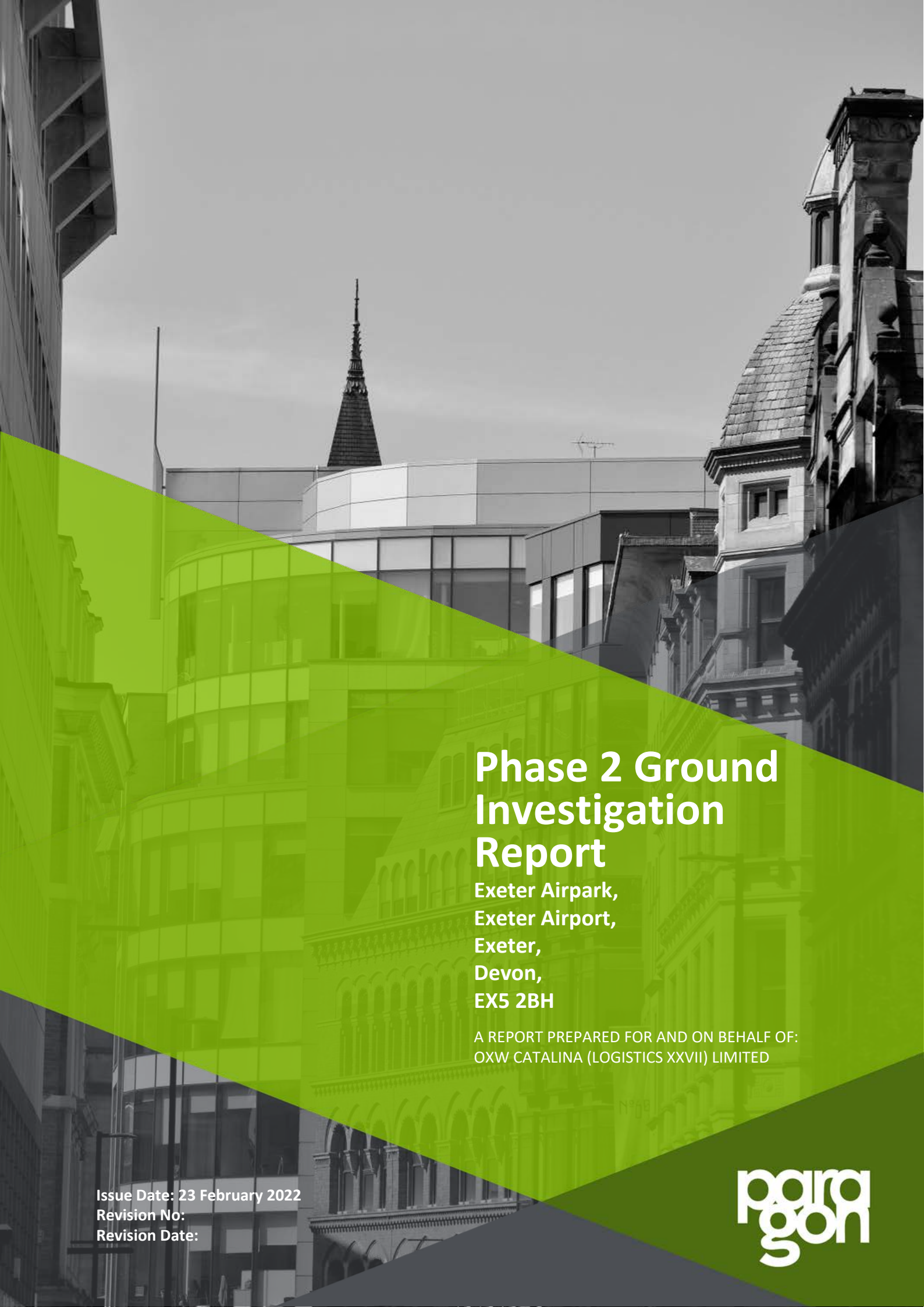




Phase 2 Ground Investigation Report

Exeter Airpark,
Exeter Airport,
Exeter,
Devon,
EX5 2BH

A REPORT PREPARED FOR AND ON BEHALF OF:
OXW CATALINA (LOGISTICS XXVII) LIMITED

Issue Date: 23 February 2022
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For and on behalf of
Paragon Building Consultancy Limited

DASHBOARD SUMMARY

KEY INVESTIGATION FINDINGS

	Rationale for the Investigation 1. Paragon Building Consultancy Limited (Paragon) was instructed by OXW CATALINA (LOGISTICS XXVII) LIMITED to complete a Phase 2 Ground Investigation on a site referred to as Exeter Airpark, Exeter Airport, Exeter, Devon, EX5 2BH. The investigation included an intrusive investigation, laboratory analysis and risk assessment. These works have been completed in connection with the redevelopment of the site. 2. The site is a 19-acre arable field that also provides access between Flybe offices (off-site) and a car park (P4) for Exeter airport, also present off site. The site is flanked by hedgerows and mature / semi mature trees, and a drainage ditch is present on the eastern boundary. The site slopes down to the northeast corner of the site. 3. Paragon previously completed a Phase 1 Environmental Audit to support the purchase of the site. The report concluded that there was a low to medium risk associated with the site and a potential source-pathway-receptor linkage exists. As such, it was recommended that a ground investigation was undertaken to assess the potential sources of contamination to determine whether these exist and whether these could impact the potential receptors. In addition, a geotechnical exercise was recommended to assess development constraints. 4. At this stage limited information is available on the proposed development. However, a proposed development plan is presented in Appendix 1 and it is understood that the development will include ca. 12 units for light industrial / commercial use. Nevertheless no formal design information has been provided. 5. The scope of the intrusive investigation is presented below: • 3 boreholes drilled using a cable percussive drilling rig to 10.00mbgl; • 9 boreholes drilled using a windowless sample drilling rig to 3.80mbgl for geotechnical testing; • 9 trial pits excavated using a mechanical back-hoe excavator (JCB 3CX) to a maximum depth of 3.50mbgl; • Geotechnical laboratory testing (in-situ Standard Penetration testing and hand vane testing) and sampling for laboratory testing; • Geoenvironmental laboratory testing commensurate with the findings of the CSM; and • 3 groundwater and ground gas monitoring visits. Ground Conditions 6. The ground conditions encountered were similar to the geology mapped by BGS. These comprised Head Deposits in the northeast corner of the site and the Aylesbeare Mudstone Group in remaining site areas. The Head Deposits were found to a maximum depth of 1.50mbgl. The Aylesbeare Mudstone Group was described as a stiff reddish brown sandy gravelly clay to 9.00mbgl over mudstone to the extent of the investigation at 10.00mbgl. In addition, the investigation identified nominal areas of Topsoil and Made Ground to a maximum depth of 0.30mbgl.
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7.	Groundwater was not encountered during drilling. However, during the three monitoring visits, groundwater was identified at depths of between 25.74mAOD and 34.13mAOD. Groundwater flow is considered to be towards the northeast. Environmental Findings
8.	The results of the chemical analysis of the Made Ground and natural soils identified that the concentration of the contaminants tested were below the GAC for a commercial land use. As such, the risks to human health are considered to be low. Furthermore, the risk to Controlled Waters was considered to be low due to the low concentration of contaminants identified. Overall, it is considered that there is a low risk associated with the site in respect of land contamination and the site is considered suitable for development for a commercial end use. No ground remediation is considered to be necessary.
9.	Paragon has identified a minor exceedance of the thresholds for barrier pipework, and as such barrier pipework may be required as part of the redevelopment. However, this should be discussed with the water provider as the exceedance was minor.
10.	Based on the preliminary Gas Risk Assessment, it is considered that the site should be classified as CS1. However, some localised source removal should be undertaken around WS4 to ensure the levels of gases are reduced. As such, no gas protection systems are necessary as there are not considered to be intolerable risks to the development or future site users. In addition, the site is not situated within a Radon Affected Area and as such, radon gas protection is not considered to be required. As such, the risk from ground gas is low. Geotechnical Findings
11.	Shallow foundations and ground floor slabs are considered appropriate for the proposed commercial development.
12.	A buried concrete classification assessment has been carried out to determine the DS and ACEC classification for the Head Deposits and the Aylesbeare Mudstone Group. At this stage DS-2 AC-2 is considered appropriate for the Head Deposits and DS-1, AC-1 is considered appropriate for the Aylesbeare Mudstone Group.
13.	Whilst CBR testing has not been completed as part of this investigation it is considered that that a CBR of 3% is suitable in cohesive soils and 20% in granular deposits. Once the alignment and formation level of the pavements and roads have been established, the formation level should be exposed, proof rolled, inspected and insitu tested to identify weak/soft spots and areas that are below the design criteria. These should be removed and replaced with well compacted granular backfill.

RECOMMENDATIONS

Environmental

1. Whilst it is unlikely, in the event that previously unidentified contamination is uncovered during construction, works should cease until inspection and testing has been undertaken by an appropriately qualified person. Therefore, a watching brief and discovery strategy should be adopted on site during development.
2. From a preliminary risk assessment of the results to thresholds set in the UK Water Industry Research (2010) '*Guidance for the selection of water supply pipes to be used in brownfield sites*', it is possible that barrier water pipes may be required for drinking water supply pipework. This is based on marginal exceedances of TPH found within the soils. As the exceedances were marginal, it may be possible to discuss the findings with the local water provider to discuss their requirements.
3. It is anticipated that throughout the development, surplus soil will be created from reducing ground levels and from foundation arisings. The arisings will therefore need to be managed appropriately. Whilst some arisings may require disposal off-site as waste, it is likely that the majority of the surplus soil could be re-used either onsite or on another site under the Definition of Waste: Code of Practice (DoW CoP) outlined by CL:AIRE. At this stage, it is anticipated that the Made Ground would be classified as non-hazardous and the underlying natural soil would be classified as inert. Therefore under DoW CoP it would be possible for the Made Ground to be reused onsite and the surplus natural soil could be reused through the direct transfer of clean and naturally occurring soils materials between sites. This method would promote a sustainable management strategy for soil arisings.

Regulatory

4. This report should be submitted to the Local Planning Authority in support of a planning application for the development.

Geotechnical

5. Geotechnical design parameters for the ground conditions encountered have been provided. They are based on the results of in-situ and laboratory test results.
6. The monitoring results indicate an average groundwater level across the site of 29.57mOD.
7. Shallow foundations are considered feasible in the form of pads/strips. A preliminary recommended allowable bearing pressure of 200kPa is provided for shallow pad/strip foundations and bearing into the Aylesbeare Mudstone Group. This assessment is likely to be revisited when the design loads are provided.
8. Floors slabs are recommended to be ground bearing. The formation level should be inspected, and proof rolled prior to construction of the slab. Weak/soft spots should be removed and backfilled with compacted granular fill material.
9. An assessment of the current data suggests that roads or pavements within locations where the ground conditions are found to be predominately cohesive, should be design for a CBR of 3%. In locations where the formation is predominately granular, pavements and roads can be designed for a CBR value of 20%.

10.	Design Sulphate (DS) classification to inform concrete mix designs have been provided based on the soil strata present. At this stage it is considered that DS-2, AC-2 is appropriate for the Head Deposits in the northeast corner of the site and DS-1, AC-1 is appropriate for the Aylesbeare Mudstone Group.
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PHASE 2 GROUND INVESTIGATION REPORT

CLIENT NAME: OXW CATALINA (LOGISTICS XXVII)
LIMITED

PROPERTY ADDRESS: Exeter Airpark,
Exeter Airport,
Exeter,
Devon,
EX5 2BH

INSPECTION DATE: 12 April 2021



1.0 INSTRUCTIONS

- | | |
|------------|---|
| 1.1 | Paragon Building Consultancy Limited (Paragon) was instructed by OXW CATALINA (LOGISTICS XXVII) LIMITED to complete a Phase 2 Ground Investigation on a site referred to as Exeter Airpark, Exeter Airport, Exeter, Devon, EX5 2BH. The investigation included an intrusive investigation, laboratory analysis and risk assessment. These works have been completed in connection with the redevelopment of the site. |
|------------|---|

2.0 AIMS AND OBJECTIVES

- | | |
|------------|---|
| 2.1 | <p>The aims of this report are:</p> <ul style="list-style-type: none">• Provide information on the geotechnical and environmental quality of the ground present on the site;• Assess the potential health and other environmental risks posed by the site to the proposed development and to other specifically identified receptors; and• Assess the potential for offsite contamination to adversely affect the proposed development. |
| 2.2 | <p>The aims above will be completed by achieving the following objective:</p> <ul style="list-style-type: none">• To complete a Phase 2 ground investigation with soil and groundwater sampling, chemical laboratory analysis and geotechnical laboratory analysis.• To undertake an environmental and geotechnical risk assessment. |

3.0 SCOPE OF WORKS

3.1	The ground investigation was undertaken in general accordance with the Code of Practice for Site Investigation British Standard BS5930:2015+A1:2020, Code of Practice for the Investigation of Potentially Contaminated Sites BS10175:2011+A2:2017, Land Contamination: Risk Management (LCRM) 2020. Due regard is made to the Environmental Protection Act (EPA) 1990 Part 2A in connection with the contamination risk assessment and requirements of the National Planning Policy Framework (NPPF).
3.2	This report outlines the results of the geoenvironmental and geotechnical assessment.

4.0 INTRODUCTION

4.1	Site Location
4.1.1	The following information has been obtained from the existing Phase 1 report (Reference: 19.0876/CK/AW. Dated: 4 September 2019). The Phase 1 should be read in conjunction with this report; the following is a summary.
4.1.2	The site is centred approximately at National Grid Reference: 300891, 093434, and extends to 7.57Ha. The approximate elevation of the site is 31.5m Above Ordnance Datum (mAOD). Site information gathered during the preliminary report is summarised below and a site location plan is provided as Figure 1, in Appendix 1.
4.2	General Description and Current Site Use
4.2.1	The site is a 19-acre arable field that also provides access between Flybe offices (off-site) and a car park (P4) for Exeter airport, also present off site.
4.2.2	The access through the site is via a macadam footpath with lighting columns along it (and manhole covers), which runs along the south of the site. There is also an area where vehicle access is possible along the southern boundary.
4.2.3	The site is flanked by hedgerows and mature / semi mature trees, and a drainage ditch is present on the eastern boundary.
4.2.4	The site slopes down to the northeast corner of the site. There is a brick-built single storey structure in the northeast corner of the site which is likely to be a pill-box. It was not possible to gain access to the structure as it was surrounded by heavily overgrown vegetation. There is a similar structure in the south eastern corner of the site, also overgrown by vegetation.
4.2.5	No significant sources of contamination or above ground tanks were observed on the site.
4.2.6	The property is immediately surrounded by buildings associated with Exeter Airport / ancillary units and arable land. To the north of the site is Exeter Airport runway and to the west is Exeter Airport Car Park 4, to the south is a country B-road beyond which includes Flybe Training Academy (offices) and to the east are agricultural fields.

4.3	Proposed Development
4.3.1	At this stage limited information is available on the proposed development. However, a proposed development plan is presented in Appendix 1 and it is understood that the development will include 12 units for light industrial / commercial use. Nevertheless no formal design information has been provided.
4.3.2	The proposed site plan shows the layout of the units, two SuDS features in the northeast and northwest corners of the site, and an area of soft landscaping around the perimeter of the site. Each unit has an area of hardstanding for parking and loading/unloading.
4.4	Planning
4.4.1	Currently there are no planning applications associated with the development.
4.5	Site History
4.5.1	A review of the historical mapping was undertaken as part of the Phase 1 Environmental Audit. A summary is provided below.
4.5.2	The earliest available mapping for the site from circa 1888, indicated that the site was open undeveloped land with trees and drainage ditches. There was an unspecified pit within the central portion of the site, which (from reviewing marked off-site pits) it is highly likely to be an Old Marl Pit. Marl was commonly excavated for use as agricultural lime to reduce soil acidity and provide nutrients for crop growth. By 1905, the pit was recorded as containing water. By 1967, a track was recorded in the centre of the site and several unnamed structures were present along the track and to the north of it in the central and eastern parts of the site. 'Issues' were reported in this area suggesting the area may be susceptible to flooding. These structures are discussed in further detail below. By 1988, the pit had been infilled. By 1991, these structures had been cleared and the site was an open, undeveloped land.
4.5.3	It was identified that the site was historically occupied by the Ministry of Defence (MoD). Exeter Airport was originally opened as a civilian airfield in 1937 and during World War 2 (WWII) it was transferred to the MoD. Between April and May 1941, it is understood that RAF Exeter suffered several heavy air raids, which destroyed many aircraft and buildings. By October 1946, RAF Exeter had closed and it was transferred to the Ministry of Civil Aviation by January 1947 then becoming Exeter Airport.
4.5.4	It is understood that several Small Arms Ammunition (SAA) buildings were historically present within the site boundary. SAA buildings were stores for ammunition for machine guns and ground defence weapons. It is understood that training exercises would have been completed from such stores, which may have resulted in a legacy of unexploded ammunition across the site. Additionally, three 'defensive positions' or pill-boxes were recorded on or within the site boundary and included Vickers / AAA machine guns. It is not clear whether there were tanks or refuelling areas on the site but given the use of vehicles and nearby aircraft there is potential that some traces of fuels could be identified on site.
4.5.5	The surrounding area was occupied by MoD land, Exeter Airport and agricultural land. There is an off-site 'Old Marl Pit' some 25m west of the site.

4.6	Geology
4.6.1	From a review of the British Geological Survey map 325, the geology of the subject site comprises Head Deposits (eastern part of the site only) over the Aylesbeare Mudstone Group.
4.6.2	As there are likely to be areas without superficial deposits and with Made Ground (from the filled pit) there is the potential for some variability in the underlying ground conditions.
4.6.3	There are no publicly available borehole records available from within the vicinity of the site.
4.7	Hydrogeology
4.7.1	The Head Deposits are classified by the Environment Agency (EA) as a Secondary (A) or Undifferentiated Aquifers. The Secondary (A) Aquifer is situated in the north-eastern part of the site which indicates the deposits are more likely to be granular in this area. The mudstone below is classified as a Secondary (B) Aquifer.
4.7.2	There is no potable groundwater abstraction within a 2km radius and the site is not within a Source Protection Zone.
4.8	Hydrology
4.8.1	There is a drainage ditch that flanks the south and east of the site. Flow direction appeared to be to the north.
4.8.2	There are no surface water abstraction points within 1km of the site.
4.9	Flooding
4.9.1	According to the Environment Agency website, the site is not located within a fluvial flood risk zone. However, there are areas that are potentially susceptible to groundwater flooding, which is likely to be in the area of the more permeable Head Deposits. EA mapping indicates that there are areas of low to high surface water flood risk in the northeast part of the site and along the drainage ditch. The risk ratings are described as follows: • Low risk means that each year this area has a chance of flooding of between 0.1% and 1%. • High risk means that each year this area has a chance of flooding of greater than 3.3%.
4.10	Regulatory Enquiries
4.10.1	To date there are no entries on the Council's contaminated land register as no land in East Devon has been declared as Contaminated Land under the provisions of the Environmental Protection Act 1990 Part 2A.
4.10.2	The Environment Agency has not been contacted as part of this assessment at this juncture as development proposals are preliminary at this stage.

4.11	Environmental Database Information
4.11.1	No Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites have been identified within 1km of the site.
4.11.2	No licensed landfill sites have been identified within 250m of the site.
4.11.3	No refuelling sites have been identified within 250m of the site.
4.12	Ground Stability Hazards
4.12.1	The natural hazards identified within the Groundsure data pack are as follows: • Shrink Swell: Very Low • Landslides: Very Low • Soluble Rocks: Very Low • Compressible Ground: Negligible • Collapsible Rocks: Very Low • Running Sand: Very Low
4.12.2	The site is not located in a radon or coal mining affected area.
4.13	Unexploded Ordnance (UXO)
4.13.1	Paragon was provided with a UXO report, as follows: • BACTEC International Limited (2008) Explosive Ordnance Threat Assessment, Exeter Airport for Entec UK Ltd, ref: 9688TH, dated October 2008.
4.13.2	In summary, the report indicated that there is a high risk of UXO at the site. The report also indicated the presence of various defensive positions (pill-boxes) onsite. These are presented in Plate 1.
4.13.3	As part of the investigation, Paragon has commissioned an intrusive UXO survey. The survey is ongoing and the results will be presented to the design team and contractors prior to further intrusive works taking place onsite.

4.13.4

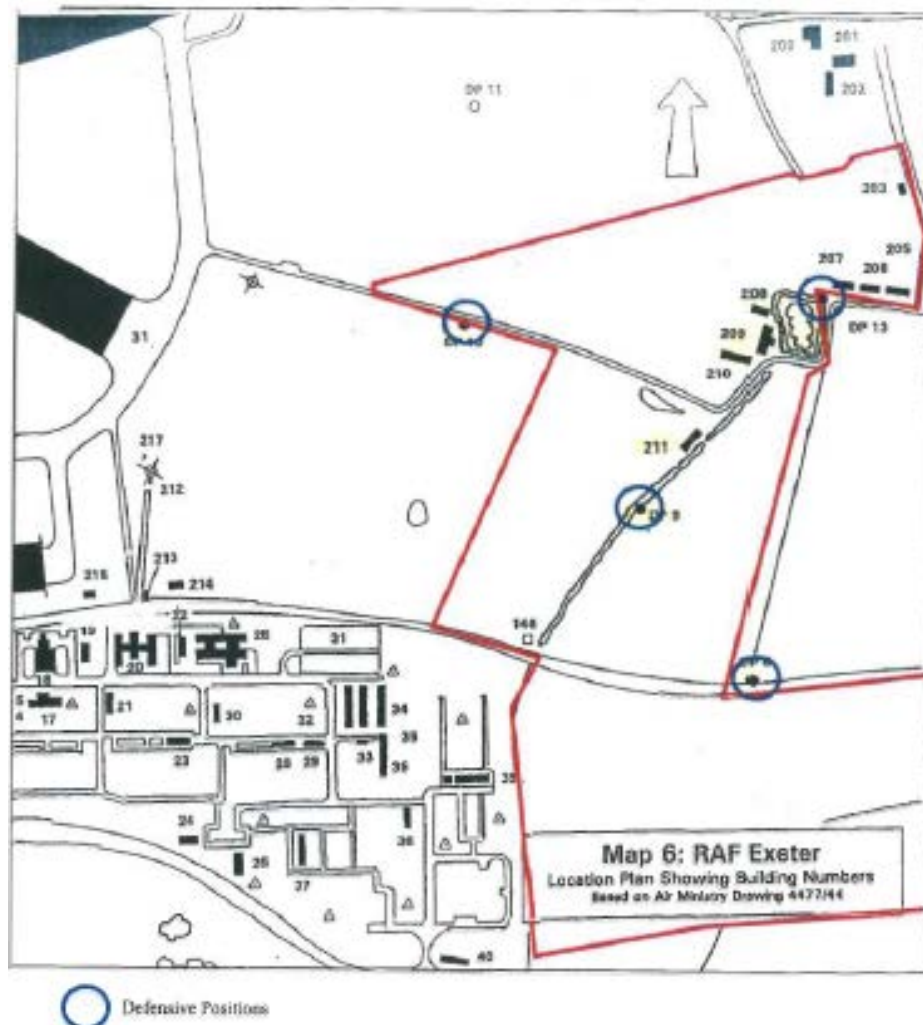


Plate 1: Defensive Positions Plan (BACTEC 2008)

4.14 Previous Reports

4.14.1 Paragon was provided with the following historical ground investigation report for review by the vendor.

- Entec UK Limited (2008) Flybe Limited, Land East of Exeter Airport Business Park, Phase 1 and Phase 2 Site Investigation Report —For Planning Application Purposes, dated 1 December 2008.

The ground investigation was not completed directly at the subject site. However, it is understood that limited contamination was identified.

4.15	Potential Contaminants of Concern
4.15.1	Based on the historical and current use of the site and surroundings, the following contaminants may have arisen at the subject property: • Made Ground including asbestos from the demolition of former MoD structures; • Total Petroleum Hydrocarbons from vehicle use on site and airfield land use; • Biodegradable materials and other contaminants (heavy metals and Polycyclic Aromatic Hydrocarbons) within the infilled pit; and • UXO and historical ammunition.
4.16	Potential Active Pathways
4.16.1	The Head Deposits identified in the eastern part of the site may allow the migration of contaminants offsite. The Aylesbeare Mudstone Group is likely to have limited permeability.
4.16.2	As the site is entirely soft landscaped i.e. there is no hardstanding present, pathways to humans would be active. This includes inhalation, ingestion and dermal contact. In addition, ground gas may migrate through the soft cover.
4.17	Potential Receptors
4.17.1	Potential receptors identified include: • Future Site Users • Offsite Users • Controlled Waters (the drainage ditch and Secondary Aquifers beneath the site) • Proposed buildings • New water supply pipes
4.18	Requirement for Further Investigation
4.18.1	Based on the above, a potential source-pathway-receptor linkage exists at the site. As such, a ground investigation is required to assess the potential sources of contamination to determine whether these exist and whether these could impact the potential receptors.

5.0 PRELIMINARY CONCEPTUAL SITE MODEL

5.1	Conceptual Site Model (CSM)
5.1.1	Based on the risks identified within the Phase 1 Investigation a Preliminary Conceptual Site Model has been produced based on redeveloping the site.

5.1.2

Receptor	Potential sources	Pathways	Risk	Justification
Future Site Users (Human Health)	Contaminants within the underlying Made Ground.	Direct contact, ingestion, and inhalation via outdoor soils or translocated soil and dust indoors.		Low to medium: Whilst the site has some previous uses on the site include buildings and a potential infilled are, the risk to future site users is considered to be low to moderate. This is because the potential for significant contamination to be present is minimal. Furthermore, it is understood that the site due is to be surfaced with hardstanding which would act as a barrier between the potential contamination beneath the site and the site users. Nevertheless, further testing is required to confirm the risk.
	Ground gas and vapour	Inhalation, Migration through granular and fractured soils into confined spaces.		Low to medium: The risk of ground gas and vapours onsite cannot be entirely discounted. However, the site is currently used as a field, and therefore gas and vapours would be able to migrate through the soils and dissipate into the atmosphere. In line with the proposed development as areas of hardstanding and buildings are to be constructed the gas may not be able to dissipate and as such further assessment is required.
Offsite Users (Human Health)	Contaminants within the underlying Made Ground.	Direct contact, ingestion, and inhalation via outdoor soils or translocated soil and dust indoors.		Low: The potential for residual contamination to be present as a result of the historical use of the site cannot be discounted at this stage. However, the potential for offsite users to be affected by the contamination is considered to be minimal.
	Ground gas and vapour	Inhalation, Migration through granular and fractured soils into confined spaces.		Low: The risk of ground gas and vapours onsite cannot be entirely discounted. However, the neighbouring plots are almost entirely surfaced with hardstanding which would limit the vertical migration into units offsite. In addition, the likelihood of significant volumes of gas and vapour being present is minimal.
Property (including Water Supply Pipes)	Contaminants within the underlying Made Ground.	Direct contact between soil and structures or services.		Low to medium: Direct contact of building materials including foundations and buried services with contaminated soils and groundwater is considered to be low to medium at this stage. Whilst gross contamination is not expected, further testing would be needed to confirm this.
	Ground gas and vapour	Migration through granular and fractured soils into confined spaces.		Low to medium: The risk of ground gas and vapours onsite cannot be entirely discounted. Further testing is required to assess this.
Groundwater (Secondary Aquifer)	Contaminants within the underlying Made Ground.	Soil leaching and migration of potential contamination.		Medium: The potential for contamination (if present onsite) impacting the underlying aquifer cannot be discounted due to the permeability of the mapped geology within the area.
Surface Water (Drainage Ditch)	Contaminants within the underlying Made Ground.	Soil leaching and migration of potential contamination.		Medium: The potential for contamination (if present onsite) impacting the adjacent drainage ditch (offsite) cannot be discounted due to the permeability of the mapped geology within the area.

Table 1. Preliminary Conceptual Site Model

5.2

Key Risks Requiring Further Investigation

5.2.1

Further investigations are deemed to be required in order to determine the risk (if any) from potential soil and groundwater contamination and to provide preliminary information on ground conditions in relation to the proposed redevelopment of the site.

6.0 GEOTECHNICAL RISK ASSESSMENT

6.1 Risk Assessment

6.1.1 The Phase 1 and Phase 2 investigations identified potential geotechnical hazards which have been summarised in Table 2.

Hazard	Risk	Rationale
Made Ground	M	There is the potential for Made Ground to be present as a result of the historical features mapped onsite.
Collapsible / Unstable Excavations	L M	There is the potential for unstable excavations in the eastern part of the site where head deposits are mapped. In the remaining site areas, mudstone is expected to be encountered at shallow depths, meaning unstable excavations are unlikely.
Shallow Groundwater	L M	There is a drainage ditch on the eastern boundary. Groundwater may be present at a shallow depth in the area of the ditch and in the northeast corner of the site where an elevated flood risk has been identified.
Compressible strata	M	There is the potential for compressible strata onsite as a result of Made Ground.
Aggressive ground conditions for concrete	M	There is potential for the underlying geology to create aggressive conditions for concrete. Chemical testing will need to be completed as part of the assessment.
Dissolution	L	The geology mapped beneath the site is unlikely to be impacted by dissolution.
Landslide	L M	Whilst there is a slope onsite, the potential for landslides to occur is limited. However, the slope will be a factor that will need to be addressed as part of the design of the development.
Mining	L	No areas of coal or non-coal mining have been identified within the vicinity of the site.

Table 2. Geotechnical Risk Assessment

6.2 Key Risks Requiring Further Investigation

6.2.1 Based on the above, geotechnical testing is required during the investigation. This should include insitu testing such as Standard Penetration Tests (SPTs) during drilling and a hand shear vane should be used in cohesive soils.

6.2.2 Geotechnical laboratory testing is also required to further assess the risks listed above. This should include standard classification testing e.g. Particle Size Distribution, Atterberg Limit testing, and sulphate testing.

7.0 GROUND INVESTIGATION

7.1	Investigation Rationale
7.1.1	The objectives for the investigation were to complete a Phase 2 ground investigation with soil and groundwater sampling, chemical laboratory analysis and geotechnical laboratory analysis, and to undertake an environmental and geotechnical risk assessment. Details of the site methods are presented in Appendix 3.
7.1.2	The ground investigation was undertaken in general accordance and with reference, where relevant to the following documents: • Specification for Ground Investigation, Site Investigation Steering Group, Thomas Telford, 1994; • British Standard BS10175:2011 (A2) Investigation of potentially contaminated sites – code of practice, as amended; • Code of Practice for the Investigation of Potentially Contaminated Sites BS10175:2011+A2:2017; • Land Contamination: Risk Management (LCRM) 2020; • Environment Agency (2000) Secondary model procedures for the development of appropriate soil sampling strategies for land contamination. Technical Report P5-066/TR; • DEFRA/Environmental Agency Report: Land Contamination: Risk Management (LCRM) 2019; • BS5930, 2015. Code of Practice for Ground Investigation; • BS1377 (1990) Methods of test for Soils for Civil Engineering Purposes; • BS EN 1997-2 (2007) Eurocode 7 – Geotechnical Design – Ground Investigation and Testing; and • BS ISO 5667-22:2010 Water quality. Sampling. Guidance on the design and installation of groundwater monitoring points.
7.1.3	The scope of the intrusive investigation is presented below: • 3 boreholes drilled using a cable percussive drilling rig to 10.00mbgl; • 9 boreholes drilled using a windowless sample drilling rig to 3.80mbgl for geotechnical testing; • 9 trial pits excavated using a mechanical back-hoe excavator (JCB 3CX) to a maximum depth of 3.50mbgl; • Geotechnical laboratory testing (in situ Standard Penetration testing and hand vane testing) and ex situ sampling for laboratory testing; • Geoenvironmental laboratory testing commensurate with the findings of the CSM; and • 3 groundwater and ground gas monitoring visits.
7.1.4	A site plan showing the locations of each exploratory hole is provided in Appendix 1.

- 7.2**
- 7.2.1** **Exploratory Locations**
- The location of each exploratory hole is presented in the Figures in Appendix 1. A summary of the scope of each position and its coordinates are presented in Table 3 below.

ID	Type	Easting	Northing	Elevation (mAOD)
BH1	Cable Percussive Borehole	300843.960	93381.144	32.333
BH2	Cable Percussive Borehole	300806.956	93528.423	34.896
BH3	Cable Percussive Borehole	301002.579	93542.120	26.855
WS1	Windowless Sample Borehole	300798.594	93310.469	31.530
WS2	Windowless Sample Borehole	300789.545	93368.988	32.770
WS3	Windowless Sample Borehole	300885.658	93340.945	29.780
WS4	Windowless Sample Borehole	300826.113	93443.391	33.870
WS5	Windowless Sample Borehole	300909.847	93411.543	30.350
WS7	Windowless Sample Borehole	300752.177	93529.757	34.487
WS8	Windowless Sample Borehole	300800.540	93542.185	34.678
WS9	Windowless Sample Borehole	300937.726	93587.531	27.610
WS10	Windowless Sample Borehole	300942.779	93504.517	30.460
TP1	Trial Pit	300749.548	93339.910	32.894
TP2	Trial Pit	300869.134	93298.820	29.83
TP3	Trial Pit	300790.372	93409.970	33.235
TP4	Trial Pit	300907.315	93358.213	29.079
TP5	Trial Pit	300871.831	93436.921	32.916
TP6	Trial Pit	300816.870	93484.458	34.671
TP7	Trial Pit	300939.569	93398.33	27.887
TP8	Trial Pit	300840.527	93551.520	33.842
TP9	Trial Pit	300887.619	93540.752	31.877
TP10	Trial Pit	301014.742	93588.412	26.675

Table 3. Exploratory Location Details

7.3**Monitoring Wells****7.3.1**

Combined ground gas and groundwater wells were installed in the boreholes as outlined below. Full details of the installations are also provided on the borehole logs presented in Appendix 4.

ID	Drilling Depth mbgl [AOD]	Plain Well Section mbgl [AOD]	Slotted Well Section mbgl [AOD]
BH1	10.00 [22.33]	0.00 – 1.00 [32.33 – 31.33]	1.00 – 10.00 [31.33 – 22.33]
BH2	9.50 [25.40]	0.00 – 2.00 [34.90 – 32.90]	2.00 – 9.50 [23.90 – 25.40]
BH3	8.00 [18.86]	0.00 – 1.00 [26.86 – 25.86]	1.00 – 8.00 [25.86 – 18.86]
WS1	1.60 [29.93]	0.00 – 1.00 [31.53 – 30.53]	1.00 – 1.60 [30.53 – 29.93]
WS2	3.80 [28.97]	0.00 – 1.00 [32.77 – 31.77]	1.00 – 3.00 [31.77 – 29.77]
WS3	3.20 [26.58]	0.00 – 1.00 [29.78 – 28.78]	1.00 – 3.20 [28.78 – 26.58]
WS4	2.20 [31.67]	0.00 – 1.00 [33.87 – 32.87]	1.00 – 2.20 [32.87 – 31.67]
WS5	2.20 [28.15]	0.00 – 1.00 [30.35 – 29.35]	1.00 – 2.20 [29.35 – 28.15]
WS7	1.50 [32.99]	0.00 – 0.50 [34.49 – 33.99]	0.50 – 1.50 [33.99 – 32.99]
WS8	1.90 [32.78]	0.00 – 0.50 [34.68 – 34.18]	0.50 – 1.90 [34.18 – 32.78]
WS9	1.80 [25.81]	0.00 – 0.50 [27.61 – 27.11]	0.50 – 1.80 [27.11 – 25.81]
WS10	1.40 [29.06]	0.00 – 0.50 [30.46 – 29.96]	0.50 – 1.40 [29.96 – 29.03]

Table 4. Monitoring Well Installation Details

7.4	Sampling and Testing Strategy
7.4.1	Soil samples were collected from across the development area to provide an even coverage of both the Made Ground and natural strata. Samples were submitted for geotechnical testing in accordance with relevant versions of BSEN ISO 17892-6:2017, BSEN ISO 14688-1:2002, and BSEN 1997-2:2007. Environmental samples were submitted under controlled conditions with a Chain of Custody to i2 Analytical, a UKAS and MCerts accredited facility.
7.4.2	Environmental soil samples were tested for a suite of contaminants to assess the risks identified in the Phase 1 report: • Heavy Metals • Polyaromatic Hydrocarbons (PAH) • Total Petroleum Hydrocarbons (TPH) • Asbestos Screen and ID • Sulphates, Phenols and Cyanide • pH and Total Organic Carbon (TOC)
7.4.3	The results of the soil analysis are presented in Appendix 7.
7.4.4	Groundwater was encountered in during subsequent rounds of monitoring. Groundwater sampling was undertaken on 2 occasions. The samples were submitted to i2 Analytical for the following analysis: • Heavy Metals • Polyaromatic Hydrocarbons (PAH) • Total Petroleum Hydrocarbons (TPH) • Asbestos Screen and ID • Sulphates, Phenols and Cyanide • pH and Total Organic Carbon (TOC) • Volatile Organic Compounds (VOC) and Semi-Volatile Organic Compounds (SVOC)
7.4.5	The results of the groundwater analysis are provided in Appendix 7.
7.4.6	Gas and groundwater monitoring was undertaken using a multi-probe gas analyser and dip meter. The results are presented in Appendix 8.
7.4.7	Soil samples were also recovered for geotechnical testing, which included: • Atterberg testing with natural moisture content • Particle Size Distribution • Sulphates and pH • Undrained shear strength (Triaxial) • Compaction testing

7.4.8 The results of the geotechnical testing are presented in Appendix 9.

8.0 GROUND CONDITIONS

8.1 General

8.1.1 The ground conditions are described in detail in the logs that are presented within Appendix 4 and 5. A summary of the ground conditions is also presented in Table 5.

Depth From (min/max) mbgl	Depth To (min/max) mbgl	Soil Type	Description
0.00	0.10 / 0.30	TOPSOIL	TOPSOIL comprising dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-rounded sandstone and mudstone. Sand is fine to coarse. Rootlets present.
0.00	0.10	MADE GROUND	MADE GROUND. Dark reddish brown slightly sandy gravelly CLAY. Gravel is angular and sub-angular fine to coarse brick, quartzite, sandstone, flint and rare slag.
0.10 / 0.30	1.50	SANDY GRAVEL	Dense to very dense brown clayey sandy sub-rounded and rounded fine to coarse quartzite and sandstone GRAVEL with medium rounded sandstone cobble content. Northeast corner only.
0.10 / 1.50	6.80 / 9.00	CLAY	Stiff reddish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded sandstone and mudstone.
6.80 / 9.00	Unproven	MUDSTONE	Very dense reddish brown MUDSTONE. BH1 and BH2 only.

Table 5. Summary of Ground Conditions

8.1.2 Generally the geology was as expected and matched the mapped geology of this area.

8.2 Olfactory and Visible Evidence of Contamination

8.2.1 No significant olfactory or visible evidence of contamination was encountered.

8.3 Obstructions

8.3.1 Although a number of the windowless sample boreholes terminated at shallow depths, these were due to very dense geology rather than obstructions within the ground.

8.4 Groundwater

8.4.1 Groundwater was not encountered during drilling. However, during the three monitoring visits, groundwater was identified at depths of between 25.74mAOD and 34.13mAOD. Groundwater flow is considered to be towards the northeast. Groundwater levels are presented in Table 6.

8.4.2 During Visit 1, only BH1, BH2, BH3 and WS9 contained water. The remaining boreholes were dry. During Visit 2, WS9 was flooded and WS4 was dry. During Visit 3, WS1, WS2 and WS9 were flooded and WS4 was dry.

8.4.3

Borehole Name	Response Zone (mbgl) [mAOD]	Depth (mbgl) [mAOD]		
		5 May 2021	13 May 2021	20 May 2021
BH1	1.00 – 10.00 [31.33 – 22.33]	4.12 [28.21]	3.99 [28.34]	3.26 [29.07]
BH2	2.00 – 9.50 [23.90 – 25.40]	6.87 [28.03]	6.58 [28.32]	5.72 [29.18]
BH3	1.00 – 8.00 [25.86 – 18.86]	1.12 [25.74]	0.82 [26.04]	0.68 [26.18]
WS1	1.00 – 1.60 [30.53 – 29.93]	Dry	0.84 [30.69]	0.01 [31.52]
WS2	1.00 – 3.00 [31.77 – 29.77]	Dry	2.24 [30.53]	0.00 [32.77]
WS3	1.00 – 3.20 [28.78 – 26.58]	Bung stuck in pipe	Bung stuck in pipe	Bung stuck in pipe
WS4	1.00 – 2.20 [32.87 – 31.67]	Dry	Dry	Dry
WS5	1.00 – 2.20 [29.35 – 28.15]	Dry	0.48 [29.87]	Dry
WS7	0.50 – 1.50 [33.99 – 32.99]	Dry	1.08 [33.41]	0.40 [34.09]
WS8	0.50 – 1.90 [34.18 – 32.78]	Dry	0.86 [33.82]	0.55 [34.13]
WS9	0.50 – 1.80 [27.11 – 25.81]	0.79 [26.82]	0.00 [27.61]	0.01 [27.60]
WS10	0.50 – 1.40 [29.96 – 29.03]	Dry	1.47 [28.99]	1.36 [29.10]

Table 6. Groundwater Monitoring Results

8.5	Gas Monitoring
8.5.1	Gas monitoring was undertaken on three occasions on 5 May 2021, 13 May 2021 and 20 May 2021.
8.5.2	During the monitoring visits it was noted that the bung within WS3 was stuck within the well pipe and it could not be removed. As such, the gas readings were collected but the groundwater depth could not be taken.
8.6	Constraints
8.6.1	The investigation was completed during growing season and it was understood that crops had recently been planted. The location of boreholes was limited to ensure that minimal damage to the crops occurred.

9.0 GEOTECHNICAL RESULTS

9.1

Ground Conditions Discussion

9.1.1

The geotechnical laboratory and in-situ test results from the current site investigation are summarised in Table 7. The geotechnical results can be found in Appendix 9.

9.1.2

Geotechnical Testing	Geology			
	Topsoil / Made Ground	Sandy Gravel (Head Deposits)	Clay (Upper Aylesbeare Mudstone Group)	Mudstone (Aylesbeare Mudstone Group)
Standard Penetration Test (SPT) – N Value (uncorrected)	N/A	48	7 – 50	50
In-situ Hand Vane Test Results (kN/m2)	N/A	N/A	60 – 130	N/A
Moisture Content (%)	N/A	N/A	16.7 – 25.1	N/A
Liquid Limit (%)	N/A	N/A	33 – 56	N/A
Plastic Limit (%)	N/A	N/A	15 – 24	N/A
Plasticity Index (%)	N/A	N/A	18 – 34	N/A
Sulphate (g/l)	N/A	0.50 – 0.61	<0.010 – 0.37	<0.010
pH	N/A	6.2 – 7.5	7.5 – 8.9	7.4 – 9 .1

	Geotechnical Testing	Geology			
		Topsoil / Made Ground	Sandy Gravel (Head Deposits)	Clay (Upper Aylesbeare Mudstone Group)	Mudstone (Aylesbeare Mudstone Group)
	Particle Size Distribution (%)	N/A	Silt and Clay: 8 – 20% Sand: 19 – 23% Gravel: 61 – 67% Cobbles and Boulders: 0 – 7%	Clay: 17% Silt: 24% Sand: 38% Gravel: 21% Cobbles and Boulders: 0%	N/A
	Particle Density (Mg/m ³)	N/A	N/A	2.7	N/A
Table 7. Summary of Geotechnical Testing					
9.1.3	A plot of SPT 'N' values against elevation is presented in Plate 2. The SPT hammer energy efficiency was 83%. Whilst these are above the standard 60% energy ratio, the SPT 'N' values have not been modified in order to provide conservative values.				

9.1.4

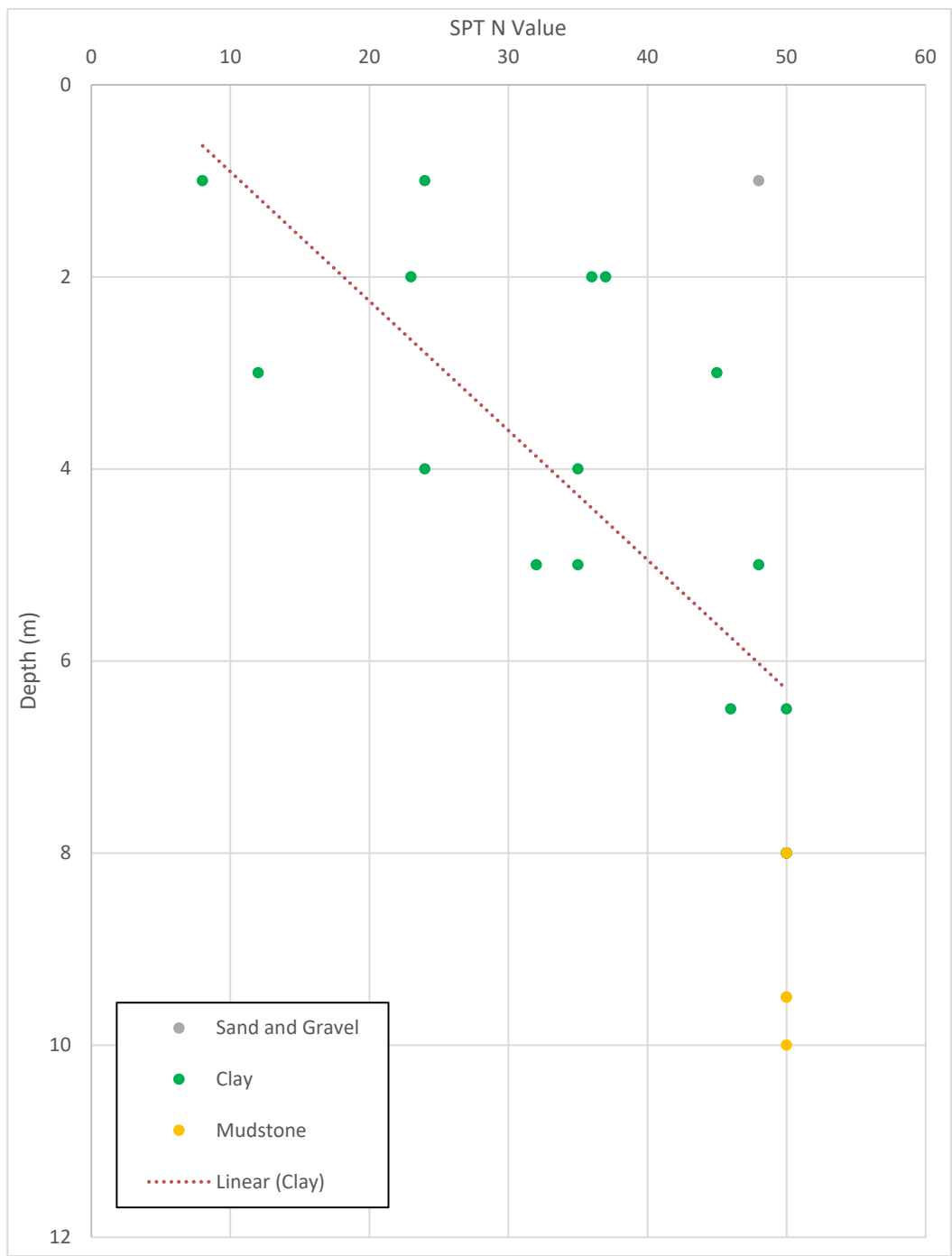


Plate 2. SPT 'N' values against level

9.1.5

The graphs shows that SPT 'N' values increased with depth.

9.2	Topsoil / Made Ground
9.2.1	The topsoil was described as comprising dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-rounded sandstone and mudstone. The topsoil was encountered between ground level and 0.30mbgl.
9.2.2	The Made Ground was generally described as a dark reddish brown slightly sandy gravelly CLAY. Gravel is angular and sub-angular fine to coarse brick, quartzite, sandstone, flint and rare slag. This deposit was identified between ground level and 0.10mbgl across the exploratory holes undertaken.
9.2.3	No in-situ testing or geotechnical laboratory testing was undertaken on these deposits due to their shallow depths.
9.3	Sandy Gravel – Head Deposits
9.3.1	Head deposits were encountered between 0.30mbgl and 1.50mbgl in the northeast corner of the site. This is where head deposits are mapped by the BGS. The deposits were described as dense to very dense brown clayey sandy sub-rounded and rounded fine to coarse quartzite and sandstone GRAVEL with medium rounded sandstone cobble content.
9.3.2	A single SPT was undertaken within the head deposits at 1.00mbgl. The 'N' value was 48 which corresponds to dense based on BS5930.
9.3.3	In addition, a Particle Size Distribution test was completed on the deposit. The results identified the silt and clay component relates to 8 – 20% of the sample, the sand component was 19 – 23%, the gravel component was 61 – 67% and the cobbles and boulder content was 0 – 7%.
9.4	Clay – Aylesbeare Mudstone Group
9.4.1	A clay deposit was encountered across the majority of the site and underlay the head deposits identified in BH03. The deposits were encountered between 0.10mbgl and 9.00mbgl. The deposit was described as a stiff reddish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, sub-rounded sandstone and mudstone.
9.4.2	SPT 'N' values were found to range between 8 and 50. Based on the correlations developed by Stroud (1975) between SPT 'N' and Plasticity Index, these suggest undrained shear strengths of between 34kN/m ² (soft) and 212.5kN/m ² (very stiff). However, it should be recognised that SPTs do not always produce accurate results in cohesive materials. Therefore, the hand shear vane results of 60kN/m ² (firm) to 130kN/m ² (stiff) should take precedence.
9.4.3	Samples of the clay were submitted for Atterberg testing. The results indicated the Plasticity Index ranged between 18% and 34%.
9.4.4	Two particle density tests were undertaken on the clay deposit. The results found the particle density to be 2.7Mg/m ³ .
9.4.5	pH and sulphate tests were undertaken on the clay deposit. The results identified the pH ranged between 7.5 and 8.9 and the sulphate ranged between <0.010 to 0.37g/l.

9.4.6	Due to the slightly granular nature of the deposit, a Particle Size Distribution test was completed. The results identified the silt component relates to 17% of the sample, the clay component was 24%, the sand component was 38%, the gravel component was 21% and the cobbles and boulder content was 0%.
9.5	Mudstone – Aylesbeare Mudstone Group
9.5.1	Mudstone was encountered at the base of BH1 and BH2, between depths of 6.80mbgl the extent of the investigation at 10.00mbgl. The mudstone was described as very dense reddish brown MUDSTONE.
9.5.2	SPT 'N' values were found to be 50 or greater..
9.5.3	pH and sulphate tests were undertaken on the mudstone. The results identified the pH ranged between 7.4 and 9.1 and the sulphate results were <0.010g/l.

10.0 GEOENVIRONMENTAL RESULTS

10.1	Analytical Test Results
10.1.1	Chemical testing was completed on soil and water samples from the investigation to determine the concentration of potential contaminants arising from existing and historical site uses, in line with the Conceptual Site Model. The results of the soil and groundwater analysis have been compared to a screening value to assess the degree of risk. The results are presented in a screening table in Appendix 8 and summarised below. The laboratory test certificates are also provided in Appendix 8.
10.1.2	The Soil Organic Matter (SOM) content of the Made Ground and natural soils ranged between <0.1% and 2.2%. The GACs used in this assessment are based on a SOM content of 1% which is considered to reflect the conditions present onsite and provides the basis for a conservative assessment.
10.2	Analytical Test Results – Made Ground Soils
10.2.1	The results from the Made Ground have been compared to industry accepted screening values known as Generic Assessment Criteria (GAC) to determine the risks to human health. The GAC used in this investigation includes Category 4 Screening Levels and Suitable 4 Use Levels (C4SLs and S4ULs). The GAC selected is based on a commercial land use in line with the proposed development. The screening assessment is presented Appendix 10. A detailed methodology for the assessment is presented in Appendix 11.
10.2.2	The results identified that there were no exceedances of the contaminants tested, above acceptable thresholds for a commercial land use.
10.3	Analytical Test Results – Natural Soils
10.3.1	The results of the chemical analysis on the natural soil samples are presented in Appendix 7. The results were compared to the GAC for a commercial use.

10.3.2	No exceedances, above acceptable thresholds for a commercial land use, were identified of the contaminants tested from natural soils.
10.4	Analytical Test Results - Groundwater
10.4.1	The results from the groundwater analysis have been compared with Tier 1 screening values, as for the soils. This has included Environmental Quality Standards (EQS) for freshwater, due to the presence of the drainage ditch on the eastern boundary, which would be considered the most sensitive surface water receptor.
10.4.2	No assessment has been completed against the Drinking Water Standards (DWS) as there are no sensitive potable abstractions within a 1km radius and the site is not within an SPZ.
10.4.3	Groundwater was sampled on one occasion between 5 May 2021 and 6 May 2021 from boreholes BH1, BH2, BH3 and WS9. Due to the small sample population, statistical analysis was not completed. Instead, the results were directly compared to the EQS. The results from the analysis and laboratory test certificates are presented in Appendix 7.
10.4.4	No exceedances of the EQS have been identified.
10.5	Gas Monitoring Results
10.5.1	Pollutant linkages associated with risks from ground gas to the property and to human health have been assessed using BS 8485:2015+A1:2019 <i>'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.'</i>
10.5.2	Three gas monitoring visits were undertaken on 5 May 2021, 13 May 2021 and 20 May 2021. A summary of the results from the gas monitoring have been presented in Table 8. The gas monitoring records are presented in Appendix 8.

10.5.3

Exploratory Hole	Steady Flow (l/hr)	Steady Methane (%)	Steady Carbon Dioxide (%)	Minimum Oxygen (%)	Steady Hydrogen Sulphide (ppm)	Steady Carbon Monoxide (ppm)	VOC (ppm)	Atmospheric Pressure (mbar)
BH1	0.3	3.2	4.6	4.8	Not detected	Not detected	Not detected	1007 – 1016
BH2	0.3	2.2	0.8	19.4	Not detected	Not detected	0.1	1007 – 1016
BH3	1.1	0.1	0.9	19.9	Not detected	3	0.1	1007 – 1016
WS1	0.0	0.1	1.3	18.0	Not detected	2	Not detected	1007 – 1016
WS2	0.0	0.1	1.3	13.7	Not detected	1	Not detected	1007 – 1016
WS3	10.2	0.4	2.3	17.6	Not detected	Not detected	Not detected	1007 – 1016
WS4	2.6	33.9	9.2	1.0	Not detected	1	Not detected	1007 – 1016
WS5	0.8	Not detected	0.6	20.0	Not detected	Not detected	Not detected	1007 – 1016
WS7	0.3	0.2	1.0	19.7	Not detected	3	0.2	1007 – 1016
WS8	0.4	0.1	1.5	18.4	1	5	1.8	1007 – 1016
WS9	-0.1	Not detected	Not detected	20.7	Not detected	1	0.1	1007 – 1016
WS10	0.9	Not detected	4.0	12.1	Not detected	Not detected	0.1	1007 – 1016

Table 8. Summary of Gas Monitoring Results

10.5.4

The results for the gas monitoring identified levels of methane were recorded to be between <0.1% v/v and 33.9% v/v. In addition, carbon dioxide levels were found to be between <0.1% v/v and 9.2% v/v. Flow readings varied between boreholes and ranged between 0.0 l/hr and 10.2 l/hr.

10.5.5

The ground gas monitoring was undertaken over periods of high atmospheric pressure ranging between 1007mb and 1016mb. No monitoring during atmospheric pressure events below 1000mb were undertaken due to the time available for the investigation and due to the investigation being completed throughout a period of dry weather.

10.6

Domestic Drinking Water Supply Pipework Assessment

10.6.1

The assessment for whether barrier pipework is likely to be required as part of the development has been undertaken by directly comparing the results from the soil testing with the Polyethylene (PE), metal and barrier pipe thresholds.

10.6.2

The concentrations of TPH marginally exceed the thresholds and therefore, it is considered that barrier pipework would be required.

10.7	Phytotoxic Analysis
10.7.1	The concentrations of Copper, Nickel and Zinc have been evaluated against the British Standard for Topsoil (BS3882:2015).
10.7.2	The results found the concentrations of Copper, Nickel and Zinc are below the thresholds. However, due to the lack of topsoil situated onsite, it is likely that imported soil would be required to form a suitable growth medium in areas of soft landscaping.

11.0 DISCUSSION

11.1	Environmental Findings
11.1.1	This section evaluates the risks to potential receptors at the site from identified chemical contamination. Potential receptors have been identified in line with the CSM presented in Table 1 and reference to environmental guidance, whereby all receptors have been considered. Additional information on the assessment is presented in Appendix 10.
11.2	Risks to Human Health from Soil Derived Contaminants
11.2.1	It is understood that a Phase 2 Ground Investigation Report is required to provide additional preliminary data on ground conditions at the site to facilitate the development of a mixed commercial use site. It is understood that there will be some areas of soft landscaping incorporated into the development.
11.2.2	On this basis, the laboratory test results were compared against the GAC for a commercial land use. The results were separated between Made Ground and natural soils.
11.2.3	The results from the environmental chemical testing has not identified exceedances of the GAC used. As such, the risk to human health is considered to be low .
11.2.4	In addition, based on the results of the environmental testing, the results to offsite users is considered to be low .
11.3	Risks to Human Health from Ground Gas
11.3.1	The Gas Risk Assessment has been carried out in general accordance with BS8485:2015+A1:2019 whereby the Characteristic Situation (CS) of the site has been identified. The Characteristic Situation ranges are between 1 and 6 and determine the gas risk to the property and the level of protection required. The process calculates a Gas Screening Value (GSV) based on gas monitoring which was undertaken based on boreholes within the Made Ground and natural geology.

11.3.2	The GSV for the site has been calculated based on the maximum concentration of methane or carbon dioxide monitored and the maximum flow rate recorded in the boreholes using the equation: $GSV = q \left(\frac{Chg}{100} \right)$ Where: • Chg = Concentration of a specific hazardous gas expressed as a percentage of total gas volume (%v/v) • q = Total gas flow from a borehole in litres per hour (l/hr) • Qhg = Calculated flow rate of a specific hazardous gas from a borehole reading The results are then compared to tables set out in the guidance for assessment.
11.3.3	During a review of historical mapping a pond feature was identified as potentially being infilled. This area was relatively small and therefore no significant sources of ground gas were anticipated onsite. In addition, a nominal thickness of Made Ground was identified during the investigation, and whilst this can be considered a source of ground gas, the composition was not considered to be particularly capable of generating ground gas. Nevertheless, monitoring wells were installed as part of the investigation and three rounds of gas monitoring were undertaken.
11.3.4	Gas monitoring was undertaken over a range of atmospheric pressures to understand the gas regime in best case (high pressure) and worst case (low pressure) scenarios. The atmospheric pressure range was between 1007mb and 1016mb. No monitoring during atmospheric pressure events below 1000mb were undertaken due to the time available for the investigation and due to the investigation being completed throughout a period of dry weather.
11.3.5	The results for the gas monitoring identified levels of methane were recorded to be between <0.1% v/v and 33.9% v/v. In addition, carbon dioxide levels were found to be between <0.1% v/v and 9.2% v/v. Flow readings varied between boreholes and ranged between 0.0 l/hr and 10.2 l/hr.
11.3.6	The GSV for a worst case scenario was calculated using the greatest methane reading of 33.9% and the greatest flow reading of 10.2 l/hr. Based on a preliminary worst case assessment the GSV has been calculated as 3.46 l/hr which falls within CS3 – Moderate Risk.
11.3.7	Whilst the risk rating listed above demonstrates a worst case, elevated carbon dioxide and methane readings were only encountered in WS4. The remaining boreholes found levels of carbon dioxide and methane were below 5%. By evaluating the remaining boreholes, it appears that the Characteristic Situation is likely to be CS1.
11.3.8	The borehole log for WS4 indicates that between 1.55mbgl and 2.20mbgl, fragments of coal were encountered. This may therefore have resulted in the elevated gas levels recorded.
11.3.9	Based on the above, it is considered that the site should be classified as CS1. However, some localised source removal should be undertaken around WS4 to ensure the levels of gases are reduced. As such, no gas protection systems are necessary as there are not considered to be intolerable risks to the development or future site users. In addition, the site is not situated within a Radon Affected Area and as such, radon gas protection is not considered to be required. As such, the risk from ground gas is Low.

11.4	Risks to Controlled Waters from Groundwater
11.4.1	The results of the chemical testing of the groundwater found no exceedances of the EQS. Therefore, the risk to Controlled Waters is considered to be low .
11.5	Property and Infrastructure
11.5.1	Plant growth is not expected to be affected by contaminant concentrations based on the results of the chemical testing. As such, the risk to plants and vegetation from phytotoxic contaminants is deemed to be low .
11.5.2	From a preliminary risk assessment of the results to thresholds set in the UK Water Industry Research (2010) ' <i>Guidance for the selection of water supply pipes to be used in brownfield sites</i> ', it is possible that barrier water pipes may be required for drinking water supply pipework. This is based on marginal exceedances of TPH found within the soils. As the exceedances were marginal, it may be possible to discuss the findings with the local water provider to discuss their requirements. As such, the risk rating is considered to be low to medium .
11.6	Waste Management
11.6.1	It is anticipated that throughout the development, surplus soil will be created from reducing ground levels and from foundation arisings. The arisings will therefore need to be managed appropriately. Whilst some arisings may require disposal off-site as waste, it is likely that the majority of the surplus soil could be re-used either onsite or on another site under the Definition of Waste: Code of Practice (DoW CoP) outlined by CL:AIRE. At this stage, it is anticipated that the nominal thickness of Made Ground would be classified as non-hazardous and the underlying natural soil would be classified as inert. Therefore under DoW CoP it would be possible for the Made Ground to be reused onsite and the surplus natural soil could be reused through the direct transfer of clean and naturally occurring soils materials between sites. This method would promote a sustainable management strategy for soil arisings.
11.6.2	If material is to be removed as waste, then this report including the laboratory certificates and drilling logs provided in the appendices, should be provided to the waste receivers to confirm their ability to accept waste arisings from the site. It is the waste producer's responsibility to classify and appropriately manage waste under duty of care (section 34 of the Environmental Protection Act 1990).
11.7	Risk Evaluation
11.7.1	Following the implementation of the Phase 2 site investigation, the pollutant linkages identified in the CSM have been re-evaluated and re-classified in relation to the additional information obtained. The risk assessment has been completed for the proposed redevelopment.
11.7.2	The overall rating for the redevelopment of the site is low to medium . The risk assessment is summarised in Table 9 below.

11.7.3

Receptor	Potential sources	Pathways	Risk	Justification
Future Site Users (Human Health)	Contaminants within the underlying Made Ground.	Direct contact, ingestion, and inhalation via outdoor soils or translocated soil and dust indoors.		Low: Based on the chemical test results, no exceedances of the GAC for a commercial end use have been identified. As such, the risk to site users is considered to be low.
	Ground gas and vapour	Inhalation, Migration through granular and fractured soils into confined spaces.		Low: The gas monitoring has identified the site can be characterised as CS1 whereby no gas protection is required. There is a single area of elevated gas (WS4) which will need to be addressed to ensure there is a low risk.
Offsite Users (Human Health)	Contaminants within the underlying Made Ground.	Direct contact, ingestion, and inhalation via outdoor soils or translocated soil and dust indoors.		Low: Based on the chemical test results, no exceedances of the GAC for a commercial end use have been identified. As such, the risk to offsite users is considered to be low.
	Ground gas and vapour	Inhalation, Migration through granular and fractured soils into confined spaces.		Low: The gas monitoring has not identified significant ground gas levels that could affect offsite users.
Property (including Water Supply Pipes)	Contaminants within the underlying Made Ground.	Direct contact between soil and structures or services.		Low to medium: A marginal exceedance of the water supply pipe threshold was encountered. Despite this, it may be possible to discuss the results with the water provider to see if standard pipework would be acceptable.
	Ground gas and vapour	Migration through granular and fractured soils into confined spaces.		Low: The gas monitoring has identified the site can be characterised as CS1 whereby no gas protection is required. There is a single area of elevated gas (WS4) which will need to be addressed to ensure there is a low risk.
Groundwater (Secondary Aquifer)	Contaminants within the underlying Made Ground.	Soil leaching and migration of potential contamination.		Low: Based on the chemical test results, no exceedances of the test criteria have been identified. As such, the risk to the underlying Aquifer is considered to be low.
Surface Water (Drainage Ditch)	Contaminants within the underlying Made Ground.	Soil leaching and migration of potential contamination.		Low: Based on the chemical test results, no exceedances of the test criteria have been identified. As such, the risk to the adjacent drainage ditch is considered to be low.

Table 9. Revised Conceptual Site Model

12.0 CONCLUSIONS

12.1	Ground Conditions
12.1.1	The ground conditions encountered were similar to the geology mapped by BGS and comprised Head Deposits in the northeast corner of the site and the Aylesbeare Mudstone Group in remaining site areas. The Head Deposits were found to a maximum depth of 1.50mbgl. The Aylesbeare Mudstone Group was described as a stiff reddish brown sandy gravelly clay to 9.00mbgl over mudstone to the extent of the investigation at 10.00mbgl. In addition, the investigation identified nominal areas of Topsoil and Made Ground to a maximum depth of 0.30mbgl.
12.1.2	Groundwater was not encountered during drilling. However, during the three monitoring visits, groundwater was identified at depths of between 25.74mAOD and 34.13mAOD. Groundwater flow is considered to be towards the northeast.
12.2	Contamination and Remediation
12.2.1	The results of the chemical analysis of the Made Ground and natural soils identified that the concentration of the contaminants tested were below the GAC for a commercial land use. As such, the risks to human health are considered to be low. Furthermore, the risk to Controlled Waters was considered to be low due to the low concentration of contaminants identified. Overall, it is considered that there is a low risk associated with the site in respect of land contamination and the site is considered suitable for development for a commercial end use. No ground remediation is considered to be necessary.
12.2.2	Based on the above, it is considered that the site should be classified as CS1. However, some localised source removal should be undertaken around WS4 to ensure the levels of gases are reduced. As such, no gas protection systems are necessary as there are not considered to be intolerable risks to the development or future site users. In addition, the site is not situated within a Radon Affected Area and as such, radon gas protection is not considered to be required. As such, the risk from ground gas is low .
12.2.3	Paragon has identified a minor exceedance of the thresholds for barrier pipework, and as such barrier pipework may be required as part of the redevelopment.
12.2.4	Due to the lack of topsoil identified onsite, it is considered that imported topsoil is likely to be required to provide a healthy growth medium for areas of soft landscaping.
12.3	Geotechnical Findings
12.3.1	Geotechnical parameters have been derived based on the results of in-situ and laboratory testing.
12.3.2	Shallow foundations and ground floor slabs are considered appropriate for the proposed commercial development.
12.3.3	A buried concrete classification assessment has been carried out to determine the DS and ACEC classification for the Head Deposits and the Aylesbeare Mudstone Group. At this stage DS-2 AC-2 is considered appropriate for the Head Deposits and DS-1, AC-1 is considered appropriate for the Aylesbeare Mudstone Group.

12.3.4	Whilst CBR testing has not been completed as part of this investigation it is considered that that a CBR of 3% is suitable in cohesive soils and 20% in granular deposits. Once the alignment and formation level of the pavements and roads have been established, the formation level should be exposed, proof rolled, inspected and insitu tested to identify weak/soft spots and areas that are below the design criteria. These should be removed and replaced with well compacted granular backfill.
--------	--

13.0 GEOENVIRONMENTAL RECOMMENDATIONS

13.1	Contamination and Remediation
13.1.1	Whilst it is unlikely, in the event that previously unidentified contamination is uncovered during construction, works should cease until inspection and testing has been undertaken by an appropriately qualified person. A watching brief and discovery strategy should be implemented during the development.
13.2	Gas Protection Measures
13.2.1	Based on the above, it is considered that the site should be classified as CS1. However, some localised source removal should be undertaken around WS4 to ensure the levels of gases are reduced. As such, no gas protection systems are necessary as there are not considered to be intolerable risks to the development or future site users. In addition, the site is not situated within a Radon Affected Area and as such, radon gas protection is not considered to be required. As such, the risk from ground gas is Low .
13.3	Buried Services
13.3.1	From a preliminary risk assessment of the results to thresholds set in the UK Water Industry Research (2010) ' <i>Guidance for the selection of water supply pipes to be used in brownfield sites</i> ', it is possible that barrier water pipes may be required for drinking water supply pipework. This is based on marginal exceedances of TPH found within the soils. As the exceedances were marginal, it may be possible to discuss the findings with the local water provider to discuss their requirements.

14.0 GEOTECHNICAL RECOMMENDATIONS

14.1	Geotechnical Discussion – Ground Conditions
14.1.1	The ground conditions encountered were similar to the geology mapped by BGS and comprised Head Deposits in the northeast corner of the site and the Aylesbeare Mudstone Group in remaining site areas. The Head Deposits were found to a maximum depth of 1.50mbgl. The Aylesbeare Mudstone Group was described as a stiff reddish brown sandy gravelly clay to 9.00mbgl over mudstone to the extent of the investigation at 10.00mbgl. In addition, the investigation identified nominal areas of Topsoil and Made Ground to a maximum depth of 0.30mbgl.
14.1.2	The topography of the site sloped towards the northeast corner of the site. As such, some degree of leveling and material movement may be required.

14.2	Swelling and Shrinkage
14.2.1	Based on the geotechnical laboratory test results, an overall classification of NHBC low to medium Volume Change Potential (VCP) is recommended for the Clay within the Aylesbeare Mudstone Group. The Head Deposits can be assumed to be negligibly shrinkable.
14.3	Groundwater
14.3.1	Groundwater was not encountered during drilling. However, during the three monitoring visits, groundwater was identified at depths of between 25.74mAOD and 34.13mAOD. Groundwater flow is considered to be towards the northeast.
14.4	Foundations
14.4.1	The Made Ground and topsoil are not considered to be suitable bearing stratum for shallow foundations. In addition, due to the limited thickness of granular deposits in the northeast part of the site, the Head Deposits are also not considered to be a suitable bearing stratum. As such, all loads should be transferred beneath these soils.
14.4.2	Based on the hand shear vane and SPT data, the Clay and Mudstone noted within the Aylesbeare Mudstone Group are considered to be suitable founding strata. The founding depth should be determined at a later stage and will depend on the proposed loadings. Local deepening of foundations may be required in the location of trees or areas of high volume change potential. At this stage a bearing pressure of 200kPa could be considered for the Clay within the Aylesbeare Mudstone Group based on BS8004.
14.4.3	At this stage, it is considered that traditional shallow foundations would be suitable for the proposed commercial units.
14.5	Buried Concrete Sulphate Durability Classification
14.5.1	Soil samples from the strata encountered were sent for laboratory testing to determine the sulphate concentrations and pH in accordance with Building Research Establishment (BRE) SD1 guidance ¹ . The test results can be found in Appendix 9. A summary of the Design Sulphate (DS) and Aggressive Chemical Environment for Concrete (ACEC) classes are provided in Table 10.

¹ Building Research Establishment. (2005). Special Digest 1 – Concrete in aggressive ground, third edition.

14.5.2	Stratum	pH	Water Soluble Sulphate as SO₄ (2:1) g/l	Design Sulphate (DS) Class [ACEC]
	Sand and Gravel (Head Deposits)	6.2 – 7.5	0.50 – 0.61	DS-2 [AC-2]
	Clay (Upper Aylesbeare Mudstone Group)	7.5 – 8.9	<0.010 – 0.37	DS-1 [AC-1]
	Mudstone (Aylesbeare Mudstone Group)	7.4 – 9.1	<0.010	DS-1 [AC-1]
Table 10. Design Sulphate (DS) Classification for Encountered Soil Strata				
14.6	Floor Slabs			
14.6.1	Based on the ground model and assumed development formation level, it is recommended that floor slabs can be ground bearing, subject to appropriate proof rolling and inspection of the formation soils prior to blinding and slab construction. Any identified weak or soft spots across the formation should be removed and backfilled within compacted granular fill. The formation should also be blinded as soon as possible after the above preparation works to prevent deterioration. All floor slabs should be designed to accommodate soils of medium volume change potential.			
14.7	Pavements and Roads			
14.7.1	An assessment of the current data suggests that roads or pavements within locations where the ground conditions are found to be predominately cohesive, should be design for a CBR of 3%. In locations where the formation is predominately granular, pavements and roads can be designed for a CBR value of 20%.			
14.7.2	Once the alignment and formation level for the roads and pavements has been establish, it is recommended that the formation level should be exposed, proof rolled, inspected and insitu CBR tested. Locations identified as being weak/soft spots or falling below the design criteria above should be removed and replaced with well compacted granular fill.			
14.8	Excavations			
14.8.1	Shallow excavations should not pose difficulties for conventional excavators and earthmoving equipment. Excavations should be planned and inspected regularly by a competent person. No operative should enter un-shored or excavations identified as unstable by a competent person, however shallow they are, in accordance with guidance presented in CIRIA Report 97 ² .			
14.8.2	Should groundwater be encountered during excavation works, it is expected that this can be controlled through sump pumping.			

² CIRIA Report 97 (1992). *Trenching Practise – Second Edition*. Construction Industry Research and Information Association Report 97.

14.9 Soakaways

14.9.1 Permeability testing was not within the scope of the investigation. However, we are able to present typical infiltration rates for sandy gravels and clay based on various publications. The results are presented in Table 11 below.

14.9.2	Stratum	BGS Infiltration Rate
	Sand and Gravel (Head Deposits)	1×10^{-3} to 1×10^{-5}
	Clay (Aylesbeare Mudstone Group)	3×10^{-9} to 3×10^{-11}

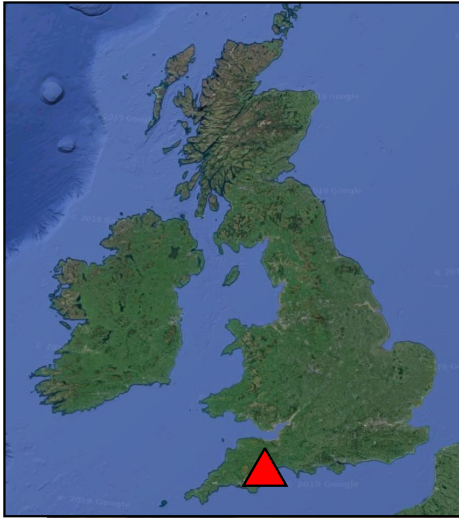
Table 11. Typical Infiltration Rates

14.9.3 Based on the above, traditional soakaways may not be appropriate for the Aylesbeare Mudstone Group. However, soakaways may be possible in the northeast corner of the site where the Head Deposits were encountered.

14.10 Earthworks

14.10.1 No earthworks testing has been undertaken as part of this investigation. Should any significant cut and fill be required for the chosen development layout, it is recommended that further investigation is undertaken to establish earthworks parameters. This would normally include compaction and particle size distribution testing as a minimum.

APPENDIX 1: FIGURES



Paragon Building Consultancy
The Harlequin Building
65 Southwark Street
London
SE1 0HR
020 7125 0112
www.paragonbc.co.uk

Key



Site Boundary

Notes

Rev	Description	Date

Project 210159 Exeter Airpark	Scale	Not to scale
	Drawn by	CB
	Approved By	TC
Title Site Location Plan	Drawing Number	1
	Date	24 March 2021



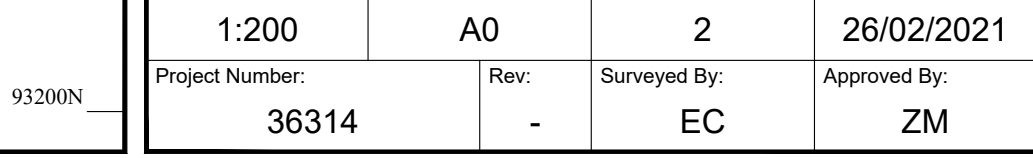
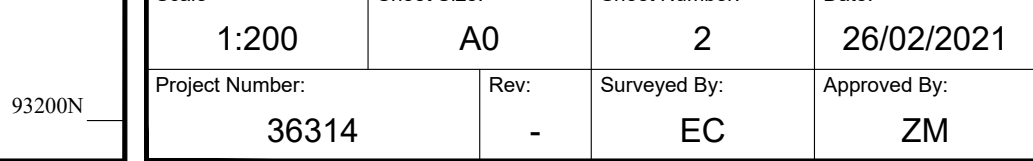
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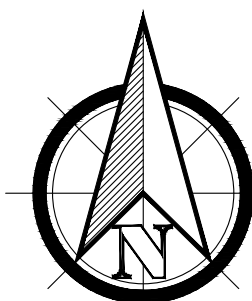
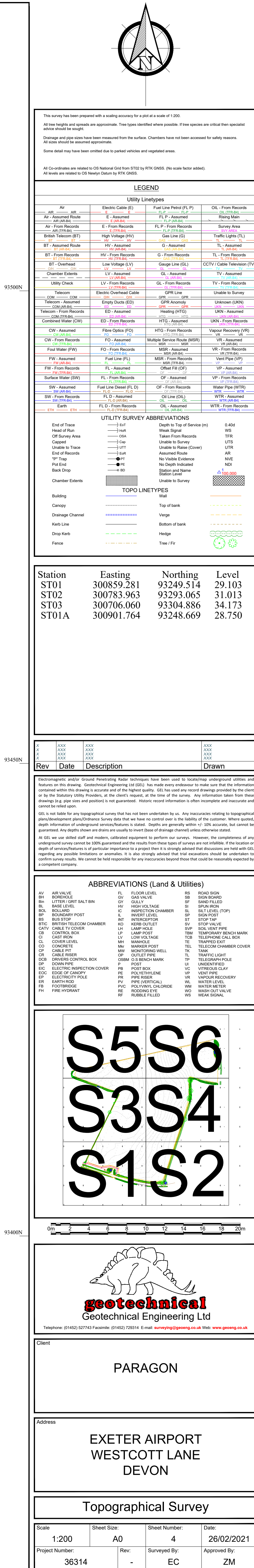
Intrusive Locations

- Cable Percussive Borehole
- ▲ Windowless Sample Borehole
- Trial Pit
- Site Boundary

Rev	Description	Date

Project 210159 Exeter Air Park	Scale 1:2500
	Drawn by CB
	Approved By TC
Title Intrusive Locations	Drawing Number 2
	Date 15 May 2021





Some detail may have been omitted due to parked vehicles and vegetated areas.

All Co-ordinates are related to OS National Grid from 5732 by RTK GNSS. (No scale factor added)
All levels are related to OS Newlyn Datum by RTK GNSS.

LEGEND

[illegible]

UTILITY SURVEY ABBREVIATIONS

End of Trace	Depth to Top of Service (m)	0.40d
End of Run	Went Dry	MS
Off Survey Area	6.51	
Claypan?	Take From Records	TRE
Unable to Trace	Unable to Survey	UTS
End of Records	Unable to Reach Close Contact	LTR
Top	Assumed Loose	AR
Put End	No More Distance	NDI
Back Dip	No Depth and Name Station Used	
Chamber Extends	Unable to Survey	

TOPO LINEITIES	
Building	Wall
Canopy	Top of bank
Drainage Channel	Verge
Kerb Line	Bottom of bank
Drain Kurb	Parapet
Fence	Tree / Frie

Station	Easting	Northing	Level
ST01	300859.281	93249.514	29.103
ST02	300783.963	93293.065	31.013
ST03	300706.060	93304.886	34.173
ST01A	300901.764	93248.669	28.750

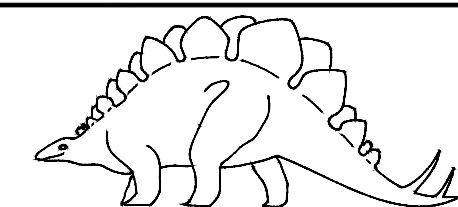
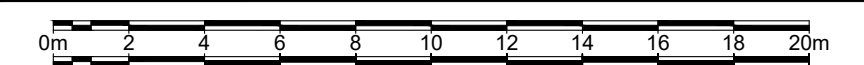
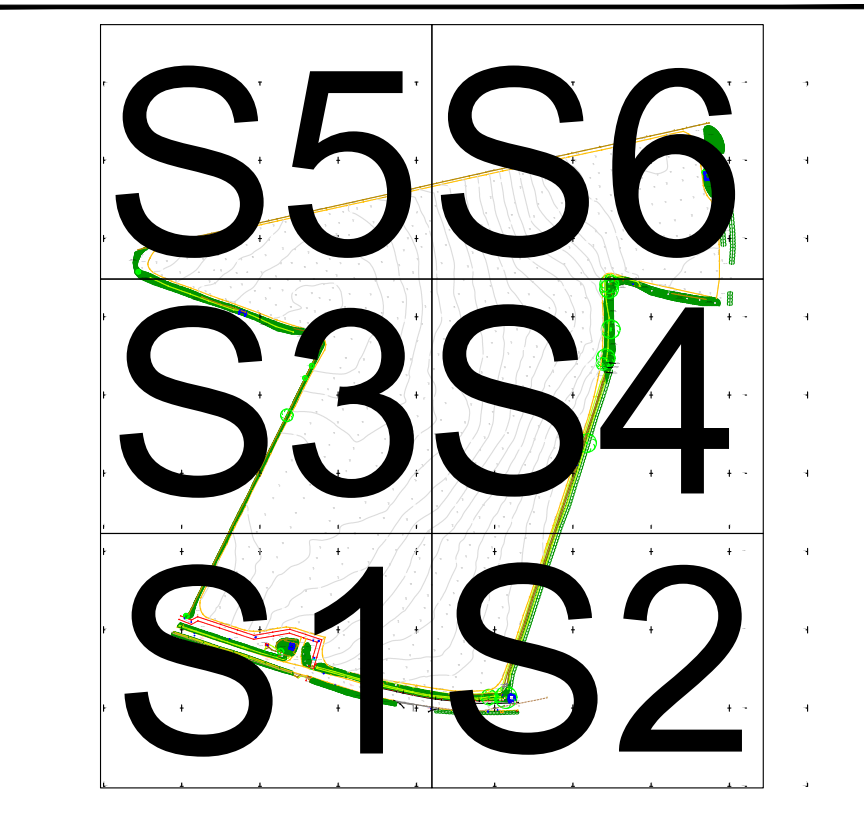
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Rev	Date	Description	Drawn

Electromagnetic and/or Ground Penetrating Radar techniques have been used to locate/map underground utilities and features on this drawing. Geotechnical Engineering Ltd (GEL) has made every endeavour to make sure that the information contained within this drawing is accurate and of the highest quality. GEL has used any record drawings provided by the client or by the Statutory Utility Providers, at the client's request, at the time of the survey. Any information taken from these drawings (e.g. pipe sizes and position) is not guaranteed. Historic record information is often incomplete and inaccurate and cannot be relied upon.

GLI is not liable for any topographical survey that has not been undertaken by us. Any inaccuracies relating to topographical surveys/development plans/Drainage Survey data that we have no control over is the liability of the customer. Where quoted, depth information of underground services/features is stated. Depths are generally within +/- 10% accurate, but cannot be guaranteed. Any depths shown are drains are usually to invert (base of drainage channel) unless otherwise stated.

At GLI we use skilled staff and modern, calibrated equipment to perform our surveys. However, the completeness of any underground survey cannot be 100% guaranteed and the results from these types of surveys are not infallible. If the location or depth of service/features is of particular importance to a project then it is strongly advised that excavations are held with GLI regarding any possible limitations or anomalies. It is also strongly advised that trial excavations should be undertaken to confirm survey results. We cannot be held responsible for any inaccuracies beyond those that could be reasonably expected by a competent company.

ABBREVIATIONS (Land & Utilities)

[illegible]

geotechnical
Geotechnical Engineering Ltd
Telephone: (01452) 527743 Facsimile: (01452) 729314 E-mail: surveying@geeeng.co.uk Web: www.geeeng.co.uk

Client

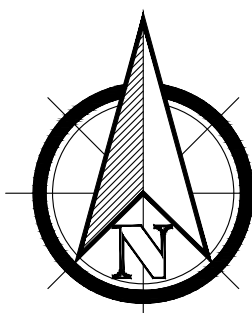
PARAGON

Address

EXETER AIRPORT
WESTCOTT LANE
DEVON

Topographical Survey

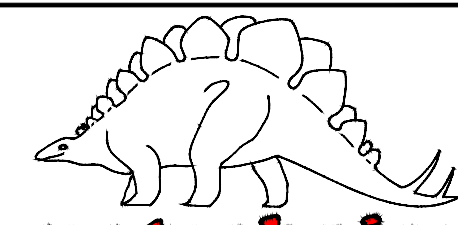
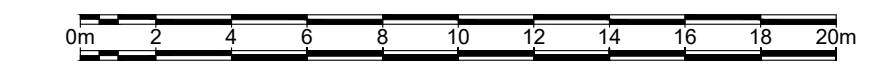
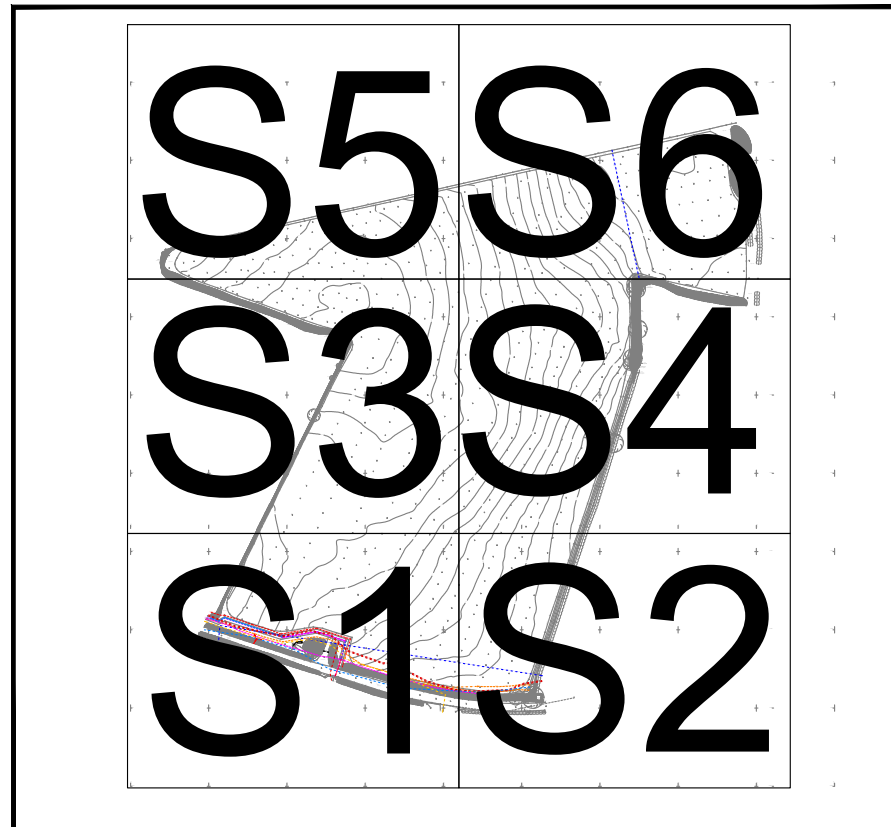
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Project Number: 36314	Rev: -	Surveyed By: EC	Approved By: ZM



All Co-ordinates are related to OS National Grid from ST32 by RTK GNSS. (No scale factor added).
All levels are related to OS Newlyn Datum by RTK GNSS.

[illegible]

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X	XXXX	XXXX	XXXX
X	XXXX	XXXX	XXXX
X	XXXX	XXXX	XXXX
Rev	Date	Description	Drawn

[illegible][illegible]

geotechnical
Geotechnical Engineering Ltd
Telephone: (01452) 527743 Facsimile: (01452) 729314 E-mail: surveying@geoteng.co.uk Web: www.geoteng.co.uk

Client _____

Client

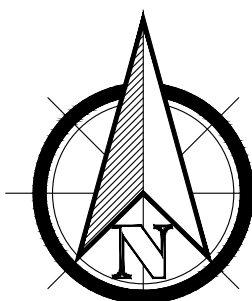
PARAGON

Address

EXETER AIRPORT
WESTCOTT LANE
DEVON

Utility Survey

Scale 1:200	Sheet Size: A0	Sheet Number: 3	Date: 06/04/2021
Project Number: T32170	Rev: -	Surveyed By: RW	Approved By: ZM

[illegible]

UTILITY SURVEY ABBREVIATIONS

End of Trace	--- EUT	Depth to Top of Service (m)	0-405
Start of Trace	--- SUT	Wells	WEL
Off-Survey Area	--- OSA	Taken From Records	TFR
Capable Line	--- CL	Unable to Survey	UTS
Unable to Trace	--- UT	Unable to Read (DOWR)	NRD
End of Record	--- EOR	Assumed Ruck	NRK
End of File	--- EOF	No Undeclared Enclosure	NUE
Back Stop	--- BS	No Depth Indicated	NDI
		Station and/or Name Station Level	ASL

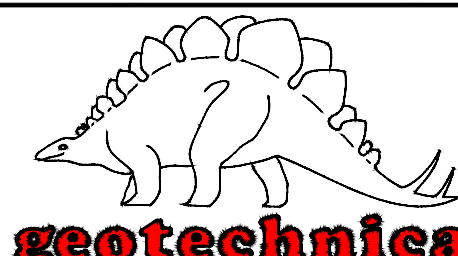
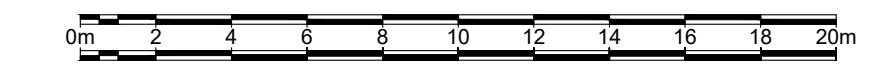
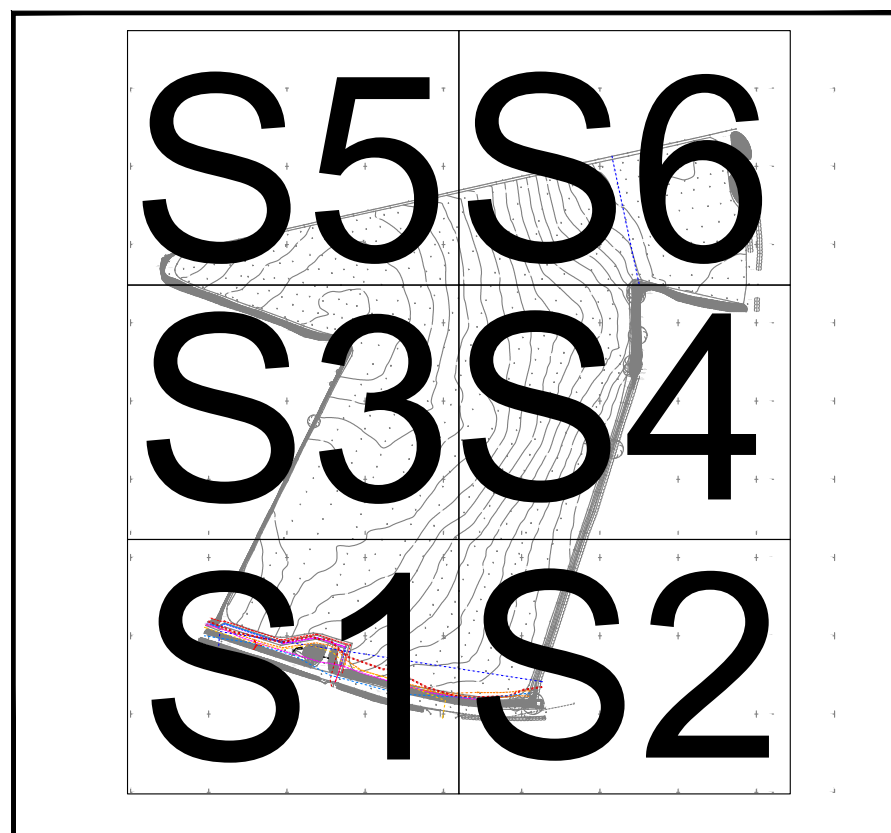
Chamber	--- CH	Unable to Survey	UTS
Underline	---		

TOPO LINE TYPES

Building	---	Wall
Canopy	---	Top of bank
Drainage Channel	---	Verge
Kerb Line	---	Bottom of bank
Drop Kerb	---	Hedge
Fence	---	Tree / Foli

Station	Easting	Northing	Level
ST01	300859.281	93249.514	29.103
ST02	300783.963	93293.065	31.013
ST03	300706.060	93304.886	34.173
ST01A	300901.764	93248.669	28.750

X	XXXX	XXXX	XXXX
X	XXXX	XXXX	XXXX
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X	XXXX	XXXX	XXXX
Rev	Date	Description	Drawn

[illegible][illegible]

Client _____

PARAGON

Address

EXETER AIRPORT
WESTCOTT LANE
DEVON

Utility Survey

Scale 1:200	Sheet Size: A0	Sheet Number: 4	Date: 06/04/2021
Project Number: T32170	Rev: -	Surveyed By: RW	Approved By: ZM





Key

Cross Sections

- Section A
- Section B
- Section C

Intrusive Locations

- Cable Percussive Borehole
- ▲ Windowless Sample Borehole
- Trial Pit
- ▭ Site Boundary

Rev	Description	Date

Project 210159 Exeter Air Park	Scale 1:2500
	Drawn by CB
	Approved By TC
Title Cross Section Plan	Drawing Number 5
	Date 15 May 2021



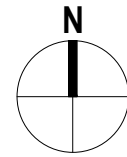
PLATEAU A:		
- Total Plateau Area:	24,859 m ² / 267,680 ft ²	
- Total Building Area (GIA):	10,120 m ² / 108,920 ft ² (40.6%)	
- Total Hard and Soft Landscaping:	14,748 m ² / 158,760 ft ² (59.4%)	

PLATEAU B:		
- Total Plateau Area:	15,380 m ² / 165,550 ft ²	
- Total Building Area (GIA):	6,820 m ² / 63,900 ft ² (38.6%)	
- Total Hard and Soft Landscaping:	8,560 m ² / 101,650 ft ² (61.4%)	

PLATEAU C:		
- Total Plateau Area:	4300m ² / 46,360 ft ²	
- Total Building Area (GIA):	1,477 m ² / 15,900 ft ² (34.3%)	
- Total Hard and Soft Landscaping:	2823 m ² / 30,460 ft ² (65.7%)	

Approximate Site Boundary based on HM Land Registry Title
Plan ref DNS586252 dated 8 Sept 2017
(exact boundary to be confirmed in due course)

0 7.5m 15m
SCALE 1:750



P01: Draft Issue
Rev
The Old Rectory Rectory Lane Milton Malzor
NORTHAMPTON NN7 3AQ
t: +44 (0)1604 858916 f: +44 (0)1604 859123
www.peter-haddon.com



pHp architects

Proposed Logistics Development
Oxenwood Real Estate
Power Park, Exeter

Illustrative Masterplan - Option 2

Issue Purpose: Preliminary
Drawn by: GB Checked by: JCL
Scale @ A1: 1:750 Date: Dec'21
CAD ref: 4424-006-AP-Exeter Dwg no.: 4424-014 Rev: P01

Copyright reserved. Dimensions to be checked on site. Discrepancies to be reported before proceeding

APPENDIX 2: PHOTOGRAPHS



01: Site Overview



02: Site Overview



03: Drilling Works



04: Drainage ditch (eastern boundary)



05: Slope to Northeast Corner



06: Northeast Corner



07: Example Trial Pit



08: Example Trial Pit

APPENDIX 3: FIELD METHODS

FIELD METHODS

3.1.	Design of Investigation
3.1.1	The site investigation was broadly undertaken in general accordance and with reference, where relevant to the following documents: • Specification for Ground Investigation, Site Investigation Steering Group, Thomas Telford, 1994; • British Standard BS10175:2011 (A2) Investigation of potentially contaminated sites – code of practice, as amended; • Code of Practice for the Investigation of Potentially Contaminated Sites BS10175:2011+A2:2017; • Land Contamination: Risk Management (LCRM) 2020; • Environment Agency (2000) Secondary model procedures for the development of appropriate soil sampling strategies for land contamination. Technical Report P5-066/TR; • DEFRA/Environmental Agency Report: Land Contamination: Risk Management (LCRM) 2019; • BS5930, 2015. Code of Practice for Ground Investigation; • BS1377 (1990) Methods of test for Soils for Civil Engineering Purposes; • BS EN 1997-2 (2007) Eurocode 7 – Geotechnical Design – Ground Investigation and Testing; and • BS ISO 5667-22:2010 Water quality. Sampling. Guidance on the design and installation of groundwater monitoring points.
3.1.2	The works were progressed on site by a subcontractor who have been scrutinised by Paragon and are on Paragon's approved sub-contractor list. The investigation was designed to provide a preliminary assessment of the ground conditions at the subject site. Prior to the progression of the site investigation, all areas were checked for services through the use of a Cable Avoidance Tool and by Ground Penetrating Radar (GPR).
3.2.	Onsite Methods
3.2.1	The scope of works included trial pitting using a JCB 3CX, cable percussive drilling and windowless drilling.
3.2.2	Soils were logged by a qualified engineering geologist in general accordance with BS 5930: 1999+A2:2010 and BS EN ISO 14688 Pt 1&2.
3.3.	Constraints
3.3.1	The ground conditions reported relate only to the point of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions these cannot be determined with complete certainty.
3.3.2	A number of constraints were identified during investigation by Paragon. These included very hard ground which made hand pitting and drilling difficult. The windowless rig encountered shallow refusals on the mudstone.

3.4.	Monitoring Well Installation
3.4.1	Upon completion of the boreholes, where required a monitoring well was installed with 50mm HDPE well pipe to depths presented on the borehole logs. A slotted section of well pipe was surrounded by gravel to provide a 'response zone'. A plain section of pipe was surrounded by bentonite to produce a seal.
3.4.2	Groundwater levels within the monitoring wells were recorded during each visit using an electronic dip/interface meter.
3.5.	Sampling and Testing Strategy
3.5.1	All the exploratory holes were logged and sampled by a site engineer. Testing and sampling at the site was undertaken to investigate the ground conditions present.
3.5.2	Soil samples were collected from across the site and at different depths within each trial position to provide an even coverage of the site.
3.5.3	Geotechnical testing was completed insitu using a hand vane. In addition, SPTs were recorded during drilling.
3.5.4	Environmental soil samples representative of the underlying conditions were collected and submitted for a suite of determinants. The soil samples were transported to an appointed United Kingdom Accreditation Service (UKAS) accredited laboratory.
3.6.	Quality Control
3.6.1	The samples were despatched under a chain of custody procedure to a UKAS accredited laboratory, for subsequent chemical analysis. Where appropriate, samples were stored within cool boxes containing ice packs. A Chain of Custody is included with all sample consignments.
3.7.	Gas Monitoring
3.7.1	The wells were monitored for methane, carbon dioxide, oxygen and hydrogen sulphide using a multi-gas analyser (GFM436).
3.7.2	Ground gas monitoring was carried out in general accordance with the guidelines presented in CIRIA C665 'Assessing risk posed by hazard ground gases to buildings'. Flow was monitored for a period of two minutes where possible; maximum flow was recorded. Ground gases, including concentrations of methane, carbon dioxide, hydrogen sulphide and carbon monoxide were monitored for up to five minutes. During monitoring, ground gas readings were logged every thirty seconds.
3.7.3	Following gas monitoring, water levels were checked using an interface meter, which is also capable of detecting the presence of free product. If groundwater is present, then water samples were retrieved using bailers. Prior to groundwater sampling, up to three times the well volume was purged to remove stagnant / rain water.

3.8.	Health and Safety
3.8.1	A site-specific Risk Assessment and Method Statement (RAMS) was produced prior to the works beginning on site; works were completed in general accordance with the methodology set up in this assessment. No incidents occurred during this investigation.

APPENDIX 4: BOREHOLE LOGS



Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 12/04/2021 - 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300843.96 N93381.14	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number BH1	Hole Type CP	Level 32.65m AoD	Logged By GA	Scale 1:50	Page Number Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.00	SPT	50 (22.3/50 for 150mm)				End of Borehole at 10.000m	
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

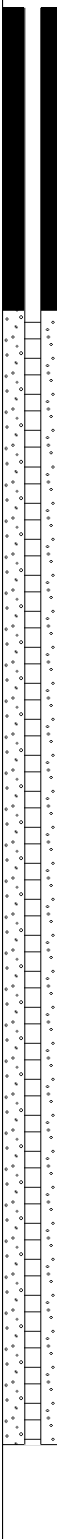
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
SPT Energy Ratio 83%



Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 14/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300806.96 N93528.42	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number BH2	Hole Type CP	Level 35.26m AoD	Logged By GEL	Scale 1:50	Page Number Sheet 1 of 1

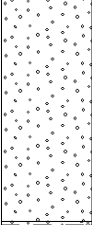
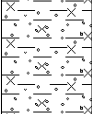
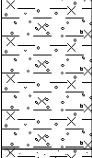
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60 - 0.80	B	N=24 (3,5/5,6,6,7)	0.30	34.96		TOSOIL comprising brown slightly gravelly clayey silty fine to coarse SAND. Gravel is subangular and subrounded fine to coarse sandstone and quartz. Firm brown and orange brown locally mottled black sandy gravelly silty CLAY with medium rounded sandstone cobbles. Gravel is subrounded fine to coarse sandstone and quartz.	1
		0.60 - 0.80	D						
		0.60 - 0.80	ES						
		1.00	SPT						
		1.50 - 2.00	B	N=37 (5,6/8,8,10,11)				Stiff orangish brown slightly gravelly sandy CLAY. Gravel is subangular and subrounded fine to coarse sandstone and quartz.	2
		1.80 - 2.00	ES						
		2.00	SPT		2.00	33.26			
		3.00	SPT	N=45 (5,8/9,9,12,15)					3
		4.00 - 4.45	U	N=48 (5,9/9,11,14,14)	4.00	31.26		Very stiff reddish brown fissured slightly sandy silty CLAY with frequent pale blueish grey and greenish grey reduction spots (up to 30mm).	4
		4.60 - 4.70	ES						
		5.00	SPT						5
		6.50	SPT	50 (9,14/50 for 225mm)					6
		8.00	SPT	50 (15,10/50 for 150mm)					7
				50 (25 for 75mm/50 for 75mm)	9.00	26.26		Dense to very dense reddish brown MUDSTONE and SILTSTONE with pale grey reduction spots (up to 15mm).	9
		9.50	SPT		9.50	25.76		End of Borehole at 9.500m	10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks SPT Energy Ratio 83%											
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Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 12/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300798.59 N93310.47	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number WS1	Hole Type WS	Level 31.53m AoD	Logged By AF	Scale 1:20	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.10	D		0.10	31.43		MADE GROUND. Dark reddish brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse brick, quartzite, sandstone, flint, and rare slag.	
		0.50 - 0.70	B					Dark reddish brown sandy silty clayey GRAVEL. Gravel is angular and subangular fine to coarse brick, quartzite, sandstone and rare granite.	
		0.50 - 0.70	ES		0.70	30.83		Stiff reddish brown slightly sandy gravelly silty CLAY with low cobble content. Gravel is subangular and subrounded fine to coarse mudstone, sandstone and flint.	1
		1.00 - 1.10	D					Stiff becoming very stiff brown and mottled reddish brown slightly gravelly sandy silty CLAY. Gravel is subangular fine to coarse quartzite and sandstone.	
		1.20 - 1.40 1.20 - 1.40 1.20	D ES SPT	N=52 (1,2/2,4,31,15)	1.40 1.60	30.13 29.93		End of Borehole at 1.600m	4

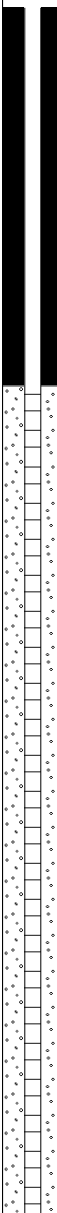
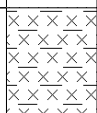
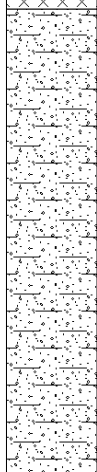
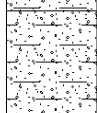
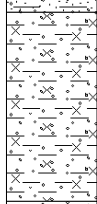
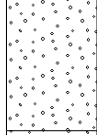
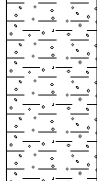
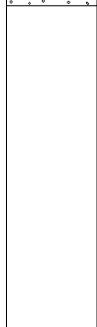
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
Dry and Stable. SPT Energy Ratio 58%.

Remarks	
Dry and Stable. SPT Energy Ratio 58%.	

Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 12/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300885.66 N93340.94	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number WS3	Hole Type WS	Level 29.79m AoD	Logged By AF	Scale 1:20	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.10	D		0.30	29.49		Firm brown slightly sandy slightly gravelly clayey SILT with frequent rootlets. Gravel is subangular and subrounded fine and medium flint, sandstone and quartzite.	1
		0.60 - 0.80 0.60 - 0.80	B ES					Red gravelly clayey fine to coarse SAND with low cobble content. Gravel is angular and subangular fine to coarse sandstone and quartzite.	
		1.20 - 2.20 1.20	D SPT	N=9 (1,2/2,2,2,3)					
		1.55 - 1.65 1.65 - 1.80	D ES		1.55	28.24		Firm to stiff dark brown and mottled black clayey gravelly fine to coarse SAND with frequent rootlets and rare decaying wood material (up to 20mm). Gravel is subangular and subrounded fine to coarse slag, sandstone and quartzite.	2
		2.00 - 2.10 2.00	D SPT	N=13 (3,3/4,3,3,3)	1.85	27.94		Soft to firm greyish brown and mottled yellow, grey and reddish brown sandy gravelly silty CLAY. Gravel is angular and subangular fine to coarse sandstone and mudstone.	
		2.20 - 3.20	D		2.35	27.44		Grey slightly clayey sandy subangular to rounded fine to coarse quartzite and sandstone GRAVEL.	
		2.50 - 2.60 2.70 - 2.80	D D		2.70	27.09		Very stiff reddish brown gravelly CLAY with medium cobble content. Gravel is subangular to rounded fine to coarse sandstone and quartzite.	3
		3.00 3.05 - 3.20	SPT ES	N=50 (3,5/15,10,14,11)	3.20	26.59		End of Borehole at 3.200m	
									4

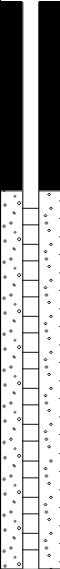
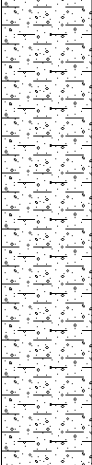
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Dry and Stable. SPT Energy Ratio 58%.											
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Remarks	
Dry and Stable. SPT Energy Ratio 58%.	

Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300752.18 N93529.76	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number WS7	Hole Type WS	Level 34.50m AoD	Logged By AF	Scale 1:20	Page Number Sheet 1 of 1

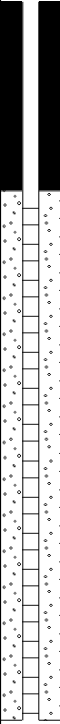
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.10	D		0.25	34.25		Brown slightly gravelly silty fine to coarse SAND. Gravel is subrounded and rounded fine to coarse quartzite and sandstone.	1
		0.60 - 0.90 0.60 - 0.90	B ES					Stiff to very stiff orangish brown, reddish brown and mottled black slightly gravelly sandy CLAY with medium low rounded sandstone cobble content.	
		1.20 1.30 - 1.40	SPT D	N=23 (4,5/5,5,6,7)					
		1.50	SPT	N=50 (10,13/13,13,14,10)	1.50	33.00		End of Borehole at 1.500m	
									2
									3
									4

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
Dry and Stable. SPT Energy Ratio 58%.

Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300800.54 N93542.18	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number WS8	Hole Type WS	Level 34.67m AoD	Logged By AF	Scale 1:20	Page Number Sheet 1 of 1

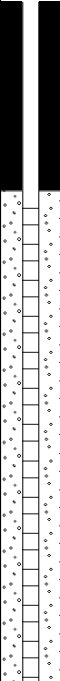
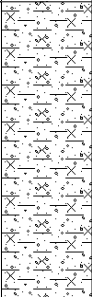
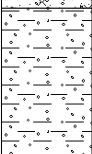
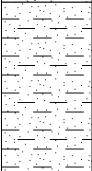
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.10	D		0.20	34.47		Brown slightly gravelly fine to coarse SAND with frequent rootlets. Gravel is subrounded and rounded fine to coarse quartzite.	1
		0.50 - 0.70	B					Stiff orangish brown and mottled black slightly gravelly sandy silty CLAY with occasional rootlets. Gravel is subrounded and rounded fine to coarse quartzite and sandstone.	
		0.50 - 0.70	ES						
		1.20	SPT	N=17 (4,3/3,4,4,6)	1.45	33.22		Orange clayey gravelly fine to coarse SAND. Gravel is subangular and subrounded fine to coarse sandstone.	
		1.50 - 1.60	D		1.60	33.07		Very stiff orangish brown and black sandy silty CLAY.	
		1.50	SPT	N=50 (5,10/13,15,14,8)					2
		1.60 - 1.70	D		1.90	32.77		End of Borehole at 1.900m	
									3
									4

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
Dry and Stable. SPT Energy Ratio 58%.

Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300937.73 N93587.53	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number WS9	Hole Type WS	Level 27.61m AoD	Logged By AF	Scale 1:20	Page Number Sheet 1 of 1

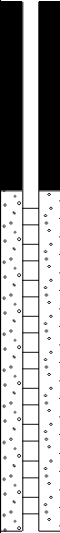
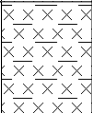
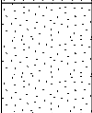
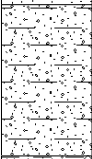
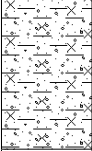
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.10	D					Firm to stiff, reddish brown locally mottled black slightly gravelly sandy silty CLAY. Gravel is subangular to rounded fine to coarse quartzite and sandstone.	
		0.40 - 0.60	B					Stiff orangish brown locally mottled greyish brown slightly gravelly CLAY with occasional pockets of fine to coarse sand.	
		0.40 - 0.60	ES					Reddish brown clayey fine to coarse SAND.	
		1.00 - 1.10	D		0.80	26.81		Stiff orangish yellowish brown slightly sandy CLAY with occasional relict rootlets with localised grey mottling.	1
		1.20 - 1.30	D		1.20	26.41			
		1.20	SPT	N=20 (1,1/5,5,5,5)	1.35	26.26			
		1.60 - 1.70	ES						
		1.70 - 1.80	D						
		1.80	SPT	N=50 (5,5/12,12,13,13)	1.80	25.81		End of Borehole at 1.800m	2
									3
									4

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Dry and Stable. SPT Energy Ratio 58%.										
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Percussion Drilling Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300942.78 N93504.52	
Project No. : 210159		Crew Name:		Drilling Equipment:	
Borehole Number WS10	Hole Type WS	Level 30.46m AoD	Logged By AF	Scale 1:20	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.10	D					Firm brown slightly gravelly sandy clayey SILT. Gravel is subangular to rounded fine to coarse sandstone, quartzite, mudstone and rare clinker.	
		0.30 - 0.50 0.30 - 0.50	B ES		0.30	30.16		Reddish brown and orangish brown clayey fine to coarse SAND.	
		0.80 - 0.90	D		0.60	29.86		Brown, dark reddish brown gravelly clayey fine to coarse SAND with rare decaying wood fragments (up to 30mm). Gravel is angular to subrounded fine to coarse quartzite, mudstone and sandstone.	
		1.10 - 1.30 1.20	ES SPT	N=7 (1,1/2,2,1,2)	1.00	29.46		Firm locally soft brown, grey and greyish brown gravelly locally sandy silty CLAY with occasional rootlets and rare coal fragments (up to 25mm). Gravel is angular and subangular fine to coarse quartzite, sandstone and clinker.	1
		1.40	SPT	52 (8,12/52 for 150mm)	1.40	29.06		End of Borehole at 1.400m	4

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

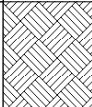
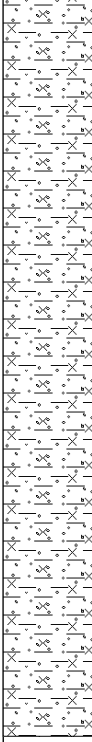
Remarks
Dry and Stable. SPT Energy Ratio 58%.

APPENDIX 5: TRIAL PIT LOGS

Remarks	
Backfilled with arisings.	

Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300869.13 N93298.82	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP02	Location Type TP	Level 29.83m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

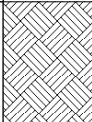
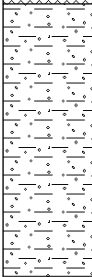
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.35	29.48		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
					0.50	29.33		MADE GROUND comprising reddish brown, gravelly CLAY. Gravel comprised fine to coarse, angular flint, brick and concrete fragments.	
		1.00	B	HVP=90.0				Firm to stiff, dark greyish brown, silty gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology.	1
		1.00							
		1.50	D	HVP=80.0					
		1.50							
		2.00	D	HVP=80.0					2
		2.00							
		2.50		HVP=70.0					
		3.00	B	HVP=30.0	3.00	26.83		End of Borehole at 3.000m	3
		3.00							
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.	
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Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300790.37 N93409.97	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP03	Location Type TP	Level 33.24m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

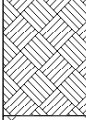
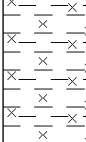
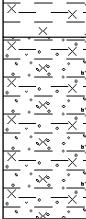
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.40	32.84		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	1
		0.50	ES					MADE GROUND comprising reddish brown, gravelly CLAY. Gravel comprised fine to coarse, angular flint, brick and concrete fragments.	
		1.00 1.00	B	HVP=60.0	1.30	31.94		Very stiff to stiff, reddish brown gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology.	2
		1.50 1.50	D	HVP=70.0					
		2.00 2.00	D	HVP=60.0	2.20	31.04		End of Borehole at 2.200m	3
		2.20	B						
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.							
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Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300907.32 N93358.21	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP04	Location Type TP	Level 29.08m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

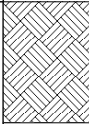
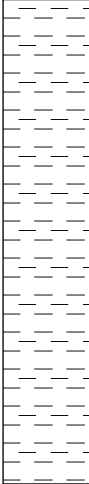
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.40	28.68		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
								Brown, silty SAND. Sand is fine to coarse.	
		0.90 0.90 1.00	D ES	HVP=60.0	1.00	28.08		Firm, dark blueish grey, silty gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology.	1
		1.50 1.50	B	HVP=80.0	1.60	27.48		Very stiff to stiff, reddish brown CLAY.	
		2.00 2.00	D	HVP=90.0					2
		3.00 3.00	B	HVP=75.0	3.00	26.08		End of Borehole at 3.000m	3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.							
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Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300871.83 N93436.92	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP05	Location Type TP	Level 32.92m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

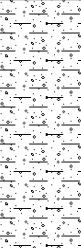
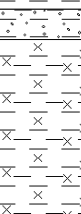
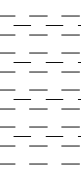
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.40	32.52		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
		1.00	D					Soft locally firm light brownish grey and reddish brown slightly sandy gravelly silty CLAY. Gravel is angular to subrounded fine to coarse mudstone and quartzite. Rare pockets (up to 15x15x15mm) of yellowish brown silty fine and medium sand. Rare fragments (up to 15x10x10mm) of possible black coal.	1
		2.00	B		2.00	30.92		End of Borehole at 2.000m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.							
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Trial Pit Log

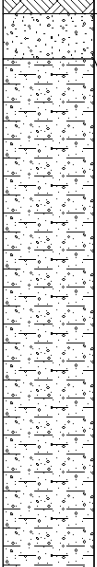
Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300816.87 N93484.46	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP06	Location Type TP	Level 34.67m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.35	34.32		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
		1.00 1.00	B	HVP=60.0	1.20	33.47		Firm, brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse.	1
		1.50 1.50 1.50	D ES	HVP=40.0				Stiff, mottled brown and grey CLAY.	
		2.00 2.00	D	HVP=40.0	2.20 2.30	32.47 32.37		Firm, reddish brown, gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Stiff to very stiff, reddish brown, gravelly silty CLAY. Gravel is fine to coarse, weak mudstone.	2
					2.90	31.77		Very stiff, reddish grey gravelly CLAY. Gravel is fine to coarse, weak mudstone.	3
		3.50	B		3.50	31.17		End of Borehole at 3.500m	4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.							
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Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300939.57 N93398.33	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP07	Location Type TP	Level 27.89m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.30	ES	HVP=80.0	0.35	27.54		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	1	
		0.50	ES		0.50	27.39		Light brown, gravelly SAND. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse.		
		1.00	B		HVP=85.0	1.00		25.69	Stiff to very stiff, reddish brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse.	
		1.50				D				
		2.00	D	HVP=85.0	2.00	25.39		Greyish red, clayey SILT.		
		2.00								
		2.50	B	2.50	25.39	End of Borehole at 2.500m		3		
										4
										5

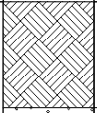
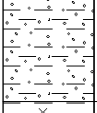
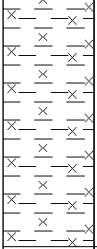
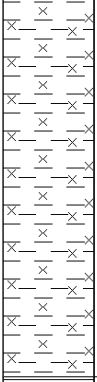
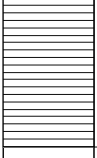
Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks	
Backfilled with arisings.	



Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300840.53 N93551.52	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP08	Location Type TP	Level 33.84m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

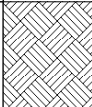
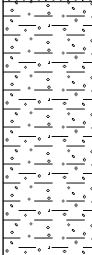
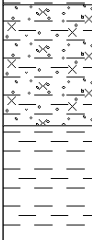
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.35	33.49		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
					0.70	33.14		Stiff, brown, gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology.	
		1.00 1.00	B	HVP=80.0				Stiff to very stiff, mottled brown and grey, silty CLAY.	1
		1.50 1.50 1.50	D ES	HVP=70.0	1.55	32.29		Stiff to very stiff, mottled brown and grey, gravelly silty CLAY. Gravel is fine to coarse, weak mudstone.	2
		3.00 3.00	B D		2.80	31.04		Mudstone.	3
					3.30	30.54		End of Borehole at 3.300m	4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.						
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Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E300887.62 N93540.75	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP09	Location Type TP	Level 31.88m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

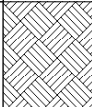
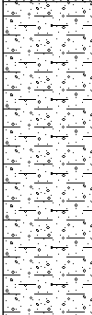
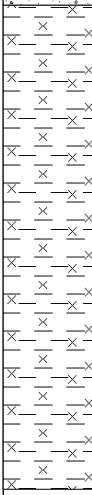
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.35	31.53		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
		1.00 1.00	B	HVP=70.0	1.20	30.68		Stiff to very stiff, brown, gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology.	1
		1.50 1.50	D	HVP=70.0	1.60	30.28		Stiff to very stiff, brown, silty gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology.	
		2.00 2.00	B	HVP=100.0	2.00	29.88		Very stiff, reddish grey, gravelly CLAY. Gravel is fine to coarse, weak mudstone.	2
								End of Borehole at 2.000m	3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.							
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Trial Pit Log

Project Name: Exeter Airpark		Client: Oxenwood Real Estate LLP		Date: 13/04/2021	
Location: Exeter Airport, B3184, EX5 2LJ		Contractor: Borehole Solutions Ltd		Co-ords: E301014.74 N93588.41	
Project No. : 210159		Crew Name:		Equipment:	
Location Number TP10	Location Type TP	Level 26.68m AoD	Logged By GA	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.35	26.32		TOPSOIL comprising dark brown, slightly sandy gravelly CLAY. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse. Rootlets present.	
		1.30	B		1.40	25.28		Light brown, sandy clayey GRAVEL. Gravel is fine to coarse and sub-rounded of mixed lithology. Sand is fine to coarse.	1
		1.50	ES					Stiff to very stiff, reddish brown, silty CLAY.	
		2.00	D						2
		3.00	B		3.00	23.68		End of Borehole at 3.000m	3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Stable	None				

Remarks Backfilled with arisings.							
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APPENDIX 6: CROSS SECTIONS

Project Title: Exeter Airpark

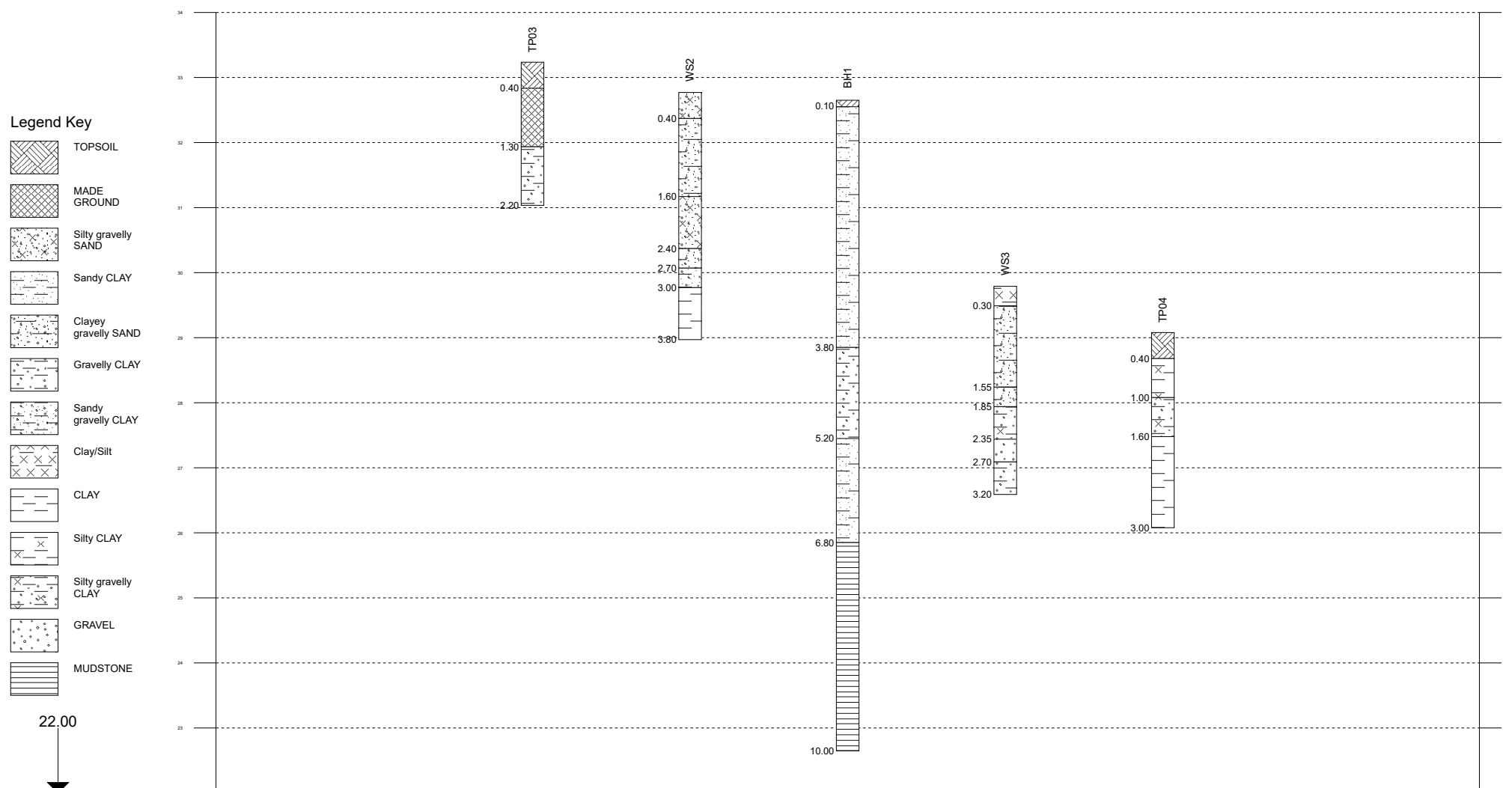
Vertical Scale: 1:87

Location: Exeter Airport, B3184, EX5 2LJ

Horizontal Scale: Not to scale

Client: Oxenwood Real Estate LLP

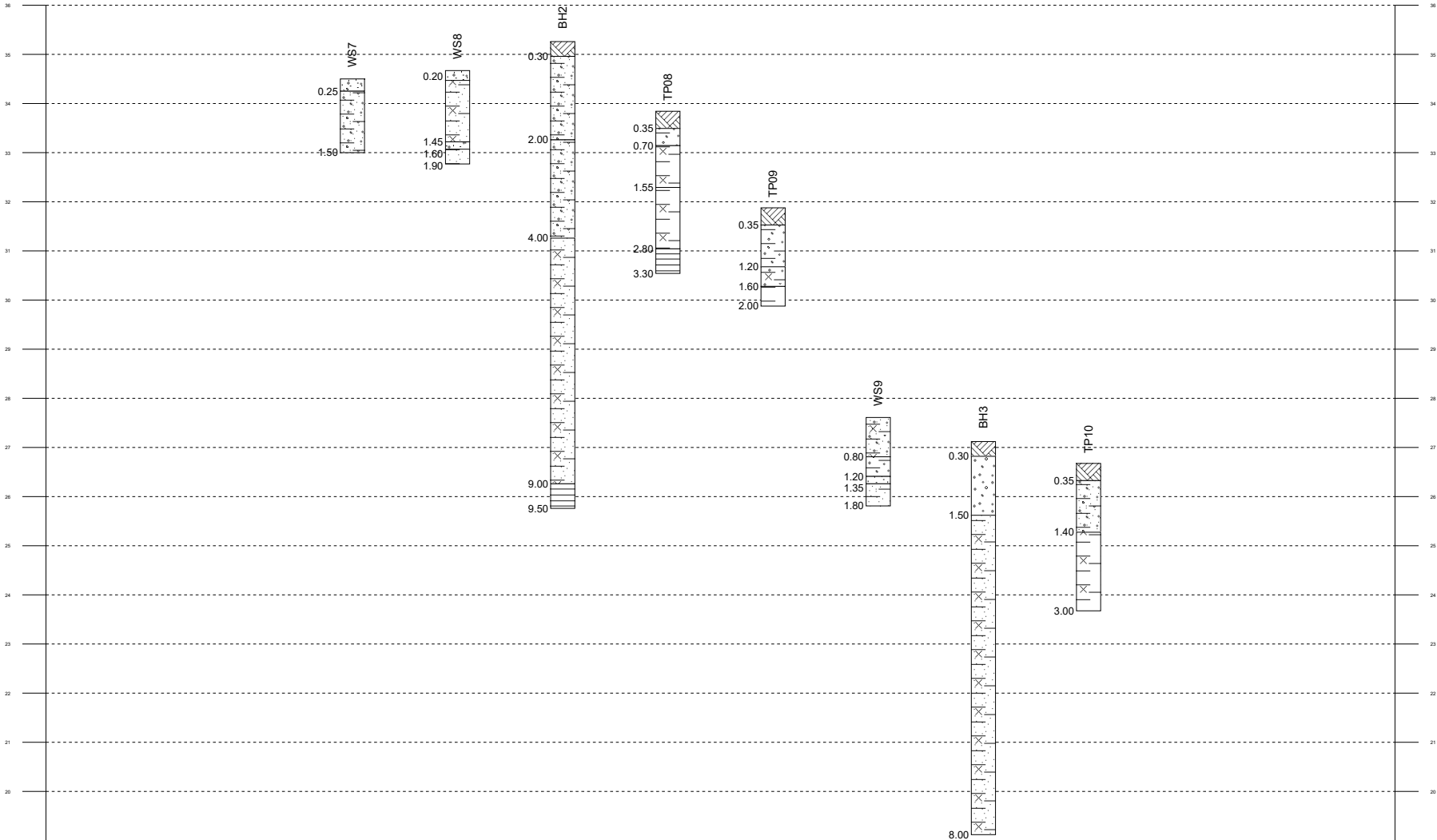
Engineer: CB



Chainage (m)	31.34	46.31	91.89	145.82	159.19
Elevation (mAOD)	18.19	19.96	12.15	8.96	15.30
Offset (m)	33.24	32.77	32.65	29.79	29.08

Legend Key

-  TOPSOIL
-  Sandy gravelly CLAY
-  Gravelly SAND
-  Silty sandy CLAY
-  Gravelly CLAY
-  Clayey gravelly SAND
-  Silty CLAY
-  MUDSTONE
-  Silty gravelly CLAY
-  CLAY
-  Silty sandy gravelly CLAY
-  GRAVEL
-  SAND
-  Sandy CLAY



Chainage (m)	30.88	80.35	84.66	121.28	166.25	222.75	280.15	299.04
Elevation (mAOD)	0.34	5.46	9.11	8.76	8.88	29.95	24.58	19.40
Offset (m)	34.50	34.67	35.26	33.84	31.88	27.61	27.12	26.68

Legend Key

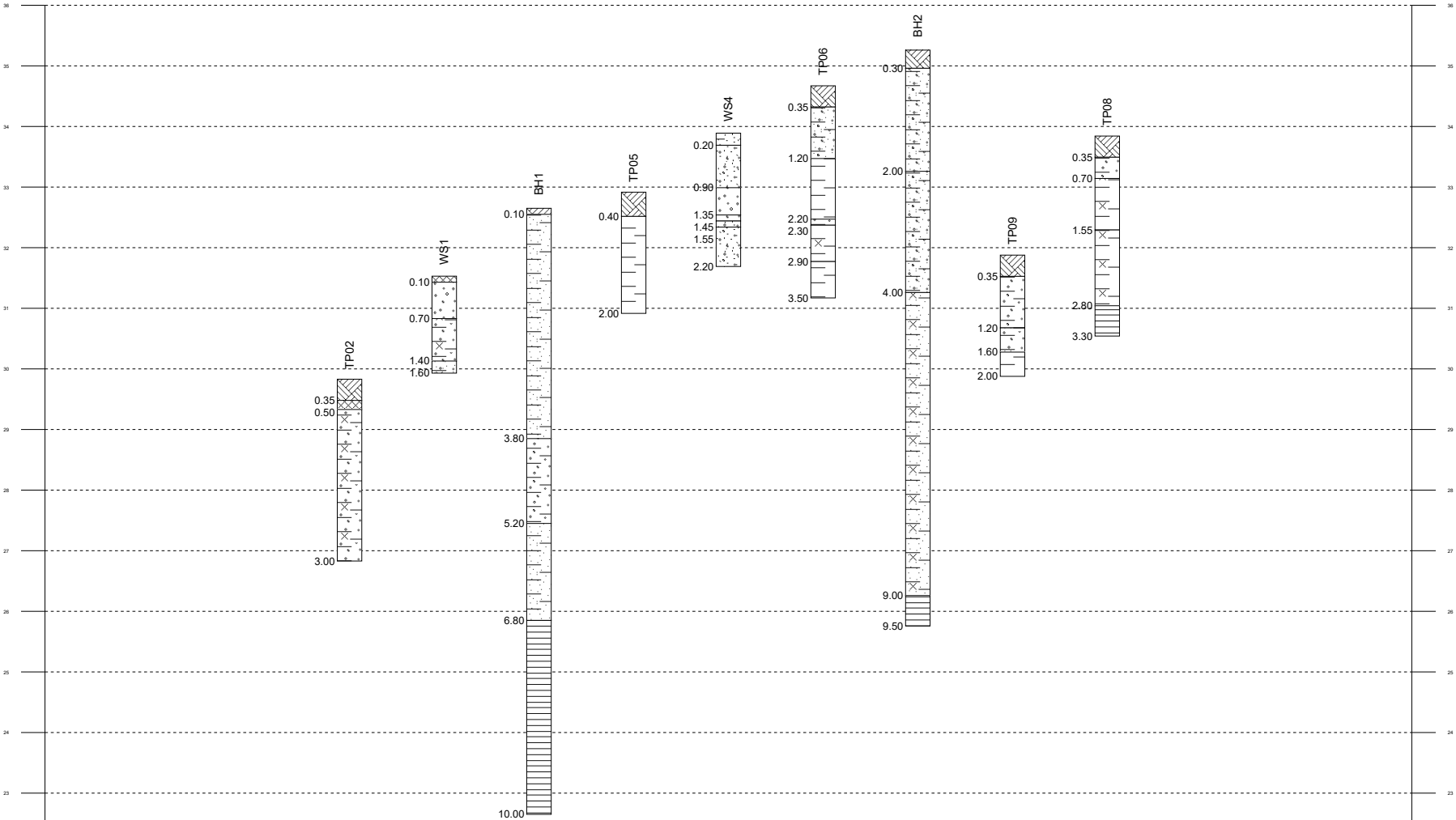
-  TOPSOIL
-  Sandy gravelly CLAY
-  Clayey SAND
-  Gravelly SAND
-  Gravelly CLAY
-  CLAY
-  Silty CLAY
-  GRAVEL
-  Sandy CLAY
-  MADE GROUND
-  Silty sandy CLAY
-  MUDSTONE
-  Silty gravelly CLAY
-  Silty sandy gravelly CLAY

22.00

Chainage (m)

Elevation (mAOD)

Offset (m)



29.83

31.53

32.65

32.92

33.89

34.67

35.26

31.88

33.84

31.09

39.01

111.97

169.14

173.19

213.72

257.10

273.66

281.93

33.27

37.79

3.80

28.70

17.30

28.69

40.90

39.00

8.59

29.83

31.53

32.65

32.92

33.89

34.67

35.26

31.88

33.84

APPENDIX 7: ENVIRONMENTAL LABORATORY TESTING



Soil Analysis

Lab Sample Number	1501171	1501172	1501173	1501174	1501175	1501176	1501177	1501178	1501179	1501180	1501181	1501182	1501183	1501184	1501185	1501186	1501187	1501188	1501189	1501190	1501191	1501192	1501193	1501194	1501195	1501196	1501197	1501198	1501199	1501200	1501201	1501202	1501203
Sample Reference	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1
Sample Number	None Supplied																																
Depth (m)	0.50-0.70	1.20-1.40	0.80-0.80	1.80-1.80	0.40-0.60	1.80-1.70	0.80-0.80	0.50-0.70	0.80-0.80	1.20-1.30	0.40-0.60	0.5	0.3	0.5	0.9	1	0.3	0.3	1.5	0.3	0.3	1.5	0.3	0.3	1.5	0.3	0.3	1.5	0.3	0.3	1.5	0.3	0.3
Date Sampled	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021	12/04/2021
Time Taken	None Supplied																																

Analytical Parameter	Units	Limit of Detection	Accreditation	GAC Commercial EN 15004	GAC Source																																		
GENERAL																																							
Moisture Content	%	0.3	NONE	N/A		<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Moisture Content	%	N/A	NONE	N/A		13	10	9.3	24	9.7	10	13	14	12	13	27	14	14	13	11	9.7	13	14	10	13	13	10	17	13	14	11	10	10						
Total mass of sample received	kg	0.001	NONE	N/A		1.7	2	1.7	2	2	0.5	1.7	1.7	2	2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2						
Adhesives in Soil Screen Identification Name	Type	N/A	ISO 17025	N/A		Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected						
Adhesives in Soil	Type	N/A	ISO 17025	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Adhesives Identification		N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A						
GENERAL HYDROCARBONS																																							
pH - Adjusted	pH units	N/A	MCERTS	N/A		8.2	7.8	7.9	7.7	7.5	8	7.5	6.7	7.1	7.6	7.5	7.1	8.1	8.2	8	7.3	8.1	7.2	7.1	6.8	6.4	6.2	8	7.8	8.1	8.1	7.9	7.6						
Total Capital	mg/kg	1	MCERTS	N/A		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0							
Total Sulphate as SO4	mg/kg	50	MCERTS	N/A		230	200	120	120	600	380	580	230	340	280	540	570	380	380	340	380	450	380	450	340	500	520	380	500	340	580	480	480						
Water Soluble SO4 (after extraction (2.1 Leachate Equivalent))	g/L	0.00125	MCERTS	N/A		0.002	0.006	0.017	0.006	0.13	0.027	0.077	0.054	0.005	0.014	0.008	0.008	0.009	0.009	0.007	0.008	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002							
Phenols	mg/kg	1	MCERTS	N/A		<1.0	0.1	<1.0	4.4	0.6	2.1	0.9	7.8	4.8	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0							
Total Organic Carbon (TOC)	%	0.1	MCERTS	N/A		1.2	0.9	<0.1	1	1.1	0.1	0.9	0.3	0.3	0.4	1.8	0.5	1.5	0.4	0.9	0.7	1.2	1.4	1.9	<0.1	2.2	1.9	0.4	0.9	0.3	<0.1	0.8	<0.1						
TOTAL PHENOLS																																							
Total Phenols (monocyclic)	mg/kg	1	MCERTS	780	N/A	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0							
DECAHALO POLYAROMATIC HYDROCARBONS																																							
Anthracene	mg/kg	0.05	MCERTS	15079-01	N/A	<0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Acenaphthylene	mg/kg	0.05	MCERTS	810008-01	N/A	<0.05	<0.05	<0.05	<0.05	0.11	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Acenaphthene	mg/kg	0.05	MCERTS	800007-01	N/A	<0.05	<0.05	<0.05	<0.05	0.40	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.1	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Phenanthrene	mg/kg	0.05	MCERTS	800008-02	N/A	<0.05	<0.05	<0.05	<0.05	0.10	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.14	1	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Benzo[a]anthracene	mg/kg	0.05	MCERTS	130000	N/A	0.1	0.05	<0.05	<0.05	0.02	1.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.12	0.2	0.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Benzo[b]fluoranthene	mg/kg	0.05	MCERTS	23000	N/A	1	0.69	<0.05	0.31	6	8.4	0.31	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.53	1.1	1.3	42	0.38	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Pyrene	mg/kg	0.05	MCERTS	14000	N/A	0.08	0.06	<0.05	0.29	6	3.3	0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.46	0.89	1.1	10	0.61	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Benzo[e]pyrene	mg/kg	0.05	MCERTS	130	N/A	0.41	0.31	<0.05	0.07	2.1	7	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	0.1	0.1	10	0.29	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Chrysene	mg/kg	0.05	MCERTS	130	N/A	0.53	0.31	<0.05	0.13	2.6	1.8	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24	0.38	0.43	12	0.32	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Benzo[a]pyrene	mg/kg	0.05	MCERTS	48	N/A	0.7	0.43	<0.05	0.15	3.6	2.1	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.27	0.35	0.51	18	0.49	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05							
Benzo[b]pyrene	mg/kg	0.05	MCERTS	1300	N/A	0.11	0.11	<0.05	0.07	1.4	1.4	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.10	0.11	8.1	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Benzo[k]pyrene	mg/kg	0.05	MCERTS	76	N/A	0.41	0.26	<0.05	0.12	3.2	1.8	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.27	0.3	16	0.39	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Indeno[1,2,3-c]pyrene	mg/kg	0.05	MCERTS	500	N/A	0.31	0.15	<0.05	0.06	1.9	0.81	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.31	0.31	16	0.39	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
Benzo[a]fluoranthene	mg/kg	0.05	MCERTS	13	N/A	0.05	<0.05	<0.05	<0.05	0.02	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05							
Benzo[b]fluoranthene	mg/kg	0.05	MCERTS	1000	N/A	0.40	0.10	<0.05	0.08	2.1	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.37	0.57	8.3	0.51	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05						
TOTAL POLYAROMATIC HYDROCARBONS																																							
Decalated Total PAHs (36 PAHs)	mg/kg	0.8	MCERTS	N/A		5.19	3.32	<0.80	1.57	15.6	20.3	1.19	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	3.75	4.89	5.79	231	1.46	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80						
HEAVY METALS / METALLOIDS																																							
Arsenic (aqueous extractable)	mg/kg	1	MCERTS	040	CEN	13	14	6.8	7.7	30	30	13	10	10	20	6.7	10	11	8.8	14	9.8	10	6	17	9.8	12	14	12	10	12	17	14	16						
Cadmium (aqueous extractable)	mg/kg	0.1	MCERTS	5000	CEN	0.1	0.4	<0.1	0.6	0.6	0.6	0.5	0.7	<0.2	0.3	0.5	0.4	0.3	0.5	0.8	0.9	1.2	<0.2	0.4	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2						
Calcium (aqueous extractable)	mg/kg	0.2	MCERTS	400	CEN	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2							
Chlorine (aqueous extractable)	mg/kg	1	MCERTS	8000	N/A	20	26	18	13	20	17	18	27	24	28	38	24	18	24	18	18	21	35	32	21	19	23	25	38	32	35	35							
Copper (aqueous extractable)	mg/kg	1	MCERTS	6000	N/A	130	26	9.2	18	14	40	35	33	38	23	20	38	23	27	22	20	38	10	10	17	16	15	18	25	41	36	15	10						
Lead (aqueous extractable)	mg/kg	0.1	MCERTS	2300	CEN	0.1	0.7	71	30	10	10	10	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30						
Manganese (aqueous extractable)	mg/kg	0.1	MCERTS	1000	N/A	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1	<0.3	<0.1							
Nickel (aqueous extractable)	mg/kg	1	MCERTS	800	N/A	27	27	12	10	15	17	14	19	20	22	30	25	21	17	22	16	17	16	17	16	17	16	14	11	30	25	40	13	41					
Selenium (aqueous extractable)	mg/kg	1	MCERTS	12000	N/A	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0							
Zinc (aqueous extractable)	mg/kg	0.1	MCERTS	100000	N/A	20	30	82	30	91	36	20	37	61	31	67	30	37	64	30	36	33	70	31	31	30	30	30	30	30	30	30	30						
MONODATAMENTS AND ORGANITES																																							
Chrysene	mg/kg	0.001	MCERTS	27	CEN	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0							

Groundwater Analysis



Lab Sample Number	1862382	1864237	1864238	1864239
Sample Reference	BH1	BH2	WS9	BH3
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	4.12-10.68	6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled	05/05/2021	06/05/2021	06/05/2021	06/05/2021
Time Taken	1530	930	1030	1130

Analytical Parameter (Water Analysis)	Units	Limit of Detection	Accreditation	Environmental Quality Standard				
GENERAL INORGANICS								
pH	pH Units	N/A	ISO 17025		7.1	7.5	7.5	7.1
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025		960	680	300	1400
Total Cyanide	µg/l	10	ISO 17025	1	< 10	< 10	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025		< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025		< 10	< 10	< 10	< 10
Sulphate as SO4	µg/l	45	ISO 17025		18200	29100	65400	629000
Sulphide	µg/l	5	NONE		< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025		75	59	27	50
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025		3600	160	72	30
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025		20	1.04	1.28	3.63
TOTAL PHENOLS								
Total Phenols (monohydric)	µg/l	10	ISO 17025	7.7	< 10	< 10	< 10	< 10
SPECIATED PAHs								
Naphthalene	µg/l	0.01	ISO 17025	2	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	0.1	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.1	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025		< 0.01	< 0.01	< 0.01	< 0.01
TOTAL PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	<LOD	< 0.16	< 0.16	< 0.16	< 0.16
HEAVY METALS								
Boron (dissolved)	µg/l	10	ISO 17025		95	45	33	270
Calcium (dissolved)	mg/l	0.012	ISO 17025		170	110	49	330
Chromium (hexavalent)	µg/l	5	ISO 17025		< 5.0	< 5.0	< 5.0	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025		0.17	0.016	0.21	0.15
Magnesium (dissolved)	mg/l	0.005	ISO 17025		34	11	6.4	52
Phosphorus (dissolved)	µg/l	20	ISO 17025		22.6	< 20.0	< 20.0	< 20.0
Potassium (dissolved)	mg/l	0.025	ISO 17025		6.3	8.5	2	7
Sodium (dissolved)	mg/l	0.01	ISO 17025		57	54	20	60
Antimony (dissolved)	µg/l	0.4	ISO 17025		0.5	< 0.4	0.7	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	50	4.34	0.74	2.03	2.35
Barium (dissolved)	µg/l	0.06	ISO 17025		270	120	25	49
Beryllium (dissolved)	µg/l	0.1	ISO 17025		< 0.1	< 0.1	< 0.1	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.08	< 0.02	< 0.02	0.03	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025		3.8	1.9	2.8	2
Cobalt (dissolved)	µg/l	0.2	ISO 17025		5.1	0.3	1	8.1
Copper (dissolved)	µg/l	0.5	ISO 17025		5.2	3.6	2.7	1.7
Lead (dissolved)	µg/l	0.2	ISO 17025	4	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025		1100	2.5	61	5000
Mercury (dissolved)	µg/l	0.05	ISO 17025	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum (dissolved)	µg/l	0.05	ISO 17025		2.1	0.79	5.4	0.91
Nickel (dissolved)	µg/l	0.5	ISO 17025		9.6	3.7	3.8	12
Selenium (dissolved)	µg/l	0.6	ISO 17025		4.9	0.8	1.3	1.1
Tin (dissolved)	µg/l	0.2	ISO 17025		0.35	< 0.20	< 0.20	0.31
Vanadium (dissolved)	µg/l	0.2	ISO 17025		0.4	0.8	10	0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	10.9	5.5	1.4	3.6	8.3
MONOAROMATICS AND OXYGENATES								
Benzene	µg/l	1	ISO 17025	10	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	74	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
PETROLEUM HYDROCARBONS								
Mineral Oil (C10 - C40)	µg/l	10	NONE		< 10.0	< 10.0	< 10.0	< 10.0
Diesel Range Organics (C10 - C25)	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH1 (C10 - C40)	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH2 (C6 - C10)	µg/l	10	ISO 17025		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	10	< 10	< 10	< 10	< 10

VOLATILE ORGANIC COMPOUNDS									
Chloromethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE			< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE			< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
SEMI-VOLATILE ORGANIC COMPOUNDS									
Aniline	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	1.2
Isophorone	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE			< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025			< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE			< 0.10	< 0.10	< 0.10	1.2



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Analytical Report Number : 21-69810

Project / Site name:	Exter Airpark	Samples received on:	16/04/2021
Your job number:	210159	Samples instructed on/ Analysis started on:	20/04/2021
Your order number:	210159	Analysis completed by:	04/05/2021
Report Issue Number:	1	Report issued on:	04/05/2021
Samples Analysed:	29 soil samples		

Signed:

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

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

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

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

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

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

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843175	1843176	1843177	1843178	1843179
Sample Reference				WS1	WS1	WS3	WS3	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.70	1.20-1.40	0.60-0.80	1.65-1.80	0.40-0.60
Date Sampled				12/04/2021	13/04/2021	12/04/2021	12/04/2021	12/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	16	9.3	14	9.7
Total mass of sample received	kg	0.001	NONE	1.7	2.0	1.7	2.0	2.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	7.8	7.9	7.7	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	250	200	110	320	610
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.032	0.056	0.017	0.056	0.13
Sulphide	mg/kg	1	MCERTS	< 1.0	6.6	< 1.0	4.4	86
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.2	0.9	< 0.1	1.0	1.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.32
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.13
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.45
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.36
Phenanthrene	mg/kg	0.05	MCERTS	0.41	0.23	< 0.05	0.29	4.2
Anthracene	mg/kg	0.05	MCERTS	0.10	0.05	< 0.05	< 0.05	0.62
Fluoranthene	mg/kg	0.05	MCERTS	1.0	0.66	< 0.05	0.31	6.0
Pyrene	mg/kg	0.05	MCERTS	0.93	0.56	< 0.05	0.29	6.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.41	0.31	< 0.05	0.07	2.2
Chrysene	mg/kg	0.05	MCERTS	0.51	0.31	< 0.05	0.13	2.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.70	0.41	< 0.05	0.15	3.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	0.20	< 0.05	0.07	1.4
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.41	0.28	< 0.05	0.12	3.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.31	0.15	< 0.05	0.06	1.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	< 0.05	< 0.05	0.42
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.42	0.16	< 0.05	0.08	2.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.53	3.32	< 0.80	1.57	35.6
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	14	6.8	7.7	10
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.4	< 0.2	0.6	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	26	18	13	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	150	26	9.2	18	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	67	71	18	45	30
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	27	12	10	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	80	82	32	61	56

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843175	1843176	1843177	1843178	1843179
Sample Reference				WS1	WS1	WS3	WS3	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.70	1.20-1.40	0.60-0.80	1.65-1.80	0.40-0.60
Date Sampled				12/04/2021	13/04/2021	12/04/2021	12/04/2021	12/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

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

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	19	< 10	< 10	< 10	120
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	14
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	30
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	11	< 10	< 10	< 10	59
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	19	< 10	< 10	< 10	100

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

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843180	1843181	1843182	1843183	1843184
Sample Reference				WS4	WS2	WS8	WS7	WS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-1.70	0.60-0.80	0.50-0.70	0.60-0.90	0.30-0.50
Date Sampled				12/04/2021	12/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	13	14	12	13
Total mass of sample received	kg	0.001	NONE	2.0	0.50	1.7	1.7	2.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.0	7.5	6.7	7.1	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	330	350	210	240	290
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.027	0.077	0.014	0.035	0.014
Sulphide	mg/kg	1	MCERTS	2.1	3.9	7.8	4.6	15
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.5	0.6	0.3	0.2	0.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.10	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.38	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	5.0	0.15	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	6.4	0.33	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	5.3	0.25	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.0	0.09	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.8	0.10	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.1	0.13	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.92	0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.8	0.09	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.81	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.91	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	29.2	1.19	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	13	19	12	10
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.5	0.2	< 0.2	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	18	27	24	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	35	33	38	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	55	21	23	26	39
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	14	19	20	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	48	37	43	51	67

Analytical Report Number: 21-69810
 Project / Site name: Exter Airpark
 Your Order No: 210159

Lab Sample Number				1843180	1843181	1843182	1843183	1843184
Sample Reference				WS4	WS2	WS8	WS7	WS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-1.70	0.60-0.80	0.50-0.70	0.60-0.90	0.30-0.50
Date Sampled				12/04/2021	12/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	37	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	21	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	16	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	37	< 10	< 10	< 10	< 10

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

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843185	1843186	1843187	1843188	1843189
Sample Reference				WS10	WS9	TP01	TP02	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.10-1.30	0.40-0.60	0.50	0.30	0.50
Date Sampled				13/04/2021	13/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	14	14	13	11
Total mass of sample received	kg	0.001	NONE	2.0	2.0	1.2	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.1	8.1	8.2	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	540	570	390	360	340
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.036	0.0096	0.0089	0.039	0.029
Sulphide	mg/kg	1	MCERTS	20	5.9	< 1.0	< 1.0	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.8	0.5	1.5	0.4	0.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.31	0.54
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	0.12
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.53	1.1
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.46	0.89
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.23	0.38
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.24	0.32
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.27	0.35
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.11	0.19
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.13	0.27
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.18	0.31
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.23	0.37

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	2.75	4.89
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	8.7	10	11	8.8
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.3	0.5	0.4	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	< 0.2	< 0.2	0.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	19	24	18	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	18	16	23	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	23	22	52	48
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	25	21	17	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	3.3	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63	57	50	57	64

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843185	1843186	1843187	1843188	1843189
Sample Reference				WS10	WS9	TP01	TP02	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.10-1.30	0.40-0.60	0.50	0.30	0.50
Date Sampled				13/04/2021	13/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	21
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	11
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	21

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

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843190	1843191	1843192	1843193	1843194
Sample Reference				TP04	TP05	TP06	TP07	TP08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	0.30	0.30	1.50
Date Sampled				13/04/2021	13/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.7	13	14	18	13
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.0	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	8.3	7.2	7.1	6.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	320	390	450	440	340
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.072	0.080	0.018	0.042	0.017
Sulphide	mg/kg	1	MCERTS	7.0	9.2	< 1.0	13	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	1.2	1.4	1.9	< 0.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.44	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.48	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.10	3.9	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.08	3.1	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.0	36	0.17	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.20	9.6	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	42	0.58	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.1	36	0.61	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.39	19	0.29	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.43	12	0.32	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.51	18	0.49	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.14	8.3	0.17	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.30	16	0.36	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.15	8.1	0.24	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.9	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.17	8.3	0.25	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.79	223	3.48	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4	9.8	10	6.0	17
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.9	0.9	1.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	18	21	21	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	20	20	11	30
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	69	33	26	32
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	17	16	17	45
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	41	56	53	51	77

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843190	1843191	1843192	1843193	1843194
Sample Reference				TP04	TP05	TP06	TP07	TP08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	0.30	0.30	1.50
Date Sampled				13/04/2021	13/04/2021	13/04/2021	13/04/2021	13/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	20	380	< 10	< 10	< 10
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	13	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	25	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	58	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	96	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	4.8	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	28	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	130	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	13	110	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	20	260	< 10	< 10	< 10

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

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843195	1843196	1843197	1843198	1843199
Sample Reference				TP09	TP10	TP10	BH1	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	1.50	3.00-4.00	0.60-0.80
Date Sampled				13/04/2021	13/04/2021	13/04/2021	12/04/2021	14/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	10	8.6	17	13
Total mass of sample received	kg	0.001	NONE	0.40	1.2	1.5	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.4	6.2	8.0	7.8	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	500	520	180	440	370
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.020	0.018	0.045	0.014
Sulphide	mg/kg	1	MCERTS	18	< 1.0	< 1.0	2.2	12
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.2	1.6	0.6	0.9	0.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.8	12	14	12	10
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.3	< 0.2	0.9	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	19	13	26	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	16	13	19	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	44	14	33	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	14	11	26	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	51	25	58	49

Analytical Report Number: 21-69810
 Project / Site name: Exter Airpark
 Your Order No: 210159

Lab Sample Number				1843195	1843196	1843197	1843198	1843199
Sample Reference				TP09	TP10	TP10	BH1	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	1.50	3.00-4.00	0.60-0.80
Date Sampled				13/04/2021	13/04/2021	13/04/2021	12/04/2021	14/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843200	1843201	1843202	1843203
Sample Reference				BH2	BH3	BH3	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50-4.70	0.50-0.70	1.50-1.70	4.50-4.60
Date Sampled				14/04/2021	15/04/2021	15/04/2021	15/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	11	18	16
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	7.9	7.6	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	250	560	600	340
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.018	0.027	0.099	0.086
Sulphide	mg/kg	1	MCERTS	< 1.0	12	< 1.0	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	0.6	< 0.1	< 0.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	17	14	16
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.3	0.7	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	16	32	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	61	91	15	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	26	31	35
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40	13	43	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67	40	82	93

Analytical Report Number: 21-69810
Project / Site name: Exter Airpark
Your Order No: 210159

Lab Sample Number				1843200	1843201	1843202	1843203
Sample Reference				BH2	BH3	BH3	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50-4.70	0.50-0.70	1.50-1.70	4.50-4.60
Date Sampled				14/04/2021	15/04/2021	15/04/2021	15/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10

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

Analytical Report Number : 21-69810
Project / Site name: Exter Airpark

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1843175	WS1	None Supplied	0.50-0.70	Brown clay and sand with gravel and vegetation.
1843176	WS1	None Supplied	1.20-1.40	Brown clay and sand with gravel and vegetation.
1843177	WS3	None Supplied	0.60-0.80	Brown clay and sand with gravel.
1843178	WS3	None Supplied	1.65-1.80	Brown clay and sand with vegetation and gravel
1843179	WS5	None Supplied	0.40-0.60	Brown clay and sand with gravel and vegetation.
1843180	WS4	None Supplied	1.60-1.70	Brown clay and sand with vegetation and gravel
1843181	WS2	None Supplied	0.60-0.80	Brown clay and sand with vegetation and gravel
1843182	WS8	None Supplied	0.50-0.70	Brown clay and sand with vegetation and gravel
1843183	WS7	None Supplied	0.60-0.90	Brown clay and sand with vegetation and gravel
1843184	WS10	None Supplied	0.30-0.50	Brown clay and sand with gravel and vegetation.
1843185	WS10	None Supplied	1.10-1.30	Brown clay and sand with vegetation and gravel
1843186	WS9	None Supplied	0.40-0.60	Brown clay and sand with vegetation and gravel
1843187	TP01	None Supplied	0.5	Brown clay and sand with vegetation and gravel
1843188	TP02	None Supplied	0.3	Brown clay and sand with vegetation and gravel
1843189	TP03	None Supplied	0.5	Brown clay and sand with vegetation and gravel
1843190	TP04	None Supplied	0.9	Brown clay and sand with vegetation and gravel
1843191	TP05	None Supplied	1	Brown clay and sand with vegetation and gravel
1843192	TP06	None Supplied	0.3	Brown clay and sand with vegetation and gravel
1843193	TP07	None Supplied	0.3	Brown clay and sand with vegetation and gravel
1843194	TP08	None Supplied	1.5	Brown clay and sand with vegetation and gravel
1843195	TP09	None Supplied	0.3	Brown clay and sand with vegetation and gravel
1843196	TP10	None Supplied	0.3	Brown loam and sand with vegetation and gravel.
1843197	TP10	None Supplied	1.5	Brown clay and sand with vegetation and gravel
1843198	BH1	None Supplied	3.00-4.00	Brown clay and sand with vegetation and gravel
1843199	BH2	None Supplied	0.60-0.80	Brown clay and sand with vegetation and gravel
1843200	BH2	None Supplied	4.50-4.70	Brown clay and sand with vegetation and gravel
1843201	BH3	None Supplied	0.50-0.70	Brown clay and sand with vegetation and gravel
1843202	BH3	None Supplied	1.50-1.70	Brown clay with plastic.
1843203	BH3	None Supplied	4.50-4.60	Brown clay and sand.

Analytical Report Number : 21-69810

Project / Site name: Exter Airpark

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS



Analytical Report Number : 21-69810
Project / Site name: Exter Airpark

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Sample Deviation Report



Analytical Report Number : 21-69810

Project / Site name: Exter Airpark

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	None Supplied	S	1843198	c	Sulphide in soil	L010-PL	c
BH1	None Supplied	S	1843198	c	Total cyanide in soil	L080-PL	c
TP01	None Supplied	S	1843187	c	Sulphide in soil	L010-PL	c
TP01	None Supplied	S	1843187	c	Total cyanide in soil	L080-PL	c
TP02	None Supplied	S	1843188	c	Sulphide in soil	L010-PL	c
TP02	None Supplied	S	1843188	c	Total cyanide in soil	L080-PL	c
TP03	None Supplied	S	1843189	c	Sulphide in soil	L010-PL	c
TP03	None Supplied	S	1843189	c	Total cyanide in soil	L080-PL	c
TP04	None Supplied	S	1843190	c	Sulphide in soil	L010-PL	c
TP04	None Supplied	S	1843190	c	Total cyanide in soil	L080-PL	c
TP05	None Supplied	S	1843191	c	Sulphide in soil	L010-PL	c
TP05	None Supplied	S	1843191	c	Total cyanide in soil	L080-PL	c
TP06	None Supplied	S	1843192	c	Sulphide in soil	L010-PL	c
TP06	None Supplied	S	1843192	c	Total cyanide in soil	L080-PL	c
TP07	None Supplied	S	1843193	c	Sulphide in soil	L010-PL	c
TP07	None Supplied	S	1843193	c	Total cyanide in soil	L080-PL	c
TP08	None Supplied	S	1843194	c	Sulphide in soil	L010-PL	c
TP08	None Supplied	S	1843194	c	Total cyanide in soil	L080-PL	c
TP09	None Supplied	S	1843195	c	Sulphide in soil	L010-PL	c
TP09	None Supplied	S	1843195	c	Total cyanide in soil	L080-PL	c
TP10	None Supplied	S	1843196	c	Sulphide in soil	L010-PL	c
TP10	None Supplied	S	1843196	c	Total cyanide in soil	L080-PL	c
TP10	None Supplied	S	1843197	c	Sulphide in soil	L010-PL	c
TP10	None Supplied	S	1843197	c	Total cyanide in soil	L080-PL	c
WS1	None Supplied	S	1843175	c	Sulphide in soil	L010-PL	c
WS1	None Supplied	S	1843175	c	Total cyanide in soil	L080-PL	c
WS1	None Supplied	S	1843176	c	Sulphide in soil	L010-PL	c
WS1	None Supplied	S	1843176	c	Total cyanide in soil	L080-PL	c
WS10	None Supplied	S	1843184	c	Sulphide in soil	L010-PL	c
WS10	None Supplied	S	1843184	c	Total cyanide in soil	L080-PL	c
WS10	None Supplied	S	1843185	c	Sulphide in soil	L010-PL	c
WS10	None Supplied	S	1843185	c	Total cyanide in soil	L080-PL	c
WS2	None Supplied	S	1843181	c	Sulphide in soil	L010-PL	c
WS2	None Supplied	S	1843181	c	Total cyanide in soil	L080-PL	c
WS3	None Supplied	S	1843177	c	Sulphide in soil	L010-PL	c
WS3	None Supplied	S	1843177	c	Total cyanide in soil	L080-PL	c
WS3	None Supplied	S	1843178	c	Sulphide in soil	L010-PL	c
WS3	None Supplied	S	1843178	c	Total cyanide in soil	L080-PL	c
WS4	None Supplied	S	1843180	c	Sulphide in soil	L010-PL	c
WS4	None Supplied	S	1843180	c	Total cyanide in soil	L080-PL	c
WS5	None Supplied	S	1843179	c	Sulphide in soil	L010-PL	c
WS5	None Supplied	S	1843179	c	Total cyanide in soil	L080-PL	c
WS7	None Supplied	S	1843183	c	Sulphide in soil	L010-PL	c
WS7	None Supplied	S	1843183	c	Total cyanide in soil	L080-PL	c
WS8	None Supplied	S	1843182	c	Sulphide in soil	L010-PL	c
WS8	None Supplied	S	1843182	c	Total cyanide in soil	L080-PL	c
WS9	None Supplied	S	1843186	c	Sulphide in soil	L010-PL	c
WS9	None Supplied	S	1843186	c	Total cyanide in soil	L080-PL	c



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Analytical Report Number : 21-73404

Project / Site name:	Exeter Airport	Samples received on:	07/05/2021
Your job number:		Samples instructed on/ Analysis started on:	07/05/2021
Your order number:	210159_CB	Analysis completed by:	17/05/2021
Report Issue Number:	1	Report issued on:	17/05/2021
Samples Analysed:	1 water sample		

Signed:

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

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

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

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

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

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



Analytical Report Number: 21-73404
Project / Site name: Exeter Airport

Your Order No: 210159_CB

Lab Sample Number				1862382
Sample Reference				BH1
Sample Number				None Supplied
Depth (m)				4.12-10.68
Date Sampled				05/05/2021
Time Taken				1530
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	960
Total Cyanide	µg/l	10	ISO 17025	< 10
Complex Cyanide	µg/l	10	ISO 17025	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10
Sulphate as SO ₄	µg/l	45	ISO 17025	18200
Sulphide	µg/l	5	NONE	< 5.0
Chloride	mg/l	0.15	ISO 17025	75
Ammoniacal Nitrogen as NH ₄	µg/l	15	ISO 17025	3600
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	20.0

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16
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Analytical Report Number: 21-73404
Project / Site name: Exeter Airport

Your Order No: 210159_CB

Lab Sample Number				1862382
Sample Reference				BH1
Sample Number				None Supplied
Depth (m)				4.12-10.68
Date Sampled				05/05/2021
Time Taken				1530
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	95
Calcium (dissolved)	mg/l	0.012	ISO 17025	170
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.17
Magnesium (dissolved)	mg/l	0.005	ISO 17025	34
Phosphorus (dissolved)	µg/l	20	ISO 17025	22.6
Potassium (dissolved)	mg/l	0.025	ISO 17025	6.3
Sodium (dissolved)	mg/l	0.01	ISO 17025	57

Antimony (dissolved)	µg/l	0.4	ISO 17025	0.5
Arsenic (dissolved)	µg/l	0.15	ISO 17025	4.34
Barium (dissolved)	µg/l	0.06	ISO 17025	270
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	3.8
Cobalt (dissolved)	µg/l	0.2	ISO 17025	5.1
Copper (dissolved)	µg/l	0.5	ISO 17025	5.2
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	1100
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	2.1
Nickel (dissolved)	µg/l	0.5	ISO 17025	9.6
Selenium (dissolved)	µg/l	0.6	ISO 17025	4.9
Tin (dissolved)	µg/l	0.2	ISO 17025	0.35
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.5

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0



Analytical Report Number: 21-73404
Project / Site name: Exeter Airport

Your Order No: 210159_CB

Lab Sample Number				1862382
Sample Reference				BH1
Sample Number				None Supplied
Depth (m)				4.12-10.68
Date Sampled				05/05/2021
Time Taken				1530
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	µg/l	10	NONE	< 10.0
Diesel Range Organics (C10 - C25)	µg/l	10	NONE	< 10

TPH1 (C10 - C40)	µg/l	10	NONE	< 10
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TPH2 (C6 - C10)	µg/l	10	ISO 17025	< 10
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TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0



Analytical Report Number: 21-73404
Project / Site name: Exeter Airport

Your Order No: 210159_CB

Lab Sample Number				1862382
Sample Reference				BH1
Sample Number				None Supplied
Depth (m)				4.12-10.68
Date Sampled				05/05/2021
Time Taken				1530
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05



Analytical Report Number: 21-73404
Project / Site name: Exeter Airport

Your Order No: 210159_CB

Lab Sample Number				1862382
Sample Reference				BH1
Sample Number				None Supplied
Depth (m)				4.12-10.68
Date Sampled				05/05/2021
Time Taken				1530
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10

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

Analytical Report Number : 21-73404
Project / Site name: Exeter Airport

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Complex cyanide in water	Determination of complex cyanide by calculation. Accredited matrices SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 dphenylcarbazine followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Mineral Oil (Waters) C10 - C40	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
TPH2 (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW. GW.	In-house method based on USEPA8260	L088-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025



Analytical Report Number : 21-73404
Project / Site name: Exeter Airport

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammonium as NH ₄ in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
DRO (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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



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Analytical Report Number : 21-73746

Project / Site name:	Exter Airport	Samples received on:	10/05/2021
Your job number:		Samples instructed on/ Analysis started on:	10/05/2021
Your order number:	210159-CB	Analysis completed by:	19/05/2021
Report Issue Number:	1	Report issued on:	19/05/2021
Samples Analysed:	3 water samples		

Signed:

Izabela Wójcik

Izabela Wójcik
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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



Analytical Report Number: 21-73746
Project / Site name: Exter Airport

Your Order No: 210159-CB

Lab Sample Number				1864237	1864238	1864239
Sample Reference				BH2	WS9	BH3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				0930	1030	1130
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status

General Inorganics

pH	pH Units	N/A	ISO 17025	7.5	7.5	7.1
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	680	300	1400
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Sulphate as SO4	µg/l	45	ISO 17025	29100	65400	629000
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	59	27	50
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	160	72	30
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	1.04	1.28	3.63

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16
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Analytical Report Number: 21-73746
Project / Site name: Exter Airport

Your Order No: 210159-CB

Lab Sample Number				1864237	1864238	1864239
Sample Reference				BH2	WS9	BH3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				0930	1030	1130
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status

Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	45	33	270
Calcium (dissolved)	mg/l	0.012	ISO 17025	110	49	330
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.016	0.21	0.15
Magnesium (dissolved)	mg/l	0.005	ISO 17025	11	5.4	52
Phosphorus (dissolved)	µg/l	20	ISO 17025	< 20.0	< 20.0	< 20.0
Potassium (dissolved)	mg/l	0.025	ISO 17025	8.5	2.0	7.0
Sodium (dissolved)	mg/l	0.01	ISO 17025	54	20	60

Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4	0.7	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.74	2.03	2.35
Barium (dissolved)	µg/l	0.06	ISO 17025	120	25	49
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.03	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.9	2.8	2.0
Cobalt (dissolved)	µg/l	0.2	ISO 17025	0.3	1.0	8.1
Copper (dissolved)	µg/l	0.5	ISO 17025	3.6	2.7	1.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	2.5	61	5000
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.79	5.4	0.91
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.7	3.8	12
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.8	1.3	1.1
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	< 0.20	0.31
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.8	10	0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.4	3.6	8.3

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-73746
Project / Site name: Exter Airport

Your Order No: 210159-CB

Lab Sample Number				1864237	1864238	1864239
Sample Reference				BH2	WS9	BH3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				0930	1030	1130
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

Petroleum Hydrocarbons

Mineral Oil (C10 - C40)	µg/l	10	NONE	< 10.0	< 10.0	< 10.0
Diesel Range Organics (C10 - C25)	µg/l	10	NONE	< 10	< 10	< 10

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10
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TPH2 (C6 - C10)	µg/l	10	ISO 17025	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10



Analytical Report Number: 21-73746

Project / Site name: Exter Airport

Your Order No: 210159-CB

Lab Sample Number				1864237	1864238	1864239
Sample Reference				BH2	WS9	BH3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				0930	1030	1130
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

VOCs

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



Analytical Report Number: 21-73746

Project / Site name: Exter Airport

Your Order No: 210159-CB

Lab Sample Number				1864237	1864238	1864239
Sample Reference				BH2	WS9	BH3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				0930	1030	1130
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	1.2
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05



Analytical Report Number: 21-73746
Project / Site name: Exter Airport

Your Order No: 210159-CB

Lab Sample Number				1864237	1864238	1864239
Sample Reference				BH2	WS9	BH3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				6.87-9.90	0.79-1.86	1.12-5.85
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				0930	1030	1130
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	1.2

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

Analytical Report Number : 21-73746
Project / Site name: Exter Airport

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Complex cyanide in water	Determination of complex cyanide by calculation. Accredited matrices SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Mineral Oil (Waters) C10 - C40	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
TPH2 (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW. GW.	In-house method based on USEPA8260	L088-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025

Analytical Report Number : 21-73746
Project / Site name: Exter Airport

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammonium as NH ₄ in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
DRO (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Sample Deviation Report



Analytical Report Number : 21-73746

Project / Site name: Exter Airport

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH2	None Supplied	W	1864237	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH2	None Supplied	W	1864237	c	Ammonium as NH4 in water	L082-PL	c
BH2	None Supplied	W	1864237	c	Electrical conductivity at 20oC of water	L031-PL	c
BH2	None Supplied	W	1864237	c	pH at 20oC in water (automated)	L099-PL	c
BH3	None Supplied	W	1864239	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH3	None Supplied	W	1864239	c	Ammonium as NH4 in water	L082-PL	c
BH3	None Supplied	W	1864239	c	Electrical conductivity at 20oC of water	L031-PL	c
BH3	None Supplied	W	1864239	c	pH at 20oC in water (automated)	L099-PL	c
WS9	None Supplied	W	1864238	c	Ammoniacal Nitrogen as N in water	L082-PL	c
WS9	None Supplied	W	1864238	c	Ammonium as NH4 in water	L082-PL	c
WS9	None Supplied	W	1864238	c	Electrical conductivity at 20oC of water	L031-PL	c
WS9	None Supplied	W	1864238	c	pH at 20oC in water (automated)	L099-PL	c

APPENDIX 8: MONITORING RESULTS

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: PARAGON BC
Site: Exeter Airport
Date: 05/05/2021

Quote No:
Visit No: 1 of 3
Operator: A.Meaden

Project Manager: Dan Stodgell



Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH1	ND	ND	ND	ND	0.8	0.8	ND	ND	ND	ND	19.4	19.4	ND	NA	-0.1	-0.1	-0.17	30	4.12	10.68	sample taken was light sandy brown colour, slightly cloudy, no odour.
BH2	ND	ND	ND	ND	0.3	0.2	ND	ND	ND	ND	20.8	21.0	ND	NA	-0.1	-0.1	-0.14	30	6.87	9.90	
BH3	ND	ND	ND	ND	0.9	0.9	3	3	ND	ND	19.9	19.9	0.1	NA	0.1	0.1	0.12	30	1.12	5.85	Sample taken was reddy orange colour, cloudy, no odour
WS1	0.1	0.1	2.0	2.0	1.3	1.3	1	1	ND	ND	19.3	19.3	ND	NA	0.0	0.0	-0.24	30	NR	1.44	
WS2	ND	ND	ND	ND	0.9	0.9	1	1	ND	ND	18.9	18.9	ND	NA	0.0	0.0	0.08	30	NR	3.92	Borehole dry
WS3	0.4	0.4	8.0	8.0	1.7	1.7	ND	ND	ND	ND	19.5	19.5	ND	NA	-0.1	-0.1	0.02	30	NR	NR	unable to dip as gas bung is stuck down borehole pipe
WS4	ND	ND	ND	ND	0.3	0.3	ND	ND	ND	ND	20.7	20.7	ND	NA	0.0	0.0	-0.05	30	NR	2.03	
WS5	ND	ND	ND	ND	0.6	0.6	ND	ND	ND	ND	20.5	20.5	ND	NA	-0.1	-0.1	-0.08	30	NR	1.38	Borehole dry
WS7	ND	ND	ND	ND	1.0	1.0	1	1	ND	ND	20.2	20.2	ND	NA	0.0	0.0	-0.37	30	NR	1.47	Borehole dry
WS8	ND	ND	ND	ND	1.5	1.4	ND	ND	1	1	19.7	20.0	0.5	NA	0.0	0.0	-0.24	30	NR	1.55	Borehole dry
WS9	ND	ND	ND	ND	ND	ND	1	1	ND	ND	20.7	20.7	0.1	NA	-0.1	-0.1	-1.27	30	0.79	1.86	Sample taken was slightly cloudy no odour
WS10	ND	ND	ND	ND	2.1	2.1	ND	ND	ND	ND	19.6	19.6	0.1	NA	-0.1	-0.1	-0.19	30	NR	1.48	
Max	0.4	0.4	8.0	8.0	2.1	2.1	3	3	1	1	20.8	21.0	NR	ND	0.1	0.1	0	30	6.87	10.68	
Min	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.9	18.9	NR	0.0	-0.1	-0.1	-1.3	30	0.79	1.38	

ND - Not detected

NR - Not recorded

NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
Wind: ☐ Calm ☒ Light ☐ Moderate ☐ Strong
Cloud cover: ☐ None ☐ Slight ☒ Cloudy ☐ Overcast
Precipitation: ☐ None ☒ Slight ☐ Moderate ☐ Heavy
Time monitoring performed: ☐ 8:30 Start ☐ 16:00 End
Barometric pressure (mbar): ☐ 1011 Start ☐ 1007 End
Pressure trend (Daily): ☒ Falling ☐ Steady ☐ Rising
Source: ☐ Met Office
Air Temperature (Deg. C): ☐ 10 Before ☐ 12 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA500668
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 22/12/2020
Date of next calibration: 22/06/2021

Ambient air check: CH₄ CO₂ O₂

JOB DETAILS:

Client: PARAGON BC
 Site: Exeter Airport
 Date: 13/05/2021

Quote No:

Visit No: 2 of 3

Operator: A.Meaden

Project Manager: Dan Stodgell



Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH1	ND	ND	ND	ND	2.1	2.1	ND	ND	ND	ND	15.9	15.9	ND	NA	0.0	0.0	-0.27	30	3.99	10.68	Borehole Dry
BH2	2.2	0.1	44.0	2.0	0.8	0.3	ND	ND	ND	ND	19.4	21.0	ND	NA	-0.1	-0.1	-0.27	30	6.58	9.89	
BH3	0.1	ND	2.0	ND	0.8	0.8	1	1	ND	ND	20.6	20.6	ND	NA	1.0	1.0	2.48	30	0.82	5.85	
WS1	ND	ND	ND	ND	1.2	1.2	2	2	ND	ND	18.0	18.0	ND	NA	0.0	0.0	-0.27	30	0.84	1.45	
WS2	0.1	0.1	2.0	2.0	1.3	1.1	ND	ND	ND	ND	13.7	13.8	ND	NA	0.0	0.0	-0.29	30	2.24	3.91	
WS3	0.4	0.4	8.0	8.0	1.9	1.9	ND	ND	ND	ND	19.0	19.0	ND	NA	10.2	10.2	59.63	30	NR	NR	unable to dip as gas bung is stuck down borehole pipe
WS4	26.5	26.5	>>>>	>>>>	8.4	8.4	1	1	ND	ND	2.3	2.3	ND	NA	-0.1	-0.1	-0.27	30	NR	2.03	
WS5	ND	ND	ND	ND	0.6	0.6	ND	ND	ND	ND	20.3	20.3	ND	NA	0.00	0.00	-0.29	30	0.48	1.40	Borehole Flooded
WS7	0.2	0.2	4.0	4.0	0.9	0.9	3	3	ND	ND	19.7	19.7	ND	NA	-0.1	-0.1	-0.41	30	1.08	1.47	
WS8	0.1	0.1	2.0	2.0	1.2	1.2	2	2	ND	ND	18.4	18.4	ND	NA	0.0	0.0	-0.04	30	0.86	1.55	
WS9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00	1.86	
WS10	ND	ND	ND	ND	2.1	2.1	ND	ND	ND	ND	19.2	19.2	ND	NA	0.0	0.0	0.00	30	1.47	1.48	
Max	26.5	26.5	44.0	8.0	8.4	8.4	3	3	ND	ND	20.6	21.0	NR	ND	10.2	10.2	60	30	6.58	10.68	
Min	ND	ND	ND	ND	0.6	0.3	ND	ND	ND	ND	2.3	2.3	NR	0.0	-0.1	-0.1	-0.4	30	0.00	1.40	

ND - Not detected

NR - Not recorded

NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen

Wind: ☐ Calm ☒ Light ☐ Moderate ☐ Strong

Cloud cover: ☐ None ☒ Slight ☒ Cloudy ☐ Overcast

Precipitation: ☐ None ☒ Slight ☐ Moderate ☐ Heavy

Time monitoring performed: 8:30 Start 16:00 End

Barometric pressure (mbar): 1011 Start 1007 End

Pressure trend (Daily): ☒ Falling ☐ Steady ☐ Rising

Source: Met Office

Air Temperature (Deg. C): 10 Before 12 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA500668

Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%

Gas Flow range: +100/-50 l/hour

Differential Pressure: (+/-) 1000 Pa

Date of last calibration: 22/12/2020

Date of next calibration: 22/06/2021

Ambient air check: CH₄ 0.0 CO₂ 0.1 O₂ 20.9

JOB DETAILS:

Client: PARAGON BC
 Site: Exeter Airport
 Date: 20/05/2021

Quote No:

Visit No: 3 of 3

Operator: A.Meaden

Project Manager: Dan Stodgell



Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH1	3.2	3.2	64.0	64.0	4.6	4.6	ND	ND	ND	ND	4.8	4.8	ND	NA	0.3	0.3	-0.07	30	3.26	10.69	
BH2	0.4	ND	8.0	ND	0.3	0.2	ND	ND	ND	ND	20.3	20.7	0.1	NA	0.3	0.3	-0.08	30	5.72	9.88	
BH3	0.1	ND	2.0	ND	0.4	0.4	2	2	ND	ND	20.8	20.8	0.1	NA	1.1	1.1	8.36	30	0.68	5.85	
WS1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NR	NR	NR	NR	0.01	1.45	Borehole Flooded
WS2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NR	NR	NR	NR	0.00	3.91	Borehole Flooded
WS3	ND	ND	ND	ND	2.3	2.3	ND	ND	ND	ND	17.6	17.6	ND	NA	1.3	1.3	2.25	30	NR	NR	unable to dip as gas bung is stuck down borehole pipe
WS4	33.9	33.9	~~~~~	~~~~~	9.2	9.2	ND	ND	ND	ND	1.0	1.0	ND	NA	2.6	2.6	6.34	30	NR	2.03	Borehole Dry
WS5	ND	ND	ND	ND	0.5	0.1	ND	ND	ND	ND	20.0	21.0	ND	NA	0.80	0.80	8.09	30	0.25	1.40	
WS7	0.2	ND	4.0	ND	0.4	0.4	ND	ND	ND	ND	20.6	20.8	0.2	NA	0.3	0.3	0.10	30	0.40	1.47	
WS8	ND	ND	ND	ND	0.9	0.9	5	5	ND	ND	18.7	18.7	1.8	NA	0.4	0.4	3.24	30	0.55	1.55	
WS9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NR	NR	NR	NR	0.01	1.86	Borehole Flooded
WS10	ND	ND	ND	ND	4.0	4.0	ND	ND	ND	ND	12.1	12.1	ND	NA	0.9	0.9	0.02	30	1.36	1.49	
Max	33.9	33.9	64.0	64.0	9.2	9.2	5	5	ND	ND	20.8	21.0	NR	ND	2.6	2.6	8	30	5.72	10.69	
Min	ND	ND	ND	ND	0.3	0.1	ND	ND	ND	ND	1.0	1.0	NR	0.0	0.3	0.3	-0.1	30	0.00	1.40	

ND - Not detected

NR - Not recorded

NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☐ Dry ☐ Moist ☒ Wet ☐ Snow ☐ Frozen

Wind: ☐ Calm ☐ Light ☒ Moderate ☐ Strong

Cloud cover: ☐ None ☐ Slight ☐ Cloudy ☒ Overcast

Precipitation: ☐ None ☒ Slight ☐ Moderate ☐ Heavy

Time monitoring performed: ☐ 7:45 Start ☐ 10:00 End

Barometric pressure (mbar): ☐ 1016 Start ☐ 1014 End

Pressure trend (Daily): ☒ Falling ☐ Steady ☐ Rising

Source: ☐ Met Office

Air Temperature (Deg. C): ☐ 10 Before ☐ 11 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA5000; G500668

Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%

Gas Flow range: +100/-50 l/hour

Differential Pressure: (+/-) 1000 Pa

Date of last calibration: 22/12/2020

Date of next calibration: 22/06/2021

Ambient air check: CH₄ CO₂ O₂

APPENDIX 9: GEOTECHNICAL LABORATORY TESTING



2718

GEOTECHNICAL ENGINEERING LIMITED



For the attention of Matthew Hollow / Joss Evans

Version No. 1

Page No. 1 of 17

Date of Issue 04/06/2021

TEST REPORT

PROJECT/SITE	Exeter Airpark	Samples received	16/04/2021
GEL REPORT NUMBER	36426	Schedule received	14/05/2021
Your ref/PO:	210159_CB	Testing commenced	27/05/2021
Test report refers to	Schedule 1	Status	Final

SUMMARY OF RESULTS ATTACHED

TEST METHOD & DESCRIPTION	QUANTITY	ACCREDITED TEST
BS EN ISO 17892-1: 2014:5. Water Content	16	YES
BS1377: Part 2: 1990:4.2-4.4&5.2-5.4, Liquid & Plastic Limits	14	YES
BS EN ISO 17892-4: 2016: 5.2, Particle Size Distribution - Wet Sieve	5	YES
BS EN ISO 17892-4: 2016: 5.4, Particle Size Distribution - Pipette	3	YES
BS1377: Part 4: 1990:3, Dry Density/Moisture Content Relationship	2	YES
BRE SD1 Suite B (Subcontracted)	21	YES/NO

Remarks This report may not be partially reproduced without written permission from this laboratory. The results reported relate to samples received in the laboratory	Approved Signatories: W Jones (Laboratory Manager) T Best (Deputy Lab Manager) J Hanson (Director) N Parry (Director) 
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Doc TR01 Rev No. 23 Revision date 10/02/21 DC:JH

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Registered number: 00700739**VAT Number:** 682 5857 89**Payments:** Geotechnical Engineering Limited**Sort code:** 16-22-11 **Bank account:** 11125135

LIQUID AND PLASTIC LIMITS

BS.1377 : PART 2 : 1990 : 4 and 5



CLIENT PARAGON

SITE EXETER AIRPARK

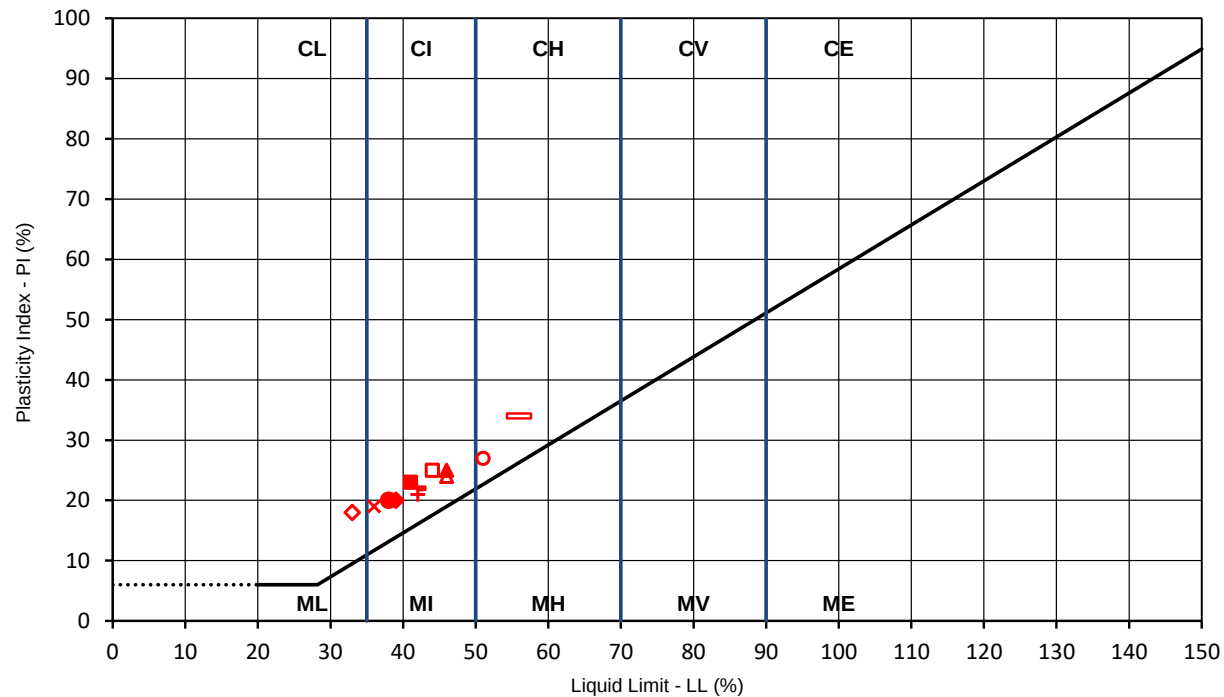
borehole /trial pit no.	sample		specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks		
	no./type	depth (m)										
BH1	B	5.50	5.50	20.4	BXE	1	44	19	25	Reddish brown slightly sandy CLAY		
BH2	D	3.00	3.00	16.7	BXE	15	33	15	18	Reddish brown slightly gravelly slightly sandy CLAY		
BH2	D	4.45	4.45	16.9	BXE	0	46	22	24	Reddish brown mottled grey slightly sandy CLAY		
BH2	D	8.00	8.00	17.9	BXE	14	36	17	19	Reddish brown mottled grey slightly sandy slightly gravelly CLAY		
BH3	B	1.50	1.50	22.5	BXE	0	42	21	21	Reddish brown slightly sandy CLAY		
TP01	B	2.00	2.00	18.2	BXE	3	51	24	27	Reddish brown slightly gravelly slightly sandy CLAY		
TP02	B	3.00	3.00	14.1	BXE	21	41	18	23	Orangish brown slightly gravelly slightly sandy CLAY		
TP03	B	2.20	2.20	19.3	BXE	11	39	19	20	Reddish brown slightly gravelly slightly sandy CLAY		
TP04	B	3.00	3.00	22.2	BXE	2	46	21	25	Reddish brown slightly gravelly slightly sandy CLAY		
TP06	B	1.00	1.00	16.9	E					Reddsih brown mottled grey slightly gravelly slightly sandy CLAY		
TP06	D	1.50	1.50	19.1	BXE	11	38	18	20	Orangish brown mottled grey slightly gravelly slightly sandy CLAY		
TP06	D	2.00	2.00	25.1	E					Reddish brown slightly gravelly slightly sandy CLAY		
TP07	B	1.00	1.00	24.7	BXE	7	56	22	34	Orangish brown slightly gravelly slightly sandy CLAY		
TP07	B	2.50	2.50	15.6	BXE	0	42	20	22	Reddish brown slightly sandy CLAY		
TP09	B	1.00	1.00	20.1	BXE	3	50	22	28	Orangish brown slightly gravelly slightly sandy CLAY		
TP10	B	3.00	3.00	20	BXE	0	43	20	23	Reddish brown slightly sandy CLAY		
general remarks natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified) NP denotes non plastic # denotes sample tested is smaller than that which is recommended in accordance with BS1377 or BS EN ISO 17892												
specimen preparation A - as received B - washed on 0.425mm sieve C - air dried									test method X - cone penetrometer (test 4.3) Y - cone penetrometer (test 4.4) Z - casagrande apparatus (test 4.5)		CONTRACT 36426	CHECKED TB

Geotechnical Engineering Limited

ATTERBERG LINE PLOT



CLIENT PARAGON
SITE EXETER AIRPARK



BH/TP No.		depth (m)	LL	PL	PI	remarks
□	BH1	5.50	44	19	25	
◇	BH2	3.00	33	15	18	
△	BH2	4.45	46	22	24	
×	BH2	8.00	36	17	19	
+	BH3	1.50	42	21	21	
○	TP01	2.00	51	24	27	
■	TP02	3.00	41	18	23	
◆	TP03	2.20	39	19	20	
▲	TP04	3.00	46	21	25	
●	TP06	1.50	38	18	20	
▢	TP07	1.00	56	22	34	
▪	TP07	2.50	42	20	22	

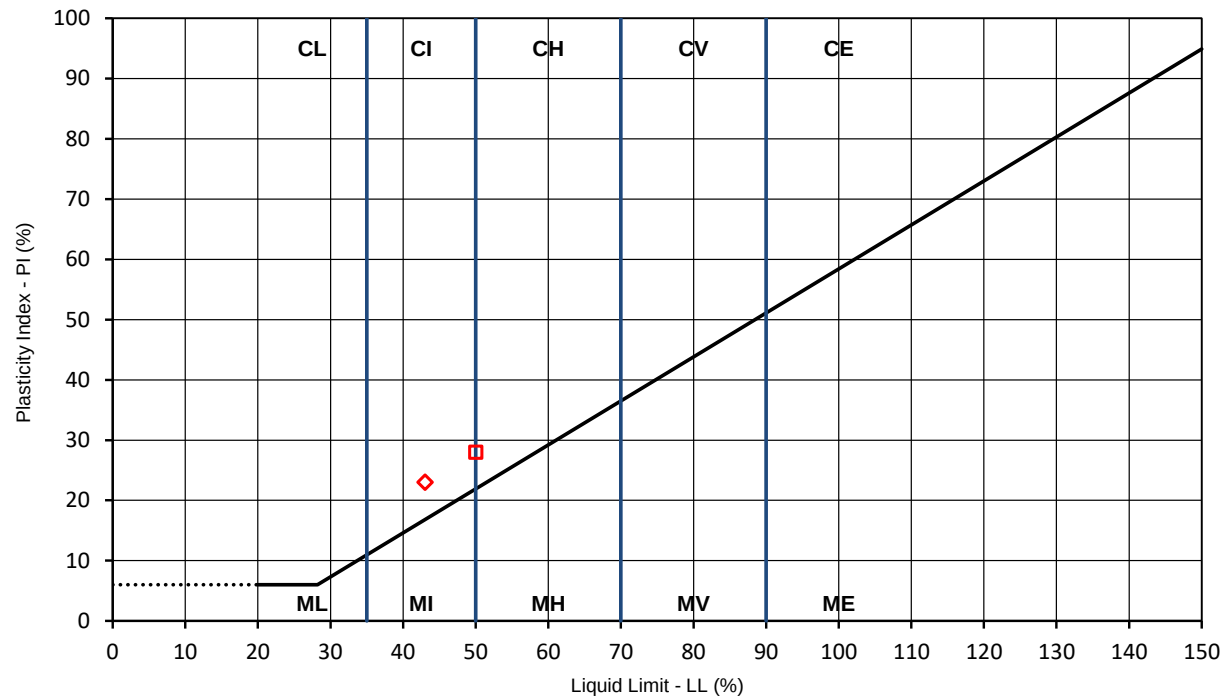
CONTRACT	CHECKED
36426	TB

Geotechnical Engineering Limited

ATTERBERG LINE PLOT



CLIENT PARAGON
SITE EXETER AIRPARK



BH/TP No.		depth (m)	LL	PL	PI	remarks
□	TP09	1.00	50	22	28	
◇	TP10	3.00	43	20	23	

CONTRACT	CHECKED
36426	TB

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5



CLIENT PARAGON

BH/TP No.

BH2

SITE EXETER AIRPARK

SAMPLE No./TYPE

B

DESCRIPTION Reddish brown slightly gravelly sandy silty CLAY

SAMPLE DEPTH (m)

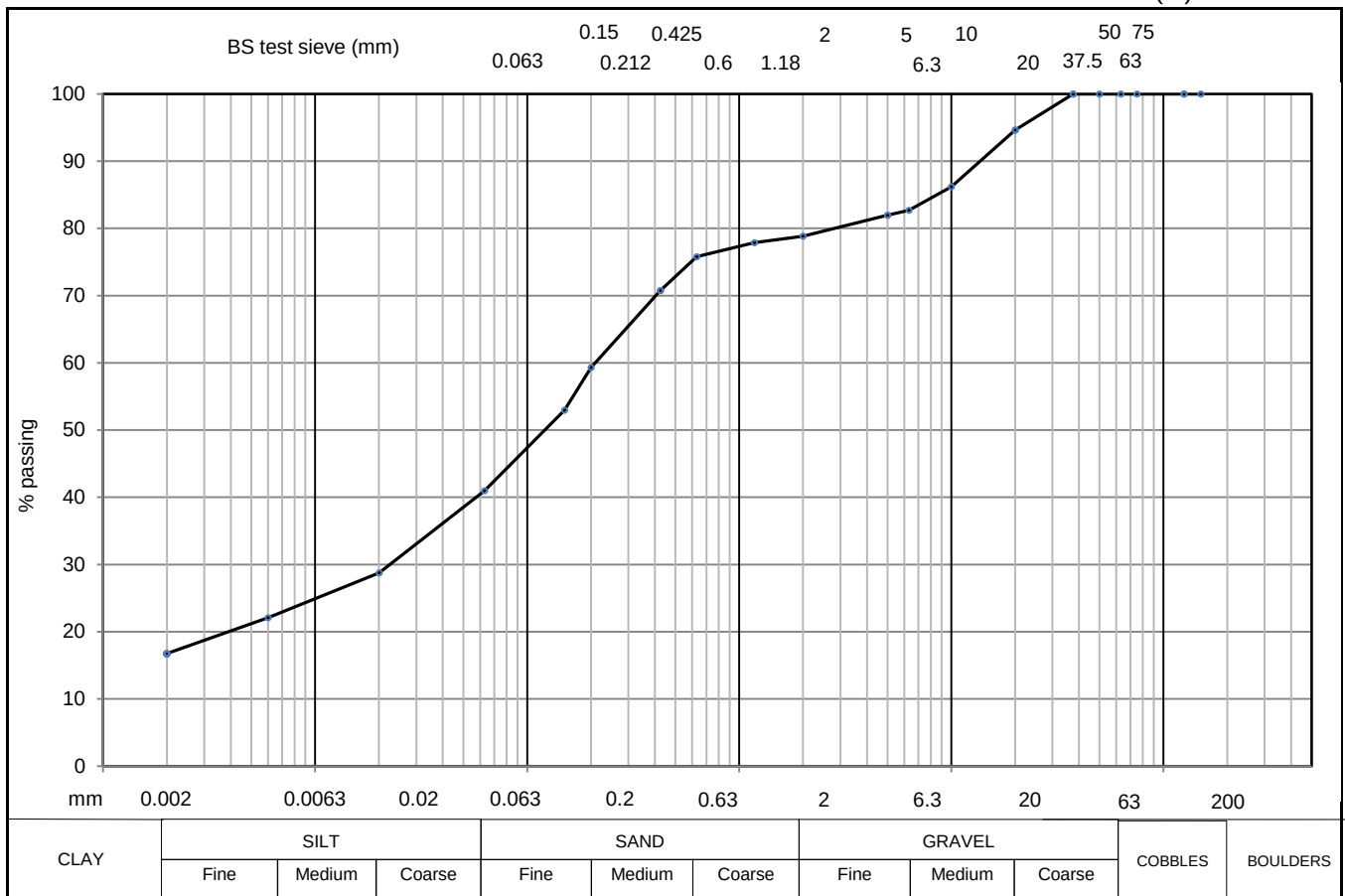
1.50

SPECIMEN TOP (m)

1.50

SPECIMEN BASE (m)

2.00



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	17						
SILT	24	150		5	82	20	29
SILT & CLAY	41						
SAND	38	75		2	79	6	22
GRAVEL	21						
COBBLE & BOULDER	0	63		1.18	78	2	17
test method(s)	5.2 & 5.4	50		0.63	76		
test method		37.5	100	0.425	71		
5.2 - sieving		20	95	0.2	59		
5.3 - sedimentation by hydrometer		10	86	0.15	53		
5.4 - sedimentation by pipette		6.3	83	0.063	41		
remarks	# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3					CONTRACT	CHECKED
						36426	TB

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5



CLIENT PARAGON

BH/TP No.

BH3

SITE EXETER AIRPARK

SAMPLE No./TYPE

D

DESCRIPTION Brown clayey very sandy GRAVEL

SAMPLE DEPTH (m)

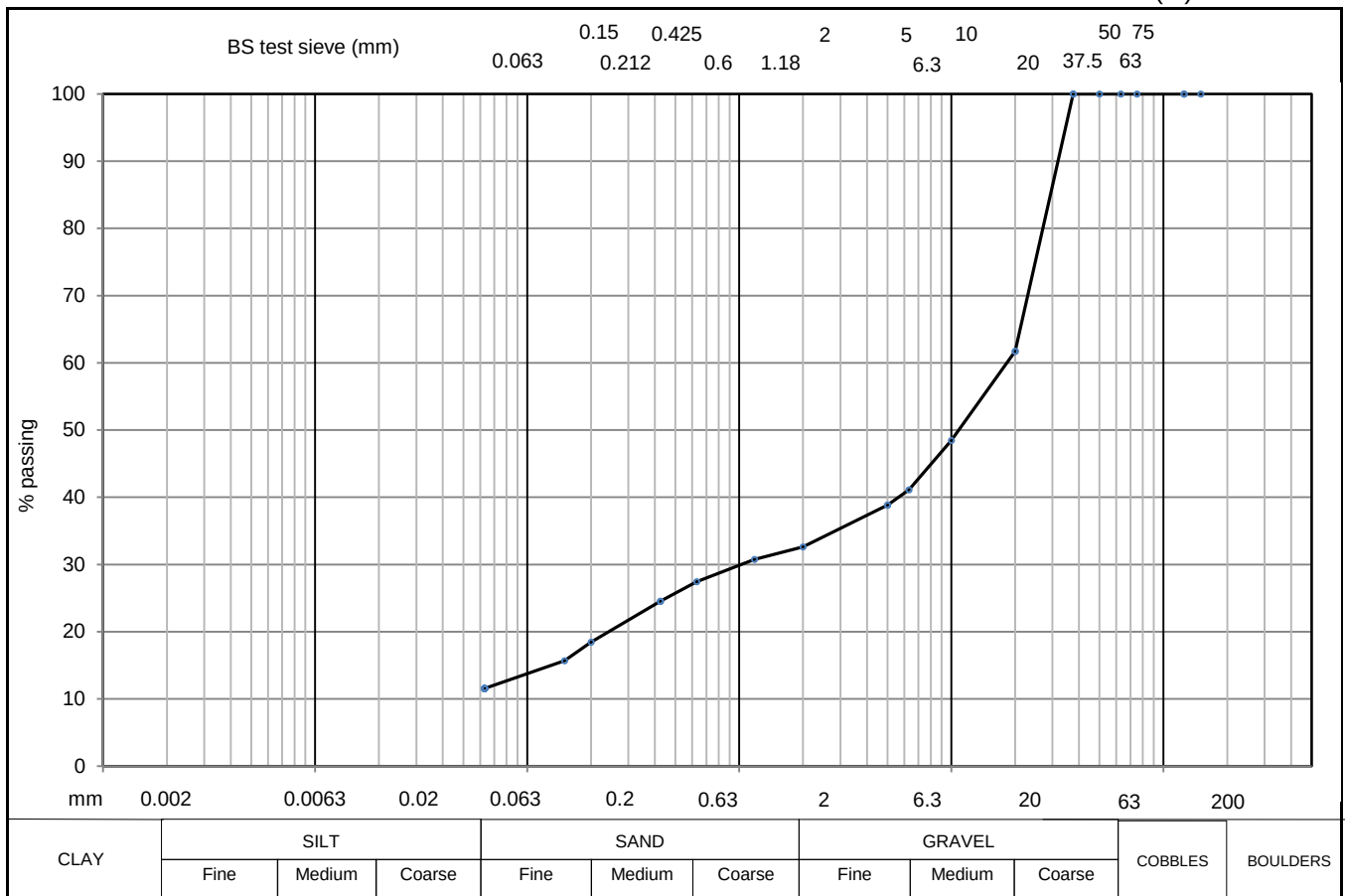
1.00

SPECIMEN TOP (m)

1.00

SPECIMEN BASE (m)

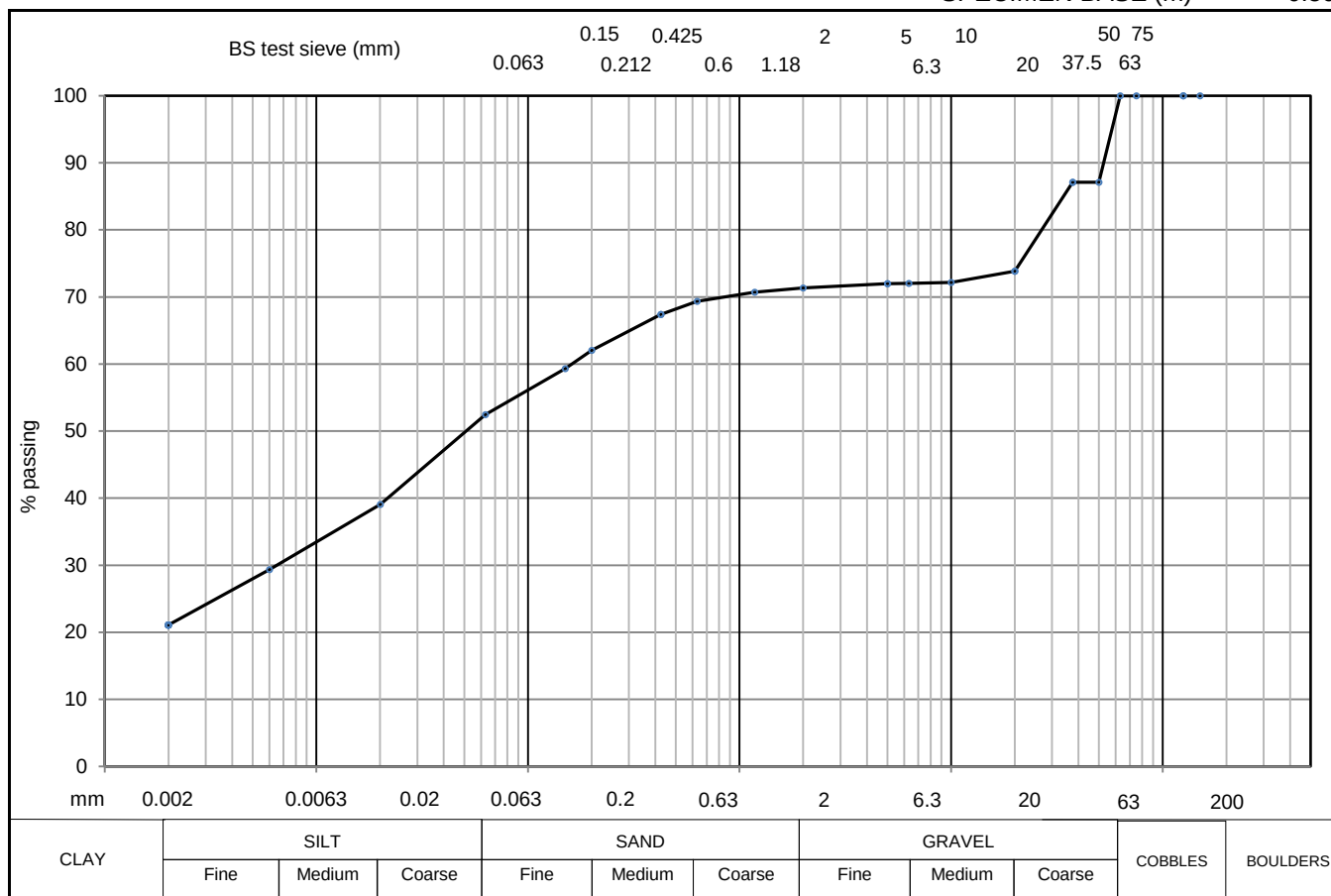
1.45



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150		5	39	20	
SILT & CLAY	12						
SAND	21	75		2	33	6	
GRAVEL	67						
COBBLE & BOULDER	0	63		1.18	31	2	
test method(s)	5.2#	50		0.63	27		
test method		37.5	100	0.425	25		
5.2 - sieving		20	62	0.2	18		
5.3 - sedimentation by hydrometer		10	48	0.15	16		
5.4 - sedimentation by pipette		6.3	41	0.063	12		
remarks	# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m ³					CONTRACT	CHECKED
						36426	TB



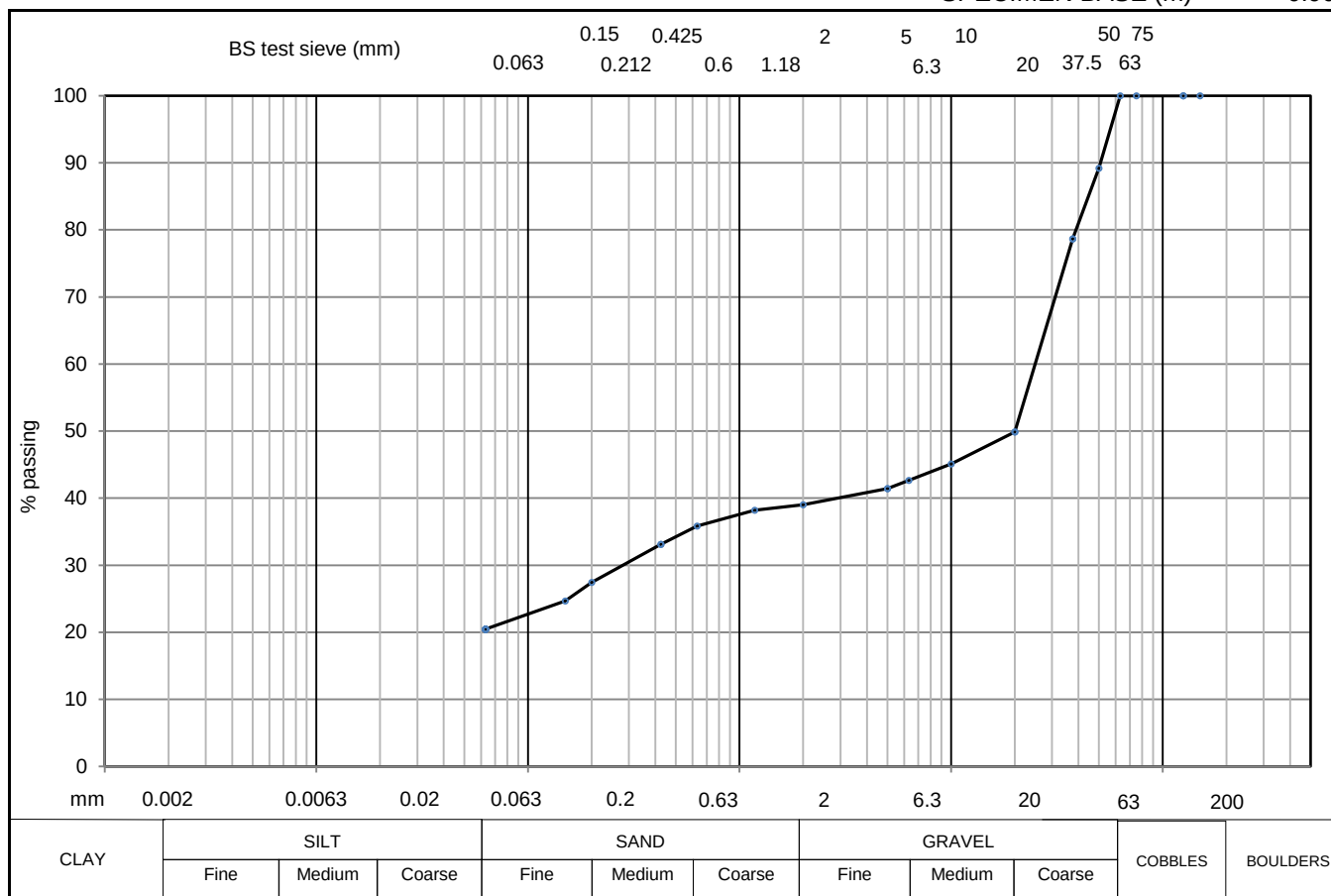
SPECIMEN BASE (m) 0.50



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	21	150		5	72	20	39
SILT	31						
SILT & CLAY	52						
SAND	19						
GRAVEL	29						
COBBLE & BOULDER	0	63	100	1.18	71	2	21
test method(s)	5.2# & 5.4	50	87	0.63	69		
test method		37.5	87	0.425	67		
5.2 - sieving		20	74	0.2	62		
5.3 - sedimentation by hydrometer		10	72	0.15	59		
5.4 - sedimentation by pipette		6.3	72	0.063	52		
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3						CONTRACT 36426	CHECKED TB



BH/TP No.	TP04
SAMPLE No./TYPE	D
SAMPLE DEPTH (m)	0.90
SPECIMEN TOP (m)	0.90
SPECIMEN BASE (m)	0.90



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150		5	41	20	
SILT & CLAY	20						
SAND	19	75		2	39	6	
GRAVEL	61						
COBBLE & BOULDER	0	63	100	1.18	38	2	
test method(s)	5.2#	50	89	0.63	36		
test method		37.5	79	0.425	33		
5.2 - sieving		20	50	0.2	27		
5.3 - sedimentation by hydrometer		10	45	0.15	25		
5.4 - sedimentation by pipette		6.3	43	0.063	20		
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3					CONTRACT 36426		CHECKED TB

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5



CLIENT PARAGON

BH/TP No.

TP10

SITE EXETER AIRPARK

SAMPLE No./TYPE

B

DESCRIPTION Reddish brown clayey very sandy GRAVEL with medium cobble content

SAMPLE DEPTH (m)

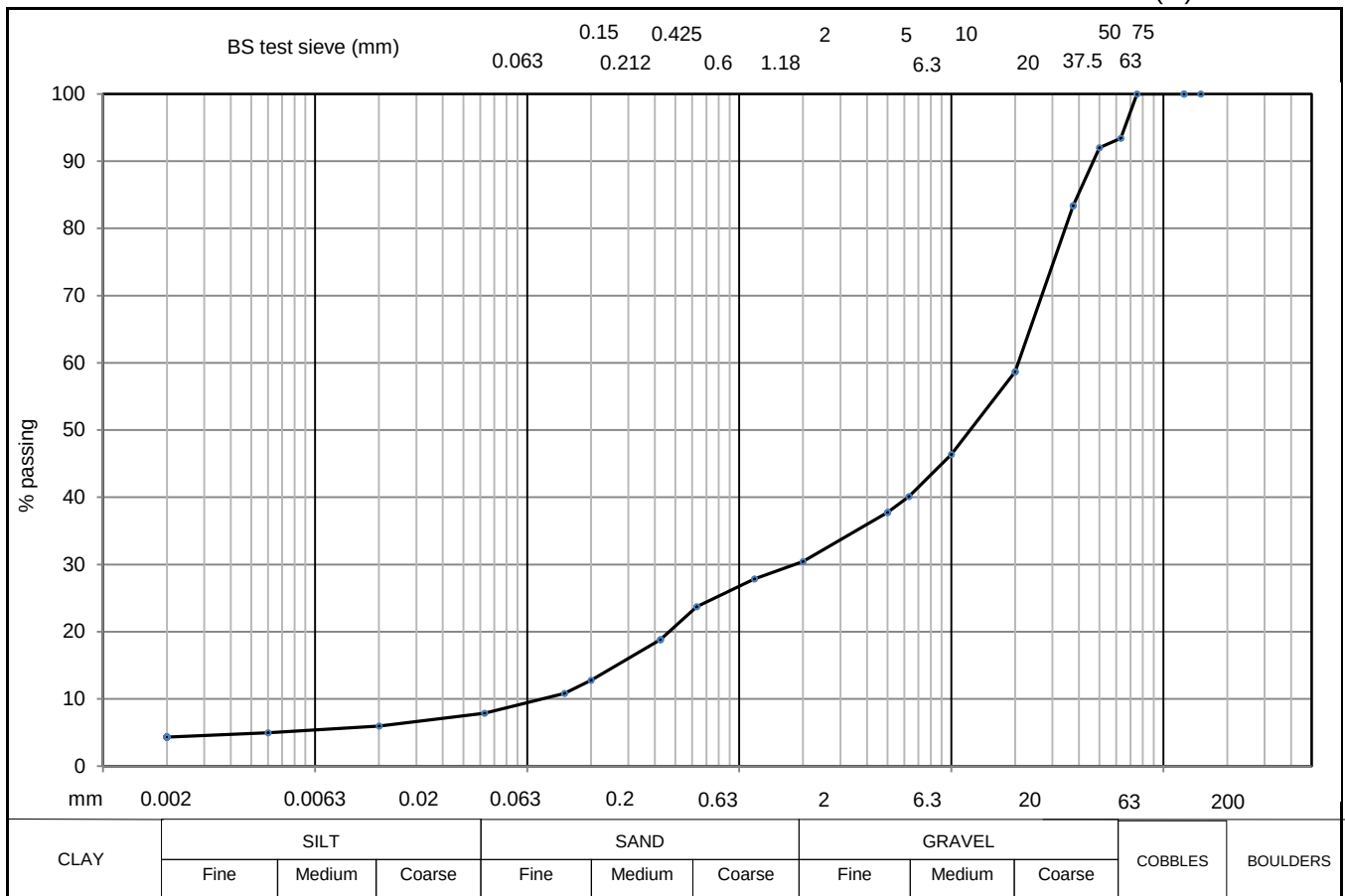
1.30

SPECIMEN TOP (m)

1.30

SPECIMEN BASE (m)

1.30



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	4						
SILT	4	150		5	38	20	6
SILT & CLAY	8						
SAND	23	75	100	2	30	6	5
GRAVEL	63						
COBBLE & BOULDER	7	63	93	1.18	28	2	4
test method(s)	5.2# & 5.4	50	92	0.63	24		
test method		37.5	83	0.425	19		
5.2 - sieving		20	59	0.2	13		
5.3 - sedimentation by hydrometer		10	46	0.15	11		
5.4 - sedimentation by pipette		6.3	40	0.063	8		
remarks	# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3					CONTRACT	CHECKED
						36426	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

BS. 1377 : Part 4 : 1990 : 3



CLIENT PARAGON

BH/TP No.

TP05

SITE EXETER AIRPARK

SAMPLE No./TYPE

B

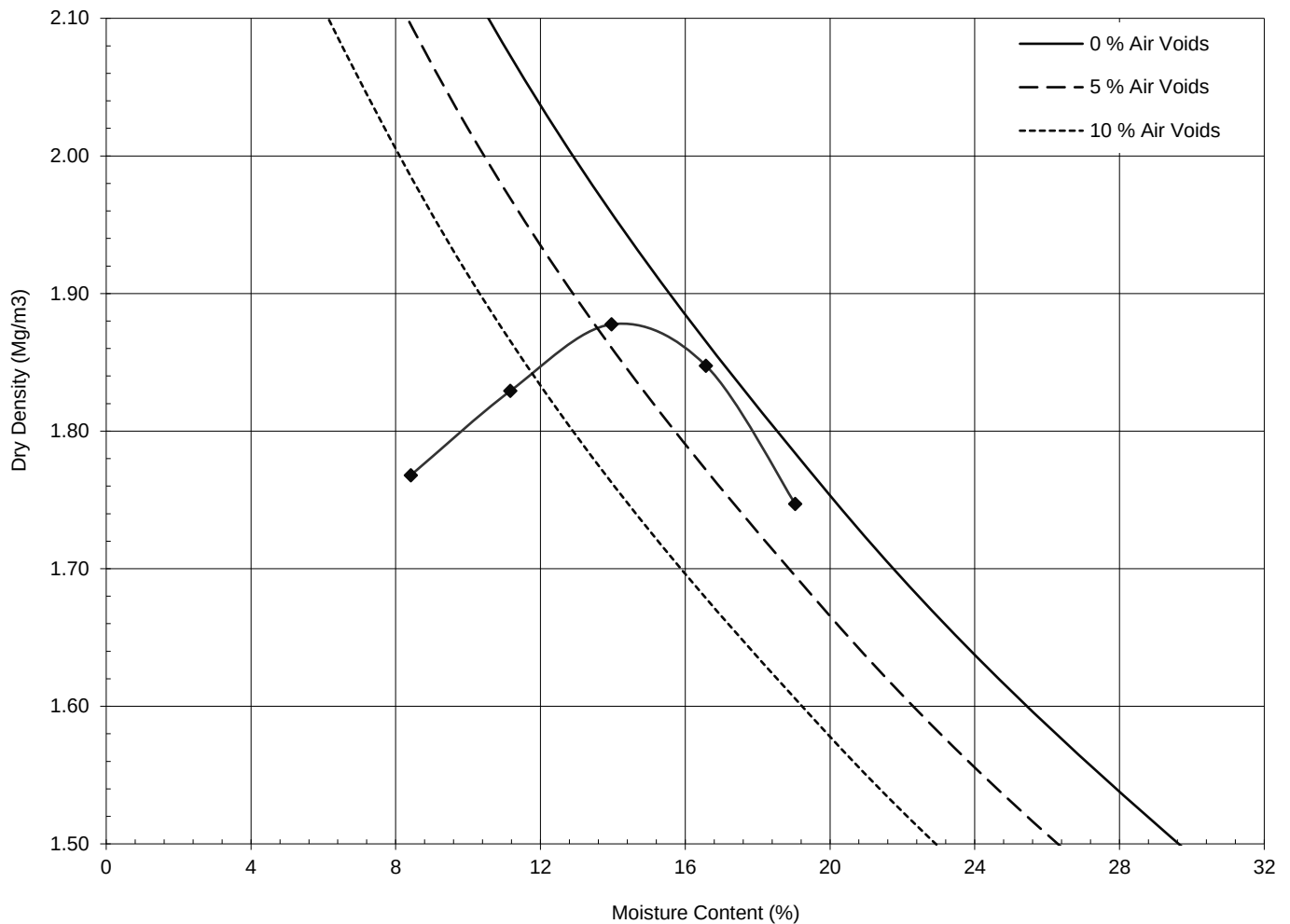
DESCRIPTION Reddish brown mottled grey slightly sandy slightly gravelly
CLAY

SAMPLE DEPTH (m)

2.00

SPECIMEN DEPTH (m)

2.00



test method	3.4.4.1 2.5kg dynamic compaction - CBR mould			
preparation procedure	3.2.5.3 (grading zone 5)			
sample preparation	C R			
proportion retained on 37.5mm sieve %	9	initial moisture content %	17	
proportion retained on 20mm sieve %	8	maximum dry density (Mg/m3)	1.88	
particle density (Mg/m3)	2.7	optimum moisture content %	14	
remarks				
# denotes particle density has been assigned an assumed value				
C denotes sample has been chopped to pass 20mm sieve				
S denotes sample has been shredded to pass 20mm sieve				
R denotes sample material has been recycled between/for points				
			CONTRACT	CHECKED
			36426	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

BS. 1377 : Part 4 : 1990 : 3



CLIENT PARAGON

BH/TP No.

TP06

SITE EXETER AIRPARK

SAMPLE No./TYPE

B

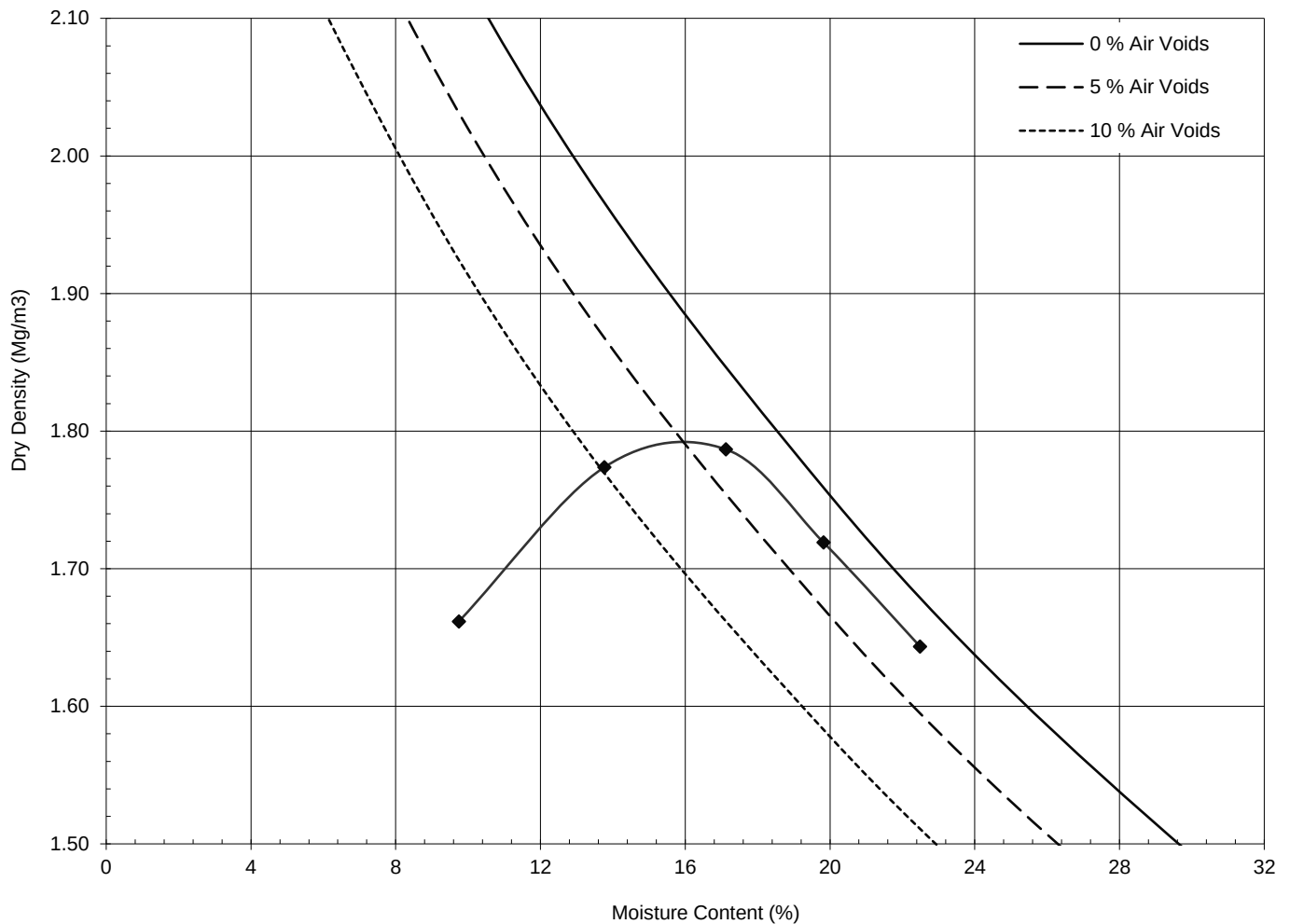
DESCRIPTION Reddish brown mottled grey slightly gravelly slightly sandy
CLAY

SAMPLE DEPTH (m)

3.50

SPECIMEN DEPTH (m)

3.50



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould			
preparation procedure	3.2.4.1 (grading zone 1)			
sample preparation	C R			
proportion retained on 37.5mm sieve %	0	initial moisture content %	17	
proportion retained on 20mm sieve %	0	maximum dry density (Mg/m3)	1.79	
particle density (Mg/m3)	2.7	optimum moisture content %	16	
remarks				
# denotes particle density has been assigned an assumed value				
C denotes sample has been chopped to pass 20mm sieve				
S denotes sample has been shredded to pass 20mm sieve				
R denotes sample material has been recycled between/for points				
			CONTRACT	CHECKED
			36426	TB



2183

Final Report

Report No.:	21-16596-1		
Initial Date of Issue:	25-May-2021		
Client	Geotechnical Engineering Ltd		
Client Address:	Centurion House Olympus Park Quedgeley Gloucester Gloucestershire GL2 4NF		
Contact(s):	GEL Tom Best		
Project	36426 Exeter Airport		
Quotation No.:		Date Received:	19-May-2021
Order No.:	36426	Date Instructed:	19-May-2021
No. of Samples:	21		
Turnaround (Wkdays):	5	Results Due:	25-May-2021
Date Approved:	25-May-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Soil

Project: 36426 Exeter Airport

Client: Geotechnical Engineering Ltd	Chemtest Job No.:				21-16596	21-16596	21-16596	21-16596	21-16596	21-16596	21-16596	21-16596
Quotation No.:	Chemtest Sample ID.:				1203099	1203100	1203101	1203102	1203103	1203104	1203105	1203106
	Sample Location:				BH1	BH1	BH1	BH1	BH2	BH2	BH2	BH2
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.20	3.00	5.50	10.00	3.00	4.45	8.00	9.00
	Bottom Depth (m):				1.65	3.45	6.00	10.55	3.45	4.50	8.45	9.50
	Date Sampled:				17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021
Determinand	Accred.	SOP	Units	LOD								
Moisture	N	2030	%	0.020	12	15	16	12	12	12	18	22
pH (2.5:1)	N	2010		4.0	8.9	8.5	8.9	9.1	8.2	8.1	8.9	9.1
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Sulphur	U	2175	%	0.010	0.021	0.036	0.016	0.020	0.015	< 0.010	0.012	< 0.010
Sulphate (Acid Soluble)	U	2430	%	0.010	0.014	0.026	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Results - Soil

Project: 36426 Exeter Airport

Client: Geotechnical Engineering Ltd	Chemtest Job No.:				21-16596	21-16596	21-16596	21-16596	21-16596	21-16596	21-16596	21-16596
Quotation No.:	Chemtest Sample ID.:				1203107	1203108	1203109	1203110	1203111	1203112	1203113	1203114
	Sample Location:				BH3	BH3	BH3	TP01	TP02	TP03	TP04	TP06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.50	5.00	8.00	2.00	3.00	2.20	3.00	1.00
	Bottom Depth (m):				2.00	5.45	8.45					
	Date Sampled:				17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021
Determinand	Accred.	SOP	Units	LOD								
Moisture	N	2030	%	0.020	17	11	14	16	11	17	18	16
pH (2.5:1)	N	2010		4.0	8.7	8.7	8.8	8.5	8.3	7.8	8.2	8.0
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Sulphur	U	2175	%	0.010	0.022	0.021	0.012	0.021	< 0.010	0.022	0.025	0.012
Sulphate (Acid Soluble)	U	2430	%	0.010	0.012	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.021	< 0.010

Results - Soil

Project: 36426 Exeter Airport

Client: Geotechnical Engineering Ltd	Chemtest Job No.:					21-16596	21-16596	21-16596	21-16596	21-16596
Quotation No.:	Chemtest Sample ID.:					1203115	1203116	1203117	1203118	1203119
	Sample Location:					TP07	TP07	TP08	TP09	TP10
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					1.00	2.50	3.00	1.00	3.00
	Bottom Depth (m):									
	Date Sampled:					17-May-2021	17-May-2021	17-May-2021	17-May-2021	17-May-2021
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.020	18	12	12	17	12	
pH (2.5:1)	N	2010		4.0	7.5	7.7	7.4	7.9	8.7	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.37	0.28	< 0.010	< 0.010	< 0.010	
Total Sulphur	U	2175	%	0.010	2.7	0.41	0.017	0.021	0.020	
Sulphate (Acid Soluble)	U	2430	%	0.010	5.4	1.5	0.029	0.013	< 0.010	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

APPENDIX 10: GENERIC ENVIRONMENTAL ASSESSMENT

10.1	Introduction
10.1.1	This appendix provides additional background information on certain approaches and methods used by Paragon in the preparation of this report.
10.1.2	This report uses the term ‘geoenvironmental’ to describe aspect relating to ground related environmental issues, such as contamination. The term ‘geotechnical’ is used to describe aspects relating to the physical nature of the site, such as foundation requirements.
10.1.3	A two-staged approach is used to classify land: • The first stage is referred to as a Phase 1 Investigation which includes a desk study and site walkover. Following this a preliminary conceptual site model (CSM) is developed to identify geotechnical and geoenvironmental risks. • The second stage is referred to as Phase 2 Site Investigation, which comprises the intrusive ground investigation, laboratory testing and provision of a risk assessment whereby the CSM identified in the CSM is updated based on the site conditions.
10.1.4	The Geoenvironmental Phase 1 and Phase 2 Investigations have been completed in general accordance with BS10175:2011+A1:2017.
10.1.5	The Geotechnical aspects of the report have been broadly written in general accordance with Eurocode 7 (BS EN 1997-2:2007) and are written with the intention of fulfilling the general requirements of a Ground Investigation Report (GIR) outlined in Section 6.
10.2	Phase 1 Investigation
10.2.1	The preliminary risk assessment is made of both geotechnical and geoenvironmental hazards identified at the desk study stage. This is then updated based on the findings of the Phase 2 Investigation. The risk associated with hazards uses a matrix of probability of occurrence vs the consequence. Geotechnical risks are assessed using a ground model.
10.2.2	In the context of geoenvironmental risks, in order for there to be a risk there must be a viable pollutant linkage, which means there must be a source of contaminations, a potential receptor and a pathway linking the two. The purpose of the Preliminary Conceptual Site Model is to identify all of the potential contaminant linkages and qualitatively assess the potential risks associated with these linkages. Contaminant linkages are potentially unacceptable risks in terms of current contaminated land regime legal framework and require either further assessment through the ground investigation. Should one of the three linkages be absent then there is no linkage and no further action is required.
10.2.3	Geoenvironmental risks are also outlined within Environmental Protection Act 1990, Part 2A which uses the term ‘significant harm or significant possibility of significant harm (SPOSH)’, where the term ‘harm’ is significant.
10.2.4	Paragon has adopted a classification level based on definitions within CIRIA Report C552 and professional judgement. Paragon’s Rationale for Risk Ratings is presented in Table A. The classification for the probability of harm is presented in Table B. This information feeds into a matrix in Table C, which is used to assign a risk rating.

10.2.5

Risk Rating	Risk Rating	Rationale	Examples
High		Contaminants very likely or known to represent an unacceptable risk, SPOSH. Equivalent to EA Category 1 pollution incident including persistent and/or extensive detrimental effects on water quality, closure of a potable abstraction point. Site not suitable for proposed use. Enforcement action possible. Urgent action required.	Significant short-term effects to humans is defined as serious injury, defects or death. Die-back of plants in landscaped areas. Short term pollution of controlled waters, major fish kill. Elevated contaminants close to potable abstraction. Major damage to buildings i.e. explosion.
Medium to High		Contaminants likely or known to represent an unacceptable risk. Action required.	Possible short-term effects and likely long-term effects to humans is defined as serious injury, defects or death. Buildings unsafe to occupy. Ingress of contaminants through plastic pipes. Stress or dead plants in landscaped areas. Pollution of sensitive water resources.
Medium		Contaminants likely to exceed assessment criteria and may to represent an unacceptable risk. Some damage to property (crops, buildings etc.). Some action required.	Significant long-term effects to humans is defined as serious injury, defects or death. Buildings unsafe to occupy. Potential ingress of contaminants through plastic pipes. Stress or dead plants in landscaped areas. Pollution of sensitive water resources.
Low to Medium		Contaminants may exceed assessment criteria but no harm as no unacceptable intake or contact. Minor or short-lived damage to property, ecosystems. Site likely to be suitable for proposed use. Action unlikely whilst in current use.	Harm not significant, pollutant linkage broken. Minor damage to plants in landscaped areas. Minor damage to buildings.
Low		Contaminants likely or known to have no risk of harm. Site likely to be suitable for proposed use. Repairable effects to damage to property etc. No further action required.	No measurable effects. No significant impact to property, plants, ecosystems.

Table A. Rationale for Risk Ratings

10.2.6

Classification	Risk Rating
High Likelihood	There is a contaminant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a contaminant linkage and all the elements are present, which means that it is probable that an event will occur.
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is no means certain that even over a longer period such event could take place and is less likely in the shorter term.
Unlikely	There is a contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

Table B. Classification of Probability of Geoenvironmental Risks

10.2.7

		Consequence				
		High	Moderate to High	Moderate	Low to Moderate	Low
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk
	Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Low Risk	Very Low Risk
	Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk	Very Low Risk
	No Linkage	No Risk				

Table C. Probability / Consequence Graphic

10.3

Contaminant Analysis

10.3.1

The procedures set out in DEFRA/Environmental Agency Report: Land Contamination: Risk Management (LCRM) 2020, ISO 10381-5:2005 Soil Quality – Sampling and the DoE Industry Profiles provide good summaries of priority pollutants for UK sites. These have been used during the Phase 1 assessment to scope the analysis of chemicals of concern.

10.4	Generic Tier 1 Human Health Risk Assessment
10.4.1	Generic Assessment Criteria (GAC) are used as the limit at which exceedances would cause harm. GAC are developed based on assumptions of characteristics and behaviours or sources, pathways and receptors. These are largely conservative and are calculated using the Contaminated Land Exposure Assessment (CLEA) model, which uses exposure to the receptor and toxicology data of the contaminant in the assessment. Published and industry recognised GACs have been produced for a range of environments: • Residential with homegrown produce • Residential without homegrown produce • Commercial • Allotments • Public Open Space – Park (POS_{park}) • Public Open Space – Residential (POS_{Resi}).
10.4.2	The results of the chemical laboratory testing were screened using GACs based on two sources: • Category 4 Screening Levels (C4SLs) including cadmium, Benzo(a)pyrene, benzene, arsenic, lead and chromium VI, produced by LQM CIEH. • Suitable 4 Use Levels (S4UL) produced by LQM CIEH (2015).
10.4.3	In general accordance with Health Protection Agency (HPA) guidance for the risk assessment approaches for Polycyclic Aromatic Hydrocarbons (PAH), 2010, benzo(a)pyrene has been used as a surrogate marker for carcinogenic PAHs. The threshold PAHs have been assessed individually.
10.4.4	Statistical analysis has been carried out on populations of greater than six results. Where the population is less than six, statistical analysis has been deemed inappropriate. Therefore, the maximum concentration of each contaminant has been recorded. The Upper Confidence Level or U₉₅ has been calculated to present the level at which we would be 95% confident that the true mean is less than the GAC. All non-detect values have been treated as being equal to half the limit of detection.
10.4.5	These results have been used to carry out a Level 1: Quantitative Human Health Assessment for the ground contamination present against standards for the proposed commercial use of the site. These results can also be used for a preliminary assessment for off-site disposal classification.
10.4.6	In general accordance with Health Protection Agency (HPA) guidance for the risk assessment approaches for Polycyclic Aromatic Hydrocarbons (PAH), 2010, benzo(a)pyrene has been used as a surrogate marker for carcinogenic PAHs. The threshold PAHs have been assessed individually.

10.5	Controlled Waters Risk Assessment
10.5.1	The Environment Agency Groundwater Protection Policy (GP3) outlines the legal framework, detailed policies, technical background and the tools to be used in the protection of groundwater. The Water Framework Directive (2000/60/EC) set out the protocol for controlling water quality of the whole water environment. During Groundwater Risk Assessments the impact on controlled waters is outlined. Controlled waters include groundwater, surface water, coastal waters, inland waters and reservoirs.
10.5.2	Aquifers are classified based on their sensitivity. The following aquifer definitions are adopted. - Principal Aquifers - These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer. - Secondary Aquifers - These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types: - Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers; and - Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers. - Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. - Unproductive Strata - These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
10.5.3	To determine the impact of contaminants on groundwater and surface water Environmental Quality Standards (EQS) have been used as screening criteria.
10.6	Gas Risk Assessment
10.6.1	The pragmatic approach to ground gas risk assessment by Card et al 2012 has been followed to determine the gas risk of the site. This method compares the Total Organic Content (TOC) of the Made Ground, and the age and depth of the fill to provide a basis to determine the Characteristic Situation of the site.
10.6.2	The risks associated with methane and carbon dioxide are assessed using BS8485:2015 and guidelines from CIRIA (Wilson et al 2007), the NHBC (Boyle and Witherington 2007) and CL:AIRE RB17 (Card et al 2012).

10.6.3 These methods use the gas monitoring results to produce a Gas Screening Value, which is compared to Tables set out within the guidance. Information on the proposed development is then used to determine the level of gas protection required via a scoring system. Each gas protection measure is assigned a score and combinations of the measures are used to meet the score required. The following tables are used to assess the gas risk.

10.6.4

CS	Hazard Potential	Site Characteristic GSV (l/hr)	Additional Factors
CS1	Very Low	<0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider and increase to CS2)
CS2	Low	0.07 to <0.7	Typical measured flow rate <70l/hr (otherwise consider an increase to CS3)
CS3	Moderate	0.7 to <3.5	
CS4	Moderate to High	3.5 to <15	
CS5	High	15 to <70	
CS6	Very High	>70	

Table D. BS8485:2015 CS Classification

10.6.5

Building Types				
	Type A	Type B	Type C	Type D
Ownership	Private	Private or commercial/public, possible multiple	Commercial / public	Commercial / industrial
Control (change of use, structural alterations, ventilation)	None	Some but not all	Full	Full
Room sizes	Small	Small/medium	Small to large	Large industrial / retail park style

Table E. BS8485:2015 Building Type

10.6.6

CS	Minimum Gas Protection Score			
	High Risk		Medium Risk	Low Risk
	Type A Building	Type B Building	Type C Building	Type D Building
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 ^A	5.5	4.5	6.5
5	^B	6.5 ^A	5.5	4.5
6	^B	^B	7.5	6.5

Table F. BS8485:2015 Gas Protection Score by CS and Type of Building

Notes:

- A. Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.
- B. The gas hazard is too high for this empirical method to be used to define the gas protection measure.

10.7

Property – Water Supply Pipes

10.7.1

Standard Water Supply Pipe Assessment has been undertaken in general accordance with UK Water Industry Research (UKWIR) Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref 10/WM/03/21, published 2010. The results of soil testing have been used to identify which pipes should be used, from options including, ductile iron, steel, polyethylene (PE), PE barrier, PVC and copper.

10.7.2	Test Group	Testing Required	PE (mg/kg)	PVC (mg/kg)	Barrier Pipe (PE-Al-PE) (mg/kg)	Wrapped Steel	Wrapped Ductile Iron	Copper
	Total VOCs	Where Preliminary Risk sssessment (PRA) has identified land potentially affected by contamination	0.5	0.125	Pass	Pass	Pass	Pass
	Total BTEX & MTBE		0.1	0.03	Pass	Pass	Pass	Pass
	Total SVOCs		2	1.4	Pass	Pass	Pass	Pass
	EC5–EC10 aliphatic and aromatic hydrocarbons		2	1.4	Pass	Pass	Pass	Pass
	EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	Pass	Pass	Pass	Pass
	EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	Pass	Pass	Pass	Pass
	Phenols		2	0.4	Pass	Pass	Pass	Pass
	Creosols and chlorinated phenols		2	0.04				
	Ethers	Only where identified	0.5	1	Pass	Pass	Pass	Pass
	Nitrobenzene		0.5	0.4	Pass	Pass	Pass	Pass
	Ketones		0.5	0.02	Pass	Pass	Pass	Pass
	Aldehydes		0.5	0.02	Pass	Pass	Pass	Pass
	Amines		Fail	Pass	Pass	Pass	Pass	Pass
	Corrosive	Conductivity Redox pH	Pass	Pass	Pass	Corrosive if pH <7 and conductivity >400us/cm	Corrosive if pH<5, Eh not neutral and conductivity >400us/cm	Corrosive if pH<5 or >8 and Eh positive

APPENDIX 11: EXTENT OF SURVEY AND LIMITATIONS

EXTENT OF SURVEY AND LIMITATIONS

This report is for your sole use, and consequently no responsibility whatsoever is undertaken or accepted to any third party for the whole or any part of its contents. Paragon accept no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned or a third party with whom an agreement has not been executed. Should any third party which to use or rely upon the contents of the report, written approval must be sought from Paragon, a charge may be levied against such approval.

The report has been designed to address potential source, pathway and receptor pollutant linkages associated with the proposed development, by means of intrusive investigation. The content and findings of the report are based on data obtained by employing site assessment methods and techniques, considered appropriate to the site as far as can be interpreted from desk-based materials and a visual walkover of the site. Such techniques and methods are subject to limitations and constraints set out in the report. The findings and opinions are relevant at the time of writing, and should not be relied upon at a substantially later date as site conditions can change. For example, seasonal groundwater levels, natural degradation of contaminants etc.

No liability can be accepted for the conditions that have not been revealed by the exploratory hole locations, or those which occur between each location. Whilst every effort will be made to interpolate the conditions between exploratory locations, such information is only indicative and liability cannot be accepted for its accuracy. By their nature, exploratory holes provide a relatively small and localised snapshot of the ground conditions relative to the size of the site.

Specific comment is made regarding the site's status under Part 2A of the Environmental Protection Act (EPA) 1990, which provides a statutory definition of Contaminated Land and as revised under The Contaminated Land (England) (Amendment) Regulations 2012. Unless specifically stated as relating to this definition, references to 'contamination' and 'contaminants' relate in general terms to the presence of potentially hazardous substances in, on or under the site.

The opinions given within this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. If additional information or data becomes available which may affect the opinions expressed in this report, Paragon reserves the right to review such information and, if warranted, to modify the opinions accordingly. Paragon reserves the right to charge additional fees for; un-anticipated second opinion reviewing of previous reports.

Paragon has prepared this report with reasonable skill, care and diligence. The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources. We cannot provide guarantees or warranties for the accuracy of third-party data, which is reviewed in good faith and assumed to be representative and accurate.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed. No liability can be accepted for the effects of any future changes to such guidelines and legislation. In the event that guidance / legislation changes it may be necessary for Paragon to update or modify reports. The risk assessment is completed in line with the relevant land use agreed for the site and the time of completing the works. Changes to site conditions or land use may require a reassessment.

DEFINITIONS

For the avoidance of doubt, Paragon Building Consultancy Limited (Paragon) has prepared the following alphabetical list of definitions and reservations to aid the client in understanding the content of our advice and or written reports(s):

Accuracy	Level of agreement between true value and observed value.
ACM's	Asbestos Containing Materials
Conceptual Site Model	Textual and or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the base of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. Note 1: The conceptual exposure model is initially derived from the information obtained by the preliminary investigation. This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of the field investigation can provide additional data that can be used to further refine the conceptual model.
Contamination	Presence of a substance which is in, on or under land, and which has <u>the potential</u> to cause significant harm or to cause significant pollution of controlled water. Note 1: There is no assumption in this definition that harm results from the presence of the contamination. Note 2: Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. Note 3: Contamination may relate to soils, groundwater or ground gas.
Controlled Water	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three-mile limit of territorial waters. Note 1: See Section 104 of The Water Resources Act 1991.
Enquiries	Any enquiries undertaken by Paragon of local authorities and statutory undertakers are made verbally in respect of environmental issues. Local searches are not undertaken and no responsibility is accepted for any inaccurate information provided. It is further assumed unless otherwise stated that all necessary licences, permits etc. either run with the property or are transferable to a new occupier as appropriate.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case humans, including property.
Hazard	Inherently dangerous quality of a substance, procedure or event.
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
Precision	Level of agreement within a series of measurements of a parameter.
Receptor	Persons, living organisms, ecological systems, controlled water, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).

Risk	Probability of the occurrence, magnitude and consequences of an unwanted adverse effect on a receptor.
Risk Assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
Soil	Upper layer of the earth's crust composed of mineral parts, organic substance, water, air and living matter. Note 1: In general accordance with BS 10175:2001 the term soil has the meaning ascribed to it through general use in civil engineering and includes topsoil and subsoil; deposits such as clays, silt, sand, gravel, cobbles, boulders and organic deposits such as peat; and material of natural or human origin (e.g. fills and deposited wastes). The term embraces all components of soil, including mineral matter, organic matter, soil gas and moisture, and living organisms.
Source	Location from which contamination is, or was, derived. Note 1: This could be the location of the highest soil or groundwater concentration of the contaminant(s).
Uncertainty	Parameter, associated with the result of a measurement that characterises the dispersion of the values that could reasonably be attributed to the measurement.

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