabs should be taken into account when designing foundations for the proposed development.

9.5.3 It should be noted that the gas monitoring carried out to date indicates that in some areas a potential Characteristic Situation 2 has been identified in accordance with CIRIA document C665.

9.5.4 The guidance given in Table 4 of BS8485:2015 +A1:2019 indicates that for site assessed as CS2 a gas protection score of 2.5 is required to be incorporated into the development, assuming a development of Building Type C (commercial building with central building management control of any alterations to the building or its uses).

9.5.5 When the minimum gas protection score has been determined for the building as a whole, or for each part of the building, then a combination of two or more of the following three types of protection measures should be used to achieve that score:

- the structural barrier of the floor slab, or of the basement slab and walls if a basement is present;
- ventilation measures; and

- gas resistant membrane.

9.5.6 The gas protection system should consist of at least two different elements; for example, a barrier element with either a membrane or a ventilation or dilution element (or both). No more than one element of each type should be combined to achieve the recommended gas protection score. The elements work independently and collaboratively, and a single element should not be used because there would be no redundancy to allow for defects in the component.

9.5.7 Once the types of protection measures have been decided, the detailed design and specification of the measures should be undertaken and should be recorded in a design report.

9.6 Pavement Design

9.6.1 Pavements carried on a suitable depth of capping/sub-base should prove adequate provided the exposed made ground deposits are compacted by a heavy smooth wheeled roller and any soft or degradable materials removed and replaced with compacted granular fill. Similarly, any remains of walls, foundations or exposed pieces of demolition material would need to be removed to prevent any development of concentrations of stress in the pavement.

9.6.2 It is recommended that design Subgrade Surface Modulus values be selected from consideration of the long-term equilibrium values proposed in CD 255 “Design for new pavement foundations. Rev 1 (2020). In the absence of any DCP or Plate Load tests on the current subgrade a provisional Subgrade Surface Modulus of the existing near surface Made Ground soils should be taken to be not greater than 30MPa, (equivalent to no greater than circa 2.5% CBR). A higher value may be adopted if the ground is built up from formation using a granular fill that is placed and compacted in accordance with an engineering specification. A geotextile should be placed to ensure separation of the granular fill from the formation. Following removal of existing surfacing and any in-ground obstructions it is recommended that additional Plate Load testing is undertaken to determine the Subgrade Surface Modulus to be used in detailed design of pavements.

9.7 Chemical Attack on Buried Concrete

9.7.1 Samples collected from the Made Ground were tested for pH and for sulphate content. The results are presented below:

Table 9.4: pH and Sulphate Analytical Data

Strata	No. of Samples	pH Range	Characteristic pH	Sulphate Range (mg/l)	Characteristic Sulphate (mg/l)	Design Sulphate Class	ACEC Class
Made Ground	12	7.2 – 12.3	12.3	21 - 243	243	DS-1	AC-1

9.7.2 The data was used to assess appropriate classification for buried concrete in accordance with BRE Special Digest 1, based on the following assumptions:

- Brownfield ground conditions; and
- Mobile groundwater conditions.

9.8 Temporary Works and Excavations

9.8.1 The site has had a significant development history and therefore it is likely that relic structures are present, these may require partial or total removal to enable the construction of the proposed development. It is considered likely that excavation of any relic structures still remaining will be possible with conventional earth moving plant.

9.8.2 Groundwater was encountered at depths from approximately 0.98 to 2.71 m bgl during intrusive works and subsequent monitoring visits. Therefore, groundwater exclusion and control measures may be required for proposed foundation excavations. It is considered that groundwater inflows should not be excessive and likely to be controlled via localised sump and pumping. If stronger inflows are encountered, recourse to a temporary groundwater exclusion system may be required, such as sheet piling.

9.8.3 Should any restoration and reconstruction of the existing retaining wall in the southern boundary be anticipated, consideration should be given to the temporary slope stability and early consultation with an appropriate temporary works designer and contractor is recommended.

9.8.4 If groundwater is encountered during excavation, degradation of the formation may occur. The formation should therefore be adequately protected from seepages and protected from adverse weather conditions. If the formation layer becomes wet resulting in loosening of the surface materials, then excavation may have to be taken deeper in order to find a suitable bearing layer. Instability of excavations in granular material should be expected, especially during periods of adverse weather. Suitable shoring measures or battering back of slopes may be required for any excavations greater than 1.20m bgl. All temporary excavations should be undertaken in accordance with CIRIA Report 97 – Trenching Practice.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 Geo-Environmental

10.1.1 The quantitative risk assessment has identified a potential risk to human health associated with presence of asbestos, lead and PAHs in shallow soils. Following redevelopment, hardstanding and building cover will provide an effective barrier to break the pathways of dermal contact, ingestion and inhalation of contaminated dust to future site users. This would also prevent the migration of contaminated dust towards off-site receptors. However, any areas of proposed soft landscaping a 300mm cover of certified clean topsoil cover should be provided to break these pathways.

10.1.2 On the basis that the mitigation measures described above are implemented, the potential risk to human health receptors from concentrations of contaminants of concern identified within soil and groundwater sampled from beneath the site upon completion of the development would not be considered to be significant.

10.1.3 Several leachable PAH contaminants of concern were encountered at concentrations exceeding the EQS assessment criteria within samples of Made Ground within WS07 and CP02. No exceedances were identified within the groundwater samples. The site lies above a secondary undifferentiated aquifer relating to the Glacial Till, which is considered to represent an impermeable barrier to the more vulnerable underlying principal aquifer relating to the Chester Formation. The site is not located within a Groundwater SPZ, and there are no sensitive groundwater abstractions within close proximity to the site. The Corn Brook is located approximately 200m to the south-west of the site. Therefore, the potential risk to groundwater resources and surface water receptors from contaminants of concern originating from the site is not considered to be significant.

10.1.4 Based on ground gas monitoring undertaken on site as part of the current investigation, CIRIA CS2 is considered applicable to a zone in the south west of the site including units 3 and 4, whereby basic gas protection measures are required for these buildings. Further investigation and subsequent confirmatory gas monitoring within this zone of the site may eliminate the requirement to classify this zone of the site as CS2. For the wider site, CIRIA CS1 is applicable, where no ground gas protection measures are considered necessary for new structures. It is recommended that where further investigations are needed in the north eastern area of the site, these include installation of monitoring wells and subsequent gas monitoring, in order to refresh the ground gas risk assessment for the wider site.

10.1.5 During the redevelopment, mitigation measures must be implemented to prevent the mobilisation of asbestos fibres from soil to air. An Asbestos in Soils Management Plan can be provided for an additional fee upon request.

10.1.6 If excavated soils show visual or olfactory evidence of gross organic contamination the impacted soils should be segregated from soils not obviously impacted to prevent mixing and cross contamination. Impacted soils should be handled and stored in a manner to prevent contamination and either disposed of off-site (in accordance with statutory obligations) or remediated for re-use on site in an appropriate manner in accordance with a materials management plan.

10.1.7 Any specific soils that are to be disposed of off-site should be subject to waste characterisation prior to removal from site.

10.2 Geotechnical

10.2.1 The Made Ground is not considered to be a suitable founding stratum. The Glacial Till s a suitable bearing stratum for lightly to moderately loaded structures with a recommended allowable bearing capacity of 110kN/m^2 for a 1m square pad foundation or 1m wide strip foundation placed at a typical depth of 2.5m bgl (or at least 300mm into the Glacial Till).

10.2.2 Ground improvement would be required to densify shallow soils beneath proposed structures in order to achieve suitable allowable bearing pressures and reduce the potential for differential settlement beneath traditional foundations and ground bearing floor slabs. Should the ground improvement options mentioned above not prove suitable at the site then recourse to a piled foundation solution may be required. Based on the setting of the site and ground conditions, it is anticipated that bored or rotary bored or Continuous Flight Auger (CFA) piles, terminating in the underlying Glacial Till or Chester Formation would be most suitable on the subject site from a geotechnical viewpoint.

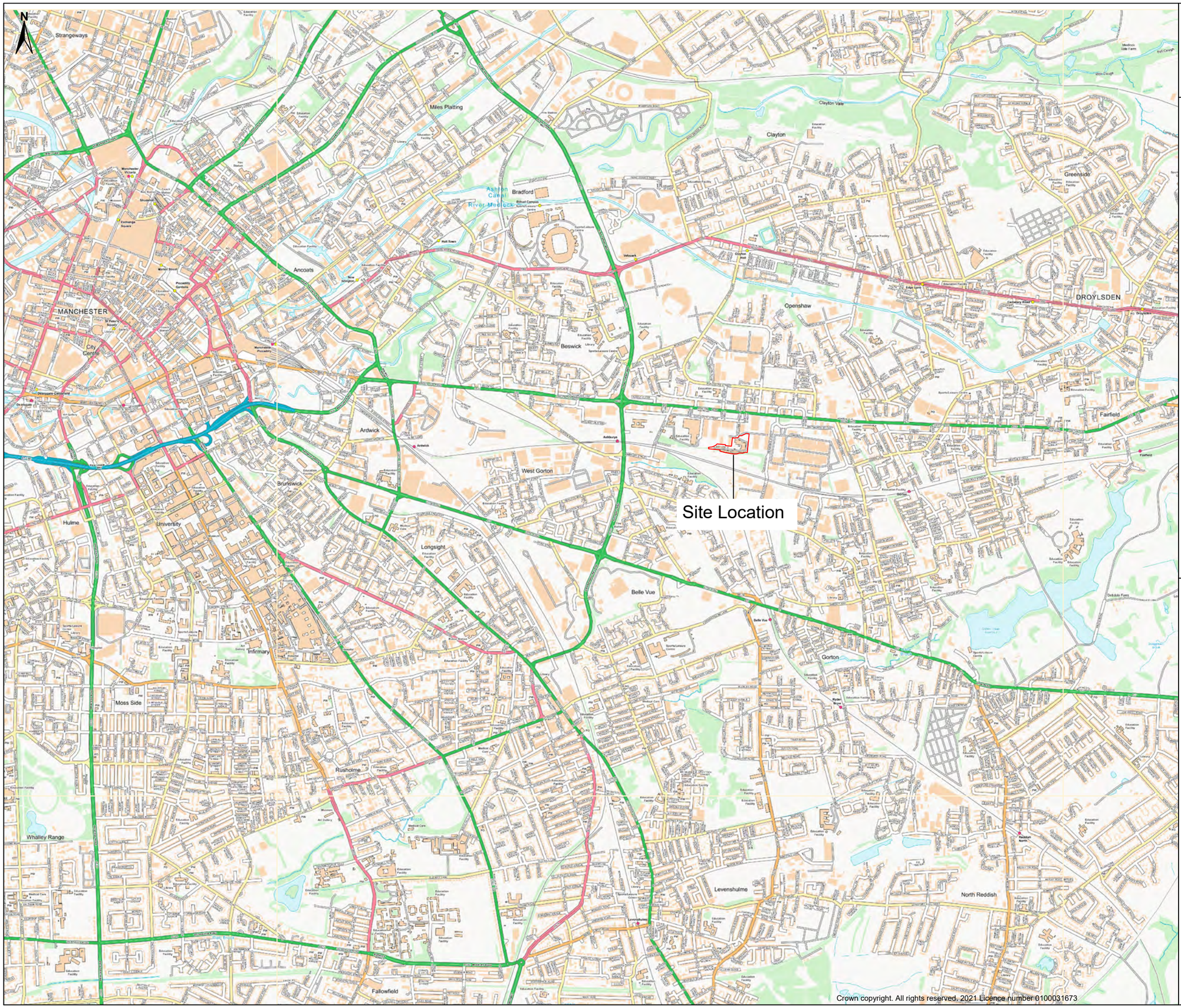
10.2.3 Pavements carried on a suitable depth of capping/sub-base should prove adequate provided the exposed made ground deposits are compacted by a heavy smooth wheeled roller and any soft or degradable materials removed and replaced with compacted granular fill. Similarly, any remains of walls, foundations or exposed pieces of demolition material would need to be removed to prevent any development of concentrations of stress in the pavement. A geotextile should be placed to ensure separation of the granular fill from the formation. Following removal of existing surfacing and any in-ground obstructions it is recommended that additional Plate Load testing is undertaken to determine the Subgrade Surface Modulus to be used in detailed design of pavements.

10.2.4 Due to the variable Made Ground at formation level suspended ground floor slabs are recommended, unless ground improvement is carried out.

10.2.5 It is considered that a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-1 would be appropriate for all buried concrete structures.

10.2.6 It should be recognised that investigation to the north east area of the site was severely restricted by shallow inground obstructions. Further investigation to these areas will be required, and can be undertaken once these ground obstructions have been cleared, or in advance of development works using specialist drilling methods.

FIGURES



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Notes

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Site boundary

MAKING COMPLEX EASY

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Client Network Space

Project Welcomb Street

Title Site Location Plan

Status	Drawn By	PM/Checked by
Draft	SD	KD
Job Ref	**Scale @ A3**	**Date Created**
JER9536	NTS	MAY 2022
Figure Number		**Rev**
1		00

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Site boundary

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Client Network Space

Project Welcomb Street

Title Site Boundary Plan

Status	Drawn By	PM/Checked by
Draft	SD	KD
Job Ref	Scale @ A3	Date Created
JER9536	NTS	MAY 2022
Figure Number		Rev
2		00

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Schedule of Accommodation

Unit	Ground Floor GIA	First Floor GIA	TOTAL UNIT GIA	Total Parking Inc. (Acc.)	Parking Ratio (m²)	Height to underside of Haunch
Unit 1a	647m² / 6,964ft²		647m² / 6,964ft²	8 (1)	1:80	Existing
Unit 1b	492m² / 5,295ft²		492m² / 5,295ft²	7 (1)	1:80	Existing
Unit 2a	571m² / 6,146ft²	319m² / 3,433ft²	**890m² / 9,579ft²**	11 (1)	1:80	Plus 6.5m For Extension
Unit 2b	781m² / 8,406ft²	152m² / 1,636ft²	**933m² / 10,042ft²**	12 (1)	1:77	Plus 6.5m For Extension
Unit 3a	288m² / 3,100ft²		**288m² / 3,100ft²**	5 (1)	1:57	6.5m
Unit 3b	437m² / 4,703ft²		437m² / 4,703ft²	7 (1)	1:62	6.5m
Unit 4a	252m² / 2,712ft²	72m² / 775ft²	324m² / 3,487ft²	5 (1)	1:64	8.5m
Unit 4b	252m² / 2,712ft²	72m² / 775ft²	324m² / 3,487ft²	5 (1)	1:64	8.5m
Unit 5a	440m² / 4,736ft²	146m² / 1,571ft²	**586m² / 6,307ft²**	8 (1)	1:73	8.5m
Unit 5b	440m² / 4,736ft²	146m² / 1,571ft²	**586m² / 6,307ft²**	8 (1)	1:73	8.5m
Unit 5c	340m² / 3,659ft²		340m² / 3,659ft²	4 (1)	1:85	6.5m
Unit 6a	434m² / 4,671ft²	72m² / 775ft²	506m² / 5,446ft²	6 (1)	1:84	8.5m
Unit 6b	434m² / 4,671ft²	72m² / 775ft²	506m² / 5,446ft²	6 (1)	1:84	8.5m
Overflow carparking				51		
TOTAL GIA			**6,859m² / 73,822ft²**	143 (13)	1:47	

Whitworth Street
Welcomb Street
Existing Unit Approx. Area: 1,510m² / 16,250ft²
Existing Unit Approx. Area: 4,680m² / 50,375ft²
Clayton Court
Proposed Mini - roundabout
Relocated estate sign
Existing Access Amended
Unit 1A Extension
Substation
Unit 6a
Unit 6b
Overflow
Existing main entrance.
Norbury Court
Existing Unit Approx. Area: 3,350m²
Existing Unit Approx. Area: 1,000m²
Medlock Court
Existing Unit Approx. Area: 1,100m²
Unit 1a
Unit 1b
Unit 2a
Unit 2b
Unit 3a
Unit 3b
Unit 4a
Unit 4b
Unit 5a
Unit 5b
Unit 5c
Internal stairs (3 flights) & Location for goods lift
Proposed main entrance.
Yard/ Parking Area = 1279m² / 0.32 acres
3 bays removed to create simple extension

NOTES AEWTP026C

- All dimensions and levels are to be checked on site.
- Any discrepancies are to be reported to the architect before any work commences
- This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
- This drawing shall not be reproduced without express written permission from AEW.
- Title overlay drawings and ownership boundaries are produced using all reasonable endeavors. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

CDM 2015

Client notified of duties: **07/04/21**

Principal Designer: **Client**

Unless noted below, all known hazards have been highlighted on the drawing:

N 0 5 10 15 20 25m

Scale 1:500

Mezzanine Extents

30" combined sewer with 30ft easement. Exact alignment TBC by survey

Footprint of existing Zone A

Manchester City Council Maximum parking standards:

B2 = 1:45 sq.m
B8 = 1:100 sq.m

REV	Date	Drawn by: -	Checked by: -
P2	13/05/22	HN	AL
Unit 2 Amended, mini-roundabout shown			
P1	05/05/22	HN	AL
Initial Issue			

Status: S2 — Purpose of Issue: Stage 2 - Concept Design

drawing stage: **For Comment**

client: **Network Space**

project: **Welcomb Street Openshaw**

drawing title: **Proposed Site Plan Option 7**

date: 05/05/22 drawn: HN

scale@A1: 1:500 checked: AL

Rev: **P2**

Job No: **12481-AEW-XX-XX-DR-A-0009**

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Legend

CP
Cable Percussive Borehole to 15m bgl

WS
Window Sample Borehole to 5m bgl

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Client Network Space

Project Welcomb St

Title Exploratory Hole Location Plan

Status	Drawn By	PM/Checked by
Final	TF	KD
Job Ref	**Scale @ A3**	**Date Created**
JER9536	NTS	AUG 2022
Figure Number		**Rev**
Figure 4a		00

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	5,446ft²	6 (1)	1:84	8.5m
72m² / 775ft²	506m² / 5,446ft²	6 (1)	1:84	8.5m
		51		
	6,859m² / 73,822ft²	143 (13)	1:47	



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Legend

CP
Cable Percussive Borehole to 15m bgl

WS
Window Sample Borehole to 5m bgl

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Client Network Space

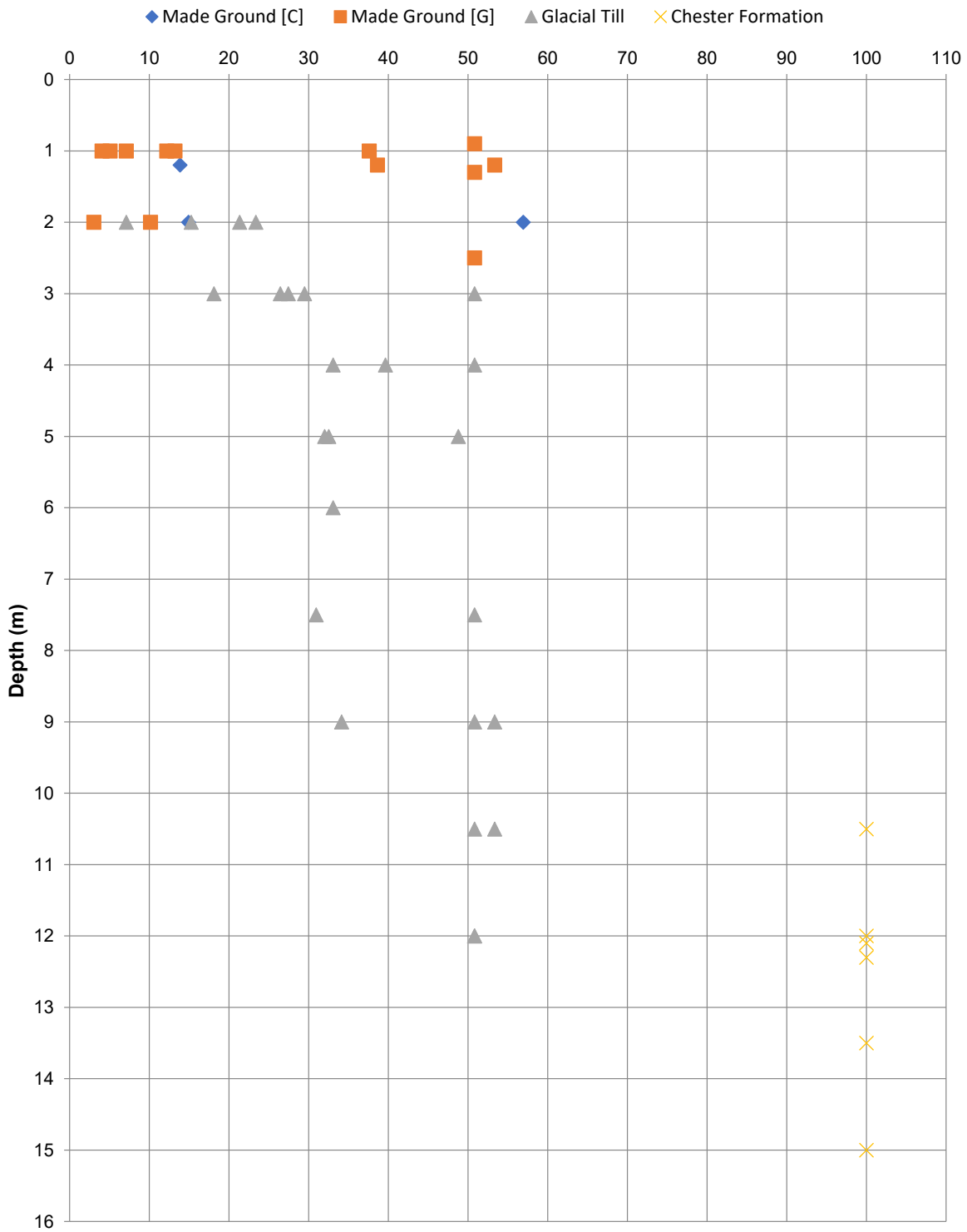
Project Welcomb St

Title Exploratory Hole Location Plan

Status	Drawn By	PM/Checked by
Final	TF	KD
Job Ref	**Scale @ A3**	**Date Created**
JER9536	NTS	AUG 2022
Figure Number		**Rev**
Figure 4b		00

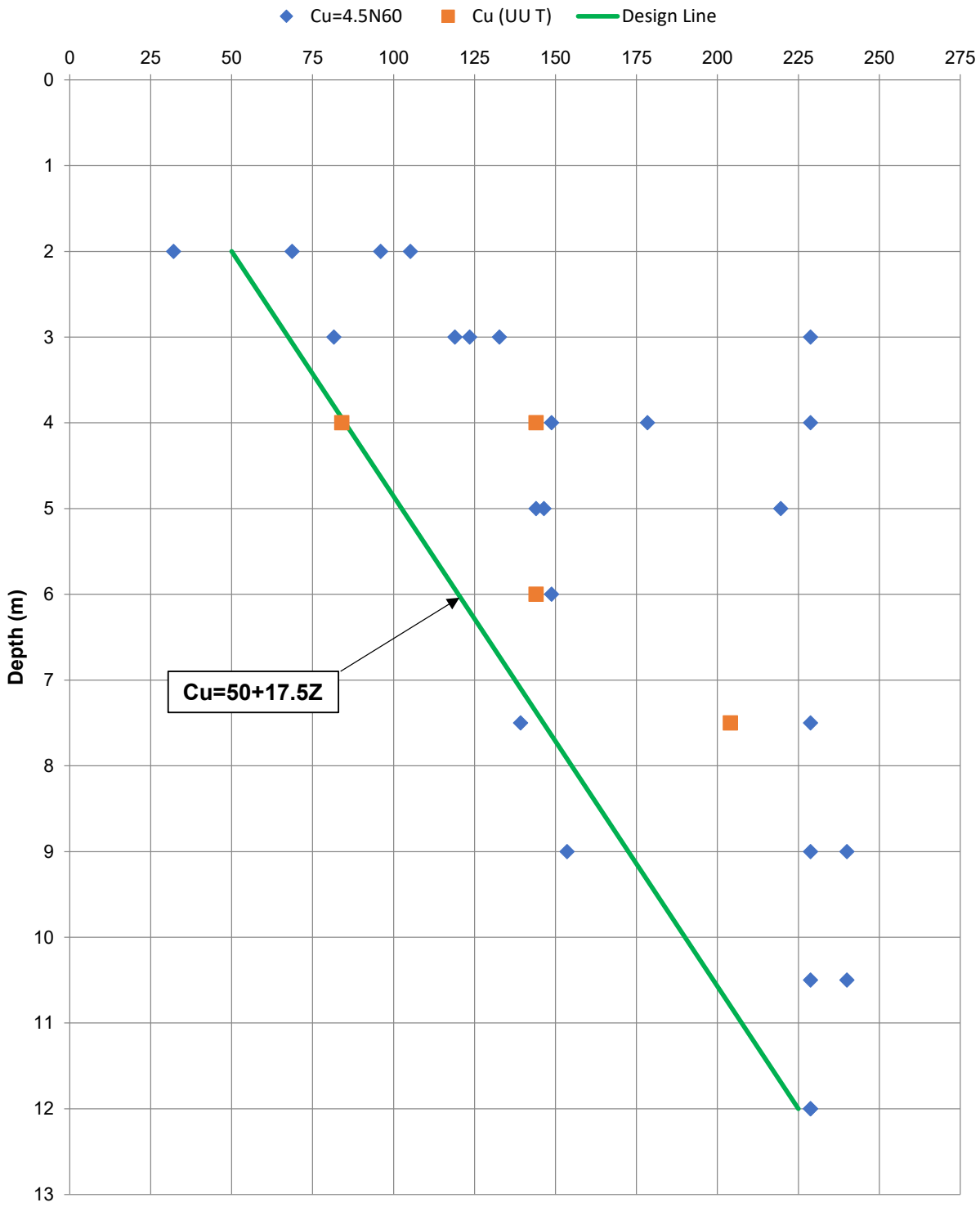
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	SPT N_{60} vs Depth	Figure 5
Project ID: **Welcomb Street**	Project Title: **JER9536**	
Client: **Network Space**	Location:	



Date Reported: **03/08/2022**

	Cu vs Depth	Glacial Till Figure 6
Project ID: **Welcomb Street**	Project Title: **JER9536**	
Client: **Network Space**	Location:	



Date Reported: **03/08/2022**

APPENDICES

Appendix A

General Notes

RPS Consulting Services Ltd

Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review

General Notes

1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
5. No sampling or analysis has been undertaken in relation to this desk study.
6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
11. These terms apply in addition to the RPS "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.

RPS Consulting Services Ltd

Phase 2 – Site Investigations

General Notes

1. The assessments made in this report are based on the ground conditions as revealed by intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination ("hot spots") and there can be no certainty that any or all such areas have been located and/or sampled.

2. There may be special conditions appertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.

3. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS Companies for inaccuracies within the data supplied by other parties.

4. Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.

5. Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.

6. This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or part after its original submission.

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Standard Terms of Business shall prevail). In the absence of such a written contract the Standard Terms of Business will apply.

Appendix B

Photographs



Photo 01: Hand dug service pit at CP04



Photo 02: Cable Percussive Rig over CP02



Photo 03: Cable Percussive Rig over CP03



Photo 04: Core Sample from WS06



Photo 05: Core sample from WS07



Photo 06: Core sample from WS08



Photo 07: Core samples from WS05



Photo 06: Core samples from WS04

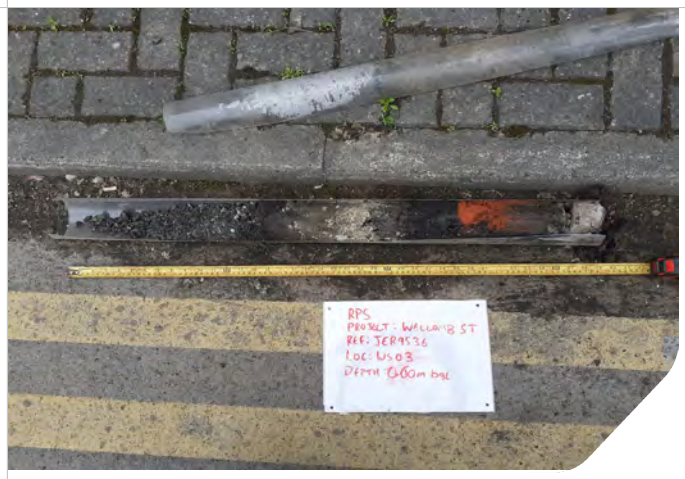


Photo 07: Core sample from WS03



Photo 08: Core sample from WS02



Photo 05: Core sample from WS01



Photo 08: Core sample from WS03a

Appendix C

Part 2A (The Contaminated Land Regime)

Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001[1], providing a definition of 'contaminated land' and setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as 'any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:

a) *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
b) *significant pollution* of controlled waters[2] is being caused or there is a significant possibility of such pollution being caused[3]'

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term 'possibility of significant harm being caused' should be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

i. Chronic or acute toxic effect, serious injury or death to humans
ii. Irreversible or other adverse harm to the ecological system
iii. Substantial damage to, or failure of, buildings
iv. Disease, other physical damage or death of livestock or crops
v. The pollution of controlled waters[4].

[1] In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

[2] In Scotland the term "controlled water" has been updated to "water environment" under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

[3] The definition was amended in 2012 by implementation of the Water Act 2003.

[4] Groundwater in this context does not include waters within underground strata but above the saturated zone.

With regard to radioactivity, contaminated land is defined as 'any land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a *significant possibility of such harm being caused*[5]'.

The Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

The Risk Assessment

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

- The likelihood of an event (probability) - takes into account both the presence of the hazard and receptor and the integrity of the pathway.
- The severity of the potential consequence - takes into account both the potential severity of the hazard and the sensitivity of the receptor.

For further information please see the Contaminated Land section on the DEFRA website (www.defra.gov.uk).

[5] The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.

Appendix D

Exploratory Hole Logs

Contract Name: Welcomb Street			Client: Network Space		Borehole ID: CP01
Contract Number: JER9536	Start Date: 07/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL	Sheet 1 of 2
Cable Percussion Borehole Log	Easting: 387817.5	Northing: 97206.9	Ground Level: 59.95mOD	Plant Used: Dando 2000	Logged By: TF	Scale: 1:50
Weather: Fair	Termination: Target depth achieved.		SPT Hammer: AR812/AR659 Energy Ratio: 64/61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.90	0.05		ASPHALT		
				59.75	0.20		Red and brown sandy angular to very angular fine to coarse GRAVEL of brick. Sand is fine to coarse. MADE GROUND		
					(1.00)		Red and brown sandy angular to very angular fine to coarse GRAVEL of brick and concrete including medium cobble content of half brick and concrete. Sand is fine to coarse. MADE GROUND		
1.20 - 1.65	B1	SPT(C) 1.20m, N=50 (8,12/15,15,20,)		58.75	1.20				
					(0.80)		Red and brown silty sandy very angular to subrounded fine to coarse GRAVEL of brick, mudstone and sandstone. Sand is fine to coarse. MADE GROUND		
2.00 - 2.45	B2	SPT(C) 2.00m, N=14 (2,2/3,3,4,4)		57.95	2.00		Reddish brown silty slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is very angular to subrounded fine to coarse of brick, sandstone and mudstone. MADE GROUND		
					(1.00)				
3.00 - 3.45	B3	SPT(C) 3.00m, N=17 (2,3/3,4,5,5)		56.95	3.00		Brown mottled grey slightly gravelly CLAY. Gravel is angular to subrounded fine to medium of brick, coal, mudstone, sandstone and quartz. MADE GROUND		
					(0.60)				
3.60 - 4.00	B4			56.35	3.60		Firm brown mottled grey slightly gravelly CLAY. Gravel is well rounded to subrounded fine to medium of mudstone, quartz and coal. GLACIAL TILL		
4.00 - 4.45	U1		Ublow=125, 95% Recovery						
4.50	D1						*At 4.50m bgl becoming stiff.*		
5.00 - 5.45	B5	SPT(S) 5.00m, N=30 (6,6/7,7,8,8)							
6.00 - 6.45	B6		Ublow=125, 0% Recovery						
6.00 - 6.45	U-NR1								
					(5.40)				
7.50 - 7.95	B7	SPT(S) 7.50m, N=29 (6,5/7,7,8,7)					*At 7.50m bgl becoming silty.*		
9.00 - 9.45	B8	SPT(S) 9.00m, 50 (8,10/50 for 280mm)		50.95	9.00		Stiff brown slightly sandy slightly gravelly CLAY with pockets of light grey sand. Gravel is subangular to rounded fine to medium of mudstone and sandstone. Sand is fine to medium. GLACIAL TILL		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	10.10	PLAIN	50
1	10.10	12.10	SLOTTED	50

Chiselling

From (m)	To (m)	Duration	Remarks
1.20	2.00	01:00	
12.00	12.10	01:00	

Borehole Diameter

Depth (m)	Dia (mm)
12.10	150

Casing Diameter

Depth (m)	Dia (mm)
12.10	150

Remarks:

1) Cable percussion borehole completed at 12.10m bgl upon encountering bedrock. 2) Gas and groundwater monitoring pipe installed with response zone between 10.10m bgl and 12.10m bgl. 3) No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP01
Contract Number: JER9536	Start Date: 07/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL
Cable Percussion Borehole Log	Easting: 387817.5	Northing: 97206.9	Ground Level: 59.95mOD	Plant Used: Dando 2000
Logged By: TF	Scale: 1:50	Sheet 2 of 2		
Weather: Fair	Termination: Target depth achieved.	SPT Hammer: AR812/AR659 Energy Ratio: 64/61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.50 - 10.95	B9	SPT(C) 10.50m, 50 (7,9/50 for 290mm)			(2.95)				
11.50 - 12.00	B10								
12.00 - 12.10	B11	SPT(S) 12.00m, 50 (25 for 85mm/50 for 115mm)		48.00	11.95 12.00				
12.00 - 12.10	D2	SPT(S) 12.10m, 50 (25 for 50mm/50 for 60mm)		47.95 47.85	12.10		Light brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium of quartz, sandstone and mudstone. GLACIAL TILL Extremely weak red fine grained highly to completely weathered SANDSTONE recovered as very dense red fine to medium SAND CHESTER FORMATION End of Borehole at 12.10m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	10.10	PLAIN	50
1	10.10	12.10	SLOTTED	50

Remarks:

1) Cable percussion borehole completed at 12.10m bgl upon encountering bedrock. 2) Gas and groundwater monitoring pipe installed with response zone between 10.10m bgl and 12.10m bgl. 3) No groundwater encountered.

Chiselling			
From (m)	To (m)	Duration	Remarks

Borehole Diameter	
Depth (m)	Dia (mm)
12.10	150

Casing Diameter	
Depth (m)	Dia (mm)
12.10	150

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP02
	Contract Number: JER9536	Start Date: 06/06/2022	End Date: 07/06/2022	Checked By: KD	Status: FINAL
Cable Percussion Borehole Log	Easting: 397295.2	Northing: 397210.2	Ground Level: 59.99mOD	Plant Used: Dando 2000	Logged By: TF
					Sheet 1 of 2
					Scale: 1:50

Weather: Fair | Termination: Target depth achieved. | SPT Hammer: AR659/ Energy Ratio: 61%

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 0.50	B1			59.89	0.10		ASPHALT		
					(0.40)		Grey sandy very angular to angular fine to coarse GRAVEL of brick, concrete, sandstone, pottery, clinker and gritstone. Sand is fine to coarse.		
0.50 - 1.20	B2			59.49	0.50		MADE GROUND		
					(0.70)		Very dark brown gravelly fine to coarse SAND including ash. Gravel is very angular to angular fine to coarse of brick and clinker.		
1.20 - 1.65	B3	SPT(C) 1.20m, N=38 (4,6/9,9,10,10)		58.79	1.20		MADE GROUND		
					(0.80)		Red and brown slightly sandy very angular to angular fine to coarse GRAVEL of brick with low cobble content of half brick. Sand is fine to coarse. MADE GROUND		
2.00 - 2.45	B4	SPT(C) 2.00m, N=56 (34 for 115mm/13,13,15,15)		57.99	2.00		Brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is very angular to sub-rounded fine to medium of brick, sandstone and mudstone.		
2.50	B5				(1.00)		MADE GROUND		
3.00 - 3.45	B6	SPT(S) 3.00m, N=29 (3,3/5,5,9,10)		56.99	3.00		Stiff brown slightly gravelly CLAY. Gravel is sub-angular to sub-rounded, of fine sandstone and mudstone. GLACIAL TILL		
3.00 - 3.45	D1								
4.00 - 4.45	U1		Ublow=57, 80% Recovery						
4.50	D2								
5.00 - 5.45	B7	SPT(S) 5.00m, N=32 (6,6/7,7,9,9)					*From 5.00m bgl to 5.45m bgl thin bands of dark grey silt and relic plant rootlets.*		
5.00 - 5.45	D3								
6.00 - 6.45	U2		Ublow=70, 100% Recovery						
6.50	D4				(7.50)		*From 6.50m bgl gravel becoming fine to coarse*		
7.50 - 7.95	B8	SPT(S) 7.50m, 50 (3,7/50 for 275mm)							
7.50 - 7.95	D5								
9.00 - 9.45	B9	SPT(S) 9.00m, N=50 (4,9/14,15,15,6)							
9.00 - 9.45	D6								

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	10.30	PLAIN	
1	10.30	12.30	SLOTTED	

Chiselling

From (m)	To (m)	Duration	Remarks
1.80	2.00	01:00	
12.00	12.30	01:00	

Borehole Diameter

Depth (m)	Dia (mm)
12.30	150

Casing Diameter

Depth (m)	Dia (mm)
12.30	150

Remarks:

1) Cable percussion borehole completed at 12.30m bgl upon encountering bedrock. 2) Gas and groundwater monitoring pipe installed with response zone between 10.30m bgl and 12.30m bgl. 3) No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP02
Contract Number: JER9536	Start Date: 06/06/2022	End Date: 07/06/2022	Checked By: KD	Status: FINAL
Cable Percussion Borehole Log	Easting: 397295.2	Northing: 397210.2	Ground Level: 59.99mOD	Plant Used: Dando 2000	Logged By: TF	Scale: 1:50
Weather: Fair	Termination: Target depth achieved.		SPT Hammer: AR659/ Energy Ratio: 61%	Sheet 2 of 2

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.50 - 10.95	B10	SPT(S) 10.50m, 50 (10,17/50 for 225mm)		49.49	10.50		Very stiff brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse very angular to sub-rounded of sandstone and mudstone. GLACIAL TILL		
10.50 - 10.95	D7				(1.50)				
12.00 - 12.10	B11	SPT(S) 12.00m, 50 (35 for 115mm/50 for 105mm) SPT(S) 12.30m, 50 (25 for 30mm/50 for 50mm)		47.99	12.00		Light brown silty sandy sub-angular to rounded fine to coarse GRAVEL of sandstone, mudstone and quartz. GLACIAL TILL		
12.00 - 12.10	D8			47.79	12.20				
12.30	D9			47.69	12.30		Extremely weak red fine grained highly to completely weathered sandstone recovered as a sandy sub-angular to angular fine to medium GRAVEL of sandstone and conglomerate. CHESTER FORMATION		
							End of Borehole at 12.30m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	10.30	PLAIN	
1	10.30	12.30	SLOTTED	

Remarks:

1) Cable percussion borehole completed at 12.30m bgl upon encountering bedrock. 2) Gas and groundwater monitoring pipe installed with response zone between 10.30m bgl and 12.30m bgl. 3) No groundwater encountered.

Chiselling			
From (m)	To (m)	Duration	Remarks

Borehole Diameter	
Depth (m)	Dia (mm)
12.30	150

Casing Diameter	
Depth (m)	Dia (mm)
12.30	150

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name:		Client:			Borehole ID:
Welcomb Street		Network Space			CP03
Contract Number:	Start Date:	End Date:	Checked By:	Status:	Sheet 1 of 2
JER9536	06/06/2022	07/06/2022	KD	FINAL	
Cable Percussion Borehole Log	Easting: 387921.1	Northing: 397203.8	Ground Level: 59.72mOD	Plant Used: Dando 2000	Logged By: TF	Scale: 1:50

Weather: Fair | Termination: Target depth achieved. | SPT Hammer: AR812 Energy Ratio: 64%

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.62	0.10		ASPHALT		
							Dark brown silty sandy sub-angular to very angular, fine to coarse GRAVEL of brick and clinker. Sand is fine to coarse including ash. MADE GROUND		
					(1.40)				
1.20 - 1.65	B1	SPT(S) 1.20m, N=13 (1,2/3,3,4,3)		58.22	1.50		Brown mottled grey slightly gravelly CLAY. Gravel is sub-rounded to sub-angular, fine to coarse of quartzite, mudstone and brick. MADE GROUND		
2.00 - 2.45	B2	SPT(C) 2.00m, N=20 (3,3/4,5,5,6)			(1.10)				
2.60 - 3.00	B3			57.12	2.60		Firm brown mottled grey slightly gravelly CLAY. Gravel is sub-rounded to sub-angular, fine to coarse of quartzite, sandstone, mudstone occasionally coal. GLACIAL TILL		
3.00 - 3.45	U1		Ublow=125, 75% Recovery						
3.50	D1						*From 3.50m becoming stiff.*		
4.00 - 4.45	B4	SPT(S) 4.00m, N=31 (5,5/6,7,9,9)							
5.00 - 5.45	B5		Ublow=125, 0% Recovery						
5.00 - 5.45	U-NR1								
6.00 - 6.45	B6	SPT(S) 6.00m, N=31 (3,3/8,7,8,8)			(7.90)				
7.50 - 7.95	U2		Ublow=125, 90% Recovery						
8.00	D2								
9.00 - 9.45	B7	SPT(S) 9.00m, N=32 (3,4/7,8,9,8)							

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	11.00	PLAIN	50
1	11.00	15.00	SLOTTED	50

Chiselling

From (m)	To (m)	Duration	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
15.00	150

Casing Diameter

Depth (m)	Dia (mm)
15.00	150

Remarks:

1) Cable percussion borehole completed at 15.00m bgl upon encountering bedrock. 2) Gas and groundwater monitoring pipe installed with response zone between 11.00m bgl and 15.00m bgl. 3) No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP03
Contract Number: JER9536	Start Date: 06/06/2022	End Date: 07/06/2022	Checked By: KD	Status: FINAL
Cable Percussion Borehole Log	Easting: 387921.1	Northing: 397203.8	Ground Level: 59.72mOD	Plant Used: Dando 2000
Logged By: TF	Scale: 1:50	Sheet 2 of 2		
Weather: Fair	Termination: Target depth achieved.	SPT Hammer: AR812 Energy Ratio: 64%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.50 - 10.95	B8	SPT(S) 10.50m, 50 (25 for 70mm/50 for 280mm)		49.22	10.50		Extremely weak red fine grained completely weathered SANDSTONE recovered as dense light brown silty sandy angular fine to coarse gravel of sandstone. Sand is fine to coarse. CHESTER FORMATION		
12.00 - 12.45	B9	SPT(S) 12.00m, 50 (25 for 75mm/50 for 60mm)			(2.50)				
13.00 - 13.45	B10			46.72	13.00		Weak red highly weathered fine grained SANDSTONE recovered as fine to medium sand. CHESTER FORMATION		
13.50	B11	SPT(S) 13.50m, 50 (10,15/50 for 130mm)			(2.00)				
		SPT(S) 15.00m, 50 (25 for 65mm/50 for 60mm)		44.72	15.00		End of Borehole at 15.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	11.00	PLAIN	50
1	11.00	15.00	SLOTTED	50

Remarks:

1) Cable percussion borehole completed at 15.00m bgl upon encountering bedrock. 2) Gas and groundwater monitoring pipe installed with response zone between 11.00m bgl and 15.00m bgl. 3) No groundwater encountered.

Chiselling			
From (m)	To (m)	Duration	Remarks

Borehole Diameter	
Depth (m)	Dia (mm)
15.00	150

Casing Diameter	
Depth (m)	Dia (mm)
15.00	150

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP04
	Contract Number: JER9536	Start Date: 06/06/2022	End Date: 06/06/2022	Checked By: KD	Status: FINAL
Cable Percussion Borehole Log	Easting: 387972.7	Northing: 397295.2	Ground Level: 60.29mOD	Plant Used: Hand Tools	Logged By: TF
					Sheet 1 of 1
					Scale: 1:50

Weather: Fair | Termination: Refusal. | SPT Hammer: N/R, Energy Ratio: N/R

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				60.19	0.10		Soft brown sandy SILT. Sand is fine to medium. MADE GROUND		
					(0.50)		Dark brown silty sandy very angular to sub-angular fine to coarse GRAVEL of brick and concrete. MADE GROUND		
				59.69	0.60		End of Borehole at 0.60m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)

Remarks:

1) Cable percussion borehole terminated at 0.60m bgl due to an obstruction. 2) Backfilled with arising upon completion. 3) No groundwater encountered.

Chiselling

From (m)	To (m)	Duration	Remarks

Borehole Diameter

Depth (m)	Dia (mm)

Casing Diameter

Depth (m)	Dia (mm)

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP04a
	Contract Number: JER9536	Start Date: 06/06/2022	End Date: 06/06/2022	Checked By: KD	Status: FINAL
					Sheet 1 of 1
Cable Percussion Borehole Log	Easting: 387973.6	Northing: 397295.2	Ground Level: 59.96mOD	Plant Used: Dando 2000	Logged By: TF
					Scale: 1:50
Weather: Fair		Termination: Refusal.		SPT Hammer: AR659 Energy Ratio: 61%	

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.86	0.10		Soft brown sandy SILT. Sand is fine to medium. MADE GROUND		
					(0.50)		Dark brown silty sandy very angular to sub-angular fine to coarse GRAVEL of brick and concrete. MADE GROUND		
				59.36	0.60		End of Borehole at 0.60m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)

Remarks:

1) Cable percussion borehole terminated at 0.60m bgl due to an obstruction. 2) Backfilled with arising upon completion. 3) No groundwater encountered.

Chiselling			
From (m)	To (m)	Duration	Remarks

Borehole Diameter	
Depth (m)	Dia (mm)

Casing Diameter	
Depth (m)	Dia (mm)

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: CP04b
	Contract Number: JER9536	Start Date: 07/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL — Sheet 1 of 1
Cable Percussion Borehole Log	Easting: 387978.0	Northing: 397286.1	Ground Level: 59.96mOD	Plant Used: Dando 2000	Logged By: TF — Scale: 1:50
Weather: Fair	Termination: Refusal.		SPT Hammer: N/R, Energy Ratio: N/R		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 0.40	B1			59.91	0.05		ASPHALT		
				59.66	0.30		CONCRETE		
0.40 - 1.20	B2		PID 0.40m, 0.0ppm				Dark grey silty sandy angular to subrounded fine to coarse GRAVEL of brick, mudstone and quartz. Sand is fine to coarse including ash. MADE GROUND		
0.40 - 1.20	ES1				(0.90)				
1.20	B3		PID 1.20m, 0.0ppm	58.76	1.20				
					(0.30)		Dark reddish brown silty sandy very angular to angular fine to coarse GRAVEL of brick, sandstone and concrete. Sand is fine to coarse. MADE GROUND		
1.50	ES2			58.46	1.50		End of Borehole at 1.50m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)

Remarks:

1) Cable percussion borehole terminated at 1.50m bgl due to an obstruction. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Chiselling			
From (m)	To (m)	Duration	Remarks
1.40	1.50	01:00	

Borehole Diameter	
Depth (m)	Dia (mm)

Casing Diameter	
Depth (m)	Dia (mm)

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS01
	Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL — Sheet 1 of 1
Windowless Borehole Log	Easting: 387784.2	Northing: 397210.2	Ground Level: 59.99mOD	Plant Used: Terrier rig	Logged By: TF — Scale: 1:30
Weather: Fair	Termination: Refusal.		SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.89	0.10		ASPHALT		
							Grey very angular to angular fine to coarse sandy GRAVEL of brick and limestone. Sand is fine to coarse. MADE GROUND		
			PID 0.50m, 0.0ppm		(0.65)				
0.80 - 0.90	ES1			59.24	0.75		Black very angular fine to coarse GRAVEL of brick and coal. MADE GROUND		
			PID 0.80m, 0.0ppm				*From 0.90m bgl to 1.00m bgl a cobble of brick was present.*		
		SPT(C) 1.00m, N=7 (8,9/6,1,0,0)		58.99	1.00		No recovery. VOID		
					(1.30)				
		SPT(C) 2.00m, N=3 (1,0/0,1,1,1)							
			PID 2.30m, 0.0ppm	57.69	2.30		Brown sandy very angular to angular fine to coarse GRAVEL of brick and clinker. Sand is fine to coarse. MADE GROUND		
2.40 - 2.50	ES2	SPT(C) 2.50m, 50 (25 for 85mm/50 for 90mm)		57.49	2.50		End of Borehole at 2.50m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Window sample borehole terminated at 2.50m bgl due to refusal. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS02
	Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL — Sheet 1 of 1
Windowless Borehole Log	Easting: 387841.6	Northing: 397200.2	Ground Level: 59.76mOD	Plant Used: Terrier rig	Logged By: TF — Scale: 1:30
Weather: Fair		Termination: Refusal.			

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
			PID 0.30m, 0.0ppm	59.66	0.10		Asphalt. MADE GROUND		
					(0.40)		Red brown very angular to angular fine to coarse GRAVEL of brick. MADE GROUND		
				59.26	0.50		End of Borehole at 0.50m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Window sample borehole terminated at 0.50m bgl due to refusal, on possible concrete substructure. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS02a
Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL
Windowless Borehole Log	Easting: 387841.7	Northing: 397200.2	Ground Level: 59.76mOD	Plant Used: Terrier rig
Logged By: TF	Scale: 1:30	Sheet 1 of 1		
Weather: Fair	Termination: Refusal.			

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.66	0.10		Asphalt. MADE GROUND		
					(0.40)		Red grey sandy very angular to angular fine to coarse GRAVEL of limestone and brick. Sand is fine to coarse. MADE GROUND		
				59.26	0.50				
0.70 - 0.80	ES1		PID 0.70m, 0.0ppm		(0.30)		Dark brown black silty gravelly fine to coarse SAND. Gravel is very angular to sub-angular, fine to coarse of coal, clinker and glass. MADE GROUND		
			PID 0.80m, 0.0ppm	58.96	0.80				
				58.86	0.90		Brown fine to medium SAND. MADE GROUND		
							End of Borehole at 0.90m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)
1	0.00	0.30	PLAIN	
1	0.30	0.90	SLOTTED	

Remarks:

1) Window sample borehole terminated at 0.90m bgl due to refusal. 2) Ground gas and groundwater monitoring standpipe installed with response zone between 0.30m bgl and 0.90m bgl. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space	Borehole ID: WS02b
	Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL	Sheet 1 of 1
Windowless Borehole Log	Easting: 387841.6	Northing: 397205.2	Ground Level: 59.76mOD	Plant Used: Terrier rig	Logged By: TF	Scale: 1:30
Weather: Fai		Termination: Refusal.		SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20 - 0.30	ES1		PID 0.30m, 0.0ppm	59.66	0.10		Asphalt.		
					(0.30)		MADE GROUND		
			PID 0.50m, 0.0ppm	59.36	0.40		Grey red sandy very angular to sub-angular fine to coarse GRAVEL of brick and sandstone. Sand is fine to coarse. MADE GROUND		
					(0.40)		Brown red silty gravelly fine to coarse SAND. Gravel is very angular fine to coarse of brick, clinker, coal and sandstone. MADE GROUND		
		SPT(C) 0.90m, 50 (25 for 95mm/50 for 85mm)		58.96	0.80		Light brown fine to medium SAND. MADE GROUND		
				58.86	0.90		End of Borehole at 0.90m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Window sample borehole terminated at 0.90m bgl due to refusal, on possible concrete substructure. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS03
	Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL — Sheet 1 of 1
Windowless Borehole Log	Easting: 387892.2	Northing: 397185.1	Ground Level: 60.04mOD	Plant Used: Hand tools	Logged By: TF — Scale: 1:30
Weather: Fair		Termination: Refusal.			

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
			PID 0.30m, 0.2ppm	59.99	0.05		Asphalt. MADE GROUND		
					(0.60)		Dark grey sandy angular fine to coarse GRAVEL of limestone. Sand is fine to coarse. MADE GROUND		
0.60 - 0.70	ES1		PID 0.70m, 5.7ppm	59.39	0.65		Black sandy very angular fine to coarse GRAVEL of coal and clinker. Sand is fine to coarse. MADE GROUND		
				59.29	0.75				
				59.14	0.90		Soft brown sandy gravelly SILT. Gravel is angular to very angular fine to coarse of brick. Sand is fine to coarse. MADE GROUND		
							End of Borehole at 0.90m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Window sample borehole terminated at 0.90m bgl due to refusal, on possible concrete substructure. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS03a
Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL
Sheet 1 of 1				
Windowless Borehole Log	Easting: 387892.2	Northing: 397185.1	Ground Level: 60.04mOD	Plant Used: Terrier rig
Logged By: TF	Scale: 1:30			
Weather: Fair	Termination: Refusal.	SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
			PID 0.30m, 0.0ppm	59.99	0.05		Asphalt.		
					(0.45)		MADE GROUND Dark grey sandy fine to coarse angular GRAVEL of limestone. Sand is fine to coarse. MADE GROUND		
0.50 - 0.60	ES1			59.54	0.50		Red grey silty sandy very angular to subangular fine to coarse GRAVEL of brick, coal, clinker and sandstone. MADE GROUND		
			PID 0.70m, 0.0ppm						
					(0.70)				
		SPT(C) 1.00m, N=5 (2,2/2,1,1,1)							
				58.84	1.20		Soft brown CLAY. GLACIAL TILL		
			PID 1.30m, 0.5ppm						
					(0.45)				
1.70 - 1.80	ES2			58.39	1.65		Soft dark grey organic rich slightly sandy slightly gravelly SILT/CLAY. Sand is fine. Gravel is subangular to subrounded fine to medium of quartz and mudstone. GLACIAL TILL		
			PID 1.70m, 2.8ppm						
		SPT(C) 2.00m, N=7 (1,2/1,2,2,2)							
					(1.00)				
							Becoming firm and light brown from 2.50m bgl.		
				57.39	2.65		Stiff brown mottled grey slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of coal and mudstone. GLACIAL TILL		
					(0.35)				
		SPT(C) 3.00m, 50 (5,6/50 for 240mm)		57.04	3.00		End of Borehole at 3.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)
1	0.00	1.00	PLAIN	
1	1.00	3.00	SLOTTED	

Remarks:

1) Window sample borehole terminated at 3.00m bgl due to refusal. 2) Ground gas and groundwater monitoring standpipe installed with response zone between 1.00m bgl and 3.00m bgl. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS04
	Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL — Sheet 1 of 1
Windowless Borehole Log	Easting: 387940.2	Northing: 397211.5	Ground Level: 59.68mOD	Plant Used: Terrier rig	Logged By: TF — Scale: 1:30
Weather: Fair	Termination: Target depth achieved.		SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.64	0.04		Asphalt.		
							MADE GROUND		
							Grey angular fine to coarse sandy GRAVEL of dolerite.		
				59.38	0.30		MADE GROUND		
0.50 - 0.60	ES1		PID 0.50m, 2.7ppm				Brown red and grey silty sandy very angular to subangular fine to coarse GRAVEL of brick and coal. Sand is fine to coarse. MADE GROUND		
					(0.90)		*From 0.50m bgl to 0.60m bgl black organic material was present.*		
		SPT(C) 1.00m, N=13 (4,5/3,3,4,3)	PID 1.00m, 0.9ppm						
				58.48	1.20		Stiff brown mottled grey slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of mudstone, coal, sandstone and. GLACIAL TILL		
		SPT(C) 2.00m, N=23 (4,5/5,5,6,7)							
		SPT(C) 3.00m, N=27 (6,5/5,6,8,8)			(3.80)				
3.20 - 3.30	ES2						*From 3.20m bgl yellow fine to medium sand is present.*		
		SPT(C) 4.00m, N=39 (5,5/6,9,11,13)							
		SPT(C) 5.00m, N=48 (6,7/9,10,13,16)		54.68	5.00		End of Borehole at 5.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)
1	0.00	1.00	PLAIN	
1	1.00	5.00	SLOTTED	

Remarks:

1) Window sample borehole completed at 5.00m bgl. 2) Ground gas and groundwater monitoring standpipe installed with response zone between 1.00m bgl and 5.00m bgl. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS05
	Contract Number: JER9536	Start Date: 09/06/2022	End Date: 09/06/2022	Checked By: KD	Status: FINAL
					Sheet 1 of 1
Windowless Borehole Log	Easting: 387959.5	Northing: 397189.7	Ground Level: 59.75mOD	Plant Used: Terrier rig	Logged By: TF
					Scale: 1:30
Weather: Fair		Termination: Refusal.			

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.70	0.05		Asphalt. MADE GROUND		
				59.50	0.25		Reinforced concrete. MADE GROUND		
					(0.75)		Black grey sandy angular to subangular fine to coarse GRAVEL of brick, sandstone, coal and charcoal. Sand is including ash. MADE GROUND		
				58.75	1.00		End of Borehole at 1.00m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Window sample borehole terminated at 1.00m bgl due to refusal. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS05a
Contract Number: JER9536	Start Date: 08/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL	Sheet 1 of 1
Windowless Borehole Log	Easting: 387959.5	Northing: 397189.7	Ground Level: 59.75mOD	Plant Used: Terrier rig	Logged By: TF	Scale: 1:30
Weather: Fair	Termination: Refusal.		SPT Hammer: DART400 Energy Ratio: 61%			

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.70	0.05		Asphalt.		
							MADE GROUND		
				59.50	0.25		Reinforced concrete.		
							MADE GROUND		
			PID 0.40m, 0.8ppm				Dark brown and grey sandy gravelly SILT. Gravel is angular to subangular fine to coarse of brick and sandstone. Sand is fine to coarse including ash.		
0.50 - 0.60	ES1				(0.45)		MADE GROUND		
				59.05	0.70		Light brown sandy very angular to subngular fine to coarse GRAVEL of brick. Sand is		
		SPT(C) 1.00m, N=4 (3,2/1,1,1,1)					MADE GROUND		
					(0.60)				
1.20 - 1.30	ES2		PID 1.20m, 0.4ppm						
				58.45	1.30		Soft brown gravelly SILT/CLAY. Gravel is subangular to subrounded fine to coarse of quartz and mudstone.		
				58.25	1.50		GLACIAL TILL		
							Very stiff brown mottled grey slightly gravelly CLAY. Gravel is angular to subangular fine to medium of sandstone, mudstone and coal.		
		SPT(C) 2.00m, N=15 (3,3/3,3,4,5)					GLACIAL TILL		
					(2.50)				
		SPT(C) 3.00m, N=26 (4,5/4,6,7,9)							
		SPT(C) 4.00m, N=50 (7,9/10,11,14 ,15)		55.75	4.00		End of Borehole at 4.00m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)
1	0.00	0.50	PLAIN	
1	0.50	2.00	SLOTTED	

Remarks:

1) Window sample borehole terminated at 4.00m bgl due to refusal. 2) Ground gas and groundwater monitoring standpipe installed with response zone between 0.50m bgl and 2.00m bgl. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

	Contract Name: Welcomb Street			Client: Network Space		Borehole ID: WS06
	Contract Number: JER9536	Start Date: 08/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL	Sheet 1 of 1
Windowless Borehole Log	Easting: 387971.9	Northing: 397252.3	Ground Level: 59.95mOD	Plant Used: Terrier rig	Logged By: TF	Scale: 1:30
Weather: Fair		Termination: Refusal.		SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20 - 0.30	ES1		PID 0.20m, 0.0ppm	59.90	0.05		Asphalt.		
					(0.40)		MADE GROUND Grey sandy very angular to angular fine to coarse GRAVEL of limestone, mudstone and asphalt. Sand is fine to coarse. MADE GROUND		
			PID 0.50m, 0.0ppm	59.50	0.45		Light brown sandy angular fine to coarse GRAVEL of sandstone. Sand is fine.		
				59.35	0.60		MADE GROUND		
		SPT(C) 0.80m, 0 (75 for 135mm/0 for 0mm)			(0.40)		Red sandy angular fine to coarse GRAVEL of brick and charcoal. Sand is fine to coarse. MADE GROUND		
				58.95	1.00		End of Borehole at 1.00m		

1 2 3 4 5 6

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Window sample borehole terminated at 1.00m bgl due to refusal. 2) Backfilled with arisings upon completion. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS07
Contract Number: JER9536	Start Date: 08/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL
Windowless Borehole Log	Easting: 387906.7	Northing: 397251.3	Ground Level: 59.42mOD	Plant Used: Terrier rig
Logged By: TF	Scale: 1:30	Sheet 1 of 1		
Weather: Fair	Termination: Refusal.	SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.34	0.08		Asphalt.		
				59.22	0.20		MADE GROUND		
			PID 0.30m, 0.0ppm				Light grey sandy angular to subangular fine to coarse GRAVEL of limestone.		
0.40 - 0.50	ES1				(0.30)		MADE GROUND		
				58.92	0.50		Dark brown slightly sandy gravelly SILT. Gravel is very angular to angular fine to coarse of brick, charcoal and plastic.		
							MADE GROUND		
							Grey brown very sandy angular fine to coarse GRAVEL of brick and concrete.		
		SPT(C) 1.00m, N=37 (4,9/9,6,7,15)			(1.00)		MADE GROUND		
1.20 - 1.30	ES2		PID 1.30m, 0.0ppm						
		SPT(C) 1.30m, 50 (25 for 145mm/50 for 85mm)		57.92	1.50		End of Borehole at 1.50m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)
1	0.00	0.50	PLAIN	
1	0.50	1.50	SLOTTED	

Remarks:

1) Window sample borehole terminated at 1.50m bgl due to refusal. 2) Ground gas and groundwater monitoring standpipe installed with response zone between 0.50m bgl and 1.50m bgl. 3) No groundwater encountered.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
			0		No groundwater encountered.

Contract Name: Welcomb Street		Client: Network Space		Borehole ID: WS08
Contract Number: JER9536	Start Date: 08/06/2022	End Date: 08/06/2022	Checked By: KD	Status: FINAL
Windowless Borehole Log	Easting: 387942.6	Northing: 397276.6	Ground Level: 60.08mOD	Plant Used: Terrier rig
Logged By: TF	Scale: 1:30	Sheet 1 of 1		
Weather: Fair	Termination: Refusal.	SPT Hammer: DART400 Energy Ratio: 61%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				59.80	0.28		Soft brown slightly gravelly sandy SILT including roots. Gravel is subangular fine to medium of brick and sandstone. Sand is fine. MADE GROUND		
0.50 - 0.60	ES1		PID 0.50m, 2.1ppm				Dark brown red and grey very sandy very angular to angular fine to coarse GRAVEL of brick, clinker and glass. MADE GROUND		
		SPT(C) 1.00m, N=12 (3,2/3,2,4,3)					*At 1.00m bgl becoming light yellowish brown*		
			PID 1.50m, 0.4ppm		(2.42)				
2.00 - 2.20	ES2	SPT(C) 2.00m, N=10 (3,3/3,2,2,3)					*At 2.00m bgl becoming dark brownish red.*		
2.00 - 2.50	D1		PID 2.00m, 2.8ppm						
			PID 2.50m, 0.8ppm						
		SPT(C) 2.70m, 0 (75 for 135mm/0 for 0mm)		57.38	2.70		End of Borehole at 2.70m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)
1	0.00	0.70	PLAIN	
1	0.70	2.70	SLOTTED	

Remarks:

1) Window sample borehole terminated at 2.70m bgl due to refusal. 2) Ground gas and groundwater monitoring standpipe installed with response zone between 0.70m bgl and 2.70m bgl. 3) Groundwater encountered at 2.00m bgl.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
2.00			0		Groundwater encountered at 2.00m bgl.

Appendix E

Falling Head Test Data

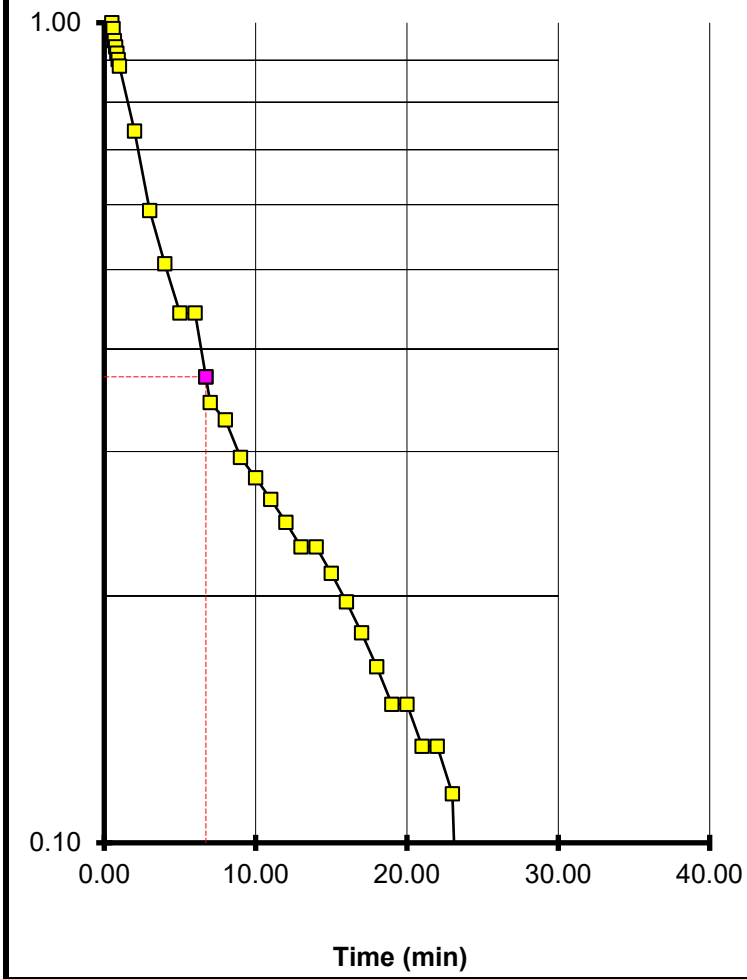
Falling Head Permeability Test

Project No.:	JER9536
Project Name:	Welcomb St
Client:	Network Space
Borehole No.:	WS02a
Compiled By	SD
Date	05/08/2002
Checked By	KD
Date	05/08/2002

TEST RESPONSE ZONE DETAILS:

Top (mbgl):	0.40
Bottom (mbgl):	1.00
Length (m):	0.60
Diameter (m):	0.050
Initial Standing Water Level (m below top of casing):	0.99
Height of casing or standpipe : above ground level (m)	0.00
Falling or Rising Head Test?	Falling

Elapsed Time (mins)	Depth to Water* (m)	Ht/Ho
0.5	0.38	1.00
0.583333333	0.39	0.98
0.666666667	0.41	0.95
0.75	0.42	0.93
0.833333333	0.43	0.92
0.916666667	0.44	0.90
1	0.45	0.89
2	0.54	0.74
3	0.63	0.59
4	0.68	0.51
5	0.72	0.44
6	0.72	0.44
7	0.78	0.34
8	0.79	0.33
9	0.81	0.30
10	0.82	0.28
11	0.83	0.26
12	0.84	0.25
13	0.85	0.23
14	0.85	0.23
15	0.86	0.21
16	0.87	0.20
17	0.88	0.18
18	0.89	0.16
19	0.9	0.15
20	0.9	0.15
21	0.91	0.13
22	0.91	0.13
23	0.92	0.11
24	0.97	0.03
25	0.97	0.03
26	0.98	0.02
27	0.98	0.02
28	0.99	
29	0.99	
30	0.99	



Cross Sectional Area of Test Zone	A=	0.00196
Shape Factor (Case D)	F=	1.19E+00
Time to reach Ht/Ho = 0.37 (sec)	T=	403
Permeability (m/s)	K=	4.11E-06

5 New York Street, Manchester M1 4JB

Comments

* Depth to water below top of casing/standpipe

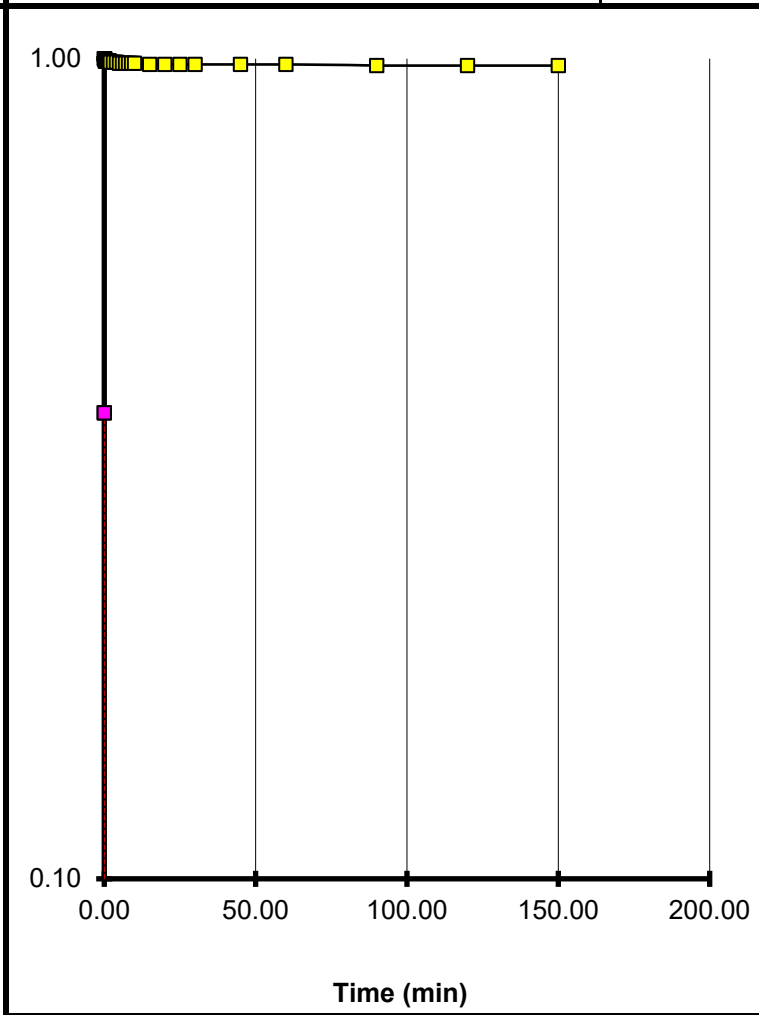
Falling Head Permeability Test

Project No.:	JER9536
Project Name:	Welcomb St
Client:	Network Space
Borehole No.:	WS04
Compiled By	SD
Date	05/08/2002
Checked By	KD
Date	05/08/2002

TEST RESPONSE ZONE DETAILS:

Top (mbgl):	1.00
Bottom (mbgl):	5.04
Length (m):	4.04
Diameter (m):	0.050
Initial Standing Water Level (m below top of casing):	4.23
Height of casing or standpipe : above ground level (m)	0.00
Falling or Rising Head Test?	Falling

Elapsed Time (mins)	Depth to Water* (m)	Ht/Ho
0	1.09	1.00
0.083	1.09	1.00
0.1677	1.09	1.00
0.2524	1.1	1.00
0.3371	1.11	0.99
0.4218	1.11	0.99
0.5065	1.11	0.99
0.5912	1.11	0.99
0.6759	1.11	0.99
0.7606	1.11	0.99
0.8453	1.11	0.99
0.93	1.11	0.99
1	1.11	0.99
1.25	1.11	0.99
1.5	1.11	0.99
1.75	1.11	0.99
2	1.12	0.99
3	1.12	0.99
4	1.12	0.99
5	1.13	0.99
6	1.13	0.99
7	1.13	0.99
8	1.13	0.99
9	1.13	0.99
10	1.13	0.99
15	1.14	0.98
20	1.14	0.98
25	1.14	0.98
30	1.14	0.98
45	1.14	0.98
60	1.14	0.98
90	1.15	0.98
120	1.15	0.98
150	1.15	0.98



Cross Sectional Area of Test Zone	A=	0.00196
Shape Factor (Case D)	F=	4.99E+00
Time to reach Ht/Ho = 0.37 (sec)	T=	N/A
Permeability (m/s)	K=	N/A

5 New York Street, Manchester M1 4JB

Comments

* Depth to water below top of casing/standpipe

Water did not infiltrate sufficiently for Ht/Ho to reach 0.37. Unable to infer a rate of infiltration.

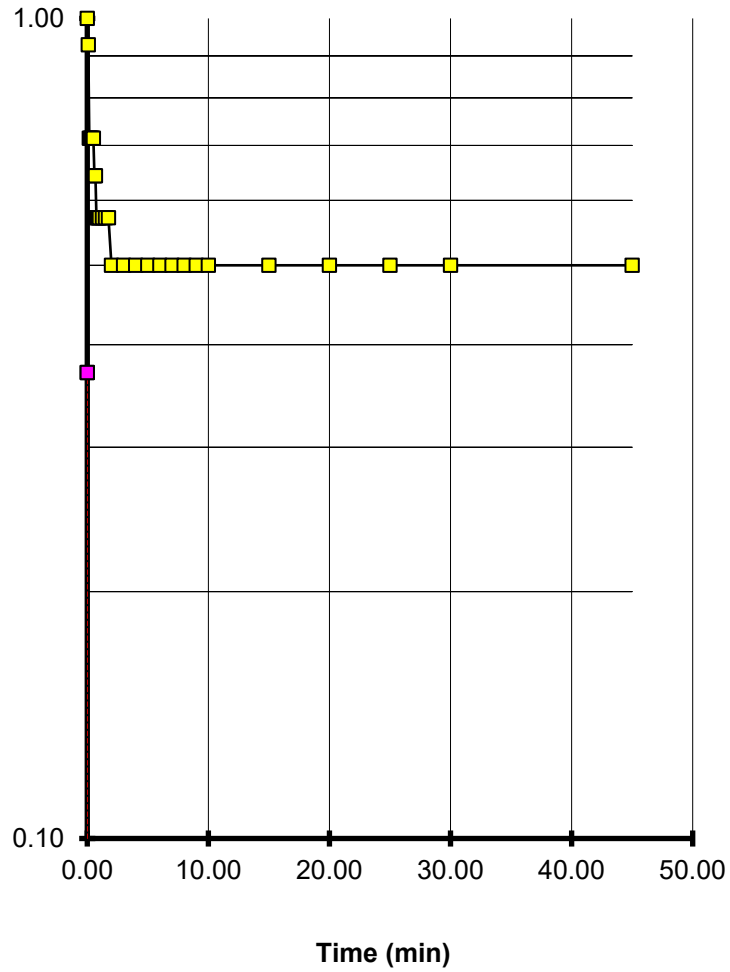
Falling Head Permeability Test

Project No.:	JER9536
Project Name:	Welcomb St
Client:	Network Space
Borehole No.:	WS07
Compiled By	SD
Date	05/08/2002
Checked By	KD
Date	05/08/2002

TEST RESPONSE ZONE DETAILS:

Top (mbgl):	0.50
Bottom (mbgl):	1.32
Length (m):	0.82
Diameter (m):	0.050
Initial Standing Water Level (m below top of casing):	1.31
Height of casing or standpipe : above ground level (m)	0.00
Falling or Rising Head Test?	Falling

Elapsed Time (mins)	Depth to Water* (m)	Ht/Ho
0	1.17	1.00
0.083	1.18	0.93
0.1677	1.21	0.71
0.2524	1.21	0.71
0.3371	1.21	0.71
0.4218	1.21	0.71
0.5065	1.21	0.71
0.5912	1.22	0.64
0.6759	1.22	0.64
0.7606	1.23	0.57
0.8453	1.23	0.57
0.93	1.23	0.57
1	1.23	0.57
1.25	1.23	0.57
1.5	1.23	0.57
1.75	1.23	0.57
2	1.24	0.50
3	1.24	0.50
4	1.24	0.50
5	1.24	0.50
6	1.24	0.50
7	1.24	0.50
8	1.24	0.50
9	1.24	0.50
10	1.24	0.50
15	1.24	0.50
20	1.24	0.50
25	1.24	0.50
30	1.24	0.50
45	1.24	0.50



Cross Sectional Area of Test Zone	A=	0.00196
Shape Factor (Case D)	F=	1.48E+00
Time to reach Ht/Ho = 0.37 (sec)	T=	
Permeability (m/s)	K=	N/A

5 New York Street, Manchester M1 4JB

Comments

* Depth to water below top of casing/standpipe

Whilst water dropped initially, it did not infiltrate sufficiently for Ht/Ho to reach 0.37. Unable to infer a rate of infiltration.

Appendix F

Geotechnical Laboratory Certificates

LABORATORY REPORT

4043

Contract Number: PSL22/4386

Report Date: 27 July 2022

Client's Reference: JER9536

Client Name: RPS Health, Safety & Environment
14 Cornhill
London
EC3V 3ND

For the attention of: Karen Dale

Contract Title: Welcomb Street

Date Received: 29/6/2022
Date Commenced: 29/6/2022
Date Completed: 27/7/2022

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

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R Berriman (Quality Manager)
S Royle (Laboratory Manager)
[redacted]
L Knight (Senior Technician)
S Eyre (Senior Technician)
T Watkins (Senior Technician)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
CP03		B	2.00	2.45	Brown gravelly sandy CLAY.
CP03		B	4.00	4.45	Brown gravelly sandy CLAY.
CP03		B	6.00	6.45	Brown very sandy CLAY.
CP03		D	9.00		Brown sandy CLAY.
CP03		U	7.50	7.95	Very stiff brown slightly gravelly very sandy CLAY.
CP02		B	1.20	1.65	Brown sandy slightly silty GRAVEL with cobbles.
CP02		B	2.50		Brown sandy GRAVEL.
CP02		D	5.00	5.45	Brown sandy CLAY.
CP02		D	7.50	7.95	Brown sandy CLAY.
CP02		D	9.00	9.45	Brown sandy CLAY.
CP02		D	10.50	10.95	Brown gravelly sandy CLAY.
CP02		U	4.00	4.45	Stiff brown slightly gravelly sandy CLAY.
CP02		U	6.00	6.45	Stiff brown very sandy CLAY.
CP01		B	1.20	1.65	Brown very sandy GRAVEL.
CP01		B	5.00	5.45	Brown gravelly sandy CLAY.
CP01		D	3.00		Brown slightly gravelly sandy CLAY.
CP01		SD	7.50		Brown sandy CLAY.
CP01		U	4.00	4.45	Firm brown sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
CP03		B	2.00	2.45	27			47	22	25	87	Intermediate Plasticity CI
CP03		B	4.00	4.45	26							
CP03		B	6.00	6.45	17			33	17	16	100	Low Plasticity CL
CP03		D	9.00		14							
CP02		B	2.50		23				NP			
CP02		D	5.00	5.45	18			35	18	17	100	Intermediate Plasticity CI
CP02		D	7.50	7.95	19			39	19	20	100	Intermediate Plasticity CI
CP02		D	9.00	9.45	10							
CP02		D	10.50	10.95	8							
CP01		B	1.20	1.65	22				NP			
CP01		B	5.00	5.45	19							
CP01		D	3.00		18			36	18	18	97	Intermediate Plasticity CI
CP01		SD	7.50		12			34	17	17	100	Low Plasticity CL

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Welcomb Street

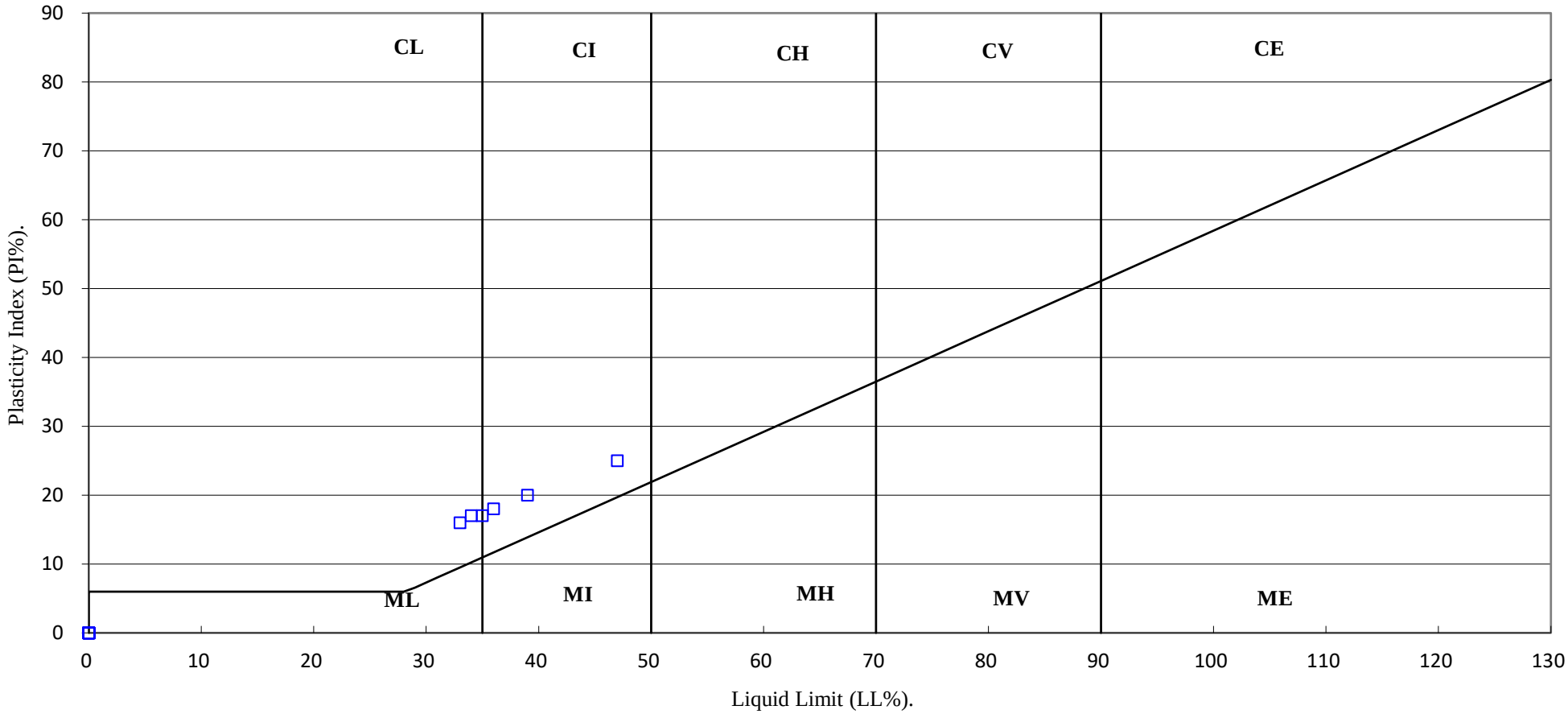
Contract No:

PSL22/4386

Client Ref:

JER9536

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	**Welcomb Street**	**Contract No:**
			PSL22/4386
			Client Ref:
			JER9536

PARTICLE SIZE DISTRIBUTION TEST

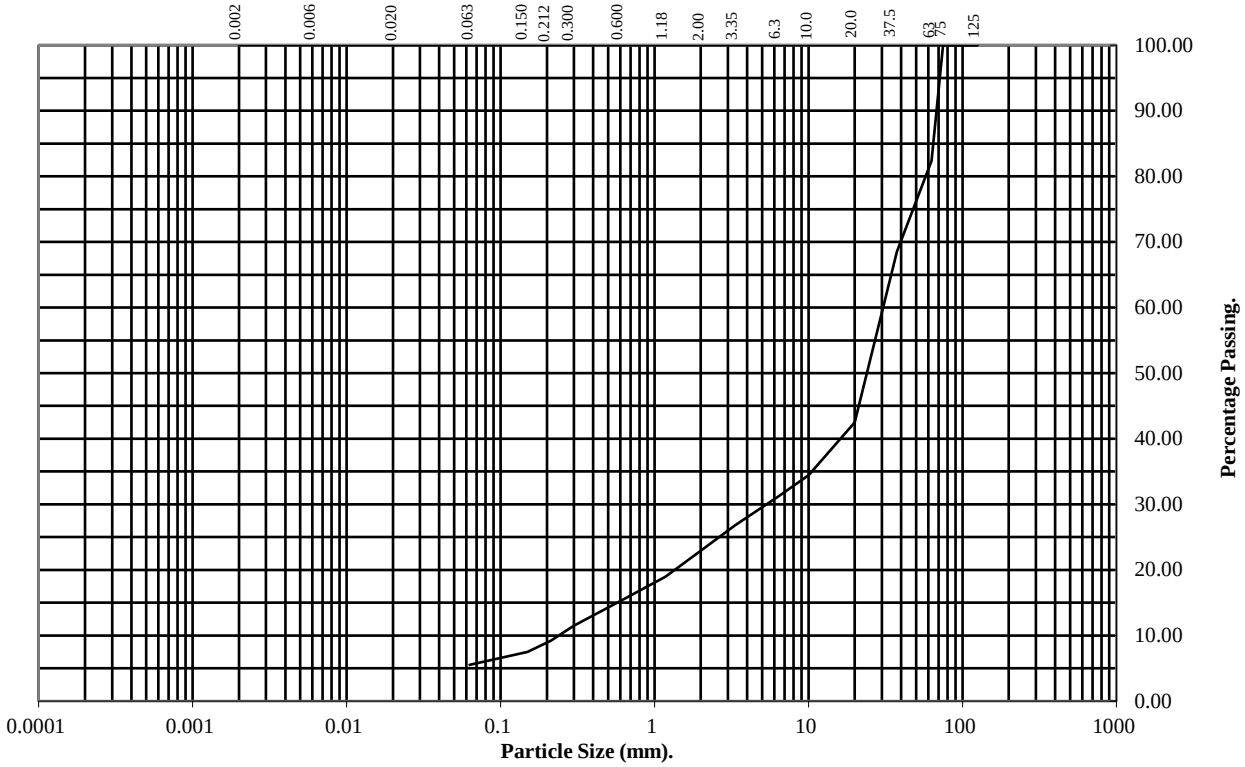
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **CP02** **Top Depth (m):** **1.20**

Sample Number: **Base Depth(m):** **1.65**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	82
37.5	69
20	42
10	34
6.3	31
3.35	27
2	23
1.18	19
0.6	15
0.3	11
0.212	9
0.15	7
0.063	6

Soil Fraction	Total Percentage
Cobbles	18
Gravel	59
Sand	17
Silt/Clay	6

Remarks:

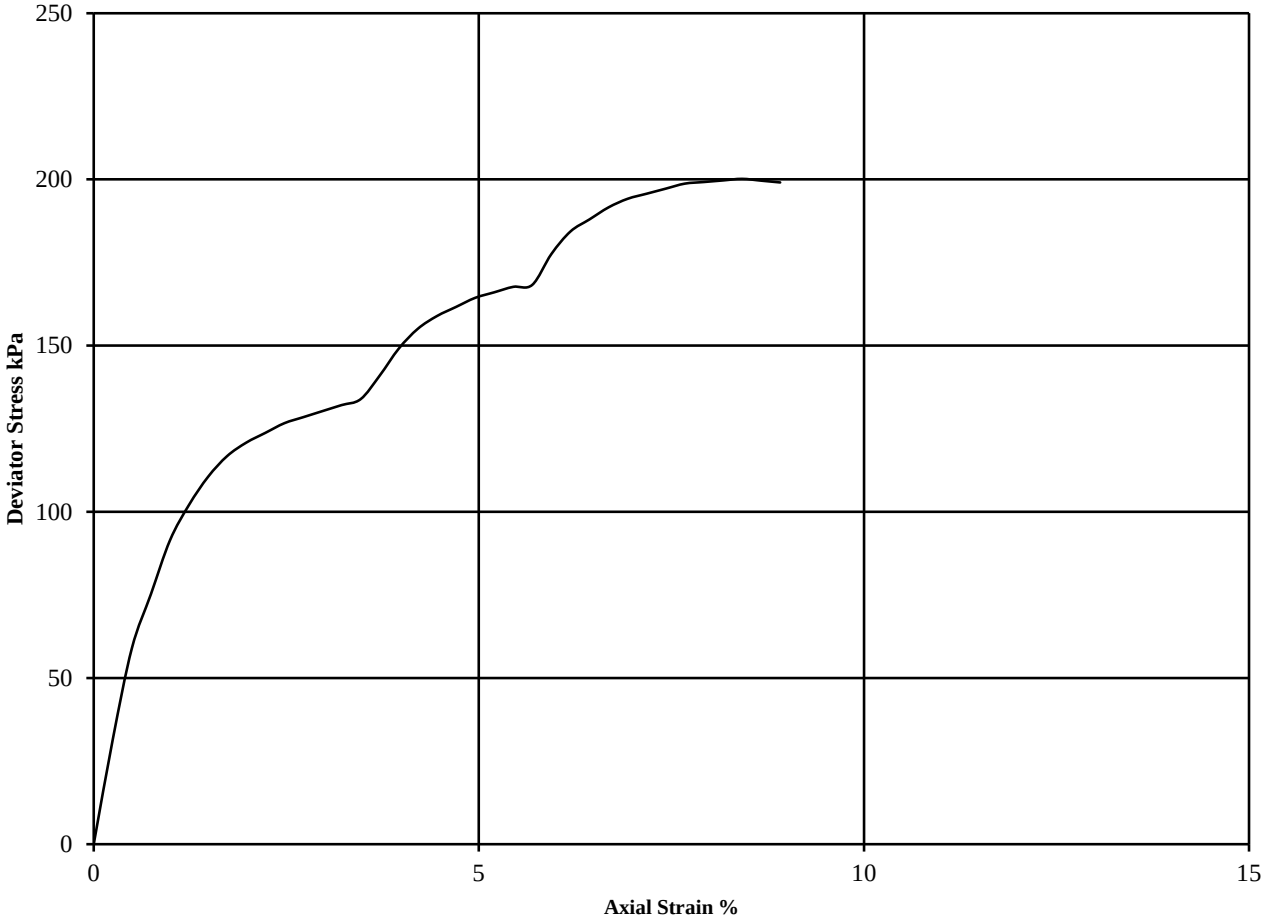
See Summary of Soil Descriptions

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**CP01**	**Top Depth (m):**	**4.00**
Sample Number:		**Base Depth (m):**	**4.45**
Sample Type	**B**		



Diameter (mm):		102	Height (mm):		206	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	24	1.92	1.55	40	134	67	3.5		0.37 0.36 0.36
				80	168	84	5.7		See summary of soil descriptions
				160	200	100	8.4	Brittle	

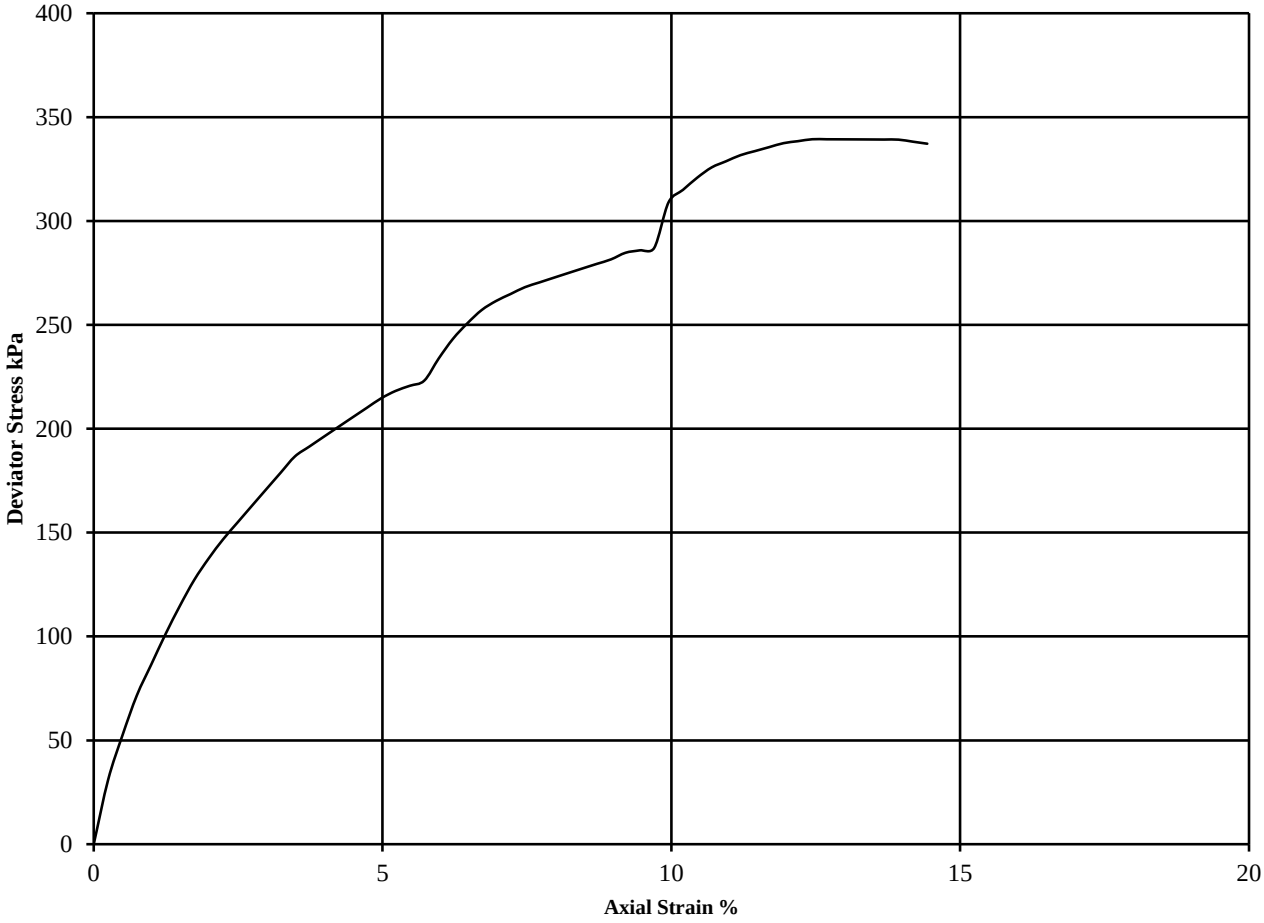
UKAS TESTING 4043	PSL Professional Soils Laboratory	**Welcomb Street**	**Contract No:** PSL22/4386 **Client Ref:** JER9536

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**CP02**	**Top Depth (m):**	**4.00**
Sample Number:		**Base Depth (m):**	**4.45**
Sample Type	**U**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	19	2.09	1.76	40	223	112	5.7		0.36 0.35 0.35
				80	287	144	9.7		See summary of soil descriptions
				160	339	170	12.4	Plastic	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Welcomb Street

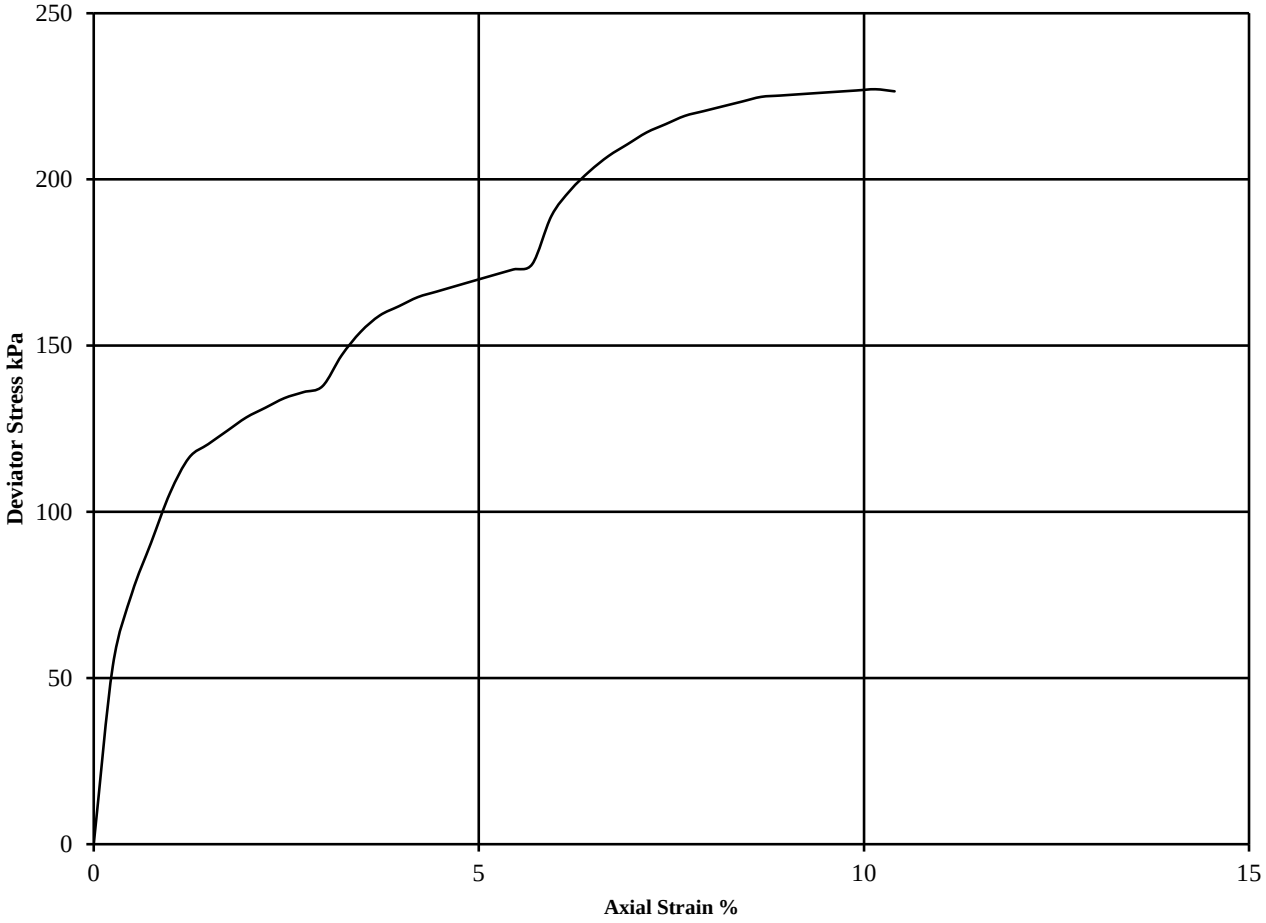
Contract No:
PSL22/4386
Client Ref:
JER9536

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**CP02**	**Top Depth (m):**	**6.00**
Sample Number:		**Base Depth (m):**	**6.45**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		206	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	17	2.14	1.83	60	138	69	3.0		0.37 0.36 0.35
				120	175	87	5.7		See summary of soil descriptions
				240	227	114	10.2	Brittle	

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Welcomb Street**	**Contract No:** PSL22/4386 **Client Ref:** JER9536

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

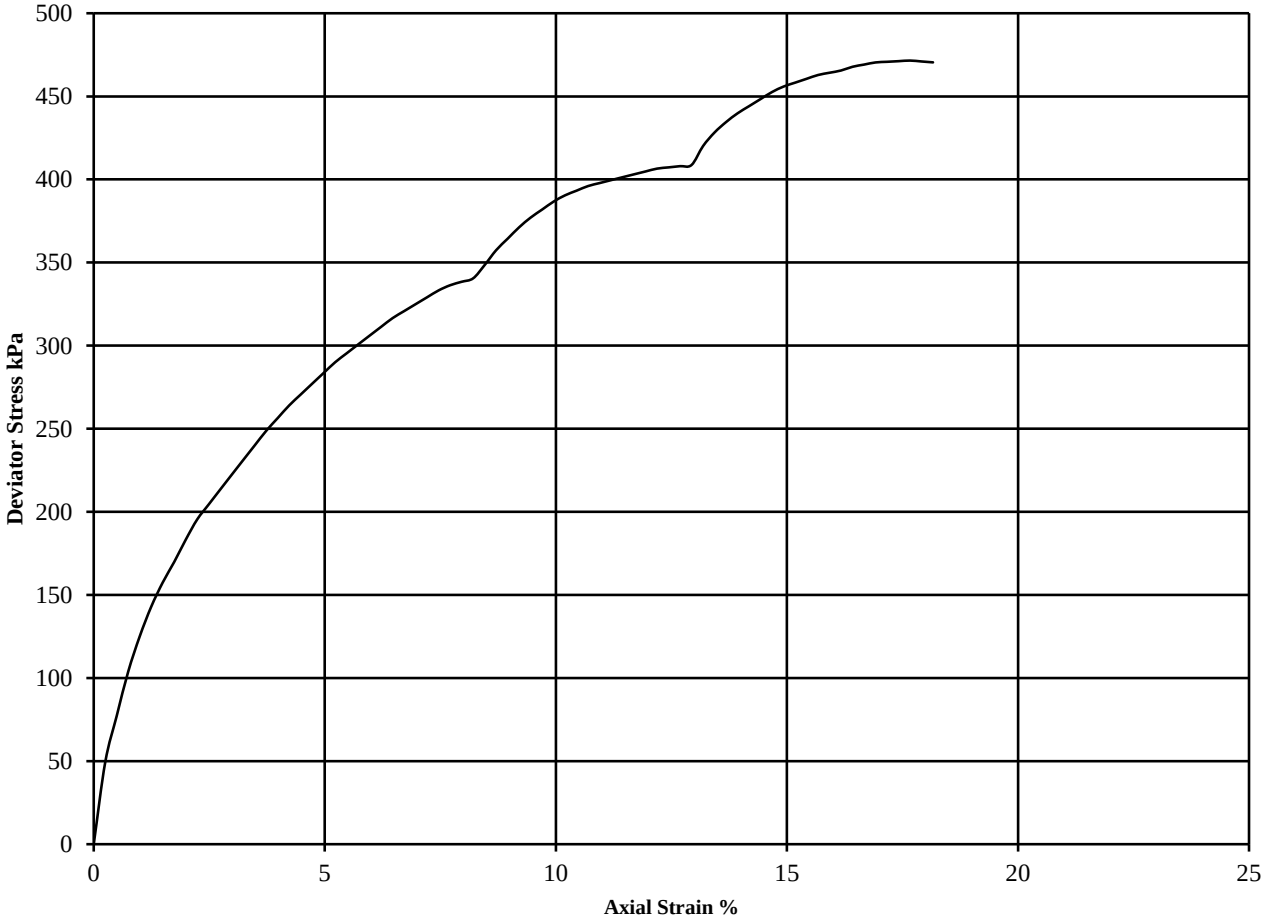
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: **CP03** **Top Depth (m):** **7.50**

Sample Number: **Base Depth (m):** **7.95**

Sample Type **U**



Diameter (mm):		103	Height (mm):		207	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa)
1	16	2.10	1.81	70	340	170	8.2		0.35 0.34 0.33
				140	409	204	12.9		See summary of soil descriptions
				280	472	236	17.7	Plastic	

ONE DIMENSIONAL CONSOLIDATION TEST

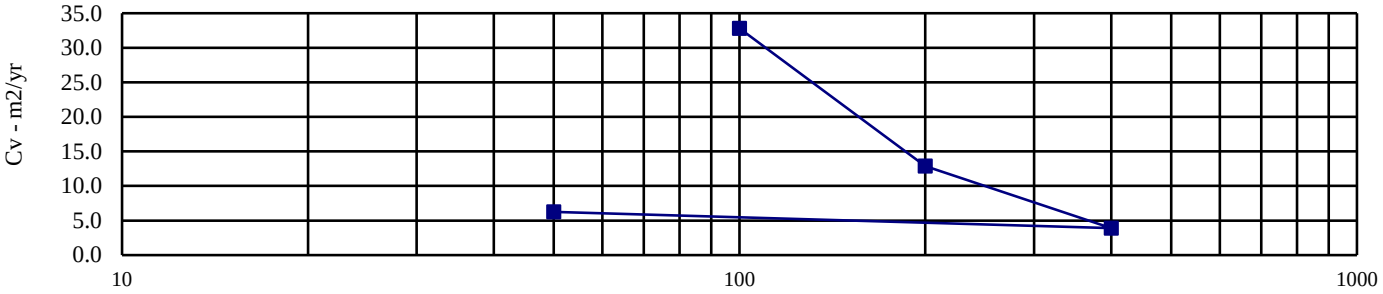
BS 1377: Part 5: 1990: Clause 3

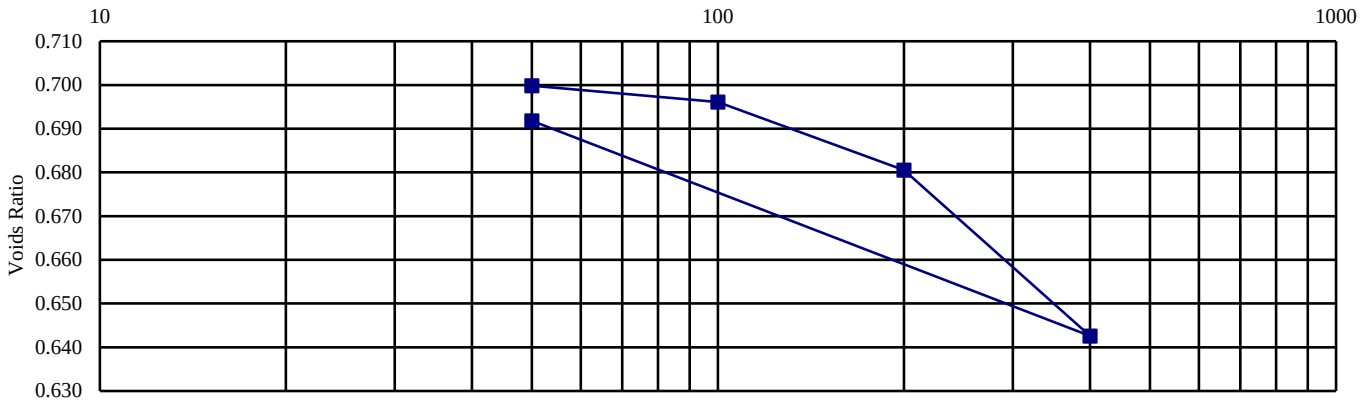
Hole Number: **CP01** **Top Depth (m):** **4.00**

Sample Number: **Base Depth (m) :** **4.45**

Sample Type: **U**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	24						
Bulk Density (Mg/m3):	1.92	0	50	Swelling	Swelling	Method used to	
Dry Density (Mg/m3):	1.55	50	100	0.044	32.811	determine CV:	T90
Voids Ratio:	0.710	100	200	0.092	12.891	Nominal temperature	
Degree of saturation:	89.7	200	400	0.113	3.906	during test ' C:	20
Height (mm):	20.07	400	50	0.086	6.239	Remarks:	
Diameter (mm)	75.06					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Welcomb Street**	**Contract No:** PSL22/4386 **Client Ref:** JER9536

ONE DIMENSIONAL CONSOLIDATION TEST

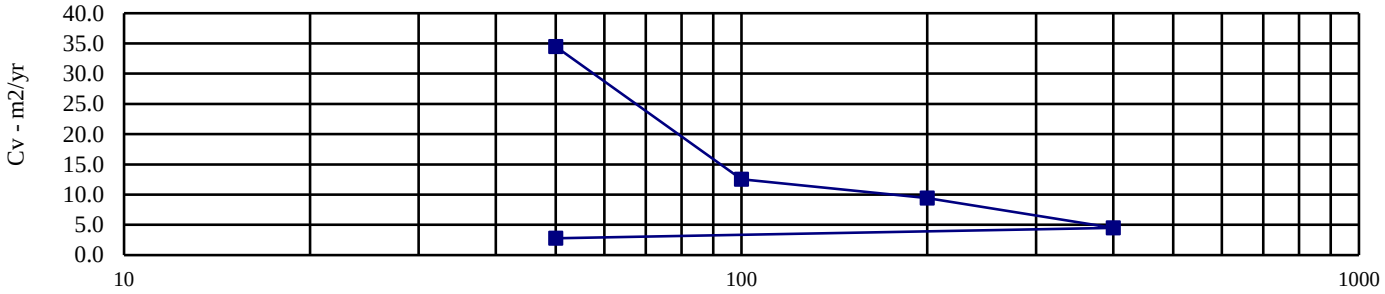
BS 1377: Part 5: 1990: Clause 3

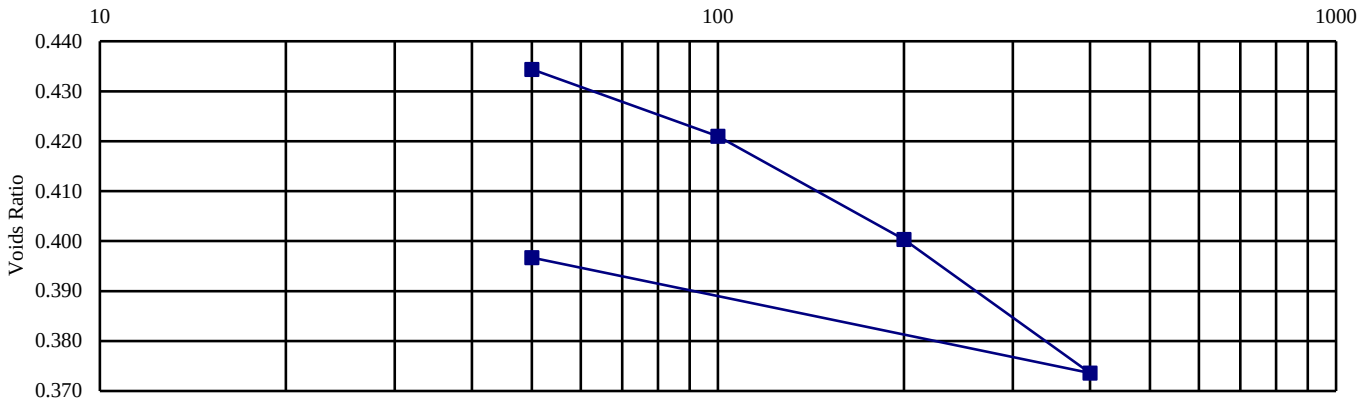
Hole Number: **CP02** **Top Depth (m):** **6.00**

Sample Number: **Base Depth (m) :** **6.45**

Sample Type: **U**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	17						
Bulk Density (Mg/m3):	2.14	0	50	0.179	34.483	Method used to	
Dry Density (Mg/m3):	1.83	50	100	0.187	12.530	determine CV:	T90
Voids Ratio:	0.447	100	200	0.145	9.432	Nominal temperature	
Degree of saturation:	100.8	200	400	0.096	4.491	during test ' C:	20
Height (mm):	20.07	400	50	0.048	2.783	Remarks:	
Diameter (mm)	75.06					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Welcomb Street**	**Contract No:** PSL22/4386 **Client Ref:** JER9536

ONE DIMENSIONAL CONSOLIDATION TEST

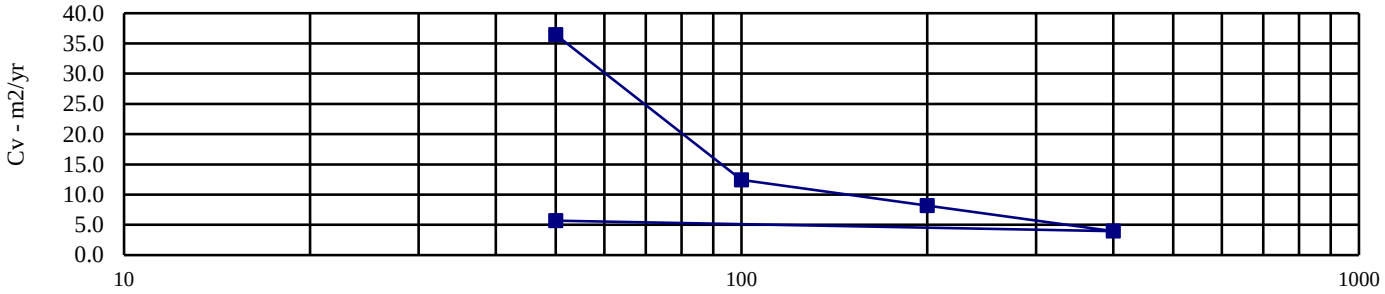
BS 1377: Part 5: 1990: Clause 3

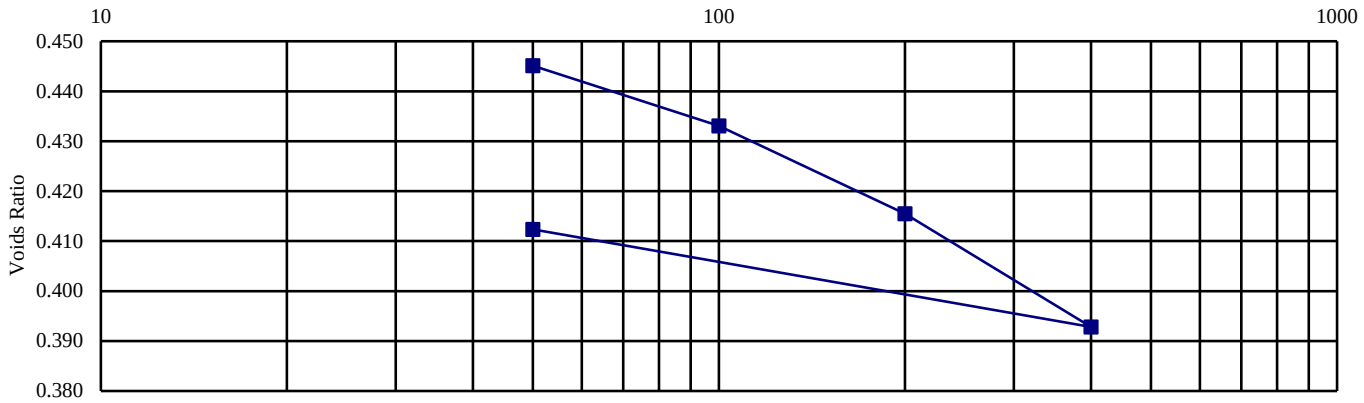
Hole Number: **CP03** **Top Depth (m):** **7.50**

Sample Number: **Base Depth (m) :** **7.95**

Sample Type: **U**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	16						
Bulk Density (Mg/m3):	2.12	0	50	0.143	36.466	Method used to	
Dry Density (Mg/m3):	1.82	50	100	0.166	12.443	determine CV:	T90
Voids Ratio:	0.456	100	200	0.123	8.184	Nominal temperature	
Degree of saturation:	94.4	200	400	0.080	3.960	during test ' C:	20
Height (mm):	20.1	400	50	0.040	5.673	Remarks:	
Diameter (mm)	75.06					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Welcomb Street**	**Contract No:** PSL22/4386 **Client Ref:** JER9536

Appendix G

Field Monitoring Data

Client:	Network Space																			
Project:	Welcomb Street																			
Job ref.:	JER9536																			

Monitored by:		Weather conditions:	Atmospheric pressure trend
16/06/22	SD	Sunny	Steady
21/06/22	SD	Sunny	Falling
29/06/22	TF	Sunny	Falling
06/07/22	SD	Sunny	Rising
14/07/22	TF	Overcast	Steady
21/07/22	TF	Sunny	Rising

BH	Date	Response zone stratum	Response zone (m)	Depth m		Atmospheric Pressure (mbar)	Flow Rate (q l/h)		Methane CH_4 (% v/v)		Carbon dioxide CO_2 (% v/v)		Oxygen % v/v (Low)	PID ppm	Carbon monoxide CO ppm (Peak)	Hydrogen sulphide H_2S ppm (Peak)	Gas Screening Values				Comments
				Water	Base		Initial	Steady	Peak	Steady	Peak	Steady					CH_4 Peak	CH_4 Steady	CO_2 Peak	CO_2 Steady	
WS02a	16/06/22	Made Ground	0.30m to 1.00m bgl	dry	1.00	1017	0.1	0.1	0.1	0.1	9.2	9.2	10.4	-	0.1	0.1	0.0001	0.0001	0.0092	0.0092	
	21/06/22			dry	1.00	1007	0.1	0.1	0.1	0.1	9.1	9.1	11.1	67.6	0.1	0.1	0.0001	0.0001	0.0091	0.0091	
	29/06/22			dry	1.00	1003	0.1	0.1	0.1	0.1	11.0	11.0	7.1	7.0	0.1	0.1	0.0001	0.0001	0.0110	0.0110	
	06/07/22			dry	1.00	1017	0.1	0.1	0.1	0.1	6.6	6.6	11.8	11.6	0.1	0.1	0.0001	0.0001	0.0066	0.0066	Falling head test
	14/07/22			1.00	1.01	1016	0.1	0.1	0.1	0.1	9.6	9.6	11.0	4.5	0.1	0.1	0.0001	0.0001	0.0096	0.0096	
	21/07/22			0.98	1.00	1013	0.1	0.1	0.1	0.1	11.1	11.1	10.5	12.72	0.1	0.1	0.0001	0.0001	0.0111	0.0111	
WS03a	16/06/22	Made Ground and Glacial Till	1.00m to 3.00m bgl	2.54	2.93	1018	0.1	0.1	0.1	0.1	0.4	0.4	20.0	-	0.1	0.1	0.0001	0.0001	0.0004	0.0004	
	21/06/22			2.37	2.92	1009	0.1	0.1	0.1	0.1	0.2	0.2	20.5	2.2	0.1	0.1	0.0001	0.0001	0.0002	0.0002	
	29/06/22			2.18	2.94	1001	0.1	0.1	0.1	0.1	0.3	0.3	20.0	0.3	0.1	0.1	0.0001	0.0001	0.0003	0.0003	
	06/07/22			2.07	2.93	1014	0.1	0.1	0.1	0.1	4.3	4.3	14.9	1.7	0.1	0.1	0.0001	0.0001	0.0043	0.0043	Ground water sample taken - grab sample
	14/07/22			2.71	2.95	1015	0.1	0.1	0.1	0.1	2.3	2.3	18.5	0.1	0.1	0.1	0.0001	0.0001	0.0023	0.0023	
	21/07/22			dry	2.95	1014	0.1	0.1	0.1	0.1	0.1	0.1	19.9	0.03	0.1	0.1	0.0001	0.0001	0.0001	0.0001	
WS04	16/06/22	Made Ground and Glacial Till	1.00m to 5.00m bgl	4.84	5.04	1016	0.1	0.1	0.1	0.1	0.7	0.7	16.9	-	0.1	0.1	0.0001	0.0001	0.0007	0.0007	
	21/06/22			4.70	5.04	1010	0.1	0.1	0.1	0.1	1.5	1.5	16.2	3.6	0.1	0.1	0.0001	0.0001	0.0015	0.0015	
	29/06/22			4.44	5.04	1002	0.1	0.1	0.1	0.1	2.6	2.6	15.4	0.1	0.1	0.1	0.0001	0.0001	0.0026	0.0026	
	06/07/22			4.23	5.04	1017	0.1	0.1	0.1	0.1	1.9	1.9	18.5	3.1	0.1	0.1	0.0001	0.0001	0.0019	0.0019	Falling head test
	14/07/22			1.24	5.03	1014	0.1	0.1	0.1	0.1	1.9	1.9	18.4	0.2	0.1	0.1	0.0001	0.0001	0.0019	0.0019	
	21/07/22			1.30	5.04	1014	0.1	0.1	0.1	0.1	2.7	2.7	16.4	2.50	0.1	0.1	0.0001	0.0001	0.0027	0.0027	
WS05a	16/06/22	Made Ground and Glacial Till	0.50m to 2.00m bgl	1.27	1.56	1016	0.1	0.1	0.1	0.1	2.1	2.1	16.5	-	0.1	0.1	0.0001	0.0001	0.0021	0.0021	
	21/06/22			1.29	1.56	1010	0.1	0.1	0.1	0.1	2.8	2.8	14.0	7.3	0.1	0.1	0.0001	0.0001	0.0028	0.0028	
	29/06/22			1.29	1.55	1001	0.1	0.1	0.1	0.1	0.9	0.9	19.7	0.1	0.1	0.1	0.0001	0.0001	0.0009	0.0009	
	06/07/22			1.28	1.56	1018	0.1	0.1	0.1	0.1	1.0	1.0	19.4	1.3	0.1	0.1	0.0001	0.0001	0.0010	0.0010	
	14/07/22			1.30	1.55	1015	0.1	0.1	0.1	0.1	1.9	1.9	16.8	0.1	0.1	0.1	0.0001	0.0001	0.0019	0.0019	
	21/07/22			1.32	1.55	1014	0.1	0.1	0.1	0.1	3.6	3.6	15.4	0.12	0.1	0.1	0.0001	0.0001	0.0036	0.0036	
WS07	16/06/22	Made Ground	0.50m to 1.00m bgl	dry	1.32	1016	0.1	0.1	0.1	0.1	0.6	0.6	19.5	-	0.1	0.1	0.0001	0.0001	0.0006	0.0006	
	21/06/22			dry	1.33	1007	0.1	0.1	0.1	0.1	0.6	0.6	19.7	1.7	0.1	0.1	0.0001	0.0001	0.0006	0.0006	
	29/06/22			dry	1.32	1001	0.1	0.1	0.1	0.1	0.7	0.7	19.4	0.1	0.1	0.1	0.0001	0.0001	0.0007	0.0007	
	06/07/22			dry	1.32	1018	0.1	0.1	0.1	0.1	0.7	0.7	20.5	0.1	0.1	0.1	0.0001	0.0001	0.0007	0.0007	Falling head test
	14/07/22			1.25	1.32	1017	0.1	0.1	0.1	0.1	0.8	0.8	20.0	0.1	0.1	0.1	0.0001	0.0001	0.0008	0.0008	
	21/07/22			1.23	1.32	1015	0.1	0.1	0.1	0.1	1.0	1.0	19.0	0.03	0.1	0.1	0.0001	0.0001	0.0010	0.0010	
WS08	16/06/22	Made Ground	0.70m to 2.70m bgl	1.78	2.24	1016	0.1	0.1	0.1	0.1	0.4	0.4	20.2	-	0.1	0.1	0.0001	0.0001	0.0004	0.0004	
	21/06/22			1.80	2.24	1009	0.1	0.1	0.1	0.1	0.3	0.3	20.5	19.2	0.1	0.1	0.0001	0.0001	0.0003	0.0003	
	29/06/22			1.81	2.23	1001	0.1	0.1	0.1	0.1	0.3	0.3	20.4	0.1	0.1	0.1	0.0001	0.0001	0.0003	0.0003	
	06/07/22			1.83	2.25	1018	0.1	0.1	0.1	0.1	0.2	0.2	20.6	2.8	0.1	0.1	0.0001	0.0001	0.0002	0.0002	
	14/07/22			1.83	2.24	1015	0.1	0.1	0.1	0.1	0.5	0.5	20.4	0.1	0.1	0.1	0.0001	0.0001	0.0005	0.0005	
	21/07/22			1.84	2.24	1015	0.1	0.1	0.1	0.1	0.4	0.4	19.5	0.19	0.1	0.1	0.0001	0.0001	0.0004	0.0004	
CP01	16/06/22	Glacial Till and Chester Formation	10.10m to 12.10m bgl	10.63	11.65	1016	0.1	0.1	0.1	0.1	3.8	3.8	11.6	-	0.1	0.1	0.0001	0.0001	0.0038	0.0038	
	21/06/22			10.55	11.65	1007	0.1	0.1	0.1	0.1	3.3	3.3	10.8	5.2	0.1	0.1	0.0001	0.0001	0.0033	0.0033	
	29/06/22			10.35	11.62	1003	0.1	0.1	0.1	0.1	2.6	2.6	7.9	46.6	0.1	0.1	0.0001	0.0001	0.0026	0.0026	
	06/07/22			10.88	11.62	1016	0.1	0.1	0.1	0.1	3.8	3.8	7.7	3.4	0.1	0.1	0.0001	0.0001	0.0038	0.0038	Ground water sample taken
	14/07/22			10.30	11.69	1016	0.1	0.1	0.1	0.1	4.0	4.0	15.7	0.1	0.1	0.1	0.0001	0.0001	0.0040	0.0040	
	21/07/22			10.75	11.69	1013	0.1	0.1	0.1	0.1	3.1	3.1	15.8	1.17	0.1	0.1	0.0001	0.0001	0.0031	0.0031	
CP02	16/06/22	Glacial Till and Chester Formation	10.30m to 12.30m bgl	11.97	12.43	1017	0.1	0.1	0.1	0.1	0.1	0.1	20.4	-	0.1	0.1	0.0001	0.0001	0.0001	0.0001	
	21/06/22			11.93	12.32	1008	0.1	0.1	0.1	0.1	2.0	2.0	15.6	0.6	0.1	0.1	0.0001	0.0001	0.0020	0.0020	
	29/06/22			11.92	12.23	1003	0.1	0.1	0.1	0.1	4.8	4.8	8.4	2.3	0.1	0.1	0.0001	0.0001	0.0048	0.0048	
	06/07/22			11.96	12.19	1017	0.1	0.1	0.1	0.1	6.6	6.6	11.8	11.6	0.1	0.1	0.0001	0.0001	0.0066	0.0066	
	14/07/22			11.92	12.23	1016	0.1	0.1	0.1	0.1	1.5	1.5	18.5	0.1	0.1	0.1	0.0001	0.0001	0.0015	0.0015	
	21/07/22			11.94	12.20	1013	0.1	0.1	0.1	0.1	0.3	0.3	19.8	0.1	0.1	0.1	0.0001	0.0001	0.0003	0.0003	
CP03	16/06/22	Glacial Till and Chester Formation	11.00m to 15.00m bgl	13.05	13.84	1013	0.1	0.1	0.1	0.1	0.8	0.8	19.4	-	0.1	0.1	0.0001	0.0001	0.0008	0.0008	
	21/06/22			13.07	13.70	1012	0.1	0.1	0.1	0.1	4.1	4.1	13.0	2.2	0.1	0.1	0.0001	0.0001	0.0041	0.0041	
	29/06/22			13.00	13.55	1001	0.1	0.1	0.1	0.1	5.7	5.7	3.5	0.2	0.1	0.1	0.0001	0.0001	0.0057	0.0057	
	06/07/22			13.10	13.57	1014	0.1	0.1	0.1	0.1	0.4	0.4	20.5	0.1	0.1	0.1	0.0001	0.0001	0.0004	0.0004	
	14/07/22			13.10	13.55	1015	0.1	0.1	0.1	0.1	0.5	0.5	20.3	0.1	0.1	0.1	0.0001	0.0001	0.0005	0.0005	
	21/07/22			13.09	13.54	1014	0.1	0.1	0.1	0.1	0.1	0.1	19.2	0.03	0.1	0.1	0.0001	0.0001	0.0001	0.0001	

Appendix H

Comparison of Analytical Data to Assessment Criteria

	Project Name	**Welcomb St**				Soil type	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
	Project Number	**JER9536**				**Sample Reference**	CP02	WS06	WS07	WS08	CP04b	WS05a	WS04	WS03	WS02a	WS01	WS01	WS03a
	Date	**Jul-22**				**Depth (m)**	0.50-1.20	0.20-0.30	0.40-0.50	0.50-0.60	0.40-1.20	0.50-0.60	0.50-0.60	0.60-0.70	0.70-0.80	0.80-0.90	2.40-2.50	0.50-0.60
	Assessment Criteria	**Commercial (2.5% SOM)**				**Date Sampled**	06/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022
Chemcial Of Concern	**Units**	**Limit of detection**	Number of samples	min	max	mean	GAC	Number exceed GAC															
Asbetsos																							
Asbestos Fibres	Type	N/A	12	N/A	N/A	N/A	If Present	-38	Fibre Bundles	NAD	Fibre Bundles	NAD	Fibre Bundles	NAD	Fibre Bundles	Fibre Bundles	NAD	NAD	NA	Fibre Bundles
Asbestos ACM	Type	N/A	12	N/A	N/A	N/A	-	-	NAD	NAD	NAD	NAD	Insulation	NAD	ACM Debris	NAD	NAD	NAD	NA	NAD
Asbestos Type 1	Type	N/A	12	N/A	N/A	N/A	-	-	Chrysotile	NAD	Chrysotile	NAD	Chrysotile	NAD	Chrysotile	Amosite	NAD	NAD	NA	Chrysotile
Asbestos Type 2	Type	N/A	12	N/A	N/A	N/A	-	-	NA	NA	NA	NA	NA	NA	Amosite	NA	NA	NA	NA	Amosite
Asbestos Type 3	Type	N/A	12	N/A	N/A	N/A	-	-	NA	NA	NA	NA	NA	NA	Crocidolite	NA	NA	NA	NA	Crocidolite
Asbestos Level Screen	Type	N/A	0	N/A	N/A	N/A	-	-												
Asbestos Gravimetric and PCOM total	mass %	<0.001									0.001				0.996					0.013
Natural Moisture Content	%	0.1	12	4.30	49.60	18.37	-	-	17.6	4.3	16.3	6.1	11	28.8	49.6	15	18.8	23.3	11.1	18.5
pH - Automated	pH Units	0.01	12	7.17	12.27	8.73	-	-	8.51	9.32	8.53	8.68	12.27	7.51	7.17	8.43	8.38	8.3	8.89	8.75
Total Cyanide	mg/kg	0.5	12	0.50	60.60	7.48	53	1	60.6	0.5	22.2	0.5	0.5	0.5	2.5	0.5	0.5	0.5	0.5	0.5
Hexavalent Chromium	mg/kg	0.3	12	0.30	0.30	0.30	33	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Sulphate as SO_4	mg/kg	1.50	12	0.02	0.24	0.10	-	-	0.243	0.2107	0.0464	0.0208	0.0471	0.0345	0.1262	0.1127	0.0955	0.0511	0.0715	0.1039
Sulphide	mg/kg	10	12	10.00	10.00	10.00	-	-	10	10	10	10	10	10	10	10	10	10	10	10
Organic Matter	%	0.2	12	2.30	92.90	16.43	-	-	14.7	4	16.7	3.4	3.3	92.9	11.8	14.5	13	2.7	2.3	17.8
Total Phenols (monohydric)	mg/kg	0.15	0	0.00	0.00	#DIV/0!	690	0												
Metals																				
Arsenic	mg/kg	0.5	12	5.40	69.30	26.92	640	0	29.4	5.4	28.9	19.1	8.8	33.9	69.3	8.5	57.9	12.8	15.2	33.8
Cadmium	mg/kg	0.1	12	0.10	0.10	0.10	190	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chromium	mg/kg	0.3	12	32.80	1884.00	257.81	8600	0	61.1	32.8	225.7	60.6	326.4	34.5	51.1	90.1	168	114.1	45.3	1884
Copper	mg/kg	1	12	20.00	180.00	103.67	68000	0	180	20	85	54	65	81	159	170	173	50	49	158
Lead	mg/kg	5	12	17.00	5081.00	650.92	2300	1	1459	17	101	102	28	154	5081	59	307	268	186	49
Mercury	mg/kg	0.1	12	0.10	6.90	0.87	58	0	6.9	0.1	0.1	0.9	0.1	0.1	1.7	0.1	0.1	0.1	0.1	0.1
Nickel	mg/kg	0.7	12	12.10	733.00	141.94	980	0	87.3	27.6	306.2	41.5	118.9	66.7	43.9	83.4	144.7	12.1	38	733
Selenium	mg/kg	1	12	1.00	15.00	3.83	12000	0	1	1	3	1	15	4	3	2	6	1	1	8
Zinc	mg/kg	5	12	61.00	870.00	241.83	730000	0	445	61	104	128	69	61	611	162	870	127	126	138
PAH MS																				
Naphthalene	mg/kg	0.04	12	0.04	9.34	1.61	460	0	0.85	0.04	9.34	0.68	0.18	5.22	1.14	0.74	0.39	0.12	0.16	0.4
enaphthylene	mg/kg	0.03	12	0.03	109.05	11.16	97000	0	1.09	0.11	109.05	3.14	0.39	0.94	17.29	0.09	0.23	0.03	1.39	0.12
enaphthene	mg/kg	0.05	12	0.05	17.64	1.79	97000	0	0.32	0.05	17.64	0.47	0.05	0.17	2.41	0.05	0.18	0.05	0.08	0.05
Fluorene	mg/kg	0.04	12	0.04	126.15	11.76	68000	0	0.4	0.04	126.15	2.77	0.07	0.55	10.77	0.08	0.15	0.04	0.04	0.04
Phenanthrene	mg/kg	0.03	12	0.11	484.31	47.95	22000	0	9.74	0.11	484.31	19.76	0.41	5.74	51.19	0.69	2.08	0.15	0.49	0.7
Anthrene	mg/kg	0.04	12	0.04	229.84	24.09	540000	0	4.53	0.08	229.84	9.07	0.2	2.18	40.39	0.24	0.81	0.04	1.43	0.21
Fluoranthene	mg/kg	0.03	12	0.15	707.19	72.69	23000	0	39.65	0.3	707.19	31.46	0.69	4.01	77.73	0.74	3.48	0.15	5.77	1.14
Pyrene	mg/kg	0.03	12	0.15	499.95	52.40	54000	0	27.22	0.3	499.95	22.9	0.58	3.74	64.25	0.61	2.87	0.15	5.27	0.91
Benzo(a)anthrene	mg/kg	0.06	12	0.11	343.95	35.19	170	1	3.66	0.34	343.95	18.45	0.49	2.9	46.82	0.38	1.77	0.11	2.88	0.57
Chrysene	mg/kg	0.02	12	0.15	257.78	27.42	350	0	4.27	0.42	257.78	13.66	0.42	2.52	43.38	0.37	1.69	0.15	3.72	0.6
Benzo(bk)fluoranthene	mg/kg	0.07	12	0.16	507.17	51.03	-	-	6.82	0.59	507.17	25.77	0.65	3.53	53.32	0.54	3.27	0.16	9.39	1.15
Benzo(a)pyrene	mg/kg	0.04	12	0.07	224.99	22.97	35	1	3.35	0.34	224.99	9.47	0.31	1.6	29.01	0.24	1.32	0.07	4.37	0.51
Indeno(1,2,3-cd)pyrene	mg/kg	0.04	12	0.04	205.75	20.16	510	0	2.86	0.04	205.75	7.83	0.33	1.12	18.25	0.23	1.51	0.07	3.43	0.53
Dibenz(a,h)anthrene	mg/kg	0.04	12	0.04	44.79	4.67	3.6	2	0.76	0.04	44.79	1.7	0.07	0.37	7.24	0.06	0.25	0.04	0.68	0.07
Benzo(ghi)perylene	mg/kg	0.04	12	0.04	142.54	14.88	4000	0	2.62	0.04	142.54	5.34	0.22	1.39	21.59	0.22	0.99	0.07	3.09	0.41
Benzo(b)fluoranthene	mg/kg	0.05	12	0.12	365.16	36.74	44	1	4.91	0.42	365.16	18.55	0.47	2.54	38.39	0.39	2.35	0.12	6.76	0.83
Benzo(k)fluoranthene	mg/kg	0.02	12	0.04	142.01	14.29	1200	0	1.91	0.17	142.01	7.22	0.18	0.99	14.93	0.15	0.92	0.04	2.63	0.32
TPH CWG																				
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	12	0.10	0.10	0.10	5900	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	12	0.10	0.70	0.16	17000	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.2	0.1	0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	12	0.10	0.10	0.10	4800	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	0.2	12	0.20	12.20	1.47	23000	0	0.2	0.2	0.2	0.2	0.2	12.2	0.2	3.1	0.2	0.5	0.2	0.2
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	4	12	4.00	34.00	9.75	82000	0	4	10	4	4	4	26	34	15	4	4	4	4
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	7	12	7.00	509.00	85.08	1700000	0	15	97	7	7	7	90	509	45	7	223	7	7
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	7	12	7.00	1692.00	168.42	1700000	0	163	1692	7	7	34	7	7	7	69	7	14	7
Total aliphatics C5-35	mg/kg	19	12	19.00	1799.00	259.58	-	-	178	1799	19	19	34	128	543	63	70	224	19	19
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	12	0.10	0.10	0.10	46000	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	12	0.10	0.10	0.10	110000	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	12	0.10	0.10	0.10	8100	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	0.2	12	0.20	13.00	3.07	28000	0	0.2	0.2	2.6	0.2	0.2	13	9.4	5.8	0.2	0.2	0.2	4.6
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	4	12	4.00	530.00	76.92	37000	0	8	4	214	11	10	85	530	28	13	4	4	12
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	7	12	14.00	5804.00	759.58	28000	0	122	75	2064	207	52	398	5804	109	68	171	14	31
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	7	12	71.00	12514.00	2040.58	28000	0	367	3055	4250	629	174	1041	12514	304	240	1639	203	71
Total aromatics C5-35	mg/kg	19	12	119.00	18857.00	2879.08	-	-	497	3130	6531	847	236	1537	18857	447	321	1810	217	119
Total TPH	mg/kg	38	12	119.00	19400.00	3132.33	-	-	675	4929	6531	847	270	1665	19400	510	391	2034	217	119
MTBE	ug/kg	5	12	2.00	5.00	4.00	-	-	2	5	5	5	5	2	5	5	2	5	5	2
Benzene	ug/kg	5	12	3.00	17.00	7.42	47000	0	12	5	15	5	5	3	5	17	3	5	9	5
Toluene	µg/kg	5	12	4.00	35.00	9.67	110000000	0	4	5	5	5	16	5	5	35	8	5	5	18
Ethylbenzene	µg/kg	5	12	3.00	5.00	4.33	13000000	0	3	5	5	5	5	3	5	5	3	5	5	3
p & m-xylene	µg/kg	5	12	5.00	12.00	6.67	14000000	0	5	5	5	5	9	8	5	12	7	5	5	9
o-xylene	µg/kg	5	12	3.00	7.00	4.58	15000000	0	3	5	5	5	7	3	5	6	3	5	5	3
VOC MS																				
Dichlorodifluoromethane	ug/kg	2	4	2.00	2.00	2.00	-	-												
Methyl Tertiary Butyl Ether	ug/kg	2	4	2.00	2.00	2.00	13000000	0	2					2			2			2
Chloromethane	ug/kg	3	4	3.00	8.00	4.50	1200	0	3					8			4			3
Vinyl Chloride	ug/kg	2	4	2.00	2.00	2.00	77	0	2					2			2			2
Bromomethane	ug/kg	1	4	1.00	1.00	1.00	-	-												
Chloroethane	ug/kg	2	4	2.00	5.00	3.25	1300000	0	4					2			5			2
Trichlorofluoromethane	ug/kg	2	4	2.00	2.00	2.00	-	-												
1,1-Dichloroethene (1,1 DCE)	ug/kg	6	4	6.00	6.00	6.00	-	-												
Dichloromethane (DCM)	ug/kg	30	4	7.00	36.00	20.25	-	-									36			
trans-1-2-Dichloroethene	ug/kg	3	4	3.00	3.00	3.00	40000	0	3					3			3			3
1,1-Dichloroethane	ug/kg	3	4	3.00	3.00	3.00	450000	0	3					3			3			3
cis-1-2-Dichloroethene	ug/kg	3	4	3.00	3.00	3.00	24000	0	3					3			3			3
2,2-Dichloropropane	ug/kg	4	4	4.00	4.00	4.00	-	-												
Bromochloromethane	ug/kg	3	4	3.00	3.00	3.00	-	-												
Chloroform	ug/kg	3	4	3.00	3.00	3.00	-	-												
1,1,1-Trichloroethane	ug/kg	3	4	3.00	3.00	3.00	-	-												
1,1-Dichloropropene	ug/kg	3	4	3.00	3.00	3.00	-	-												
Carbon tetrhloride	ug/kg	4	4	4.00	4.00	4.00	-	-												
1,2-Dichloroethane	ug/kg	4	4	4.00	4.00	4.00	-	-												
Benzene	ug/kg	5	4	3.00	12.00	5.75	47000	0	12					3			3			5
Trichloroethene (TCE)	ug/kg	3	4	3.00	2571.00	645.00	2600	0	3					3			2571			3
1,2-Dichloropropane	ug/kg	6	4	6.00	6.00	6.00	5900	0	6					6			6			6
Dibromomethane	ug/kg	3	4	3.00	3.00	3.00	-	-												
Bromodichloromethane	ug/kg	3	4	3.00	3.00	3.00	3700	0	3					3			3			3
cis-1-3-Dichloropropene	ug/kg	4	4	4.00	4.00	4.00	-	-												
Toluene	ug/kg	3	4	4.00	18.00	8.75	110000000	0	4					5			8			18
trans-1-3-Dichloropropene	ug/kg	3	4	3.00	3.00	3.00	-	-												
1,1,2-Trichloroethane	ug/kg	3	4	3.00	3.00	3.00	190000	0	3					3			3			3
Tetrhloroethene (PCE)	ug/kg	3	4	3.00	20.00	7.25	42000	0	3					3			20			3
1,3-Dichloropropane	ug/kg	3	4	3.00	3.00	3.00	-	-												
Dibromochloromethane	ug/kg	3	4	3.00	3.00	3.00	-	-												
1,2-Dibromoethane	ug/kg	3	4	3.00	3.00	3.00	-	-												
Chlorobenzene	ug/kg	3	4	3.00	3.00	3.00	130000	0	3					3			3			3
1,1,1,2-Tetrhloroethane	ug/kg	3	4	3.00	3.00	3.00	-	-												
Ethylbenzene	ug/kg	3	4	3.00	3.00	3.00	13000000	0	3					3			3			3
m/p-Xylene	ug/kg	5	4	5.00	9.00	7.25	14000000	0	5					8			7			9

	Project Name	**Welcomb St**						Soil type	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
	Project Number	**JER9536**						**Sample Reference**	CP02	WS06	WS07	WS08	CP04b	WS05a	WS04	WS03	WS02a	WS01	WS01	WS03a	
	Date	**Jul-22**						**Depth (m)**	0.50-1.20	0.20-0.30	0.40-0.50	0.50-0.60	0.40-1.20	0.50-0.60	0.50-0.60	0.60-0.70	0.70-0.80	0.80-0.90	2.40-2.50	0.50-0.60	
	Assessment Criteria	**Commercial (2.5% SOM)**						**Date Sampled**	06/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	
Chemcial Of Concern	**Units**	**Limit of detection**	Number of samples	min	max	mean	GAC	Number exceed GAC															
o-Xylene	ug/kg	3	4	3.00	3.00	3.00	15000000	0	3					3			3			3			
Styrene	ug/kg	3	4	3.00	3.00	3.00	6500000	0	3					3			3			3			
Bromoform	ug/kg	3	4	3.00	3.00	3.00	1500000	0	3					3			3			3			
Isopropylbenzene	ug/kg	3	4	3.00	3.00	3.00	3300000	0	3					3			3			3			
1,1,2,2-Tetrhloroethane	ug/kg	3	4	3.00	3.00	3.00	-	-															
Bromobenzene	ug/kg	2	4	2.00	2.00	2.00	220000	0	2					2			2			2			
1,2,3-Trichloropropane	ug/kg	4	4	4.00	4.00	4.00	-	-															
Propylbenzene	ug/kg	4	4	4.00	4.00	4.00	97000000	0	4					4			4			4			
2-Chlorotoluene	ug/kg	3	4	3.00	3.00	3.00	-	-															
1,3,5-Trimethylbenzene	ug/kg	3	4	3.00	3.00	3.00	-	-															
4-Chlorotoluene	ug/kg	3	4	3.00	3.00	3.00	-	-															
tert-Butylbenzene	ug/kg	5	4	5.00	5.00	5.00	-	-															
1,2,4-Trimethylbenzene	ug/kg	6	4	6.00	6.00	6.00	99000	0	6					6			6			6			
sec-Butylbenzene	ug/kg	4	4	4.00	4.00	4.00	-	-															
4-Isopropyltoluene	ug/kg	4	4	4.00	4.00	4.00	-	-															
1,3-Dichlorobenzene	ug/kg	4	4	4.00	4.00	4.00	-	-															
1,4-Dichlorobenzene	ug/kg	4	4	4.00	4.00	4.00	-	-															
n-Butylbenzene	ug/kg	4	4	4.00	4.00	4.00	-	-															
1,2-Dichlorobenzene	ug/kg	4	4	4.00	4.00	4.00	-	-															
1,2-Dibromo-3-chloropropane	ug/kg	4	4	4.00	4.00	4.00	-	-															
1,2,4-Trichlorobenzene	ug/kg	7	4	7.00	7.00	7.00	530000	-															
Hexhlorobutadiene	ug/kg	4	4	4.00	4.00	4.00	-	-															
Naphthalene	ug/kg	27	4	27.00	27.00	27.00	460	0	27					27			27			27			
1,2,3-Trichlorobenzene	ug/kg	7	4	7.00	7.00	7.00	-	-															
PCBs																							
Total PCBs	ug/kg	60	3	60.00	60.00	60.00	240000	0					60				60			60			

Less than loratory detection

Greater than LOD with no

Greater than GAC

Project Name	Welcomb St							Sample Reference		CP01	WS03
Project Number	JER9536							Depth (m)			
Data Type	Groundwater							Date Sampled		05/07/2022	05/07/2022
Receiving Water Receptor	Principal Aquifer										
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**number of samples**	**Min**	**Max**	**EQS**	**DWS**	**WHO DWS**	**Comments**		
Hardness - Total	mgCaCO3/l	1	2	550	3080	-	-	-		3080	550
Arsenic (dissolved)	µg/l	2.5	2	2.5	5.2	50	-	-		2.5	5.2
Cadmium (dissolved)	µg/l	0.5	2	0.5	0.5	5	-	-		0.5	0.5
Chromium (dissolved)	µg/l	1.5	2	1.5	3.8	4.7	-	-		1.5	3.8
Chromium (hexavalent)	µg/l	5	0	0	0	3.4	-	-			
Copper (dissolved)	µg/l	7	2	7	14	40	-	-		7	14
Lead (dissolved)	µg/l	5	2	5	5	7.2	-	-		5	5
Magnesium (dissolved)	mg/l	0.005	0	0	0	-	-	-			
Mercury (dissolved)	µg/l	1	2	1	1	0.05	-	-		1	1
Nickel (dissolved)	µg/l	2	2	8	11	20	-	-		8	11
Selenium (dissolved)	µg/l	3	2	3	3	-	10	-		3	3
Sodium (dissolved)	mg/l	0.01	0	0	0	200000	-	-			
Zinc (dissolved)	µg/l	3	2	11	25	300	-	-		11	25
Acenaphthene	µg/l	0.005	0	0	0	-	-	-			
Acenaphthylene	µg/l	0.005	0	0	0	-	-	-			
Anthracene	µg/l	0.005	2	0.005	0.005	0.1	-	-		0.005	0.005
Benzo(a)anthracene	µg/l	0.005	2	0.005	0.011	-	-	-		0.005	0.011
Benzo(a)pyrene	µg/l	0.005	2	0.005	0.007	0.05	-	-		0.005	0.007
Benzo(b)fluoranthene	µg/l	0.008	2	0.008	0.011	0.03	-	-		0.008	0.011
Benzo(ghi)perylene	µg/l	0.005	2	0.005	0.005	0.002	-	-		0.005	0.005
Benzo(k)fluoranthene	µg/l	0.008	2	0.008	0.008	0.03	-	-		0.008	0.008
Benzo(bk)fluoranthene	µg/l	0.008	2	0.008	0.015					0.008	0.015
Chrysene	µg/l	0.005	2	0.005	0.008	-	-	-		0.005	0.008
Dibenz(a,h)anthracene	µg/l	0.005	2	0.005	0.005	-	-	-		0.005	0.005
Fluoranthene	µg/l	0.005	2	0.005	0.022	0.1	-	-		0.005	0.022
Fluorene	µg/l	0.005	2	0.005	0.009	-	-	-		0.005	0.009
Indeno(1,2,3-cd)pyrene	µg/l	0.005	2	0.005	0.006	0.002	-	-		0.005	0.006
Naphthalene	µg/l	0.1	2	0.1	0.1	-	-	-		0.1	0.1
Phenanthrene	µg/l	0.005	2	0.005	0.018	-	-	-		0.005	0.018
Pyrene	µg/l	0.005	2	0.005	0.034	-	-	-		0.005	0.034
Sum Benzo(a)-pyrene + Benzo(bk)fluoranthene + Benzo(ghi)perylene + Indeno(123cd)pyrene		0.031	2	0.023	0.033	0.00017	-	-		0.023	0.033
pH (min)	pH Units	N/A	2	7.04	7.67	6	-	-		7.67	7.04
pH (max)	pH Units	N/A	2	7.04	7.67	9	-	-		7.67	7.04
Total Phenols (monohydric)	µg/l	10	2	0.01	0.01	-	-	-		0.01	0.01
Total Cyanide	µg/l	10	2	0.01	0.18	1	-	-	Lod >EQS	0.18	0.01
Free Cyanide	µg/l	10	0	0	0	-	-	-			
Sulphate as SO_4	mg/l	0.045	2	354.6	1789.5	-	250000	-		1789.5	354.6
Sulphide	µg/l	5	2	0.01	0.01	-	-	-		0.01	0.01
Chloride	mg/l	0.15	0	0	0	250000	-	-			
Calcium (dissolved)	mg/l	0.012	0	0	0	-	-	-			
Ammonia as NH_3	µg/l	15	0	0	0	-	-	-			
Electrical Conductivity at 20 °C	µS/cm	10	0	0	0	-	-	-			
Total Dissolved Solids (Gravimetric)	mg/l	4	0	0	0	-	-	-			
Dissolved Oxygen	mg/l	1	0	0	0	-	-	-			
Benzene	µg/l	5	2	5	5	10	-	-		5	5
Toluene	µg/l	5	2	5	5	50	-	-		5	5
Ethylbenzene	µg/l	5	2	5	5	-	-	300		5	5
p & m-xylene	µg/l	5	2	5	5	30	-	-		5	5
o-xylene	µg/l	5	2	5	5	30	-	-		5	5
MTBE (Methyl Tertiary Butyl Ether)	µg/l	5	2	5	5	-	-	-		5	5
Aliphatic >C5 - C6	µg/l	10	2	10	10	11	-	1500		10	10
Aliphatic >C6 - C8	µg/l	10	2	10	10	11	-	1500		10	10
Aliphatic >C8 - C10	µg/l	10	2	10	10	11	-	300		10	10
Aliphatic >C10 - C12	µg/l	5	2	5	5	11	-	300		5	5
Aliphatic >C12 - C16	µg/l	10	2	10	10	11	-	-		10	10
Aliphatic >C16 - C21	µg/l	10	2	10	10	11	-	-		10	10
Aliphatic >C21 - C35	µg/l	10	2	10	10	11	-	-		10	10
Aliphatic (C5 - C35)	µg/l	10	2	10	10	11	-	-		10	10
Aromatic >C5 - C7	µg/l	10	2	10	10	11	-	10		10	10
Aromatic >C7 - C8	µg/l	10	2	10	10	11	-	700		10	10
Aromatic >C8 - C10	µg/l	10	2	10	10	11	-	300		10	10
Aromatic >C10 - C12	µg/l	5	2	5	5	11	-	90		5	5
Aromatic >C12 - C16	µg/l	10	2	10	10	11	-	90		10	10
Aromatic >C16 - C21	µg/l	10	2	10	10	11	-	90		10	10
Aromatic >C21 - C35	µg/l	10	2	10	10	11	-	90		10	10
Aromatic (C5 - C35)	µg/l	10	2	10	10	11	-	-		10	10

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

Project Name	Welcomb St							Sample Reference		CP02	WS07
Project Number	JER9536							Depth (m)		0.50-1.20	0.40-0.50
Data Type	Leachates							Date Sampled		06/06/2022	08/06/2022
Receiving Water Receptor	Principal Aquifer										
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**number of samples**	**Min**	**Max**	**EQS**	**DWS**	**WHO DWS**	**Comments**		
Hardness - Total	mgCaCO3/l	1	0	0	0	-	-	-			
Arsenic (dissolved)	µg/l	2.5	2	8.7	11.3	50	-	-		8.7	11.3
Cadmium (dissolved)	µg/l	0.5	2	0.5	0.5	5	-	-		0.5	0.5
Chromium (dissolved)	µg/l	1.5	2	2.1	18.8	4.7	-	-		2.1	18.8
Chromium (hexavalent)	µg/l	5	0	0	0	3.4	-	-			
Copper (dissolved)	µg/l	7	2	7	14	40	-	-		14	7
Lead (dissolved)	µg/l	5	2	5	5	7.2	-	-		5	5
Magnesium (dissolved)	mg/l	0.005	0	0	0	-	-	-			
Mercury (dissolved)	µg/l	1	2	1	1	0.05	-	-		1	1
Nickel (dissolved)	µg/l	2	2	2	9	20	-	-		2	9
Selenium (dissolved)	µg/l	3	2	3	3	-	10	-		3	3
Sodium (dissolved)	mg/l	0.01	0	0	0	200000	-	-			
Zinc (dissolved)	µg/l	3	2	4	10	300	-	-		10	4
Acenaphthene	µg/l	0.005	2	0.02	3.019	-	-	-		0.02	3.019
Acenaphthylene	µg/l	0.005	2	0.063	11.213	-	-	-		0.063	11.213
Anthracene	µg/l	0.005	2	0.14	4.94	0.1	-	-		0.14	4.94
Benzo(a)anthracene	µg/l	0.005	2	0.483	3.985	-	-	-		0.483	3.985
Benzo(a)pyrene	µg/l	0.005	2	0.275	0.69	0.05	-	-		0.275	0.69
Benzo(b)fluoranthene	µg/l	0.008	2	0.361	1.335	0.03	-	-		0.361	1.335
Benzo(ghi)perylene	µg/l	0.005	2	0.096	0.112	0.002	-	-		0.096	0.112
Benzo(k)fluoranthene	µg/l	0.008	2	0.14	0.519	0.03	-	-		0.14	0.519
Chrysene	µg/l	0.008	2	0.325	3.022	-	-	-		0.325	3.022
Dibenz(a,h)anthracene	µg/l	0.005	2	0.025	0.061	-	-	-		0.025	0.061
Fluoranthene	µg/l	0.005	2	0.715	18.729	0.1	-	-		0.715	18.729
Fluorene	µg/l	0.005	2	0.032	11.525	-	-	-		0.032	11.525
Indeno(1,2,3-cd)pyrene	µg/l	0.005	2	0.17	0.353	0.002	-	-		0.17	0.353
Naphthalene	µg/l	0.005	2	0.1	0.3	-	-	-		0.1	0.3
Phenanthrene	µg/l	0.1	2	0.307	13.067	-	-	-		0.307	13.067
Pyrene	µg/l	0.005	2	0.642	12.358	-	-	-		0.642	12.358
Benzo(bk)fluoranthene	µg/l	0.005	2	0.501	1.854					0.501	1.854
Sum Benzo(a)-pyrene + Benzo(bk)fluoranthene + Benzo(ghi)perylene + Indeno(123cd)pyrene		0.031	2	1.042	3.009	0.00017	-	-		1.042	3.009

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

Project Name	Welcomb St
Project Number	JER9539
Data Type	Groundwater
Assessment Critera	SoBRA Inhalation Pathway Commercial End Use

Analytical Parameter (Water Analysis)	Units	Limit of detection	number of samples	Min	Max	SoBRA	Comments	Sample Reference	CP01	WS03
								Depth (m)		
								Date Sampled	05/07/2022	05/07/2022
Acenaphthene	µg/l	0.005	2	0.005	0.016	15000000			0.005	0.016
Acenaphthylene	µg/l	0.005	2	0.005	0.005	20000000			0.005	0.005
Fluorene	µg/l	0.005	2	0.005	0.016	18000000			0.005	0.016
Naphthalene	µg/l	0.1	2	0.1	0.1	23000			0.1	0.1
Benzene	µg/l	5	2	5	5	20000			5	5
Toluene	µg/l	5	2	5	5	21000000			5	5
Ethylbenzene	µg/l	5	2	5	5	960000			5	5
p & m-xylene	µg/l	5	2	5	5	940000			5	5
o-xylene	µg/l	5	2	5	5	980000			5	5
Aliphatic >C5 - C6	µg/l	10	2	10	10	190000			10	10
Aliphatic >C6 - C8	µg/l	10	2	10	10	150000			10	10
Aliphatic >C8 - C10	µg/l	10	2	10	10	5700			10	10
Aliphatic >C10 - C12	µg/l	5	2	5	5	3600			5	5
Aliphatic >C12 - C16	µg/l	10	2	10	10	-			10	10
Aliphatic >C16 - C21	µg/l	10	2	10	10	-			10	10
Aliphatic >C21 - C35	µg/l	10	2	10	10	-			10	10
Aliphatic (C5 - C35)	µg/l	10	2	10	10	-			10	10
Aromatic >C5 - C7	µg/l	10	2	10	10	20000000			10	10
Aromatic >C7 - C8	µg/l	10	2	10	10	21000000			10	10
Aromatic >C8 - C10	µg/l	10	2	10	10	190000			10	10
Aromatic >C10 - C12	µg/l	5	2	5	5	660000			5	5
Aromatic >C12 - C16	µg/l	10	2	10	10	3700000			10	10
Aromatic >C16 - C21	µg/l	10	2	10	10	-			10	10
Aromatic >C21 - C35	µg/l	10	2	10	10	-			10	10
Aromatic (C5 - C35)	µg/l	10	2	10	10	-			10	10

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

Appendix I

Laboratory Analytical Certificates

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

RPS
Unit 12 Watersedge Business Park
Modwen Rd
Salford
M5 3EZ

Attention :	Karen Dale
Date :	4th August, 2022
Your reference :	JER9536
Our reference :	Test Report 22/9576 Batch 1
Location :	Welcomb St
Date samples received :	10th June, 2022
Status :	Final Report
Issue :	1

Twenty samples were received for analysis on 10th June, 2022 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

[redacted]

Phil Sommerton BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	7-9	10-12	16-18	22-24	28-29	32-33	36-37	38-39	42-43	LOD/LOR	Units	Method No.
Sample ID	CP02	WS06	WS07	WS08	CP04b	WS05a	WS04	WS03	WS02a	WS01			
Depth	0.50-1.20	0.20-0.30	0.40-0.50	0.50-0.60	0.40-1.20	0.50-0.60	0.50-0.60	0.60-0.70	0.70-0.80	0.80-0.90			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J	V J	V J	V J	V J			
Sample Date	06/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
Arsenic #	29.4	5.4	28.9	19.1	8.8	33.9	69.3	8.5	57.9	12.8	<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	61.1	32.8	225.7	60.6	326.4 AB	34.5	51.1	90.1	168.0	114.1	<0.5	mg/kg	TM30/PM15
Copper #	180	20	85	54	65	81	159	170	173	50	<1	mg/kg	TM30/PM15
Lead #	1459	17	101	102	28	154	5081 AB	59	307	268	<5	mg/kg	TM30/PM15
Mercury #	6.9	<0.1	0.1	0.9	<0.1	0.1	1.7	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	87.3	27.6	306.2 AB	41.5	118.9	66.7	43.9	83.4	144.7	12.1	<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	3	<1	15	4	3	2	6	1	<1	mg/kg	TM30/PM15
Zinc #	445	61	104	128	69	61	611	162	870	127	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.85	0.04	9.34 AC	0.68	0.18	5.22	1.14 AB	0.74	0.39	0.12	<0.04	mg/kg	TM4/PM8
Acenaphthylene	1.09	0.11	109.05 AC	3.14	0.39	0.94	17.29 AB	0.09	0.23	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.32	<0.05	17.64 AC	0.47	<0.05	0.17	2.41 AB	<0.05	0.18	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	0.40	<0.04	126.15 AC	2.77	0.07	0.55	10.77 AB	0.08	0.15	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	9.74	0.11	>>484.31 AC	19.76	0.41	5.74	51.19 AB	0.69	2.08	0.15	<0.03	mg/kg	TM4/PM8
Anthracene #	4.53	0.08	229.84 AC	9.07	0.20	2.18	40.39 AB	0.24	0.81	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	39.65	0.30	>>707.19 AC	31.46	0.69	4.01	77.73 AB	0.74	3.48	0.15	<0.03	mg/kg	TM4/PM8
Pyrene #	27.22	0.30	>>499.95 AC	22.90	0.58	3.74	64.25 AB	0.61	2.87	0.15	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	3.66	0.34	343.95 AC	18.45	0.49	2.90	46.82 AB	0.38	1.77	0.11	<0.06	mg/kg	TM4/PM8
Chrysene #	4.27	0.42	257.78 AC	13.66	0.42	2.52	43.38 AB	0.37	1.69	0.15	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	6.82	0.59	507.17 AC	25.77	0.65	3.53	53.32 AB	0.54	3.27	0.16	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	3.35	0.34	224.99 AC	9.47	0.31	1.60	29.01 AB	0.24	1.32	0.07	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	2.86	<0.04	205.75 AC	7.83	0.33	1.12	18.25 AB	0.23	1.51	0.07	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.76	<0.04	44.79 AC	1.70	0.07	0.37	7.24 AB	0.06	0.25	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	2.62	<0.04	142.54 AC	5.34	0.22	1.39	21.59 AB	0.22	0.99	0.07	<0.04	mg/kg	TM4/PM8
Coronene	-	-	32.18 AC	-	-	0.32	-	-	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	108.1	2.6	3910.4 AC	172.5	5.0	36.0	484.8 AB	5.2	21.0	1.2	<0.6	mg/kg	TM4/PM8
PAH 17 Total	-	-	3942.62 AC	-	-	36.30	-	-	-	-	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	4.91	0.42	365.16 AC	18.55	0.47	2.54	38.39 AB	0.39	2.35	0.12	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	1.91	0.17	142.01 AC	7.22	0.18	0.99	14.93 AB	0.15	0.92	0.04	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	92	89	89 AC	90	88	111	86 AB	90	90	91	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	<2	-	-	-	-	<2 SV	-	-	<2 SV	-	<2	ug/kg	TM15/PM10
Benzene #	12	-	-	-	-	<3 SV	-	-	<3 SV	-	<3	ug/kg	TM15/PM10
Toluene #	4	-	-	-	-	5 SV	-	-	8 SV	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	-	-	-	-	<3 SV	-	-	<3 SV	-	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	-	-	-	-	8 SV	-	-	7 SV	-	<5	ug/kg	TM15/PM10
o-Xylene #	<3	-	-	-	-	<3 SV	-	-	<3 SV	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	83	-	-	-	-	19 SV	-	-	59 SV	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	65	-	-	-	-	41 SV	-	-	44 SV	-	<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	<30	-	-	508	-	-	-	-	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	7-9	10-12	16-18	22-24	28-29	32-33	36-37	38-39	42-43	LOD/LOR	Units	Method No.
Sample ID	CP02	WS06	WS07	WS08	CP04b	WS05a	WS04	WS03	WS02a	WS01			
Depth	0.50-1.20	0.20-0.30	0.40-0.50	0.50-0.60	0.40-1.20	0.50-0.60	0.50-0.60	0.60-0.70	0.70-0.80	0.80-0.90			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J	V J	V J	V J	V J			
Sample Date	06/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1 SV	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1 SV	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	0.7 SV	0.2 SV	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 SV	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	<0.2	<0.2	<0.2	<0.2	12.2	<0.2	3.1	<0.2	0.5	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	10	<4	<4	<4	26	34	15	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	15	97	<7	<7	<7	90	509	45	<7	223	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	163	1692	<7	<7	34	380	1408	37	69	2160	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	178	1799	<19	<19	34	508	1951	100	70	2384	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1 SV	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1 SV	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1 SV	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	2.6	<0.2	<0.2	13.0	9.4	5.8	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	8	<4	214	11	10	85	530	28	13	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	122	75	2064	207	52	398	5804	109	68	171	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	367	3055	4250	629	174	1041	12514	304	240	1639	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR)#	497	3130	6531	847	236	1537	18857	447	321	1810	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	675	4929	6531	847	270	2045	20808	547	391	4194	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	-	<5 SV	<5	<5 SV	<5 SV	-	<5 SV	<5 SV	-	<5 SV	<5	ug/kg	TM36/PM12
Benzene#	-	<5 SV	15	<5 SV	<5 SV	-	<5 SV	17 SV	-	<5 SV	<5	ug/kg	TM36/PM12
Toluene#	-	<5 SV	<5	<5 SV	16 SV	-	<5 SV	35 SV	-	<5 SV	<5	ug/kg	TM36/PM12
Ethylbenzene#	-	<5 SV	<5	<5 SV	<5 SV	-	<5 SV	<5 SV	-	<5 SV	<5	ug/kg	TM36/PM12
m/p-Xylene#	-	<5 SV	<5	<5 SV	9 SV	-	<5 SV	12 SV	-	<5 SV	<5	ug/kg	TM36/PM12
o-Xylene#	-	<5 SV	<5	<5 SV	7 SV	-	<5 SV	6 SV	-	<5 SV	<5	ug/kg	TM36/PM12
PCB 77	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 81	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 105	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 114	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 118	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 123	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 126	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 156	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 157	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 167	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 169	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 189	-	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM17/PM8
Total 12 PCBs	-	-	-	-	<60	-	-	-	<60	-	<60	ug/kg	TM17/PM8
PCB 28#	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 52#	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 101#	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	7-9	10-12	16-18	22-24	28-29	32-33	36-37	38-39	42-43	LOD/LOR	Units	Method No.
Sample ID	CP02	WS06	WS07	WS08	CP04b	WS05a	WS04	WS03	WS02a	WS01			
Depth	0.50-1.20	0.20-0.30	0.40-0.50	0.50-0.60	0.40-1.20	0.50-0.60	0.50-0.60	0.60-0.70	0.70-0.80	0.80-0.90			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J	V J	V J	V J	V J			
Sample Date	06/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022			
PCB 118 #	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	<35	-	<35	<35	-	-	<35	-	<35	ug/kg	TM17/PM8
Total Phenols HPLC	0.21	<0.15	0.15	<0.15	<0.15	<0.15	4.22 AB	<0.15	<0.15	<0.15	<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	17.6	4.3	16.3	6.1	11.0	28.8	49.6	15.0	18.8	23.3	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.2430	0.2107	0.0464	0.0208	0.0471	0.0345	0.1262	0.1127	0.0955	0.0511	<0.0015	g/l	TM38/PM20
Total Cyanide #	60.6 AA	<0.5	22.2	<0.5	<0.5	<0.5	<2.5 AB	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	-	-	10.01	-	-	51.25	-	-	-	-	<0.02	%	TM21/PM24
Organic Matter	14.7	4.0	16.7	3.4	3.3	92.9	11.8	14.5	13.0	2.7	<0.2	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM107/PM45
ANC at pH4	-	-	1.01	-	-	NDP	-	-	-	-	<0.03	mol/kg	TM77/PM0
ANC at pH7	-	-	0.07	-	-	NDP	-	-	-	-	<0.03	mol/kg	TM77/PM0
Loss on Ignition #	-	-	13.2	-	-	41.7	-	-	-	-	<1.0	%	TM22/PM0
pH #	8.51	9.32	8.53	8.68	12.27	7.51	7.17	8.43	8.38	8.30	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	44-45	46-47									LOD/LOR	Units	Method No.
Sample ID	WS01	WS03a											
Depth	2.40-2.50	0.50-0.60											
COC No / misc													
Containers	V J	V J											
Sample Date	09/06/2022	09/06/2022											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	10/06/2022	10/06/2022											
Arsenic #	15.2	33.8									<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Chromium #	45.3	1884.0 AC									<0.5	mg/kg	TM30/PM15
Copper #	49	158									<1	mg/kg	TM30/PM15
Lead #	186	49									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	38.0	733.0 AB									<0.7	mg/kg	TM30/PM15
Selenium #	<1	8									<1	mg/kg	TM30/PM15
Zinc #	126	138									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.16	0.40									<0.04	mg/kg	TM4/PM8
Acenaphthylene	1.39	0.12									<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.08	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.49	0.70									<0.03	mg/kg	TM4/PM8
Anthracene #	1.43	0.21									<0.04	mg/kg	TM4/PM8
Fluoranthene #	5.77	1.14									<0.03	mg/kg	TM4/PM8
Pyrene #	5.27	0.91									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.88	0.57									<0.06	mg/kg	TM4/PM8
Chrysene #	3.72	0.60									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	9.39	1.15									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	4.37	0.51									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	3.43	0.53									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.68	0.07									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	3.09	0.41									<0.04	mg/kg	TM4/PM8
Coronene	-	0.11									<0.04	mg/kg	TM4/PM8
PAH 16 Total	42.2	7.3									<0.6	mg/kg	TM4/PM8
PAH 17 Total	-	7.43									<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	6.76	0.83									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	2.63	0.32									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	86	91									<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2 SV									<2	ug/kg	TM15/PM10
Benzene #	-	5 SV									<3	ug/kg	TM15/PM10
Toluene #	-	18 SV									<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3 SV									<3	ug/kg	TM15/PM10
m/p-Xylene #	-	9 SV									<5	ug/kg	TM15/PM10
o-Xylene #	-	<3 SV									<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	71 SV									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	48 SV									<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30									<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	44-45	46-47									LOD/LOR	Units	Method No.
Sample ID	WS01	WS03a											
Depth	2.40-2.50	0.50-0.60											
COC No / misc													
Containers	V J	V J											
Sample Date	09/06/2022	09/06/2022											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	10/06/2022	10/06/2022											
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	14	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	<19	<19									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	4.6									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	12									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	14	31									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	203	71									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR)#	217	119									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	217	119									<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	<5	-									<5	ug/kg	TM36/PM12
Benzene#	9	-									<5	ug/kg	TM36/PM12
Toluene#	<5	-									<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	-									<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	-									<5	ug/kg	TM36/PM12
o-Xylene#	<5	-									<5	ug/kg	TM36/PM12
PCB 77	-	<5									<5	ug/kg	TM17/PM8
PCB 81	-	<5									<5	ug/kg	TM17/PM8
PCB 105	-	<5									<5	ug/kg	TM17/PM8
PCB 114	-	<5									<5	ug/kg	TM17/PM8
PCB 118	-	<5									<5	ug/kg	TM17/PM8
PCB 123	-	<5									<5	ug/kg	TM17/PM8
PCB 126	-	<5									<5	ug/kg	TM17/PM8
PCB 156	-	<5									<5	ug/kg	TM17/PM8
PCB 157	-	<5									<5	ug/kg	TM17/PM8
PCB 167	-	<5									<5	ug/kg	TM17/PM8
PCB 169	-	<5									<5	ug/kg	TM17/PM8
PCB 189	-	<5									<5	ug/kg	TM17/PM8
Total 12 PCBs	-	<60									<60	ug/kg	TM17/PM8
PCB 28#	-	<5									<5	ug/kg	TM17/PM8
PCB 52#	-	<5									<5	ug/kg	TM17/PM8
PCB 101#	-	<5									<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	44-45	46-47									LOD/LOR	Units	Method No.
Sample ID	WS01	WS03a											
Depth	2.40-2.50	0.50-0.60											
COC No / misc													
Containers	V J	V J											
Sample Date	09/06/2022	09/06/2022											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	10/06/2022	10/06/2022											
PCB 118 #	-	<5									<5	ug/kg	TM17/PM8
PCB 138 #	-	<5									<5	ug/kg	TM17/PM8
PCB 153 #	-	<5									<5	ug/kg	TM17/PM8
PCB 180 #	-	<5									<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35									<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	11.1	18.5									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0715	0.1039									<0.0015	g/l	TM38/PM20
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	-	12.17									<0.02	%	TM21/PM24
Organic Matter	2.3	17.8									<0.2	%	TM21/PM24
Sulphide	<10	<10									<10	mg/kg	TM107/PM45
ANC at pH4	-	NDP									<0.03	mol/kg	TM77/PM0
ANC at pH7	-	NDP									<0.03	mol/kg	TM77/PM0
Loss on Ignition #	-	8.2									<1.0	%	TM22/PM0
pH #	8.89	8.75									<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : Solid (Duplicate results)

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	46-47												
Sample ID	WS03a												
Depth	0.50-0.60												
COC No / misc													
Containers	V J												
Sample Date	09/06/2022												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	10/06/2022												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
PCB 28 #	<5										<5	ug/kg	TM17/PM8
PCB 52 #	<5										<5	ug/kg	TM17/PM8
PCB 101 #	<5										<5	ug/kg	TM17/PM8
PCB 118 #	<5										<5	ug/kg	TM17/PM8
PCB 138 #	<5										<5	ug/kg	TM17/PM8
PCB 153 #	<5										<5	ug/kg	TM17/PM8
PCB 180 #	<5										<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35										<35	ug/kg	TM17/PM8

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	10-12	32-33									
Sample ID	CP02	WS07	WS04									
Depth	0.50-1.20	0.40-0.50	0.50-0.60									
COC No / misc												
Containers	V J B	V J B	V J									
Sample Date	06/06/2022	08/06/2022	09/06/2022									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	10/06/2022	10/06/2022	10/06/2022									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Dissolved Arsenic #	8.7	11.3	NDP								<2.5	ug/l	TM30/PM14
Dissolved Boron #	<12	20	NDP								<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	NDP								<0.5	ug/l	TM30/PM14
Dissolved Chromium #	2.1	18.8	NDP								<1.5	ug/l	TM30/PM14
Dissolved Copper #	14	<7	NDP								<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	NDP								<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	NDP								<1	ug/l	TM30/PM14
Dissolved Nickel #	2	9	NDP								<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	NDP								<3	ug/l	TM30/PM14
Dissolved Zinc #	10	4	NDP								<3	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	0.3	NDP								<0.1	ug/l	TM4/PM30
Acenaphthylene	0.063	>>11.213	NDP								<0.005	ug/l	TM4/PM30
Acenaphthene	0.020	3.019	NDP								<0.005	ug/l	TM4/PM30
Fluorene	0.032	>>11.525	NDP								<0.005	ug/l	TM4/PM30
Phenanthrene	0.307	>>13.067	NDP								<0.005	ug/l	TM4/PM30
Anthracene	0.140	4.940	NDP								<0.005	ug/l	TM4/PM30
Fluoranthene	0.715	>>18.729	NDP								<0.005	ug/l	TM4/PM30
Pyrene	0.642	>>12.358	NDP								<0.005	ug/l	TM4/PM30
Benzo(a)anthracene	0.483	3.985	NDP								<0.005	ug/l	TM4/PM30
Chrysene	0.325	3.022	NDP								<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene	0.501	1.854	NDP								<0.008	ug/l	TM4/PM30
Benzo(a)pyrene	0.275	0.690	NDP								<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene	0.170	0.353	NDP								<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene	0.025	0.061	NDP								<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene	0.096	0.112	NDP								<0.005	ug/l	TM4/PM30
PAH 16 Total	3.794	85.228	NDP								<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.361	1.335	NDP								<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	0.140	0.519	NDP								<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	80	76	NDP								<0	%	TM4/PM30

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

SVOC Report : **Solid**

EMT Sample No.	4-6	28-29	38-39	46-47							LOD/LOR	Units	Method No.
Sample ID	CP02	WS05a	WS02a	WS03a									
Depth	0.50-1.20	0.50-0.60	0.70-0.80	0.50-0.60									
COC No / misc													
Containers	V J B	V J	V J	V J									
Sample Date	06/06/2022	09/06/2022	09/06/2022	09/06/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022									
SVOC MS													
Phenols													
2-Chlorophenol #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2-Methylphenol	<100 AC	353 SV	<10	<10							<10	ug/kg	TM16/PM8
2-Nitrophenol	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<100 AC	730 SV	<10	<10							<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Methylphenol	<100 AC	1168 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Nitrophenol	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Pentachlorophenol	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Phenol #	305 AC	246 SV	<10	<10							<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<100 AC	3980 SV	400	337							<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<1000 AC	1113 SV	<100	<100							<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<1000 AC	<100 SV	<100	<100							<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<1000 AC	365 SV	<100	<100							<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<1000 AC	<100 SV	<100	<100							<100	ug/kg	TM16/PM8
Diethyl phthalate	<1000 AC	<100 SV	<100	<100							<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<1000 AC	<100 SV	<100	<100							<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2-Nitroaniline	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
3-Nitroaniline	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Chloroaniline	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
4-Nitroaniline	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Azobenzene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Carbazole	580 AC	769 SV	77	27							<10	ug/kg	TM16/PM8
Dibenzofuran #	359 AC	1396 SV	146	109							<10	ug/kg	TM16/PM8
Hexachlorobenzene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Hexachloroethane	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Isophorone #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Nitrobenzene #	<100 AC	<10 SV	<10	<10							<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	113 AC	120 SV	104	100							<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	111 AC	142 SV	103	96							<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale
EMT Job No: 22/9576

VOC Report : **Solid**

EMT Sample No.	4-6	28-29	38-39	46-47							LOD/LOR	Units	Method No.
Sample ID	CP02	WS05a	WS02a	WS03a									
Depth	0.50-1.20	0.50-0.60	0.70-0.80	0.50-0.60									
COC No / misc													
Containers	V J B	V J	V J	V J									
Sample Date	06/06/2022	09/06/2022	09/06/2022	09/06/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	10/06/2022	10/06/2022	10/06/2022	10/06/2022									
VOC MS													
Dichlorodifluoromethane	<2	<2 SV	<2 SV	<2 SV							<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2 SV	<2 SV	<2 SV							<2	ug/kg	TM15/PM10
Chloromethane #	<3	8 SV	4 SV	<3 SV							<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2 SV	<2 SV	<2 SV							<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1 SV	<1 SV	<1 SV							<1	ug/kg	TM15/PM10
Chloroethane #	4	<2 SV	5 SV	<2 SV							<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2 SV	<2 SV	<2 SV							<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6 SV	<6 SV	<6 SV							<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	12	<7 SV	36 SV	26 SV							<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Chloroform #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
Benzene #	12	<3 SV	<3 SV	5 SV							<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3 SV	>>2571	<3 SV							<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6 SV	<6 SV	<6 SV							<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
Toluene #	4	5 SV	8 SV	18 SV							<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3 SV	20 SV	<3 SV							<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	8 SV	7 SV	9 SV							<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Styrene	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2 SV	<2 SV	<2 SV							<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3 SV	<3 SV	<3 SV							<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5 SV	<5 SV	<5 SV							<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6 SV	<6 SV	<6 SV							<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
4-Isopropyltoluene	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
n-Butylbenzene	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7	<7 SV	<7 SV	<7 SV							<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4 SV	<4 SV	<4 SV							<4	ug/kg	TM15/PM10
Naphthalene	<27	<27 SV	<27 SV	<27 SV							<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7	<7 SV	<7 SV	<7 SV							<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	83	19 SV	59 SV	71 SV							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	65	41 SV	44 SV	48 SV							<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

CEN 10:1 LEACHATE RESULTS BS EN 12547-2

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	16.5
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	85.9
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
EMT Job No	**22/9576**			
Sample No	**12**			
Client Sample No	**WS07**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**0.40-0.50**			
Sample Date	**08/06/2022**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	10.01	3	5	6
Loss on Ignition (%)	13.2	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-	-
PAH Sum of 17(mg/kg)	3942.62	100	-	-
pH (pH Units)	8.53	-	>6	-
ANC to pH 7 (mol/kg)	0.07	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	1.01	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	0.0080	0.080	0.5	2	25
Barium	0.026	0.26	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	0.0134	0.134	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.010	0.10	0.5	10	30
Nickel	0.006	0.06	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	0.8	8	800	15000	25000
Fluoride	0.8	8	10	150	500
Sulphate as SO4	8.0	80	1000	20000	50000
Total Dissolved Solids	78	780	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	2	<20	500	800	1000

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

CEN 10:1 LEACHATE RESULTS BS EN 12547-2

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	NDP
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	NDP
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
EMT Job No	**22/9576**			
Sample No	**29**			
Client Sample No	**WS05a**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**0.50-0.60**			
Sample Date	**09/06/2022**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	51.25	3	5	6
Loss on Ignition (%)	41.7	-	-	10
Sum of BTEX (mg/kg)	<0.017	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	508	500	-	-
PAH Sum of 17(mg/kg)	36.30	100	-	-
pH (pH Units)	7.51	-	>6	-
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	NDP	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	NDP	NDP	0.5	2	25
Barium	NDP	NDP	20	100	300
Cadmium	NDP	NDP	0.04	1	5
Chromium	NDP	NDP	0.5	10	70
Copper	NDP	NDP	2	50	100
Mercury	NDP	NDP	0.01	0.2	2
Molybdenum	NDP	NDP	0.5	10	30
Nickel	NDP	NDP	0.4	10	40
Lead	NDP	NDP	0.5	10	50
Antimony	NDP	NDP	0.06	0.7	5
Selenium	NDP	NDP	0.1	0.5	7
Zinc	NDP	NDP	4	50	200
Chloride	NDP	NDP	800	15000	25000
Fluoride	NDP	-	10	150	500
Sulphate as SO4	NDP	NDP	1000	20000	50000
Total Dissolved Solids	NDP	-	4000	60000	100000
Phenol	NDP	NDP	1	-	-
Dissolved Organic Carbon	NDP	NDP	500	800	1000

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All solid results are expressed on a dry weight basis unless stated otherwise.

CEN 10:1 LEACHATE RESULTS BS EN 12547-2

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	NDP
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	NDP
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
EMT Job No	**22/9576**			
Sample No	**47**			
Client Sample No	**WS03a**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**0.50-0.60**			
Sample Date	**09/06/2022**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	12.17	3	5	6
Loss on Ignition (%)	8.2	-	-	10
Sum of BTEX (mg/kg)	0.032	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-	-
PAH Sum of 17(mg/kg)	7.43	100	-	-
pH (pH Units)	8.75	-	>6	-
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	NDP	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	NDP	NDP	0.5	2	25
Barium	NDP	NDP	20	100	300
Cadmium	NDP	NDP	0.04	1	5
Chromium	NDP	NDP	0.5	10	70
Copper	NDP	NDP	2	50	100
Mercury	NDP	NDP	0.01	0.2	2
Molybdenum	NDP	NDP	0.5	10	30
Nickel	NDP	NDP	0.4	10	40
Lead	NDP	NDP	0.5	10	50
Antimony	NDP	NDP	0.06	0.7	5
Selenium	NDP	NDP	0.1	0.5	7
Zinc	NDP	NDP	4	50	200
Chloride	NDP	NDP	800	15000	25000
Fluoride	NDP	-	10	150	500
Sulphate as SO4	NDP	NDP	1000	20000	50000
Total Dissolved Solids	NDP	-	4000	60000	100000
Phenol	NDP	NDP	1	-	-
Dissolved Organic Carbon	NDP	NDP	500	800	1000

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
22/9576	1	CP02	0.50-1.20	6	Anthony Carman	24/06/2022	**General Description (Bulk Analysis)**	Black Soil/Stones
					Anthony Carman	24/06/2022	**Asbestos Fibres**	Fibre Bundles
					Anthony Carman	24/06/2022	**Asbestos ACM**	NAD
					Anthony Carman	24/06/2022	**Asbestos Type**	Chrysotile
22/9576	1	WS06	0.20-0.30	9	Anthony Carman	24/06/2022	**General Description (Bulk Analysis)**	Soil/Stones/Tar
					Anthony Carman	24/06/2022	**Asbestos Fibres**	NAD
					Anthony Carman	24/06/2022	**Asbestos ACM**	NAD
					Anthony Carman	24/06/2022	**Asbestos Type**	NAD
22/9576	1	WS07	0.40-0.50	12	Catherine Coles	24/06/2022	**General Description (Bulk Analysis)**	soil, dust, debris
					Catherine Coles	24/06/2022	**Asbestos Fibres**	Fibre Bundles
					Catherine Coles	24/06/2022	**Asbestos ACM**	NAD
					Catherine Coles	24/06/2022	**Asbestos Type**	Chrysotile
					Matthew Turner	01/08/2022	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Matthew Turner	01/08/2022	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Matthew Turner	01/08/2022	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					Matthew Turner	02/08/2022	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					Matthew Turner	02/08/2022	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
22/9576	1	WS08	0.50-0.60	18	Simon Postlewhite	24/06/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	24/06/2022	**Asbestos Fibres**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos ACM**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos Type**	NAD
22/9576	1	CP04b	0.40-1.20	24	Simon Postlewhite	24/06/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	24/06/2022	**Asbestos Fibres**	Fibre Bundles
					Simon Postlewhite	24/06/2022	**Asbestos ACM**	Insulation
					Simon Postlewhite	24/06/2022	**Asbestos Type**	Chrysotile
22/9576	1	WS05a	0.50-0.60	29	Catherine Coles	24/06/2022	**General Description (Bulk Analysis)**	black soot, stone, debris
					Catherine Coles	24/06/2022	**Asbestos Fibres**	NAD
					Catherine Coles	24/06/2022	**Asbestos ACM**	NAD
					Catherine Coles	24/06/2022	**Asbestos Type**	NAD
22/9576	1	WS04	0.50-0.60	33	Catherine Coles	24/06/2022	**General Description (Bulk Analysis)**	black soil, soot, debris
					Catherine Coles	24/06/2022	**Asbestos Fibres**	Fibre Bundles
					Catherine Coles	24/06/2022	**Asbestos Fibres (2)**	Fibre Bundles
					Catherine Coles	24/06/2022	**Asbestos Fibres (3)**	Fibre Bundles

Client Name: RPS
Reference: JER9536
Location: Welcomb St
Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
22/9576	1	WS04	0.50-0.60	33	Catherine Coles	24/06/2022	**Asbestos ACM**	ACM Debris
					Catherine Coles	24/06/2022	**Asbestos ACM (2)**	ACM Debris
					Catherine Coles	24/06/2022	**Asbestos ACM (3)**	ACM Debris
					Catherine Coles	24/06/2022	**Asbestos Type**	Chrysotile
					Catherine Coles	24/06/2022	**Asbestos Type (2)**	Amosite
					Catherine Coles	24/06/2022	**Asbestos Type (3)**	Crocidolite
					Matthew Turner	01/08/2022	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Matthew Turner	01/08/2022	**Total Detailed Gravimetric Quantification (% Asb)**	0.994 (mass %)
					Matthew Turner	01/08/2022	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	0.994 (mass %)
					Matthew Turner	02/08/2022	**Asbestos PCOM Quantification (Fibres)**	0.002 (mass %)
					Matthew Turner	02/08/2022	**Asbestos Gravimetric & PCOM Total**	0.996 (mass %)
22/9576	1	WS03	0.60-0.70	37	Simon Postlewhite	24/06/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	24/06/2022	**Asbestos Fibres**	Fibre Bundles
					Simon Postlewhite	24/06/2022	**Asbestos ACM**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos Type**	Amosite
22/9576	1	WS02a	0.70-0.80	39	Simon Postlewhite	24/06/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	24/06/2022	**Asbestos Fibres**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos ACM**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos Type**	NAD
22/9576	1	WS01	0.80-0.90	43	Simon Postlewhite	24/06/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	24/06/2022	**Asbestos Fibres**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos ACM**	NAD
					Simon Postlewhite	24/06/2022	**Asbestos Type**	NAD
22/9576	1	WS03a	0.50-0.60	47	Catherine Coles	24/06/2022	**General Description (Bulk Analysis)**	black soot, charcoal, debris
					Catherine Coles	24/06/2022	**Asbestos Fibres**	Fibre Bundles
					Catherine Coles	24/06/2022	**Asbestos Fibres (2)**	Fibre Bundles
					Catherine Coles	24/06/2022	**Asbestos Fibres (3)**	Fibre Bundles
					Catherine Coles	24/06/2022	**Asbestos ACM**	NAD
					Catherine Coles	24/06/2022	**Asbestos ACM (2)**	NAD
					Catherine Coles	24/06/2022	**Asbestos ACM (3)**	NAD
					Catherine Coles	24/06/2022	**Asbestos Type**	Chrysotile
					Catherine Coles	24/06/2022	**Asbestos Type (2)**	Amosite
					Catherine Coles	24/06/2022	**Asbestos Type (3)**	Crocidolite
					Matthew Turner	01/08/2022	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Matthew Turner	01/08/2022	**Total Detailed Gravimetric Quantification (% Asb)**	0.011 (mass %)
					Matthew Turner	01/08/2022	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	0.011 (mass %)
					Matthew Turner	02/08/2022	**Asbestos PCOM Quantification (Fibres)**	0.002 (mass %)
					Matthew Turner	02/08/2022	**Asbestos Gravimetric & PCOM Total**	0.013 (mass %)

Client Name: RPS

Reference: JER9536

Location: Welcomb St

Contact: Karen Dale

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Method No.	NDP Reason
22/9576	1	WS05a	0.50-0.60	28-29	NONE/PM4	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	PM4/PM0	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	TM77/PM0	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	NONE/PM4	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	PM4/PM0	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM77/PM0	Insufficient sample for test

Client Name: RPS

Reference: JER9536

Location: Welcomb St

Contact: Karen Dale

Matrix : CEN 10:1 1 Batch

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Method No.	NDP Reason
22/9576	1	WS05a	0.50-0.60	28-29	TM26/PM0	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	TM38/PM0	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	TM20/PM0	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	TM60/PM0	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	TM170/PM14	Insufficient sample for test
22/9576	1	WS05a	0.50-0.60	28-29	TM173/PM0	Insufficient sample for test
22/9576	1	WS04	0.50-0.60	32-33	TM30/PM14	Insufficient sample for test
22/9576	1	WS04	0.50-0.60	32-33	TM4/PM30	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM26/PM0	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM38/PM0	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM20/PM0	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM60/PM0	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM170/PM14	Insufficient sample for test
22/9576	1	WS03a	0.50-0.60	46-47	TM173/PM0	Insufficient sample for test

Client Name: RPS

Matrix : Solid

Reference: JER9536

Location: Welcomb St

Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
22/9576	1	WS07	0.40-0.50	10-12	LOI, PAH, PCB, TOC	Sample holding time exceeded
22/9576	1	WS05a	0.50-0.60	28-29	LOI, PCB, TOC	Sample holding time exceeded
22/9576	1	WS03a	0.50-0.60	46-47	LOI, PCB, TOC	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

EMT Job No.: 22/9576

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x5 Dilution
AC	x10 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/9576

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 22/9576

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes

EMT Job No: 22/9576

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

EMT Job No: 22/9576

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
TM131	Quantification of Asbestos Fibres and ACM based on HSG 248 Second edition:2021, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes		AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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RPS
Unit 12 Watersedge Business Park
Modwen Rd
Salford
M5 3EZ

Attention :	Karen Dale
Date :	2nd August, 2022
Your reference :	JER9539
Our reference :	Test Report 22/11836 Batch 1
Location :	Welcombe St.
Date samples received :	12th July, 2022
Status :	Final Report
Issue :	1

Two samples were received for analysis on 12th July, 2022 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

[redacted]

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: RPS
Reference: JER9539
Location: Welcombe St.
Contact: Karen Dale
EMT Job No: 22/11836

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-5	6-13									LOD/LOR	Units	Method No.
Sample ID	CP01	WS03											
Depth													
COC No / misc													
Containers	V P G	V HN N Z P G											
Sample Date	05/07/2022	05/07/2022											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	12/07/2022	12/07/2022											
Dissolved Arsenic #	<2.5	5.2									<2.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	3.8									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	14									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	8	11									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Zinc #	11	25									<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	3080 AA	550									<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	0.016									<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	0.009									<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	0.018									<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	0.022									<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	0.034									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	0.011									<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	0.008									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	0.015									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	0.007									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	0.006									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	0.011									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	86	91									<0	%	TM4/PM30
MTBE #	<5	<5									<5	ug/l	TM36/PM12
Benzene #	<5	<5									<5	ug/l	TM36/PM12
Toluene #	<5	<5									<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5									<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5									<5	ug/l	TM36/PM12
o-Xylene #	<5	<5									<5	ug/l	TM36/PM12

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JER9539
Location: Welcombe St.
Contact: Karen Dale
EMT Job No: 22/11836

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-5	6-13									LOD/LOR	Units	Method No.
Sample ID	CP01	WS03											
Depth													
COC No / misc													
Containers	V P G	V HN N Z P G											
Sample Date	05/07/2022	05/07/2022											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	12/07/2022	12/07/2022											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Phenol #	<0.01	<0.01									<0.01	mg/l	TM26/PM0
Sulphate as SO4 #	1789.5	354.6									<0.5	mg/l	TM38/PM0
Total Cyanide #	0.18	<0.01									<0.01	mg/l	TM89/PM0
Hexavalent Chromium	<0.006	<0.006									<0.006	mg/l	TM38/PM0
Sulphide	<0.01	<0.01									<0.01	mg/l	TM107/PM0
pH #	7.67	7.04									<0.01	pH units	TM73/PM0
Total Organic Carbon #	14	42									<2	mg/l	TM60/PM0

Client Name: RPS

Matrix : Liquid

Reference: JER9539

Location: Welcombe St.

Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
22/11836	1	CP01		1-5	GRO, Mercury, Metals	Sample holding time exceeded
22/11836	1	WS03		6-13	GRO	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

Please include all sections of this report if it is reproduced

EMT Job No.: 22/11836

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/11836

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes			

EMT Job No: 22/11836

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				