



e3p

Phase II Geoenvironmental Site Assessment
Peel Hall, Warrington

Reference: 15-740-R1-1
Date: May 2022



PHASE II GEOENVIRONMENTAL SITE ASSESSMENT

Peel Hall
Radley Lane
Warrington
WA2 0TA

Prepared for:
Satnam Group

Report Ref: 15-740-R1-1
Date Issued: May 2022

Peel Hall

Phase II Geoenvironmental Site Assessment
May 2022

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EXECUTIVE SUMMARY

Site Address	Land at Peel Hall Farm, Warrington, Cheshire, WA2 0TA.
Grid Reference	E 361455 N 391746
Site Area	64.23 Ha.
Proposed Development	E3P understands that Satnam Group has been granted outline planning permission for the development of the Peel Hall Site for a predominantly residential lead end-use that will comprise ~1200 dwellings with associated infrastructure with some commercial and retail development within the masterplan.
Current Site Use	The site is irregular in shape and is located to the south of the M62 at junction 9, to the north of Warrington. The site is open access to the public and encompasses several different parcels including a recreational ground in the east and playing fields in the south east, community centre in the south with the remaining site utilised as an open public space popular with dog walkers. The site is grassland and appears to be cut and maintained regularly. The recreational ground is accessed by a small gravelled car park off Ballater Drive. The recreational ground is relatively uniform in topography with a small grass mound located along the boundaries. Several football pitches are marked out within this sector with two football posts located in the east. The playing fields located in the south east of the site and to the north of the community centre can be accessed by the community centre car park. In the north of this sector lighting, basketball hoops and seating are present, with evidence of Japanese knotweed in the north east. To the north of Radley Lane in the north east of the site, the ground is uneven underfoot from the turning of the ground, with vegetation present on the southern boundary, along Radley Lane. Access can be gained via Mill Lane in the north east and Radley Lane. To the south of Radley Lane, there is a very gentle slope in a southerly direction. The ground remains uneven, with a footpath crossing the site in an east to west direction in the centre of the site. Waterlogged ground and dense were noted in the south of this sector also containing Himalayan Balsam. This was also identified within the area south of Peel Hall. The south of Peel Hall within the densely vegetated area of trees can be accessed via Peel Cottage Lane and via a footpath in the north of the site leading from the pedestrian motorway bridge. Several asbestos cement stockpiles were identified to the north of the drain, which are discoloured orange and green. Historic development was evident in this area with old footings and steel frames to ground level still present. Two Ponds are present to the north of Radley Plantation, with stockpiles of stripped vegetation close by, with evidence they are utilized as animal burrows.



Current Site Use	In the centre of the site, Spa Brook flows in a southerly direction surrounded by reeds and vegetated with semi mature trees. Two stone crossing bridges are present in the centre and further upstream of the brook. A tributary to the brook flows from the densely vegetated area to the south of Peel Hall westwards into the brook. Further west of the site another drain is present transecting the site from north to south also surrounded by reeds, that continue along the western boundary by the residential units. The land between Spa Brook and drain has sporadic areas of reed and grass growth indicative of seasonal ponds. Along the southern boundary in the west of the site, there was evidence of fly-tipped material, including mattresses and window frames and evidence of a bonfire. In addition to this, it appears the residents have extended their boundaries into the field by several metres. To the south of the off-site health centre, more evidence of fly-tipping was recorded, and another stockpile of stripped vegetation was identified, possibly used as an animal burrow. A structure is also present in this area of the site, which is presumed to be in association with the historic sewer disposal plant on site. To the west of the health centre waste and other fly-tipped material was evident along with evidence of a bonfire. A track is present along the northern boundary of the site with access gained via a gate on Elm Road in the north west corner of the site. The track leads to a pump owned by United Utilities. Gas pipeline markers are present along the track and along the northern boundary. Himalayan Balsam was identified in the south of the central sector of the site and along the western boundary of the Radley Plantation. Giant Hogweed was also identified in the south of the central sector.	
Site History	A review of the pertinent Ordnance Survey mapping dating from circa 1850 to the present day confirmed the subject site had remained largely undeveloped agricultural land throughout its mapped history. There are numerous sporadic agricultural type buildings with ancillary access roadways and infrastructure. The sewage disposal plant first appeared in the south west of the site on the mapping series in 1938. A review of the historical land use mapping confirms the presence of small, infilled ponds, field boundaries and other natural and anthropogenic features throughout the mapping series.	
Environmental Setting	Drift Geology	West- Shirdley Hill Sand Formation – SAND. Central and East - Glaciofluvial Sheet Deposits, Devensian - Sand and Gravel. South east- Till, Devensian - Diamicton. Bedrock Geology North West- Chester Formation - SANDSTONE, Pebbly (gravelly). Remaining site- Wilmslow Sandstone Formation - SANDSTONE.



	Faults	No faults are recorded within 250m of the site.
	Hydrogeology	Secondary A (drift) overlying a Principal aquifer (solid). One groundwater abstraction has been identified 497m north of the site registered to United Utilities Water PLC and is for public drinking water supply. The site is also located within a Zone 3 (total catchment) source protection zone.
	Hydrology	Spa Brook and several drains and ponds are located on site.
	Flood Risk	Unaffected by flooding from rivers.
Natural Landform and Geomorphology	The site is relatively uniform in topography with the central sector of the site at a slightly lower elevation. Likely areas of cutting processes caused by Spa Brook and several drains in the centre of the site. It is considered that this is the natural landform of the site due to the lack of historical development on site.	
Previous Reports	The following previous reports have been completed for the site:  Phase One Desk Study Report, Environmental Management Solutions. Report ref: EMS5414a, dated August 2015  Utilities Report, Transport Planning Associates. Report ref: 1506-45/TN/01B, dated June 2016  Updated Ecological Appraisal & Impact Assessment, Appletons. Report ref: 1820-E1, dated January 2020 A full summary of findings is provided in Section 2.1.	
Utility Locations	A review of online records has identified identifying a LHP (High Pressure) gas main enters the site in the north west transecting the site in a west to east direction along the northern boundary. In addition to a low pressure gas main is present along Peel Cottage Lane and Radley Lane in the north east of the site. Cadent attended the site and marked out the gas main. Electricity infrastructure is present in the north east of the site, within the centre of the site comprising overhead power lines and along the eastern boundaries. A surface water sewer is present along the south-western boundary and within the north-western corner of the site is a combined public sewer, foul sewer, surface water sewer and an abandoned sewer. Surface water sewers are present in the east of site located within the playing fields. Comms clean water pipes are present in Peel Cottage Lane and surrounding roadways of the site. BT infrastructure is present in the west of the site. BT infrastructure is also present along Peel Cottage Lane and the surrounding roadways of the site. Within the south east of the site, BT has been identified crossing the north of the community centre and recreation ground.	



Landfill Sites and Ground Gases	The EA mapping does not record the presence of any historical or licensed landfill within close proximity of the subject site. The closest historical landfill is located 311m south-west of the site named Winwick quay landfill. However, the presence of localised Made Ground and infilled field boundaries on site have the potential to produce hazardous ground gas.
Radon	Unaffected – no special precautions are required.
Coal Mining/Land Stability	Information identified within the Phase 1 Desk Study completed by Environmental Management Solutions obtained a coal mining report for the site. The report highlighted the site is within the zone of influence from workings of four coal seams which ceased in 1992 at depths between 750m and 1130m bgl. However, the Coal Authority has stated the site is not in the likely zone of influence of any present underground coal workings. In addition, there are no known coal mine entries within or within 20 metres of, the boundary of the site.
Hazardous Installations	No hazardous installations that could potentially prejudice the proposed construction of highly sensitive residential dwellings have been identified within influencing distance of the subject site.
Initial Conceptual Site Model	Contaminant Sources ✿ Made Ground (historical buildings, infilled ponds and field boundaries) – Polycyclic aromatic hydrocarbons (PAHs), heavy metals, asbestos-containing material (ACM), ground gas. ✿ Historical agricultural use (spillages of fuel etc.) – PAHs, TPHs, Metals ✿ Historical use as allotment gardens - PAH and heavy metals ✿ Historical use as a sewage disposal plant – Heavy metals, PAHs. Pathways ✿ Direct contact and ingestion ✿ Volatilisation/indoor explosion ✿ Vapour inhalation ✿ Dust inhalation Receptors ✿ Future site users (proposed residential end-users and construction workers) ✿ Buildings (proposed residential units) ✿ Spa Brook, drainage ditches and Underlying aquifer (Principal bedrock aquifer)



GROUND INVESTIGATION

Ground Investigation Works	E3P has completed an intrusive ground investigation comprising: ✿ 67 mechanically excavated trial pits, ✿ 48 window sample boreholes, ✿ 12 BRE Digest 365 Soakaways ✿ 3 cable percussive boreholes, ✿ 4 rotary boreholes, ✿ 27 environmental monitoring installations.
Ground Conditions	MADE GROUND – 0.00 m bgl to 1.20 m bgl Made Ground was encountered in 22 exploratory hole locations at depths from ground level to a maximum proven depth of 1.20 bgl (TP124). However, the majority of Made Ground encountered was encountered to a depth <1.00mbgl. Where encountered the Made Ground generally comprised of a reworked topsoil of a dark brown sandy clay or a clayey fine to medium sand. This was often underlain by a reworked slightly gravelly sandy clay or a greyish brown clayey fine to medium sand with gravel of mudstone, sandstone and occasionally brick and rare glass, asphalt, clinker and ash. Within TP211 the reworked clay also contained cobbles of brick. Underlying the topsoil in TP106, gravelly sand was encountered with gravel of sandstone, mudstone and rare fragments of brick and clinker. The deepest area of Made Ground encountered in the central area of the site just south of the drainage ditch within TP124 comprised of a greyish brown clayey fine to medium sand, with a land drain identified at 0.70m bgl. In the area to the south of Peel Hall, within WS225, Made Ground is comprised of a grey mottled brown, slightly gravelly sandy clay, with gravel of clinker, ash sandstone, mudstone and fragments of brick. Topsoil- 0.00 m bgl to 0.50 m bgl Natural topsoil was encountered within the majority of the exploratory hole locations with the exception of those identified as reworked topsoil as described above. Topsoil is generally comprised of a brown sandy CLAY with frequent rootlets or a dark brown clayey fine to medium SAND with frequent rootlets. DRIFT – 0.00 m bgl to 5.50 m bgl Drift deposits were encountered within all exploratory hole locations. Drift deposits were varied across the site but generally comprised of either firm to stiff brown sandy slightly gravelly CLAY with gravel of mudstone and sandstone or loose to dense clayey slightly gravelly grey or brown fine to medium SAND.



	Loose sands were identified within WS102, WS103, WS104, WS105, WS106, WS110, WS115, WS120, WS121, WS122, WS201, WS205, WS206, WS220, WS224, CP101 and CP102. Loose sands were identified between 0.25-5.45m bgl. Very soft or soft CLAY was identified within SA107 at 0.30-1.00mbgl and TP148 at 1.20-2.50mbgl; the materials within TP148 are likely to be attributed to possible pond fill on site as it comprised of dark grey CLAY with frequent organic matter. Other drift deposits containing organic matter was identified within TP103, WS123, WS204, WS208 and WS212 at depths of between 0.10 -3.30mbgl. Silty CLAY drift deposits were identified within RB101, RB103 and RB105. SOLID – 3.80 m bgl to 7.25 m bgl Weathered red sandstone recovered as a GRAVEL was encountered across the site, within exploratory hole locations, CP103, RB101, RB103, RB104, and RB105 at depths between 3.80 m bgl to 7.25 mbgl. WS213 refused at 1.86mbgl. on suspected weathered bedrock. GROUNDWATER Groundwater was encountered during the site investigation between 0.30-5.10m bgl. Running sands were encountered across the site at depths of between 0.50m and 2.30mbgl. Saturated drift deposits have been noted across the site.
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CONTAMINATED LAND ASSESSMENT

Human Health	A Tier I human health risk assessment has been undertaken using the chemical analysis results of the soils and comparing them to the relevant Tier I criteria. This assessment has not identified the presence of any exceedances. Therefore, the site has been classified as low risk to human health. Asbestos sheeting has been identified in the north-central sector of the site. During the remediation and enabling works, these should be removed from the site by a licensed asbestos removal contractor. Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 4.1. Isolated areas of Made Ground on-site will require segregating during the enabling works, and further analysis was undertaken to determine its suitability for retention on-site. Where retained, it is likely a cover system will be required; the remainder of the site can be constructed using the installation of a 300mm growing medium. Chemical analysis of the natural clay drift deposits and natural topsoil has identified these soils acceptable for use as subsoil and topsoil within the proposed garden areas subject to validation testing.
Controlled Waters	Low risk to controlled waters.
Ground Gas	Characteristic Situation 1 (pending completion of gas monitoring).



Potable Water Infrastructure	The assessment of the current ground conditions indicates that PE pipeline would be suitable. However, post-remediation and enabling works ground conditions may be different from those identified during this site investigation. This will need to be confirmed following the completion of a UKWIR risk assessment following remediation and enabling works.
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GEOTECHNICAL ASSESSMENT

Underground Obstructions	Significant concrete and brick obstructions have not been encountered during the site investigation. However, relic foundations from the former sewage works and former buildings in the area south of the off-site residential dwelling in the north-central sector of the site are likely to be present. Slabs and metal stations were noted in the northern sector of the site. During a phase of cut-and-fill enabling works to create a developable platform, all below-ground obstructions will require grubbing out to the base of the Made Ground to enable the construction of proposed plots.
Allowable Bearing Pressure	The underlying natural sand deposits have been assessed as being loose to dense. SANDs have been assessed as having a net allowable bearing pressure (ABP) in the order of 70-286 kN/m² between 1.00-5.00m bgl. Increasing to a dense relative density with a net ABP of 157-456 kN/m² at circa 2.00-7.00mbgl. CLAY drift deposits have been assessed as being firm low strength to very stiff, with very high strength between 1.00m and 5.00mbgl with an AMP of between 41-488 kN/m².
Foundation Options	It is anticipated that the proposed development can be constructed on a combination of the shallow strip, mass trench fill, and the re-engineering of Made Ground and loose SANDs for the use of Vibro stone columns to support a doubly reinforced shallow strip foundation. Where saturated deposits and running sands are present in a bottom feed, a VSC foundation solution will be required or driven piled foundations. Driven piled foundations will be required in areas of soft CLAYs and in the vicinity of former ponds and where drainage ditches are currently present but will be infilled as part of the proposed development. Foundation depths should take account of the presence of existing and proposed trees, with foundations deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirements of NHBC standards.
Building Floor Slabs	Ground-bearing floor slabs are unlikely to be viable given the anticipated depths or reworked Made Ground > 600 mm and shallow cohesive soils.
Heave Precautions	The site has been assessed to be underlain by low to medium volume change potential clays. A conservative approach should be followed and the site should be deemed to be of medium volume change potential therefore heave precautions are required to the internal face of the external load-bearing walls (within tree influence). An isolated area of high volume change potential has been identified within TP148 and this area should be delineated during remediation and enabling works with further testing completed.



Soakaway Drainage	12 BRE365 Soakaway tests have been completed however, an infiltration rate was only able to be calculated within SA102 where the test was completed within SAND drift deposits; the infiltration rate was noted to be good to moderate within this location. In the remaining locations, and especially where CLAY drift deposits were present, the soakage potential was significantly reduced. It is considered there is a limited potential that soakaway drainage may be suitable for the proposed development.
Sulphate Assessment	Concrete classification will be DS1 AC1s, with the exception of WS225 which is DS2 AC1s.
CBR Design %	Granular soils can be re-engineered to ensure 5% within the subgrade during favourable climatic conditions. Natural clay soils will provide a CBR in the order of 3–5% during drier climatic periods. However, if water is allowed to shed onto the formation, the CBR will reduce to < 2%, which will require specialist engineering of the subgrade.
Cut/Fill	Development levels unknown at this time; however, some cut-and-fill works will be required to prepare the development platform.
Waste Characterisation	Any material that is to be disposed off-site should undergo assessment using Technical Guidance WM3: <i>Waste Classification – Guidance on the classification and assessment of waste</i> .

RECOMMENDATIONS

Based on the findings of the Geoenvironmental site assessment, the following additional works are recommended to be completed in due course:

- ✿ Further investigation of inaccessible areas.
- ✿ Plot-specific foundation schedule (upon receipt of the final development levels).
- ✿ CL:AIRE DoW CoP Materials management plan.
- ✿ Pre-commencement geotechnical materials testing to confirm earthworks design;
- ✿ Geotechnical earthworks design strategy (infrastructure).
- ✿ Remediation and enabling earthworks strategy.
- ✿ Construction phase Surface Water Management Plan.
- ✿ Full three-dimensional earthworks cut/fill model and materials spoil assessment;
- ✿ Settlement Analysis for earthworks design; and,
- ✿ Build Phase Mitigation Plan and design of specialist ground gas mitigation measures.



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DRAWING LIST

15-740-001 - Site Location Plan
15-740-003 - Historical Features Plan
15-740-004 - Site Features Plan
15-740-005 - Exploratory Hole Location Plan
15-740-006 - Depth of Made Ground Plan
15-740-007 - Depth of Topsoil Plan
15-740-010 - Conceptual Site Model
15-740-014 - Loose Sands and Soft Clay Plan
15-740-016 – Saturated and Running Sands Plan



1. INTRODUCTION

1.1. BACKGROUND

E3P has been commissioned by the Satnam Group to undertake a detailed Phase II Geoenvironmental Site Assessment for a parcel of land located to the south of the M62 at junction 9, in the north of Warrington.

This report is required to determine potential contaminated land liabilities, remediation requirements and geotechnical engineering works that will be required as part of the proposed development for a proposed low-rise residential development.

1.2. PROPOSED DEVELOPMENT

E3P understands that Satnam Group has been granted outline planning permission for the development of the Peel Hall Site for a predominantly residential lead end-use that will comprise of circa 1200 dwellings with associated infrastructure with some commercial and retail development within the masterplan. A proposed development plan has not been provided to E3P at this time.

1.3. OBJECTIVES

The objectives of the Geoenvironmental assessment are as follows:

- ✦ Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available in order to complete a desk study in line with Environment Agency (EA) document *Land Contamination: Risk Management (LCRM) (2019)*.
- ✦ Undertake a preliminary stage of sampling and analysis to provide an overview of environmental issues identified.
- ✦ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors.
- ✦ Assess the geotechnical information and provide preliminary recommendations in relation to foundations, pavement construction and floor slabs.
- ✦ Provide recommendations regarding future works required.

1.4. SCOPE OF WORKS

The scope of work includes the following elements:

- ✦ Detailed review of historic information;
- ✦ Design of suitable intrusive ground investigation;
- ✦ Window sample probeholes with, and construction of, environmental monitoring installations;
- ✦ Deep cable percussive boreholes;
- ✦ Rotary Boreholes with groundwater monitoring installations where cable percussive boreholes were not viable due to access restraints;



- ✳ Mechanically excavated trial pits;
- ✳ In-situ geotechnical testing;
- ✳ Chemical and geotechnical laboratory analysis;
- ✳ Groundwater monitoring and sampling
- ✳ Surface water sampling;
- ✳ Ground gas monitoring;
- ✳ Contamination risk assessment and conceptual site model;
- ✳ Geotechnical assessment and interpretation; and
- ✳ Factual and interpretive reporting.

1.5. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.6. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.



2. GROUND INVESTIGATION

2.1. PREVIOUS REPORTS

Previously completed reports and permanent environmental information about the site are discussed below:

PHASE ONE DESK STUDY REPORT, ENVIRONMENTAL MANAGEMENT SOLUTIONS. REPORT REF: EMS5414A, DATED AUGUST 2015

- ✳ The majority of the site area is occupied by disused agricultural fields. The land surface was very rough as if it had been ploughed before allowing it to become overgrown. Some parts of the fields were overgrown with bushes and young trees which had not been cleared. A number of overgrown mature hedges were present around watercourses. Dense reeds were also present around watercourses, preventing detailed inspection of these features.
- ✳ The desk study has shown the majority of the site to historically have been used only for agricultural purposes. The site as a whole is considered to have a low risk of contamination.
- ✳ Several areas within the site have been identified as having an increased risk of contamination. They include an area of former farm buildings, where chrysotile asbestos cement has been identified on the surface of the ground, an area of former masts, an area of former allotments, and a former sewage disposal plant.
- ✳ The bedrock deposits of Sherwood Sandstone Supergroup (Bunter Pebble Beds and Wilmslow Sandstone Formation) which underlie the site, are listed as Principal Aquifers. The overlying superficial deposits (Shirdley Hill Sand Formation, Glaciofluvial Sheet Deposits, and Glaciofluvial Deposits) are considered to be Secondary-A-Aquifers. The Till, marked only in a small south-eastern corner of the site, is considered to be Unproductive Strata.
- ✳ The closest identified groundwater abstraction is an abstraction from a well/borehole at a location 497 m north of the site. The abstraction is registered to United Utilities Water PLC and is for public drinking water supply. This is listed as active. The whole site is within a Zone 3 (total catchment) source protection zone.
- ✳ The closest identified surface water bodies are a number of drains and ponds located within the site itself. The only named surface water body at the site is the Spa Brook which runs from north to south through the centre of the site, to sink beneath the adjacent housing estate, probably in an artificial culvert.
- ✳ Borehole logs held by the BGS suggest that standard strip/trench/pad foundations will be appropriate across the majority of the site.
- ✳ The site is not within an area, as described by the BRE report BR211, where radon protective measures are required within new dwellings or extensions.



UTILITIES REPORT, TRANSPORT PLANNING ASSOCIATES. REPORT REF: 1506-45/TN/01B, DATED JUNE 2016.

- ✳ The asset location plans provided by the utility distributors show evidence that at least three of the services will directly affect the proposed development. United Utilities, National Grid and Scottish Power have apparatus crossing the development site, which will either need diversion or incorporating into the site layout.
- ✳ Points of connection will need to be confirmed or formalised for utilities before construction.

UPDATED ECOLOGICAL APPRAISAL & IMPACT ASSESSMENT, APPLETONS. REPORT REF: 1820-E1, DATED JANUARY 2020

- ✳ There will be no direct effects on Radley Plantation and Pond LWS, however current semi-natural habitats within the application site that directly abut the LWS woodland edge will be partially displaced by proposed playing fields, resulting in a slight potential impact to woodland structure. The Woodland Trust and County Ecologist/Consulting Body will be consulted as part of the planning process to further assess the potential impacts of proposals on Radley Plantation and Pond LWS.
- ✳ The evaluation of predicted effects has shown that a Moderate Adverse effect is predicted on the site as a whole through the loss of common but extensive semi-natural habitats during construction. These effects are partially reversible through the enhancement of retained habitats and provision of new habitats.
- ✳ Critical to a moderate adverse effect being predicted, is the overall low diversity and rankness of the plant communities on site, and the artificial nature of the woodlands effected by proposals. Whilst the site is large and losses extensive and of very high magnitude, the individual habitats affected are essentially poor. Extensive habitat degradation in the form of fly tipping and invasive species further reduces the ecological value of the site.
- ✳ Faunal species/species groups of conservation concern recorded on site include foraging bats, breeding birds and a small population of breeding great crested newts.
- ✳ Species for which on-site mitigation is not possible include skylark and noctule bat, which are likely to be displaced to surrounding open agricultural land.
- ✳ Himalayan Balsam was identified in the northern central, northern south-east, and southern central sectors of the site. Giant hogweed has been identified in the southern central sector of the site.

2.2. GENERAL OVERVIEW

A ground investigation has been designed based on the findings of the desk study, with exploratory holes advanced to target specific potential contaminant sources identified within the previous site investigations. The investigation has also been used to collect geotechnical information to assist in the design and construction of the proposed development.

Exploratory fieldwork was completed between 21st March 2022 and 1st April 2022. The works are summarised in Table 2.1.



2.3. LIMITATIONS OF THE INVESTIGATION

During the site investigation, the site was noted to be waterlogged in large areas of the site and as such access to these areas was restricted. Additionally, areas within the south-east, south and northern central sectors of the site comprised areas of Himalayan Balsam and Giant Hogweed which stopped access to these areas. Areas of dense woodland restricted access to the northern central sector of the site, along with electricity infrastructure and a residential property. Dense woodland also restricted access to areas within the south and south-east of the site.

Works were restricted along the northern boundary of the site due to the presence of a high pressure gas main. Overhead electricity infrastructure was also present across the central sector of the site.

Works were not completed in the south of the site in the vicinity of the current community centre.

2.4. SCOPE OF GROUND INVESTIGATION

TABLE 2.1 SUMMARY OF FIELDWORK

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground within the Playing Fields in the East of the Site and in the Vicinity of Former Ponds.	WS201	Window Sample Probehole	5.45	N/A
	WS202		5.45	2.00-4.00
	WS203		3.15	1.00-2.50
	WS204		5.45	2.00-3.00
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground Within the North-Eastern Field.	WS101	Window Sample Probehole	5.45	1.00-4.00
	WS102		5.45	0.50-3.50
	WS103		5.45	1.00-3.00
	WS104		5.45	N/A
	WS105		5.45	0.50-2.50
	WS106		5.45	N/A
	TP101 – TP107	Mechanically Excavated Trial Pit	2.10	N/A
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground Within the Eastern Field and in the Vicinity of Former Ponds and Field Boundaries.	WS205	Window Sample Probehole	5.45	N/A
	WS206		3.45	N/A
	WS207		5.45	N/A
	WS208		5.45	1.00-5.00
	WS209		4.38	N/A
	WS210		2.38	1.00-2.00
	WS211		4.38	N/A



POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground Within the Eastern Field and in the Vicinity of Former Ponds and Field Boundaries.	TP108 – TP114, TP201 – TP206, TP209	Mechanically Excavated Trial Pit	2.30	N/A
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground in the Vicinity of Former Buildings in the North of the Site.	WS225	Window Sample Probehole	5.00	0.50-4.50
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground in the Central Sector of the Site.	WS107	Window Sample Probehole	3.25	1.00-3.00
	WS108		3.12	N/A
	WS109		2.75	N/A
	WS110		3.39	0.50-2.50
	WS111		2.38	0.50-1.50
	WS112		2.94	N/A
	WS113		2.92	0.50-2.50
	WS114		3.38	N/A
	WS115		2.39	N/A
	WS212		3.02	N/A
	WS213		1.86	0.50-1.50
	WS214		2.11	N/A
	WS215		3.16	N/A
	WS216		3.25	1.00-2.00
	WS217		3.28	0.50-3.00
	WS218		2.38	1.00-2.00
	WS219		3.18	N/A
	WS220		3.15	N/A
	TP115-TP133, TP139, TP207-TP208, TP210-TP212	Mechanically Excavated Trial Pit	2.70	N/A
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground in the Northern Central Sector of the Site.	WS221	Window Sample Probehole	4.15	2.00-4.00
	WS222		4.38	N/A
	WS223		5.15	1.00-3.50
	WS224		5.45	N/A



POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground in the Northern Central Sector of the Site.	TP214-TP216	Mechanically Excavated Trial Pit	2.00	N/A
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground in the Western Central Sector of the Site.	WS116	Window Sample Probehole	5.10	0.50-4.50
	WS117		4.45	2.00-4.00
	WS118		4.44	N/A
	WS119		4.31	2.00-4.00
	WS123		4.18	1.00-4.00
General Ground Conditions Including the Presence/Nature of Obstructions and Made Ground in the Western Central Sector of the Site.	TP134-TP138, TP140, TP213, TP217-TP219	Mechanically Excavated Trial Pit	2.40	N/A
General Ground Condition in North Western Sector of the Site.	WS120	Window Sample Probehole	4.31	0.50-2.50
	WS121		5.45	1.00-2.00
	WS122		4.45	1.00-4.00
	TP141-TP148	Mechanically Excavated Trial Pit	2.50	N/A
Investigation of Deeper Soil Horizons	CP101	Cable Percussive Borehole	6.50	N/A
	CP102		7.00	N/A
	CP103		7.00	N/A
	RB101	Rotary Borehole	7.25	N/A
	RB103		6.15	N/A
	RB104		5.25	N/A
	RB105		5.25	0.50-5.00
BRE365 Soakaways	SA101-SA110	BRE365 Soakaways	2.00	N/A

Mechanically excavated trial pits were advanced to investigate ground conditions and to retrieve environmental samples, spatially distributed to offer the maximum site coverage whilst also being advanced to target specific contaminant sources.

Window sample probeholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental samples and install groundwater and ground gas monitoring wells.



Cable percussive boreholes were advanced to undertake the investigation of deeper soil horizons (in excess of 6.0m) with extensive in-situ geotechnical testing to determine the relative densities of granular soils and undrained strengths of clays. Due to soft, saturated ground conditions and associated access constraints, a series of rotary boreholes were advanced to investigate deeper soil horizon and the depth of bedrock, where cable percussive drilling rigs could not access. Deeper groundwater and environmental monitoring wells were placed in selected locations to confirm hydrogeological conditions and assist with extensive environmental monitoring within the sub-stratum.

The sampling locations are illustrated in Drawing 15-740-005 (Appendix III). The ground conditions encountered are indicated on the logs, which are provided in Appendix V.

Return visits were made to monitor installations for groundwater level and gas concentrations. In addition, selected wells were purged and samples of groundwater recovered for chemical analysis.

2.5. IN-SITU STANDARD PENETRATION TESTING (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60° cone (SPT(C)) was used instead of the sampling tube. The results are shown in the probehole logs in Appendix V and presented in Table 3.6 and discussed in Section 5.

2.6. PERMEABILITY TESTS

Twelve in-situ BRE 365 Soakaway tests were undertaken over a 48 hour period within trial pits completed as SA101-SA112. Soil infiltration was taken over the wetted area from between 75% and 25% of the effective depth. The results are presented in Table 3.9 and the test certificates are included within Appendix IX.

2.7. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical analysis comprising:

-  Metals.
-  pH, total sulphate, water-soluble sulphate (2:1 extract).
-  Sulphide.
-  Cyanide.
-  Phenols.
-  Total and speciated polycyclic aromatic hydrocarbons (PAHs).
-  Semi Volatile Organic Compounds (SVOC).
-  Volatile Organic Compounds (VOC).
-  Asbestos identification and quantification.
-  Speciated and banded total petroleum hydrocarbon (TPH).

I2 Analytical undertook the analytical work and the testing results are included in Appendix VI and discussed in Section 4.



Selected samples were submitted to PSL Laboratory where the following geotechnical tests were undertaken:

-  Atterberg limits determinations;
-  Particle size distribution;
-  One dimensional consolidation; and
-  Single-stage triaxial tests.

Laboratory analysis sheets are included in Appendix VIII and are summarised in Section 3.



3. GROUND AND GROUNDWATER CONDITIONS

3.1. SUMMARY OF GROUND CONDITIONS

The ground investigation generally confirms the published geology and identifies the strata set out in Table 3.1.

TABLE 3.1 SUMMARY OF STRATA

HOLE	DEPTH TO STRATUM (m bgl)				
	MADE GROUND	TOPSOIL	SAND	CLAY	WEATHERED SANDSTONE GRAVEL
SA101	0.00-0.30	-	1.60-2.00	0.30-1.60	-
SA102	-	0.00-0.30	0.30-1.40	-	-
SA103	0.00-0.50	-	1.50-1.80	0.50-1.50	-
SA104	-	0.00-0.40	0.40-1.60	-	-
SA105/TP203	-	0.00-0.30	0.60-2.00	0.30-0.60	-
SA106	-	0.00-0.30	0.30-1.30	-	-
SA107	-	0.00-0.30	-	0.30-1.50	-
SA108	-	0.00-0.30	-	0.30-1.50	-
SA109	-	0.00-0.30	-	0.30-1.70	-
SA110	-	0.00-0.30	-	0.30-1.80	-
SA111	-	0.00-0.30	0.50-1.40	-	-
SA112	-	0.00-0.30	0.30-1.30	1.30-1.70	-
TP101	-	0.00-0.40	0.40-2.10	-	-
TP102	0.00-0.90	-	-	0.90-1.80	-
TP103	-	0.00-0.25	0.25-1.90	-	-
TP104	-	0.00-0.30	-	0.30-1.70	-
TP105	-	0.00-0.40	0.40-2.00	-	-
TP106	0.00-0.80	-	-	0.80-1.90	-
TP107	-	0.00-0.25	0.25-2.10	-	-
TP108	0.00-1.10	-	-	1.10-1.85	-
TP109	-	0.00-0.35	-	0.35-1.75	-
TP110	-	0.00-0.35	0.35-1.80	1.80-2.20	-
TP111	-	0.00-0.30	-	0.30-1.90	-
TP112	-	0.00-0.30	0.30-1.40	-	-
TP113	0.00-0.80	-	-	0.80-2.20	-
TP114	-	0.00-0.25	0.25-2.30	-	-
TP115	0.00-0.30	-	0.30-1.30	1.30-1.75	-
TP116	-	0.00-0.20	0.20-2.30	-	-



HOLE	DEPTH TO STRATUM (m bgl)				
	MADE GROUND	TOPSOIL	SAND	CLAY	WEATHERED SANDSTONE GRAVEL
TP117	–	0.00–0.20	0.20–1.00 1.80–2.40	1.00–1.80	–
TP118	–	0.00–0.20	0.20–0.50 1.80–2.00	0.50–1.80	–
TP119	–	0.00–0.30	2.10–2.25	0.30–2.10	–
TP120	0.25–0.90	–	1.50–2.30	0.90–1.50	–
TP121	–	0.00–0.40	–	0.40–2.05	–
TP122	–	0.00–0.20	0.20–0.70	0.70–2.15	–
TP123	–	0.00–0.35	0.35–0.80	0.80–2.00	–
TP124	0.00–1.20	–	–	1.20–2.20	–
TP125	–	0.00–0.35	0.35–0.80 1.40–2.00	0.80–1.40	–
TP126	–	0.00–0.30	0.30–1.20 1.40–2.25	1.20–1.40	–
TP127	–	0.00–0.30	–	0.30–1.95	–
TP128	–	0.00–0.30	–	0.30–2.05	–
TP129	–	0.00–0.30	–	0.30–1.80	–
TP130	0.00–0.70	–	–	0.70–1.85	–
TP131	–	0.00–0.15	–	0.15–1.80	–
TP132	0.00–0.40	–	–	0.40–2.00	–
TP133	–	0.00–0.25	0.25–0.50	0.50–2.05	–
TP134	–	0.00–0.20	–	0.20–1.90	–
TP135	0.20–0.60	–	–	0.60–2.10	–
TP136	–	0.00–0.30	–	0.30–2.00	–
TP137	–	0.00–0.15	–	0.15–1.70	–
TP138	–	0.00–0.20	–	0.20–1.75	–
TP139	–	0.00–0.25	–	0.25–2.10	–
TP140	–	0.00–0.40	1.30–2.40	0.40–1.30	–
TP141	–	0.00–0.30	0.30–2.40	–	–
TP142	–	0.00–0.30	0.30–1.10	1.10–2.00	–
TP143	–	0.00–0.30	0.30–1.90	–	–
TP144	–	0.00–0.30	0.30–1.10	1.10–2.20	–
TP145	–	0.00–0.25	0.25–1.10	1.10–1.70	–
TP146	–	0.00–0.30	0.30–1.60	1.60–1.75	–
TP147	–	0.00–0.30	0.30–0.75	0.75–2.40	–
TP148	–	0.00–0.30	–	0.30–2.50	–



HOLE	DEPTH TO STRATUM (m bgl)				
	MADE GROUND	TOPSOIL	SAND	CLAY	WEATHERED SANDSTONE GRAVEL
TP201	0.00–0.60	–	–	0.60–1.80	–
TP202	–	0.00–0.30	–	0.30–1.60	–
TP204	–	0.00–0.30	0.30–1.50	–	–
TP205	–	0.00–0.30	0.30–1.50	–	–
TP206	–	0.00–0.40	0.40–1.70	–	–
TP207	0.00–0.30	–	0.30–1.00	1.00–1.80	–
TP208	0.00–0.40	–	0.40–0.80	0.80–2.00	–
TP209	–	0.00–0.40	0.40–1.80	–	–
TP210	–	0.00–0.40	0.40–0.70	0.70–1.70	–
TP211	0.00–0.60	–	–	0.60–1.70	–
TP212	–	0.00–0.30	–	0.30–1.40	–
TP213	–	0.00–0.30	0.30–0.50	0.50–1.60	–
TP214	–	0.00–0.30	0.30–0.50	0.50–1.70	–
TP215	–	0.00–0.30	0.30–1.60	–	–
TP216	–	0.00–0.30	0.30–0.80	0.80–2.00	–
TP217	–	0.00–0.30	–	0.30–1.70	–
TP218	0.00–0.30	–	–	0.30–1.80	–
TP219	–	0.00–0.30	–	0.30–1.30	–
WS101	–	0.00–0.30	1.80–2.00	0.30–1.80 2.00–5.45	–
WS102	–	0.00–0.30	0.30–5.45	–	–
WS103	–	0.00–0.30	0.30–5.45	–	–
WS104	0.00–0.60	–	0.60–5.45	–	–
WS105	–	0.00–0.30	0.30–5.45	–	–
WS106	–	0.00–0.30	0.50–5.45	0.30–0.50	–
WS107	–	0.00–0.30	0.30–0.60	0.60–3.25	–
WS108	–	0.00–0.30	2.00–3.12	0.30–2.00	–
WS109	–	0.00–0.30	0.30–2.75	–	–
WS110	–	0.00–0.25	0.25–3.39	–	–
WS111	–	0.00–0.20	0.20–2.38	–	–
WS112	–	0.00–0.30	0.30–0.60 2.70–2.94	0.60–2.70	–
WS113	–	0.00–0.30	0.30–0.60 2.80–2.92	0.60–2.80	–
WS114	–	0.00–0.25	2.60–3.38	0.25–2.60	–



HOLE	DEPTH TO STRATUM (m bgl)				
	MADE GROUND	TOPSOIL	SAND	CLAY	WEATHERED SANDSTONE GRAVEL
WS115	–	0.00–0.30	0.60–2.39	–	–
WS116	–	0.00–0.30	0.30–0.90 4.40–4.50	0.90–4.40 4.50–5.10	–
WS117	–	0.00–0.35	–	0.35–4.45	–
WS118	–	0.00–0.30	–	0.30–4.44	–
WS119	–	0.00–0.20	–	0.20–4.31	–
WS120	–	0.00–0.30	0.30–2.80 3.20–3.70	2.80–3.20 3.20–4.31	–
WS121	0.00–0.40	–	0.55–2.80 3.10–5.45	0.40–0.55 2.80–3.10	–
WS122	–	0.00–0.35	0.35–2.00	2.00–4.45	–
WS123	–	–	–	0.00–4.18	–
WS201	–	0.00–0.50	0.50–3.60 4.00–5.45	3.60–4.00	–
WS202	–	0.00–0.20	3.10–5.45	0.20–3.10	–
WS203	–	0.00–0.20	2.20–3.15	0.20–2.20	–
WS204	–	0.00–0.20	4.00–5.45	0.20–4.00	–
WS205	–	0.00–0.35	0.35–2.40 3.20–5.45	2.40–3.20	–
WS206	–	0.00–0.40	0.40–2.50	2.50–3.45	–
WS207	–	0.00–0.30	2.00–2.60 3.10–4.00	0.30–2.00 2.60–3.10 4.00–5.45	–
WS208	–	0.00–0.10	0.30–0.40	0.10–0.30 0.40–5.45	–
WS209	0.00–0.90	–	–	0.90–4.38	–
WS210	–	0.00–0.30	0.30–2.38	–	–
WS211	–	0.00–0.40	2.90–3.80	0.40–2.90 3.80–4.38	–
WS212	–	0.00–0.30	2.00–3.02	0.30–2.00	–
WS213	–	0.00–0.30	0.30–0.80 1.00–1.50 1.80–1.86	0.80–1.00 1.50–1.80	–
WS214	–	0.00–0.30	–	0.30–2.11	–
WS215	–	0.00–0.20	–	0.20–3.16	–
WS216	–	0.00–0.40	3.00–3.25	0.40–3.00	–
WS217	–	0.00–0.20	3.00–3.28	0.20–3.00	–
WS218	–	0.00–0.40	1.80–2.38	0.40–1.80	–



HOLE	DEPTH TO STRATUM (m bgl)				
	MADE GROUND	TOPSOIL	SAND	CLAY	WEATHERED SANDSTONE GRAVEL
WS219	–	0.00–0.30	3.00–3.18	0.30–3.00	–
WS220	–	0.00–0.30	0.30–1.50 2.45–3.15	1.50–2.45	–
WS221	0.00–0.30	–	3.00–3.10 4.00–4.15	0.30–3.00 3.10–4.00	–
WS222	–	0.00–0.30	0.30–1.80 2.00–2.30 3.00–4.38	1.80–2.00 2.30–3.00	–
WS223	–	0.00–0.40	0.40–1.60 2.40–5.15	1.60–2.40	–
WS224	–	0.00–0.40	0.40–2.00 3.00–5.45	2.00–3.00	–
WS225	0.00–0.90	–	1.20–1.70 2.00–3.80 4.30–5.00	0.90–1.20 1.70–2.00 3.80–4.30	–
CP101	–	0.00–0.30	0.70–3.20 4.80–6.50	0.30–0.70 3.20–4.80	–
CP102	–	0.00–0.40	0.40–4.10 5.50–7.00	4.10–5.50	–
CP103	–	0.00–0.30	0.30–2.50 5.10–5.40	2.50–5.10	5.40–7.00
RB101	–	0.00–0.20	–	0.20–4.20	4.20–7.25
RB103	–	0.00–0.20	–	0.20–4.50	4.50–6.15
RB104	–	0.00–0.20	0.20–3.70	3.70–4.10	4.10–5.25
RB105	–	0.00–0.20	–	0.20–3.80	3.80–5.25

3.2. MADE GROUND

Made Ground was encountered in 22 exploratory hole locations at depths from ground level to a maximum proven depth of 1.20 bgl (TP124). However, the majority of Made Ground encountered was encountered to a depth <1.00mbgl.

Where encountered the Made Ground generally comprised of a reworked topsoil of a dark brown sandy clay or a clayey fine to medium sand. This was often underlain by a reworked slightly gravelly sandy clay or a greyish brown clayey fine to medium sand with gravel of mudstone, sandstone and occasionally brick and rare glass, asphalt, clinker and ash. Within TP211 the reworked clay also contained cobbles of brick.

Underlying the topsoil in TP106, a gravelly sand was encountered with gravel of sandstone, mudstone and rare fragments of brick and clinker. The deepest area of Made Ground encountered in the central area of the site just south of the drainage ditch within TP124 comprised of a greyish brown clayey fine to medium sand, with a land drain identified at 0.70m bgl.



In the area to the south of Peel Hall, within WS225, Made Ground is comprised of a grey mottled brown slightly gravelly sandy clay, with gravel of clinker, ash sandstone, mudstone and fragments of brick.

A Depth of Made Ground Plan is presented as Drawing 15-740-006 in Appendix III.

3.3. TOPSOIL

Natural topsoil was encountered within the majority of the exploratory hole locations with the exception of those identified as reworked topsoil as described above.

Topsoil is generally comprised of a brown sandy CLAY with frequent rootlets or a dark brown clayey fine to medium SAND with frequent rootlets.

3.4. DRIFT DEPOSITS

Drift deposits were encountered within all exploratory hole locations.

Drift deposits were varied across the site but generally comprised of either firm to stiff brown sandy slightly gravelly CLAY with gravel of mudstone and sandstone or loose to dense clayey slightly gravelly grey or brown fine to medium SAND.

Loose sands were identified within WS102, WS103, WS104, WS105, WS106, WS110, WS115, WS120, WS121, WS122, WS201, WS205, WS206, WS220, WS224, CP101 and CP102. Loose sands were identified between 0.25-5.45m bgl.

Very soft or soft CLAY was identified within SA107 at 0.30-1.00mbgl and TP148 at 1.20-2.50mbgl; the materials within TP148 are likely to be attributed to possible pond fill on site as it comprised of dark grey CLAY with frequent organic matter.

Other drift deposits containing organic matter was identified within TP103, WS123, WS204, WS208 and WS212 at depths of between 0.10 -3.30mbgl.

Silty CLAY drift deposits were identified within RB101, RB103 and RB105.

Drift deposits were noted to be saturated on numerous occasions, with running sands also encountered during the ground investigation, the details of which are included within Table 3.2.

3.5. SOLID GEOLOGY

Weathered red sandstone recovered as a GRAVEL was encountered across the site, within exploratory hole locations, CP103, RB101, RB103, RB104, and RB105 at depths between 3.80 m bgl to 7.25 mbgl.

WS213 refused at 1.86mbgl. on suspected weathered bedrock.

3.6. GROUNDWATER

Groundwater strikes were encountered throughout the site. The depth of the strikes are shown on the exploratory hole records in Appendix V and are summarised in Table 3.2.



TABLE 3.2 SUMMARY GROUNDWATER STRIKES

LOCATION	DEPTH TO STRIKE (m)	NOTES
TP101	1.80	Seepage / Possible running sand
TP103	0.60	Perched
TP103	1.80	Strike - Slow ingress
TP105	0.60	Perched
TP105	0.90	Possible running sand
TP107	1.80	Possible running sand
TP110	1.70	Possible running sand
TP113	1.70	Seepage
TP114	1.20	Possible running sand
TP115	0.70	Strike - Moderate ingress
TP115	1.10	Possible running sand
TP116	0.50	Seepage
TP117	0.60	Seepage
TP117	1.90	Strike - Slow ingress
TP118	1.60	Seepage
TP119	1.40	Seepage
TP120	0.60	Land Drain - Slow ingress
TP120	0.90	Possible running sand. Strike - Moderate ingress
TP121	1.10	Strike - Slow ingress
TP122	1.80	Strike - Moderate ingress
TP123	0.80	Perched on CLAY
TP123	1.85	Strike - Slow ingress
TP124	0.70	Land drain - Seepage
TP124	1.50	Possible running sand
TP125	1.40	Perched on CLAY
TP128	1.95	Seepage
TP129	0.00-0.30	Saturated Ground
TP129	0.60	Seepage
TP129	1.65	Seepage
TP132	0.40	Land Drain - Slow ingress
TP134	1.10	Seepage
TP135	0.40	Land Drain - Moderate ingress
TP135	0.80	Strike - Fast ingress
TP140	2.30	Seepage and possible running sand



LOCATION	DEPTH TO STRIKE (m)	NOTES
TP141	2.10	Seepage
TP146	1.45	Possible running sand
TP147	1.80	Seepage
TP148	1.25	Strike - Slow ingress
TP203 / SA105	1.90	Possible running sand
TP205	1.40	Possible running sand
TP206	1.70	Possible running sand
TP207	0.90	Possible running sand
TP208	0.40	Land Drain - Seepage
TP209	1.10	Possible running sand
TP210	0.70	Seepage
TP212	1.40	Seepage
TP214	1.70	Seepage
TP215	0.50	Possible running sand
TP216	0.70	Possible running sand
TP217	1.70	Seepage
TP218	0.30	Land Drain - Seepage
WS101	3.00	Strike; materials saturated from this depth to base of borehole.
WS102	2.00	Strike; materials saturated from this depth to base of borehole.
WS104	2.00	Strike; materials saturated from this depth to base of borehole.
WS105	1.00	Strike
WS105	3.00	Strike
WS106	2.00	Strike
WS110	1.00	Strike; materials saturated from this depth to base of borehole.
WS112	2.00	Strike
WS114	3.00	Strike; materials saturated from this depth to base of borehole.
WS115	2.00	Strike; materials saturated from this depth to base of borehole.
WS116	4.00	Saturated deposits identified.
WS116	4.20	Strike
WS117	3.00	Saturated deposits identified.
WS117	3.20	Strike
WS120	2.00	Strike



LOCATION	DEPTH TO STRIKE (m)	NOTES
WS120	3.00	Strike
WS120	3.20-3.70	Saturated deposits
WS121	2.00	Strike
WS122	1.80	Strike
WS123	3.00	Strike
WS201	1.00	Strike
WS202	3.00	Strike
WS202	3.10-5.45	Saturated deposits
WS204	3.00	Strike; materials saturated from this depth to base of borehole.
WS205	4.00	Strike; materials saturated from this depth to base of borehole.
WS206	1.50	Strike
WS209	0.90	Land Drain - Strike
WS209	4.00	Strike
WS210	1.80	Strike
WS211	2.00	Strike
WS215	3.00	Strike
WS216	2.80	Strike
WS216	3.00	Saturated deposits identified.
WS217	2.00	Strike; materials saturated from this depth to base of borehole.
WS218	1.00	Strike
WS219	2.80	Strike
WS220	2.00	Strike; materials saturated from this depth to base of borehole.
WS222	0.50	Strike
WS223	1.00	Strike. Saturated deposits throughout borehole.
WS224	2.00	Strike; materials saturated from this depth to base of borehole.
WS225	2.20	Strike
WS225	4.00	Strike
CP101	3.00	Strike
CP102	3.00	Strike
CP103	0.50	Strike
CP103	5.10	Strike



Monitoring was undertaken using an electronic dip meter and interface probe to record the depth to groundwater and the thickness of any free-phase hydrocarbon product, if present.

3.7. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has been identified during the site investigation and these are summarised in Table 3.3.

TABLE 3.3 SUMMARY VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

LOCATION	DEPTH (m)	STRATUM	NOTES
TP135	0.80	Water ingress	Slight organic odour within water strike.

3.8. SOIL CONSISTENCY

Undrained shear strength values were measured using both field hand shear vane tests and laboratory undrained triaxial tests. Results of the tests are presented in Table 3.4 and Table 3.5, which indicate the clay soils to vary between very soft and very stiff. Strength test data is generally consistent with the field descriptions of the aforementioned soils.

TABLE 3.4 SUMMARY OF HAND SHEAR VANE TESTS

LOCATION	DEPTH	SHEAR STRENGTH (kPa)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)
TP102	0.55	63	148
TP102	0.80	85	200
TP102	1.00	126	296
TP102	1.40	89	209
TP102	1.70	113	266
TP104	0.60	65	153
TP104	1.00	77	181
TP104	1.50	100	235
TP106	1.00	65	153
TP106	1.40	95	223
TP106	1.80	114	268
TP108	1.25	55	129
TP108	1.60	75	176
TP108	1.80	81	190
TP109	0.60	81	190
TP109	1.10	90	212
TP109	1.40	99	233
TP109	1.60	91	214
TP110	1.90	81	190



LOCATION	DEPTH	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)
TP110	2.10	93	219
TP111	0.50	75	176
TP111	0.90	92	216
TP111	1.50	89	209
TP111	1.80	96	226
TP113	0.50	52	122
TP113	1.20	65	153
TP113	1.80	63	148
TP113	2.00	66	155
TP115	1.50	53	125
TP115	1.70	59	139
TP117	1.20	85	200
TP117	1.50	92	216
TP117	1.70	92	216
TP118	1.00	69	162
TP118	1.60	84	197
TP119	0.50	70	165
TP119	0.80	90	212
TP119	1.40	92	216
TP119	1.90	92	216
TP120	1.10	56	132
TP120	1.40	59	139
TP121	0.50	61	143
TP121	1.00	86	202
TP121	1.40	96	226
TP121	1.80	112	263
TP122	1.00	77	181
TP122	1.50	96	226
TP122	1.80	113	266
TP122	2.00	109	256
TP123	1.00	85	200
TP123	1.40	107	251
TP123	1.80	100	235
TP124	1.40	90	212
TP124	1.80	113	266



LOCATION	DEPTH	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)
TP125	1.00	75	176
TP127	0.50	66	155
TP127	1.00	83	195
TP127	1.50	88	207
TP127	1.80	95	223
TP128	0.50	79	186
TP128	0.90	92	216
TP128	1.40	85	200
TP128	1.80	94	221
TP129	0.60	79	186
TP129	1.30	85	200
TP129	1.50	92	216
TP130	0.50	107	251
TP131	0.40	116	273
TP131	0.90	118	277
TP131	1.20	113	266
TP132	0.60	83	195
TP132	1.00	101	237
TP132	1.40	126	296
TP132	1.90	140	329
TP133	0.70	83	195
TP133	1.30	106	249
TP133	1.70	118	277
TP133	2.00	126	296
TP134	0.50	83	195
YP134	1.10	114	268
TP134	1.40	116	273
TP134	1.80	120	282
TP135	0.40	57	134
TP135	0.90	64	150
TP135	1.40	70	165
TP135	2.00	60	141
TP136	0.60	94	221
TP136	1.20	101	237
TP136	1.40	99	233



LOCATION	DEPTH	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)
TP136	1.70	97	228
TP137	0.40	96	226
TP137	0.90	100	235
TP137	1.30	103	242
TP137	1.60	107	251
TP138	0.50	96	226
TP138	1.00	112	263
TP138	1.50	144	338
TP139	0.80	79	186
TP139	1.20	85	200
TP139	1.70	86	202
TP142	1.40	73	172
TP142	1.80	100	235
TP144	1.40	69	162
TP144	1.90	110	259
TP145	1.40	110	259
TP146	1.70	81	190
TP147	1.20	62	146
TP147	1.70	83	195
TP147	2.00	83	195
TP147	2.30	94	221
TP148	0.60	83	195
TP148	1.40	16	38
TP148	1.80	15	35
TP201	1.00	92	216
TP201	1.50	94	221
TP202	1.00	111	261
TP202	1.50	102	240
TP207	1.50	100	235
TP207	1.80	135	317
TP210	1.00	55	129
TP210	1.50	89	209
TP212	0.50	127	298
TP212	1.00	122	287
TP213	1.00	103	242



LOCATION	DEPTH	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)
TP213	1.50	130	306
TP214	1.00	148	348
TP214	1.50	160	376
TP216	1.00	93	219
TP216	1.50	95	223
TP216	2.00	150	353
TP217	0.50	130	306
TP217	1.00	89	209
TP217	1.50	135	317
TP219	0.50	106	249
TP219	1.00	127	298

Notes

ABP Calculated using Stroud and Butler et al 1974.

Results of the standard penetration tests, including undrained shear strengths derived from SPTs are included in Table 3.6.

TABLE 3.5 SUMMARY OF UNDRAINED SHEAR STRENGTH TEST RESULTS

LOCATION	SAMPLE DEPTH (m)	LAB DESCRIPTION	UNDRAINED SHEAR STRENGTH (kN/m ²)	CONSISTENCY
WS113	1.50–2.00	Stiff brown slightly gravelly slightly sandy CLAY.	94	Stiff
WS119	1.50–2.00	Firm brown slightly gravelly sandy CLAY.	62	Firm
WS122	2.50–3.00	Firm brown slightly sandy CLAY.	56	Firm
WS205	2.50–3.00	Firm brown slightly gravelly very sandy CLAY.	61	Firm
WS216	2.50–3.00	Stiff brown gravelly very sandy CLAY.	140	Stiff
WS221	0.50–1.00	Firm brown slightly sandy CLAY.	44	Firm

3.9. SIDE STABILITY AND EASE OF EXCAVATION

The sides of the exploratory trial pit excavations varied in stability across the site.

The presence of running sand and loose granular deposits meant that in certain areas trial pits were noted to be unstable. Furthermore, stiff CLAY across the site resulted in the excavation of trial pits to be slow.



TABLE 3.6 STANDARD/CONE PENETRATION TEST RESULTS

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS101	1	CLAY	8	8.07	N/A	Medium strength	Stiff	40.33	82.91
WS101	2	CLAY	9	8.22	N/A	Medium strength	Stiff	41.11	84.52
WS101	3	CLAY	11	9.57	N/A	Medium strength	Stiff	47.83	98.34
WS101	4	CLAY	9	7.60	N/A	Low strength	Firm	38.02	78.17
WS101	5	CLAY	12	9.96	N/A	Medium strength	Stiff	49.78	102.34
WS102	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS102	2	SAND	11	10.05	Medium Dense	N/A	N/A	N/A	100.49
WS102	3	SAND	15	13.04	Medium Dense	N/A	N/A	N/A	130.45
WS102	4	SAND	16	13.52	Medium Dense	N/A	N/A	N/A	135.18
WS102	5	SAND	14	11.61	Medium Dense	N/A	N/A	N/A	116.15
WS103	1	SAND	12	12.10	Medium Dense	N/A	N/A	N/A	120.98
WS103	2	SAND	9	8.22	Loose	N/A	N/A	N/A	82.22
WS103	3	SAND	10	8.70	Loose	N/A	N/A	N/A	86.97
WS103	4	SAND	13	10.98	Medium Dense	N/A	N/A	N/A	109.83
WS103	5	SAND	19	15.76	Medium Dense	N/A	N/A	N/A	157.63
WS104	1	SAND	11	11.09	Medium Dense	N/A	N/A	N/A	110.90
WS104	2	SAND	12	10.96	Medium Dense	N/A	N/A	N/A	109.62
WS104	3	SAND	11	9.57	Loose	N/A	N/A	N/A	95.66



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS104	4	SAND	22	18.59	Medium Dense	N/A	N/A	N/A	185.87
WS104	5	SAND	20	16.59	Medium Dense	N/A	N/A	N/A	165.92
WS105	1	SAND	7	7.06	Loose	N/A	N/A	N/A	70.57
WS105	2	SAND	10	9.14	Loose	N/A	N/A	N/A	91.35
WS105	3	SAND	19	16.52	Medium Dense	N/A	N/A	N/A	165.23
WS105	4	SAND	23	19.43	Medium Dense	N/A	N/A	N/A	194.32
WS105	5	SAND	27	22.40	Medium Dense	N/A	N/A	N/A	224.00
WS106	1	SAND	8	8.07	Loose	N/A	N/A	N/A	80.65
WS106	2	SAND	8	7.31	Loose	N/A	N/A	N/A	73.08
WS106	3	SAND	12	10.44	Medium Dense	N/A	N/A	N/A	104.36
WS106	4	SAND	15	12.67	Medium Dense	N/A	N/A	N/A	126.73
WS106	5	SAND	22	18.25	Medium Dense	N/A	N/A	N/A	182.52
WS107	1	CLAY	6	6.05	N/A	Low strength	Firm	30.24	62.18
WS107	2	CLAY	17	15.53	N/A	High strength	Very Stiff	77.65	159.65
WS107	3	CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS108	1	CLAY	10	10.08	N/A	Medium strength	Stiff	50.41	103.64
WS108	2	SAND	12	10.96	Medium Dense	N/A	N/A	N/A	109.62
WS108	3	SAND	50	43.48	Dense	N/A	N/A	N/A	434.83



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS109	1	SAND	15	15.12	Medium Dense	N/A	N/A	N/A	151.22
WS109	2	SAND	26	23.75	Medium Dense	N/A	N/A	N/A	237.52
WS109	2.6	SAND	50	44.20	Dense	N/A	N/A	N/A	442.01
WS110	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS110	2	SAND	11	10.05	Medium Dense	N/A	N/A	N/A	100.49
WS110	3	SAND	50	43.48	Dense	N/A	N/A	N/A	434.83
WS111	1	SAND	13	13.11	Medium Dense	N/A	N/A	N/A	131.06
WS111	2	SAND	50	45.68	Dense	N/A	N/A	N/A	456.77
WS112	1	CLAY	8	8.07	N/A	Medium strength	Stiff	40.33	82.91
WS112	2	CLAY	19	17.36	N/A	High strength	Very Stiff	86.79	178.43
WS112	2.7	SAND.	50	44.01	Dense	N/A	N/A	N/A	440.05
WS113	1	CLAY	6	6.05	N/A	Low strength	Firm	30.24	62.18
WS113	2	CLAY	15	13.70	N/A	Medium strength	Stiff	68.52	140.87
WS113	2.6	CLAY	50	44.20	N/A	Very high strength	Very Stiff	220.03	454.38
WS114	1	CLAY	10	10.08	N/A	Medium strength	Stiff	50.41	103.64
WS114	2	CLAY	18	16.44	N/A	High strength	Very Stiff	82.22	169.04
WS114	3	SAND	50	43.48	Dense	N/A	N/A	N/A	434.83
WS115	1	SAND	8	8.07	Loose	N/A	N/A	N/A	80.65



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS115	2	SAND	50	45.68	Dense	N/A	N/A	N/A	456.77
WS116	1	CLAY	12	12.10	N/A	Medium strength	Stiff	60.49	124.37
WS116	2	CLAY	10	9.14	N/A	Medium strength	Stiff	45.68	93.91
WS116	3	CLAY	9	7.83	N/A	Low strength	Firm	39.13	80.46
WS116	4	CLAY	48	40.55	N/A	Very high strength	Very Stiff	202.76	416.88
WS116	4.8	CLAY	50	41.61	N/A	Very high strength	Very Stiff	208.03	427.72
WS117	1	CLAY	7	7.06	N/A	Low strength	Firm	35.29	72.55
WS117	2	CLAY	9	8.22	N/A	Medium strength	Stiff	41.11	84.52
WS117	3	CLAY	16	13.91	N/A	Medium strength	Stiff	69.57	143.04
WS117	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS118	1	CLAY	13	13.11	N/A	Medium strength	Stiff	65.53	134.73
WS118	2	CLAY	12	10.96	N/A	Medium strength	Stiff	54.81	112.69
WS118	3	CLAY	14	12.18	N/A	Medium strength	Stiff	60.88	125.16
WS118	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS119	1	CLAY	15	15.12	N/A	High strength	Very Stiff	75.61	155.46
WS119	2	CLAY	23	21.01	N/A	High strength	Very Stiff	105.06	216.00
WS119	3	CLAY	27	23.48	N/A	High strength	Very Stiff	117.40	241.38
WS119	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS120	1	SAND	8	8.07	Loose	N/A	N/A	N/A	80.65
WS120	2	SAND	19	17.36	Medium Dense	N/A	N/A	N/A	173.57
WS120	3	SAND	16	13.91	Medium Dense	N/A	N/A	N/A	139.14
WS120	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS121	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS121	2	SAND	5	4.57	Loose	N/A	N/A	N/A	45.68
WS121	3	SAND	16	13.91	Medium Dense	N/A	N/A	N/A	139.14
WS121	4	SAND	7	5.91	Loose	N/A	N/A	N/A	59.14
WS121	5	SAND	17	14.10	Medium Dense	N/A	N/A	N/A	141.04
WS122	1	SAND.	6	6.05	Loose	N/A	N/A	N/A	60.49
WS122	2	CLAY	12	10.96	N/A	Medium strength	Stiff	54.81	112.69
WS122	3	CLAY	13	11.31	N/A	Medium strength	Stiff	56.53	116.22
WS122	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS123	1	CLAY	4	4.03	N/A	Low strength	Firm	20.16	41.46
WS123	2	CLAY	5	4.57	N/A	Low strength	Firm	22.84	46.96
WS123	3	CLAY.	33	28.70	N/A	High strength	Very Stiff	143.49	295.02
WS123	3.8	CLAY.	50	42.44	N/A	Very high strength	Very Stiff	212.21	436.31
WS201	1	SAND	11	11.09	Medium Dense	N/A	N/A	N/A	110.90



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS201	2	SAND	10	9.14	Loose	N/A	N/A	N/A	91.35
WS201	3	SAND	11	9.57	Loose	N/A	N/A	N/A	95.66
WS201	4	SAND	13	10.98	Medium Dense	N/A	N/A	N/A	109.83
WS201	5	SAND	19	15.76	Medium Dense	N/A	N/A	N/A	157.63
WS202	1	CLAY	13	13.11	N/A	Medium strength	Stiff	65.53	134.73
WS202	2	CLAY	29	26.49	N/A	High strength	Very Stiff	132.46	272.34
WS202	3	SAND	17	14.78	Medium Dense	N/A	N/A	N/A	147.84
WS202	4	SAND	35	29.57	Medium Dense	N/A	N/A	N/A	109.83
WS202	5	SAND	50	41.48	Dense	N/A	N/A	N/A	157.63
WS203	1	CLAY	15	15.12	N/A	High strength	Very Stiff	75.61	155.46
WS203	2	SAND	17	15.53	Medium Dense	N/A	N/A	N/A	155.30
WS203	2.7	SAND	50	44.01	Dense	N/A	N/A	N/A	440.05
WS204	1	CLAY	13	13.11	N/A	Medium strength	Stiff	65.53	134.73
WS204	2	CLAY	13	11.88	N/A	Medium strength	Stiff	59.38	122.09
WS204	3	CLAY	14	12.18	N/A	Medium strength	Stiff	60.88	125.16
WS204	4	SAND	15	12.67	Medium Dense	N/A	N/A	N/A	126.73
WS204	5	SAND	18	14.93	Medium Dense	N/A	N/A	N/A	149.33
WS205	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS205	2	SAND	9	8.22	Loose	N/A	N/A	N/A	82.22
WS205	3	SAND	10	8.70	Loose	N/A	N/A	N/A	86.97
WS205	4	SAND	8	6.76	Loose	N/A	N/A	N/A	67.59
WS205	5	SAND	11	9.13	Loose	N/A	N/A	N/A	91.26
WS206	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS206	2	SAND	8	7.31	Loose	N/A	N/A	N/A	73.08
WS206	3	CLAY.	6	5.22	N/A	Low strength	Firm	26.09	53.64
WS207	1	CLAY	9	9.07	N/A	Medium strength	Stiff	45.37	93.27
WS207	2	SAND	12	10.96	Medium Dense	N/A	N/A	N/A	109.62
WS207	3	SAND	16	13.91	Medium Dense	N/A	N/A	N/A	139.14
WS207	4	CLAY	14	11.83	N/A	Medium strength	Stiff	59.14	121.59
WS207	5	CLAY	13	10.79	N/A	Medium strength	Stiff	53.93	110.87
WS208	1	CLAY	7	7.06	N/A	Low strength	Firm	35.29	72.55
WS208	2	CLAY	20	18.27	N/A	High strength	Very Stiff	91.35	187.82
WS208	3	CLAY	19	16.52	N/A	High strength	Very Stiff	82.62	169.86
WS208	4	CLAY	24	20.28	N/A	High strength	Very Stiff	101.38	208.44
WS208	5	CLAY	28	23.23	N/A	High strength	Very Stiff	116.15	238.80
WS209	1	CLAY	11	11.09	N/A	Medium strength	Stiff	55.45	114.00



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS209	2	CLAY	13	11.88	N/A	Medium strength	Stiff	59.38	122.09
WS209	3	CLAY	17	14.78	N/A	Medium strength	Stiff	73.92	151.98
WS209	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS210	1	SAND	14	14.11	Medium Dense	N/A	N/A	N/A	141.14
WS210	2	SAND	50	45.68	Dense	N/A	N/A	N/A	456.77
WS211	1	CLAY	8	8.07	N/A	Medium strength	Stiff	40.33	82.91
WS211	2	CLAY	15	13.70	N/A	Medium strength	Stiff	68.52	140.87
WS211	3	SAND	13	11.31	Medium Dense	N/A	N/A	N/A	113.05
WS211	4	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS212	1	CLAY	10	10.08	N/A	Medium strength	Stiff	50.41	103.64
WS212	2	SAND	28	25.58	Medium Dense	N/A	N/A	N/A	255.79
WS212	2.7	SAND	50	44.01	Dense	N/A	N/A	N/A	440.05
WS213	1	SAND	13	13.11	Medium Dense	N/A	N/A	N/A	131.06
WS213	1.5	CLAY	50	47.51	N/A	Very high strength	Very Stiff	237.54	488.38
WS214	1	CLAY	8	8.07	N/A	Medium strength	Stiff	40.33	82.91
WS214	1.8	CLAY	50	46.32	N/A	Very high strength	Very Stiff	231.62	476.20
WS215	1	CLAY	12	12.10	N/A	Medium strength	Stiff	60.49	124.37
WS215	2	CLAY	14	12.79	N/A	Medium strength	Stiff	63.95	131.48



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS215	3	CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS216	1	CLAY	14	14.11	N/A	Medium strength	Stiff	70.57	145.09
WS216	2	CLAY	47	42.94	N/A	Very high strength	Very Stiff	214.68	441.39
WS216	2.8	CLAY	53	46.45	N/A	Very high strength	Very Stiff	232.25	477.51
WS217	1	CLAY	10	10.08	N/A	Medium strength	Stiff	50.41	103.64
WS217	2	CLAY	17	15.53	N/A	High strength	Very Stiff	77.65	159.65
WS217	2.9	SAND	50	43.65	Dense	N/A	N/A	N/A	436.47
WS218	1	CLAY	7	7.06	N/A	Low strength	Firm	35.29	72.55
WS218	2	SAND	50	45.68	Dense	N/A	N/A	N/A	456.77
WS219	1	CLAY	5	5.04	N/A	Low strength	Firm	25.20	51.82
WS219	2	CLAY	14	12.79	N/A	Medium strength	Stiff	63.95	131.48
WS219	2.8	SAND	50	43.82	Dense	N/A	N/A	N/A	438.21
WS220	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS220	2	CLAY	19	17.36	N/A	High strength	Very Stiff	86.79	178.43
WS220	3	SAND	50	43.48	Dense	N/A	N/A	N/A	434.83
WS221	1	CLAY	11	11.09	N/A	Medium strength	Stiff	55.45	114.00
WS221	2	CLAY	10	9.14	N/A	Medium strength	Stiff	45.68	93.91
WS221	3	CLAY	22	19.13	N/A	High strength	Very Stiff	95.66	196.68



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS221	3.7	CLAY	50	42.55	N/A	Very high strength	Very Stiff	212.75	437.42
WS222	1	SAND	14	14.11	Medium Dense	N/A	N/A	N/A	141.14
WS222	2	SAND	18	16.44	Medium Dense	N/A	N/A	N/A	164.44
WS222	3	SAND	18	15.65	Medium Dense	N/A	N/A	N/A	156.54
WS222	4	SAND	50	42.24	Dense	N/A	N/A	N/A	422.43
WS223	1	SAND	13	13.11	Medium Dense	N/A	N/A	N/A	131.06
WS223	2	CLAY	18	16.44	N/A	High strength	Very Stiff	82.22	169.04
WS223	3	SAND	22	19.13	Medium Dense	N/A	N/A	N/A	191.32
WS223	4	SAND	25	21.12	Medium Dense	N/A	N/A	N/A	211.21
WS223	5	SAND	50	41.48	Dense	N/A	N/A	N/A	414.81
WS224	1	SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS224	2	CLAY	12	10.96	N/A	Medium strength	Stiff	54.81	112.69
WS224	3	SAND	10	8.70	Loose	N/A	N/A	N/A	86.97
WS224	4	SAND	11	9.29	Loose	N/A	N/A	N/A	92.93
WS224	5	SAND	13	10.79	Medium Dense	N/A	N/A	N/A	107.85
WS225	1	SAND	10	10.08	Medium Dense	N/A	N/A	N/A	100.81
WS225	2	SAND	12	10.96	Medium Dense	N/A	N/A	N/A	109.62
WS225	3	SAND	8	6.96	Loose	N/A	N/A	N/A	69.57



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS225	4	CLAY	13	10.98	N/A	Medium strength	Stiff	54.92	112.91
WS225	4.7	SAND	50	41.67	Dense	N/A	N/A	N/A	416.74
CP101	1	SAND	8	8.07	Loose	N/A	N/A	N/A	80.65
CP101	2	SAND	9	8.22	Loose	N/A	N/A	N/A	82.22
CP101	3	CLAY	21	18.26	N/A	High strength	Very Stiff	91.31	187.74
CP101	4	CLAY	21	17.74	N/A	High strength	Very Stiff	88.71	182.39
CP101	5	SAND	50	41.48	Dense	N/A	N/A	N/A	414.81
CP101	6	SAND	50	40.99	Dense	N/A	N/A	N/A	409.94
CP102	1	SAND	7	7.06	Loose	N/A	N/A	N/A	70.57
CP102	2	SAND	9	8.22	Loose	N/A	N/A	N/A	82.22
CP102	3	SAND	10	8.70	Loose	N/A	N/A	N/A	86.97
CP102	4	CLAY	18	15.21	N/A	High strength	Very Stiff	76.04	156.33
CP102	5	CLAY	45	37.33	N/A	Very high strength	Very Stiff	186.66	383.78
CP102	6	SAND	50	40.99	Dense	N/A	N/A	N/A	409.94
CP102	7	SAND	50	40.68	Dense	N/A	N/A	N/A	406.78
CP103	1	SAND	14	14.11	Medium Dense	N/A	N/A	N/A	141.14
CP103	2	SAND	13	11.88	Medium Dense	N/A	N/A	N/A	118.76
CP103	3	CLAY	15	13.04	N/A	Medium strength	Stiff	65.22	134.10



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
CP103	4	CLAY	21	17.74	N/A	High strength	Very Stiff	88.71	182.39
CP103	5	SAND	50	41.48	Dense	N/A	N/A	N/A	414.81
CP103	6	GRAVEL	50	40.99	Dense	N/A	N/A	N/A	409.94
CP103	7	GRAVEL	30	24.41	Medium Dense	N/A	N/A	N/A	406.78
RB101	1	CLAY	30	30.24	N/A	Very high strength	Very Stiff	151.22	310.91
RB101	2	CLAY	15	13.70	N/A	Medium strength	Stiff	68.52	140.87
RB101	3	CLAY	15	13.04	N/A	Medium strength	Stiff	65.22	134.10
RB101	4	GRAVEL	50	42.24	Dense	N/A	N/A	N/A	422.43
RB101	5	GRAVEL	50	41.48	Dense	N/A	N/A	N/A	414.81
RB101	6	GRAVEL	50	40.99	Dense	N/A	N/A	N/A	409.94
RB101	7	GRAVEL	40	32.54	Dense	N/A	N/A	N/A	325.43
RB103	1	CLAY	17	17.14	N/A	High strength	Very Stiff	85.69	176.18
RB103	2	CLAY	29	26.49	N/A	High strength	Very Stiff	132.46	272.34
RB103	3	CLAY	35	30.44	N/A	Very high strength	Very Stiff	152.19	312.90
RB103	4	CLAY	44	37.17	N/A	Very high strength	Very Stiff	185.87	382.14
RB103	5	GRAVEL	50	41.48	Dense	N/A	N/A	N/A	414.81
RB103	6	GRAVEL	50	40.99	Dense	N/A	N/A	N/A	409.94
RB104	1	SAND	22	22.18	Medium Dense	N/A	N/A	N/A	221.79



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
RB104	2	SAND	18	16.44	Medium Dense	N/A	N/A	N/A	164.44
RB104	3	SAND	33	28.70	Medium Dense	N/A	N/A	N/A	286.99
RB104	4	GRAVEL	50	42.24	Dense	N/A	N/A	N/A	422.43
RB104	5	GRAVEL	50	41.48	Dense	N/A	N/A	N/A	414.81
RB105	1	CLAY	20	20.16	N/A	High strength	Very Stiff	100.81	207.28
RB105	2	CLAY	25	22.84	N/A	High strength	Very Stiff	114.19	234.78
RB105	3	CLAY	31	26.96	N/A	High strength	Very Stiff	134.80	277.14
RB105	4	GRAVEL	50	42.24	Dense	N/A	N/A	N/A	422.43
RB105	5	GRAVEL	50	41.48	Dense	N/A	N/A	N/A	414.81

NOTES

* The Allowable Bearing Pressure (ABP) should be considered indicative.

The interpretation of in situ mass undrained shear strength (c_u) data from SPT Blow Count (N) results and the influence of the Plasticity Index (PI) was reported in Standard Penetration Test in Insensitive Clays and Soft Rocks. Stroud (1974). The standard penetration test and the engineering properties of glacial materials subsequently. Stroud and Butler (1975) and (1989).

Allowable bearing pressure on sands. Soil Mechanics in Engineering Practice Terzaghi, K. & Peck, R.B. 1996.



3.10. CONSOLIDATION

Two undisturbed samples of Glacial Till were submitted for oedometer analysis. The results are provided in Table 3.7.

TABLE 3.7 OEDOMETER CONSOLIDATION RESULTS

LOCATION	DEPTH (m)	SAMPLE TYPE	MOISTURE CONTENT (%)	OEDOMETER CONSOLIDATION		
				PRESSURE RANGE (kPa)	M _v (m ² /MN)	C _v (m ² /year)
WS208	0.50-1.00	U100	28	0-15	0.259	42.459
				15-30	0.173	11.225
				30-60	0.271	9.591
				60-120	0.301	2.045
				120-15	0.166	1.209
WS115	1.50-2.00	U100	33	0-35	0.496	15.538
				35-70	0.394	2.554
				70-140	0.314	1.104
				140-280	0.186	0.787
				280-35	0.084	0.905

When considered at over-burden pressure with an additional load of 120-280 kPa the coefficient of volume compressibility (M_v) ranged from 0.084 m²/MN up to 0.496 m²/MN. The material is considered to be low to high compressibility.

The rate at which settlement is likely to occur is determined by the coefficient of consolidation (C_v). As shown in Table 3.7, the coefficient ranges from 0.787 m²/yr to 42.459 m²/yr. The rate at which settlement will occur is increased by the presence of sand within the Glacial Till and it is likely that settlement will occur over a period of months to years.

3.11. PARTICLE SIZE DISTRIBUTION

Particle Size Distribution Tests have been undertaken on selected samples of granular material via wet sieve to obtain information on the soil fractions. The results are included in Table 3.8. The full results can be found in Appendix VIII.

TABLE 3.8 SUMMARY OF PARTICLE SIZE DISTRIBUTION TEST RESULTS

LOCATION	DEPTH (m)	SOIL FRACTION (%)			
		COBBLES	GRAVEL	SAND	SILT/CLAY
TP107	1.00 (Natural - SAND)	0	3	90	7
TP112	1.20 (Natural - SAND)	0	2	95	3
TP116	1.20 (Natural - SAND)	0	5	85	10
TP122	0.40 (Natural - SAND)	0	13	74	13
TP140	2.00 (Natural - SAND)	14	9	66	11



LOCATION	DEPTH (m)	SOIL FRACTION (%)			
		COBBLES	GRAVEL	SAND	SILT/CLAY
TP142	0.70 (Natural - SAND)	0	1	92	7
TP147	0.50 (Natural - SAND)	0	1	90	9
TP205	0.70 (Natural - SAND)	0	2	91	7
TP215	0.80 (Natural - SAND)	0	6	90	4

3.12. SOIL INFILTRATION

In-situ BRE 365 Soakaway tests were undertaken over a 48 hour period within trial pits completed as SA101-SA112.

The results are presented in Table 3.9 below and the test certificates are included within Appendix IX.

TABLE 3.9 BRE365 SOAKAWAY TESTING RESULTS

LOCATION	DEPTH (m)	MATERIAL	TEST NO.	SOIL INFILTRATION RATE (m/s)
SA101	2.00	CLAY / SAND	Test No.1	N/A
SA102	1.40	SAND	Test No.1	1.54E-05
			Test No.2	4.51E-06
			Test No.3	1.34E-05
SA103	1.80	SAND	Test No.1	N/A
SA104	1.60	SAND	Test No.1	N/A
SA105	2.00	CLAY / SAND	Test No.1	N/A
SA106	1.30	SAND	Test No.1	N/A
SA107	1.50	CLAY	Test No.1	N/A
SA108	1.50	CLAY	Test No.1	N/A
SA109	1.70	CLAY	Test No.1	N/A
SA110	1.80	CLAY	Test No.1	N/A
SA111	1.40	SAND	Test No.1	N/A
SA112	1.70	SAND / CLAY	Test No.1	N/A

Soil infiltration was taken over the wetted area from between 75% and 25% of the effective depth. An infiltration rate was only able to be calculated within SA102 where the test was completed within SAND drift deposits; the infiltration rate was noted to be good to moderate within this location. In the remaining locations, and especially where CLAY drift deposits were present, the soakage potential was significantly reduced.



It is considered there is a limited potential that soakaway drainage may be suitable for the proposed development. However, the application of soakaway drainage will ultimately be dependent on the specific requirements of the development. All soakaways should be designed in accordance with BRE Special Digest 365 – *Soakaway Design*.

3.13. SOIL PLASTICITY

The Atterberg limits determinations, summarised in Table 3.10, show the clay to be of predominantly low to moderate plasticity with discrete areas of high plasticity clay.

TABLE 3.10 SUMMARY OF PLASTICITY INDEX TEST RESULTS

LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425 µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
TP104	1.50	15	19	42	23	97	22.31	Medium
TP118	0.80	17	14	33	19	98	18.62	Low
TP130	1.00	14	13	28	15	95	14.25	Low
TP138	0.60	31	27	62	35	100	35.00	Medium
TP144	1.30	15	15	31	16	97	15.52	Low
TP148	1.60	352	217	455	238	100	238	High
WS205	3.00-3.45	15	15	33	18	89	16.02	Low
WS113	1.00-1.45	17	14	29	15	98	14.70	Low
WS117	1.00-1.45	26	23	50	27	96	25.92	Medium
WS119	1.00-1.45	23	24	53	29	97	28.13	Medium
WS121	3.00-3.45	22	23	48	25	100	25.00	Medium
WS122	2.00-2.45	23	24	52	28	100	28.00	Medium
WS123	2.00-2.45	29	19	38	19	95	18.05	Low
WS204	2.00-2.45	24	20	41	21	96	20.16	Medium
WS208	2.00-2.45	11	15	32	17	94	15.98	Low
WS101	1.00-1.45	8.5	14	31	17	95	16.15	Low
WS213	1.00-1.45	10	16	34	18	93	16.74	Low



LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425 µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
WS224	2.00-2.45	25	24	53	29	95	27.55	Medium
WS211	1.00-1.45	18	16	34	18	98	17.64	Low

The results of the Atterberg limits testing confirmed that the soils would generally be deemed to be “Low to Medium Volume Change Potential” in accordance with the classification system utilised by the LABC/NHBC industry guidance. One location, TP148, was noted to be of high volume change potential.

3.14. pH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained in Appendix VI (summarised in Table 3.11), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).

Elevated sulphate concentrations meeting Class DS-2, AC-1s were noted within the Made Ground deposits in WS225 at 0.60 m bgl.

TABLE 3.11 SUMMARY OF pH AND SULPHATE DATA

LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
TP106	0.40	0.02	8.0	DS-1, AC-1s
TP109	1.20	0.012	8.2	DS-1, AC-1s
TP115	0.20	0.013	5.7	DS-1, AC-1s
TP116	1.70	0.011	7.1	DS-1, AC-1s
TP117	0.1	0.019	5.8	DS-1, AC-1s
TP124	0.20	0.0094	6.3	DS-1, AC-1s
TP125	1.30	0.0086	7.9	DS-1, AC-1s
TP131	0.10	0.011	7.0	DS-1, AC-1s
TP136	0.80	0.031	7.7	DS-1, AC-1s
TP139	0.10	0.0095	6.3	DS-1, AC-1s
TP140	1.60	0.015	8.8	DS-1, AC-1s
TP142	0.10	0.0074	5.5	DS-1, AC-1s
TP143	1.80	0.0045	8.2	DS-1, AC-1s
TP145	1.50	0.013	8.3	DS-1, AC-1s
TP206	1.00	0.0025	8.1	DS-1, AC-1s
TP207	0.80	0.0057	7.3	DS-1, AC-1s
TP208	0.90	0.0062	7.9	DS-1, AC-1s
TP210	0.20	0.018	6.8	DS-1, AC-1s



LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
TP211	0.50	0.012	8.0	DS-1, AC-1s
TP218	0.20	0.022	6.4	DS-1, AC-1s
WS101	1.40	0.052	8.0	DS-1, AC-1s
WS102	0.1	0.0088	6.3	DS-1, AC-1s
WS104	0.20	0.013	6.7	DS-1, AC-1s
WS105	0.40	0.003	6.9	DS-1, AC-1s
WS106	0.20	0.0045	7.3	DS-1, AC-1s
WS109	0.10	0.066	6.2	DS-1, AC-1s
WS116	1.20	0.058	8.2	DS-1, AC-1s
WS201	0.30	0.0069	7.6	DS-1, AC-1s
WS201	0.80	0.0028	7.0	DS-1, AC-1s
WS203	0.80	0.0014	8.2	DS-1, AC-1s
WS208	0.20	0.0039	6.5	DS-1, AC-1s
WS210	0.60	0.0074	7.1	DS-1, AC-1s
WS211	1.10	0.023	8.2	DS-1, AC-1s
WS217	1.00	0.027	8.1	DS-1, AC-1s
WS222	0.80	0.0031	8.0	DS-1, AC-1s
WS223	0.20	0.0068	8.2	DS-1, AC-1s
WS224	1.60	0.015	7.5	DS-1, AC-1s
WS225	0.60	0.54	7.0	DS-2, AC-1s



4. TIER I QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 1 qualitative risk assessment to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

4.1. HUMAN HEALTH RISK ASSESSMENT

At Tier 1 stage, the long term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

The results of this comparison have been summarised within Table 4.1.



TABLE 4.1 SUMMARY OF INORGANIC AND HYDROCARBON TOXICITY ASSESSMENT FOR A RESIDENTIAL END USE

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Arsenic	mg/kg	37	58	21	N/A	1	No Further Action
Cadmium	mg/kg	11	58	0.9	N/A	1	No Further Action
Chromium (VI)	mg/kg	6.0	58	< 4.0	N/A	1	No Further Action
Lead	mg/kg	200	58	140	N/A	1	No Further Action
Mercury	mg/kg	1.2	58	0.60	N/A	4	No Further Action
Nickel	mg/kg	130	58	57	N/A	1	No Further Action
Selenium	mg/kg	250	58	2.50	N/A	1	No Further Action
Copper	mg/kg	2400	82	82	N/A	1	No Further Action
Zinc	mg/kg	3700	58	430	N/A	1	No Further Action
Cyanide – Total	mg/kg	791	58	< 1.0	N/A	1	No Further Action
Phenols – Total	mg/kg	120	38	1.0	N/A	1	No Further Action
Asbestos	Fibres	NFD	29	NFD	N/A	3	No Further Action
Naphthalene	mg/kg	2.3	58	1.3	N/A	4	No Further Action
Acenaphthylene	mg/kg	170	58	<0.05	N/A	2	No Further Action
Acenaphthene	mg/kg	210	58	0.25	N/A	1	No Further Action
Fluorene	mg/kg	170	58	<0.05	N/A	1	No Further Action
Phenanthrene	mg/kg	95	58	1.4	N/A	2	No Further Action
Anthracene	mg/kg	2400	58	0.25	N/A	2	No Further Action
Fluoranthene	mg/kg	280	58	1.4	N/A	2	No Further Action
Pyrene	mg/kg	620	58	1.5	N/A	2	No Further Action
Benzo(a)Anthracene	mg/kg	7.2	58	0.82	N/A	2	No Further Action
Chrysene	mg/kg	15	58	0.65	N/A	2	No Further Action
Benzo(b)Fluoranthene	mg/kg	2.6	58	0.5	N/A	2	No Further Action
Benzo(k)Fluoranthene	mg/kg	77	58	0.29	N/A	2	No Further Action
Benzo(a)Pyrene	mg/kg	2.2	58	0.51	N/A	2	No Further Action
Indeno(123-cd)Pyrene	mg/kg	27	58	<0.05	N/A	2	No Further Action
Dibenzo(a,h)Anthracene	mg/kg	0.24	58	<0.05	N/A	2	No Further Action
Benzo(ghi)Perylene	mg/kg	320	58	<0.05	N/A	2	No Further Action
TPH C5-C6 (aliphatic)*	mg/kg	42	58	< 1.0	N/A	4	No Further Action
TPH C6-C8 (aliphatic)*	mg/kg	100	58	< 0.1	N/A	4	No Further Action
TPH C8-C10 (aliphatic)*	mg/kg	27	58	< 0.1	N/A	4	No Further Action
TPH C10-C12 (aromatic)*	mg/kg	74	58	<2.0	N/A	4	No Further Action
TPH C12-C16 (aromatic)*	mg/kg	140	58	<4.0	N/A	4	No Further Action
TPH C16-C21 (aromatic)*	mg/kg	260	58	6	N/A	1	No Further Action
TPH C21-C35 (aromatic)*	mg/kg	1100	58	180	N/A	1	No Further Action



Notes

PL1 = soil ingestion; PL2 = dermal contact and ingestion; PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants

Abbreviations: GAC = general assessment criteria, n = number of samples, MC = maximum concentration; Loc of Ex = location of exceedance; NFD = no fibres detected.

* The Tier 1 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 1 values for aliphatic compounds for the volatile and semi volatile fractions (C5-C12) and the Tier 1 values for aromatic compound for the non-volatile fractions (C12-C35). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.

** Atkins ATRISK

*** USEPA Risk Management Levels

Referring to Table 4.1, the results of this direct comparison indicates that the data does not exceed the screening criteria for a residential end use for any of the contaminants.

No elevated concentrations of SVOCs or VOCs were identified in the soils submitted for chemical analysis.

HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

As there have been no elevated concentrations identified at any locations across site, there is little to no risk to chronic human health associated with the elevated concentrations of inorganic heavy metals, non-volatile PAH compounds or TPH compounds.

Therefore it is unlikely that the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils will be required. However, the installation of a suitable growing medium will be required. A cover system will likely be required in areas of retained Made Ground.

Chemical analysis of the natural clay and sand drift deposits, along with topsoil deposits, has identified these soils to be acceptable for use as subsoil or topsoil within the proposed garden areas; however, further chemical validation samples will be required to confirm this.

Within the north of the site in the vicinity of former buildings and the off-site dwelling asbestos cement sheeting stockpiles were identified. During the remediation and enabling works these should be removed from site by a licensed asbestos removal contractor. Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 4.1.



FIGURE 4.1 ASBESTOS RISK MITIGATION CONCEPTUAL SITE MODEL



Notes

ND None Detect

0.001% Soils may contain $\leq 0.001\%$ asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be a short term low level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression)

0.1% Soils at a depth of $>1.00\text{m}$ bgl may contain $<0.1\%$ asbestos using composite testing where they will not be likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with Asbestos JIWG risk assessment tools.

Undefined- this will be dependent upon soils encountered during earthworks, which may be placed at these depths to ensure no potential risk to human health.



4.2. CONTROLLED WATERS RISK ASSESSMENT

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 4.2.

TABLE 4.2 CONTROLLED WATERS CONCEPTUAL MODEL AND SENSITIVITY PROFILE

DISCUSSION		SENSITIVITY RATING
Contaminant Source		
Made Ground Areas of limited Made Ground in areas of historic development on site has the potential to be a source of heavy metals or PAHs; however soil analysis has not identified any heavy metal or PAH contamination during the site investigation. No other sources have been identified.		Low
Pathway		
Vertical Migration Due to the majority of the site being underlain by granular deposits interbedded with cohesive clay deposits, vertical migration of contaminants is highly reduced. The presence of this low permeability drift will offer some protection to the underlying aquifer and inhibit lateral migration of any contaminants towards Spa Brook.		Medium
Lateral migration Lateral migration of contaminants is considered possible due to the presence of granular deposits across the site.		Medium
Receptor		
Aquifer Classification in Superficial Drift Deposits	Secondary A aquifer and Unproductive	Medium
Aquifer Classification in Bedrock	Principal aquifer	High
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is in source protection zone 3 (total catchment)	High
Distance to the Closest Groundwater Abstraction Point	Groundwater abstraction licenses are located 497m and 1202m north of the site. The closest abstraction point 497m north of the site is a potable water supply.	Medium
Is the Site Located Within 50 m of a Surface Watercourse?	Spa Brook is located in the centre of the site. Furthermore ponds and drainage ditches are located across the site, with a stream noted in the north of the site near to an area of former development.	High
The ICSM developed within the context of the site setting has identified viable pollutant pathways, which would be the downward migration of potentially mobile phase-soluble contaminants towards the underlying principal aquifer and the lateral migration towards the Spa Brook located in the centre of the site and additional ponds and drainage ditches on the site.		

To ensure a robust appraisal of the identified risk to controlled waters, E3P has identified the sources of potential contamination that represent a risk to controlled waters from the initial CSM, and subsequently assessed the ground investigation data in the form of analysis of the solid phase (soil) and dissolved phase within the perched groundwater or aquifer. The results of this assessment are presented in Table 4.3.



TABLE 4.3 QUALITATIVE RISK TO CONTROLLED WATERS FROM SOIL ANALYTICAL RESULTS

CONTAMINANT	ASSESSMENT RATING	DISCUSSION
BTEX > 1 mg/kg	The soil data analysis has not identified any detectable concentrations of VOCs above 1mg/kg or TPH C5 to C6 that might otherwise be indicative of VOC impact.	None
Total VOC > 1 mg/kg		
Total SVOC > 1 mg/kg	No SVOC sources have been identified; no elevated concentrations of SVOCs have been identified.	None
C5-C10 > 5 mg/kg	All concentrations are below the laboratory LOD.	None
C10-C12 > 10 mg/kg	All concentrations are below the laboratory LOD.	None
C12-C16 > 50 mg/kg	All concentrations are below the laboratory LOD.	None
Phenols > 2 mg/kg	All concentrations are below 2 mg/kg.	None
Naphthalene > 2 mg/kg	Concentrations of naphthalene above 2 mg/kg have been not been recorded on site.	None
Total PAH > 10 mg/kg	Total concentrations of low-solubility PAH compounds greater than 10 mg/kg have not been detected on site.	None
PCB > 1 mg/kg	No potential sources of PCB have been identified	None
Heavy metals > 500 mg/kg	Concentrations of heavy metals above 500 mg/kg have been not been detected on site.	None

The Tier I assessment has included a comparison of leachate analysis from samples of the Made Ground and groundwater samples to drinking water standards and environmental quality standards (EQS). Surface water samples have been obtained from a stream in the north of the site adjacent to former development and off-site residential dwelling.

Samples were not able to be obtained from drainage ditches or Spa Brook due to the limited amount of water present during the monitoring visits.

These are presented in Table 4.4 and Table 4.5.



TABLE 4.4 COMPARISON OF GROUNDWATER AND LEACHATE ANALYSIS WITH TIER 1 SCREENING LEVELS

DETERMINAND	UNIT	EQS ^{1,2,3}	DWS _{3,4,5}	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA								
Arsenic	µg/l	50	10	6	2.74	N/A	3	7.3	N/A	No Further Action
Cadmium	µg/l	0.08-0.25	5	6	0.13	N/A	3	0.20	N/A	No Further Action
Chromium (VI)	µg/l	3.4	–	6	<5.0	N/A	3	<5.0	N/A	No Further Action
Chromium (III)	µg/l	4.7	50	6	2.6	N/A	3	2.1	N/A	No Further Action
Copper	µg/l	1	2000	6	10 15 1.9	WS119 WS102 WS113	3	20 16 6	WS121 0.10 WS225 0.60 TP106 0.40	Further Action
Total Cyanide	µg/l	1	50	6	<1.0	N/A	3	<1.0	N/A	No Further Action
Lead	µg/l	1.2	10	6	<0.2	N/A	3	7.5 6.9 4.1	WS121 0.10 WS225 0.60 TP106 0.40	Further Action
Mercury	µg/l	–	1.0	6	<0.05	N/A	3	<0.50	N/A	No Further Action
Nickel	µg/l	4	20	6	9.1 10 14	WS119 WS102 WS107	3	7.5 5.3 4.4	WS121 0.10 WS225 0.60 TP106 0.40	Further Action
Selenium	µg/l	–	10	6	1.4	N/A	3	<4.0	N/A	No Further Action
Zinc	µg/l	10.9	–	6	8.6	N/A	3	34 27	WS225 0.60 WS121 0.10	Further Action
pH	6–9			6	6.7-7.3	N/A	3	7.2-7.7	N/A	No Further Action
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Anthracene	µg/l	0.1	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Benzo[b]fluoranthene	µg/l	0.00017*	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action



DETERMINAND	UNIT	EQS 1, 2, 3	DWS 3,4,5	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA								
Benzo[k]fluoranthene	µg/l	0.00017*	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Benzo(a)pyrene	µg/l	0.00017*	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Indeno(123-cd)pyrene	µg/l	0.00017*	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Fluoranthene	µg/l	0.0063	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Benzo(ghi)perylene	µg/l	1.7–4	10*	6	<0.01	N/A	3	<0.01	N/A	No Further Action
Aromatic Hydrocarbon ⁵										
TPH C5-C6 (benzene)	µg/l	10	1	6	<1.0	N/A	3	< 1.0	N/A	No Further Action
TPH C6-C8 (toluene)	µg/l	74	700	6	<1.0	N/A	3	< 1.0	N/A	
TPH C8-C10 (ethyl benzene)	µg/l	20	300	6	<1.0	N/A	3	< 1.0	N/A	
TPH C10-C12 (xylene)	µg/l	30	500	6	<10	N/A	3	< 10	N/A	
TPH C12-C16	µg/l	2	90 ⁵	6	<10	N/A	3	< 10	N/A	
TPH C16-C35	µg/l	50#	90 ⁵	6	<10	N/A	3	< 10	N/A	
Aliphatic Hydrocarbon ⁵										
TPH C5-C6	µg/l	–	15000	6	<1.0	N/A	3	< 1.0	N/A	No Further Action
TPH C6-C8	µg/l	–	15000	6	<1.0	N/A	3	< 1.0	N/A	
TPH C8-C10	µg/l	–	300	6	<1.0	N/A	3	< 1.0	N/A	
TPH C10-C12	µg/l	–	300	6	<10	N/A	3	< 10	N/A	
TPH C12-C16	µg/l	–	300	6	<10	N/A	3	< 10	N/A	
TPH C16-C21	µg/l	–	300**	6	<10	N/A	3	< 10	N/A	
TPH C21-C35	µg/l	–	300**	6	<10	N/A	3	< 10	N/A	



DETERMINAND	UNIT	EQS 1, 2, 3	DWS 3,4,5	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA								
Volatile Organic Compounds										
Tetrachloroethylene	µg/l	0.4	10	6	<1.0	N/A	-	-	-	No Further Action
Trichloroethylene	µg/l	10	10	6	<1.0	N/A	-	-	-	
Trichlorobenzene	µg/l	0.4	–	6	<1.0	N/A	-	-	-	
Trichloromethane	µg/l	2.5	–	6	<1.0	N/A	-	-	-	
Dichloromethane	µg/l	20	200	6	<1.0	N/A	-	-	-	
Carbon Tetrachloride	µg/l	12	3	6	<1.0	N/A	-	-	-	
Vinyl Chloride	µg/l	–	0.3	6	<1.0	N/A	-	-	-	

Notes

Solubility <0.01µg/l

AA – Annual Average

MAC- Maximum Admissible Concentration

* Polyaromatic hydrocarbons (PAH) - Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water

** There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

1. The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations (2015)
2. Directive establishing a framework for Community action in the field of water policy (Water Framework Directive)
3. Council Directive on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (Dangerous Substances Directive) - List II substances
4. Council Directive on the quality of water intended for human consumption (Drinking Water Directive)
5. WHO Guidelines for Drinking Water Quality. Third edition (2004)



TABLE 4.5 COMPARISON OF SURFACE ANALYSIS WITH TIER 1 SCREENING LEVELS

DETERMINAND	UNIT	EQS ^{1,2,3}	DWS ^{3,4,5}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN SURFACE WATER	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			19/04/2022		
Arsenic	µg/l	50	10	1	3.41	N/A	No Further Assessment
Cadmium	µg/l	0.08-0.25	5	1	0.05	N/A	No Further Assessment
Chromium (VI)	µg/l	3.4	–	1	<5.0	N/A	No Further Assessment
Chromium (III)	µg/l	4.7	50	1	<0.2	N/A	No Further Assessment
Copper	µg/l	1	2000	1	0.5	N/A	No Further Assessment
Total Cyanide	µg/l	1	50	1	<1.0	N/A	No Further Assessment
Lead	µg/l	1.2	10	1	<0.2	N/A	No Further Assessment
Mercury	µg/l	–	1.0	1	<0.05	N/A	No Further Assessment
Nickel	µg/l	4	20	1	3.2	N/A	No Further Assessment
Selenium	µg/l	–	10	1	0.7	N/A	No Further Assessment
Zinc	µg/l	10.9	–	1	<0.5	N/A	No Further Assessment
pH	6–9			1	7.4	N/A	No Further Assessment
Naphthalene	µg/l	2	10*	1	<0.01	N/A	No Further Assessment
Anthracene	µg/l	0.1	10*	1	<0.01	N/A	No Further Assessment
Benzo[b]fluoranthene	µg/l	0.00017*	10*	1	<0.01	N/A	No Further Assessment
Benzo[k]fluoranthene	µg/l	0.00017*	10*	1	<0.01	N/A	No Further Assessment
Benzo(a)pyrene	µg/l	0.00017*	10*	1	<0.01	N/A	No Further Assessment
Indeno(123-cd)pyrene	µg/l	0.00017*	10*	1	<0.01	N/A	No Further Assessment
Fluoranthene	µg/l	0.0063	10*	1	<0.01	N/A	No Further Assessment
Benzo(ghi)perylene	µg/l	1.7–4	10*	1	<0.01	N/A	No Further Assessment



DETERMINAND	UNIT	EQS ^{1, 2, 3}	DWS _{3,4,5}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN SURFACE WATER	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			19/04/2022		
Aromatic Hydrocarbon							
TPH C5-C6 (benzene)	µg/l	10	1	1	<1.0	N/A	No Further Assessment
TPH C6-C8 (toluene)	µg/l	74	700	1	<1.0	N/A	
TPH C8-C10 (ethyl benzene)	µg/l	20	300	1	<1.0	N/A	
TPH C10-C12 (xylene)	µg/l	30	500	1	<1.0	N/A	
TPH C12-C16	µg/l	2	90 ⁵	1	<10	N/A	
TPH C16-C35	µg/l	50#	90 ⁵	1	<10	N/A	
Aliphatic Hydrocarbon							
TPH C5-C6	µg/l	–	15000	1	<1.0	N/A	No Further Assessment
TPH C6-C8	µg/l	–	15000	1	<1.0	N/A	
TPH C8-C10	µg/l	–	300	1	<1.0	N/A	
TPH C10-C12	µg/l	–	300	1	<10	N/A	
TPH C12-C16	µg/l	–	300	1	<10	N/A	
TPH C16 – C21	µg/l	–	300**	1	<10	N/A	
TPH C21-C35	µg/l	–	300**	1	<10	N/A	
Volatile Organic Compounds							
Tetrachloroethylene	µg/l	0.4	10	1	<1.0	N/A	No Further Assessment
Trichloroethylene	µg/l	10	10	1	<1.0	N/A	No Further Assessment
Trichlorobenzene	µg/l	0.4	–	1	<1.0	N/A	No Further Assessment
Trichloromethane	µg/l	2.5	–	1	<1.0	N/A	No Further Assessment
Dichloromethane	µg/l	20	200	1	<1.0	N/A	No Further Assessment



Peel Hall

Phase II Geoenvironmental Site Assessment

May 2022

DETERMINAND	UNIT	EQS ^{1,2,3}	DWS _{3,4,5}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN SURFACE WATER	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			19/04/2022		
Carbon Tetrachloride	µg/l	12	3	1	<1.0	N/A	No Further Assessment
Vinyl Chloride	µg/l	–	0.3	1	<1.0	N/A	No Further Assessment

Notes

Solubility <0.01µg/l

AA – Annual Average

MAC- Maximum Admissible Concentration

* Polyaromatic hydrocarbons (PAH) - Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water

** There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

6. The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations (2015)

7. Directive establishing a framework for Community action in the field of water policy (Water Framework Directive)

8. Council Directive on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (Dangerous Substances Directive) - List II substances

9. Council Directive on the quality of water intended for human consumption (Drinking Water Directive)

10. WHO Guidelines for Drinking Water Quality. Third edition (2004)



4.2.1. CONTROLLED WATER RISK ASSESSMENT AND MITIGATION

This comparison indicates that the data exceeds the EQS and DWS values for the following inorganic compounds:

- ✿ Copper (Groundwater and Leachate)
- ✿ Lead (Leachate)
- ✿ Nickel (Groundwater and Leachate)
- ✿ Zinc (Leachate)

Leachate analysis identified elevated concentrations of Copper, Lead, Nickel and Zinc against EQS screening values but not DWS screening values. Where leachate analysis has been undertaken, this can overstate the risk and is not wholly representative of the site characterisation, and as such reliance should be on groundwater and surface water samples rather than the leachate analysis.

In relation to the remaining exceedances, Table 4.6 provides a summary.

TABLE 4.6 SUMMARY OF ELEVATED CONTAMINANTS IN GROUNDWATER

CONTAMINANT	WS102 (µg/l)	WS107 (µg/l)	WS113 (µg/l)	WS119 (µg/l)
	Contaminant Source			
	Natural Ground	Natural Ground	Natural Ground	Natural Ground
Copper	15	-	1.9	10
Nickel	10	14	-	9.1

4.2.2. M-BAT ASSESSMENT

Due to exceedances in ground water samples for copper and nickel, an m-BAT assessment has been completed to assess the bioavailability of the metals with respect to surface water receptors (Stream / Spa Brook). The chemical values from the groundwater analysis have been input into the assessment.

Where the Risk Characterisation Ratio (RCR) is greater than 1, this indicates the bioavailable concentration is above the EQS and the receptor is therefore at risk. In this instance, the RCR has not been exceeded for copper, nickel or zinc within groundwater or surface water samples, and as such they are not considered to be bioavailable. Manganese has been identified to exceed the RCR within the surface water sample from the stream in the north of the site and WS107. There is not considered to be risk to controlled waters from manganese.

In light of the above assessment, E3P do not consider the site to pose an unacceptable level of risk to surface waters for copper and nickel. It should also be noted the site is currently uncapped and the proposed development will largely encapsulate the site, thus limiting the potential for infiltration and therefore leaching potential.



4.2.3. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

Historically, the site has been subjected to minimal former development. Across the site are former field boundaries and infilled ponds, with a former sewage works in the west of the site and buildings in the north of the site.

It is considered that the primary source of potential contaminants at the subject site will be from isolate Made Ground at the site, however given the localised extent of Made Ground encountered during the site investigation it is not considered to be a significant source.

The site is underlain by a mixed geology of both low permeability cohesive deposits and high permeability granular deposits. The granular deposits will afford less protection to the underlying principal aquifer in the bedrock in comparison to areas of the site, where clay deposits have been identified. Surface water features comprising ditches / streams, Spa Brook and on-site ponds have been identified across the site.

Soil analysis did not identify any elevated concentrations of determinants that may present a risk to controlled waters. Leachate analysis identified elevated concentrations of heavy metals however the risk is considered to be low given the overstating of risk associated with leachate analysis and as such reliance should be on groundwater samples.

As the site currently comprises of open grass land and agricultural fields rainfall is not being intercepted and subsequently infiltrates freely into the underlying deposits, and where Made Ground is present can, potentially mobilising the identified contaminants.

The proposed development will create hardstanding cover across the site, thus reducing the amount of infiltration generated. This will in turn, reduce the amount of contaminants present in leachate off the site and reduce the risk further to the underlying aquifer and on-site water features.

Surface Water Receptor

A comparison of a surface water sample from the north of the site did not identify any elevated concentrations of determinants.

Given the elevated concentrations of copper and nickel within groundwater samples, an m-BAT assessment was undertaken, which determined that the determinants were not considered to be bioavailable and as such the elevated metal concentrations at the site are not considered to be impacting the surface water feature in the north of the site or causing an increased risk to aquatic life. This leaves the underlying Principal Aquifer as the critical receptor to assess.

It is recommended that during any future cut/fill works to create a development platform surface water sampling of the on-site receptors is completed to ensure no detrimental affect during remediation and enabling works.

Principal Aquifer

There is not considered to be a risk to the underlying Principal Aquifer as both leachate and groundwater analysis did not identify any elevated concentrations against DWS screening values. Additionally, there is not considered to be a significant source on site with the potential to present a risk to the underlying aquifer.



4.3. GROUND GAS RISK ASSESSMENT METHODOLOGY

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in:

-  CIRIA Report 665 – Assessing risks posed by hazardous ground gases to buildings (2007)
-  BS8485:2015+A1:2019 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation (CS) and the proposed development based on building type.

Therefore, in accordance with BS8485, based on the measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) shall be derived for each monitoring point, from which the site characteristic hazardous gas flow rate (Q_{hgs}), and then the Characteristic Situation (CS) can be determined.

The following equation should be utilised:

$$Q_{hg} = q \left(\frac{C_{hg}}{100} \right)$$

Where:

q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe
 C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

The subsequent derived gas screening value (GSV) should be the maximum Q_{hg} (flow rate x concentration as a percentage volume) for all the monitoring events.

A 'worst case check' may be carried out using the maximum recorded flow in any hole with the maximum concentration in any hole to present the plausible worst case conditions. Adoption of the worst case Q_{hg} requires thorough justification and reference to the CSM.

The final derived GSV can then be used to characterise the site as summarised in Table 4.7.



TABLE 4.7 SITE CHARACTERISATION BY GSV (BS8485:2015)

CS	HAZARD POTENTIAL	GSV (l/hr) FOR METHANE AND CARBON DIOXIDE	ADDITIONAL FACTORS
CS1	Very Low	< 0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	< 0.70	Typical measured flow rate <70 l/h (otherwise consider an increase to CS3)
CS3	Moderate	< 3.5	N/A
CS4	Moderate to High	< 15	N/A
CS5	High	< 70	N/A
CS6	Very High	> 70	N/A

Notes

1. The CS is equivalent to the characteristic GSV in CIRIA C665.
2. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter should be considered.
3. Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, multiplied by the concentration in the air stream of the particular gas being considered.
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

4.4. MONITORING METHODOLOGY

Concentrations of methane (CH₄), carbon dioxide (CO₂) and oxygen (O₂) (hydrogen sulphide) were measured using a calibrated infrared gas analyser (GFM435) with gas flow rates measured using an integrated flow meter.

Gas measurements were recorded for a minimum of 500 seconds at each location, at which point the maximum concentration of CH₄ and CO₂, together with the lowest concentration of O₂ were recorded.

The results of the ground gas monitoring are presented in Table 4.8.

In addition to the raw data, the results for each individual standpipe have been assessed with reference to guidance provided in BS8485:2015. Based on the initial peak measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) have been derived for each monitoring point, from which an individual Characteristic Situation (CS) can ultimately be determined.



TABLE 4.8 SUMMARY OF GROUND GAS MONITORING RESULTS

WELL	STRATA	DATE	CH ₄ PEAK (%V/V)	CH ₄ STEADY (%V/V)	CH ₄ Q _{hg} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{hg} (l/hr)	O ₂ (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS101	CLAY / SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19	1011	Rising	0.1	0.1	1.00-4.00	2.70	1.60
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1016	Steady	0.1	0.1		2.70	1.85
WS102	SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1011	Rising	0.1	0.1	0.50-3.50	1.75	Dry
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	1016	Steady	0.1	0.1		1.75	1.50
WS103	SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1012	Rising	0.1	0.1	1.00-3.00	2.10	Dry
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1016	Steady	0.1	0.1		2.10	Dry
WS105	SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	1011	Rising	0.1	0.1	0.50-2.50	2.10	1.80
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1016	Steady	0.1	0.1		2.10	1.70
WS107	CLAY	13/04/2022	Damaged and repaired for following visit.											1.00-3.00	-	
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1024	Steady	0.1	0.1		3.00	0.95
WS110	SAND	13/04/2022	Well destroyed and unable to be repaired.													
		26/04/2022														
WS111	SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	1012	Rising	0.1	0.1	0.50-1.50	2.30	0.87
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1023	Steady	0.1	0.1		2.30	1.00
WS113	CLAY	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.1	1011	Rising	0.1	0.1	0.50-2.50	2.80	1.50
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1023	Steady	0.1	0.1		2.80	1.45
WS116	CLAY	13/04/2022	0.7	0.7	0.0007	0.1	0.1	0.0001	19.9	1012	Rising	0.1	0.1	0.50-4.50	4.70	0.50
		25/04/2022	0.2	0.1	0.0002	0.1	0.1	0.0001	19.9	1017	Steady	0.1	0.1		4.70	1.20
WS117	CLAY	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1012	Rising	0.1	0.1	2.00-4.00	4.20	0.60
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1017	Steady	0.1	0.1		4.20	3.85
WS119	CLAY	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1011	Rising	0.1	0.1	2.00-4.00	4.20	1.50
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1018	Steady	0.1	0.1		4.20	2.10



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WS120	SAND	13/04/2022	0.3	0.3	0.0003	0.1	0.1	0.0001	19.4	1012	Rising	0.1	0.1	0.50-2.50	2.70	Dry
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	1018	Steady	0.1	0.1		2.70	Dry
WS121	SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	1012	Rising	0.1	0.1	1.00-2.00	1.92	Dry
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1018	Steady	0.1	0.1		1.95	Dry
WS122	SAND / CLAY	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.3	1012	Rising	0.1	0.1	1.00-4.00	2.50	1.30
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1018	Steady	0.1	0.1		2.50	1.55
WS123	CLAY	13/04/2022	0.4	0.4	0.0004	1.2	0.1	0.0012	20	1012	Rising	0.1	0.1	1.00-4.00	4.10	1.40
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1018	Steady	0.1	0.1		4.10	2.00
WS202	CLAY / SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	1014	Rising	0.1	0.1	2.00-4.00	3.05	1.27
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	1016	Steady	0.1	0.1		3.05	1.70
WS203	CLAY / SAND	13/04/2022	0.2	0.1	0.0004	1.2	0.1	0.0024	19.9	1014	Rising	0.2	0.2	1.00-2.50	2.20	1.12
		25/04/2022	0.1	0.1	0.0001	0.2	0.1	0.0002	19.9	1016	Steady	0.1	0.1		2.20	1.50
WS204	CLAY / SAND	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	1014	Rising	0.1	0.1	2.00-5.00	4.50	1.35
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1016	Steady	0.1	0.1		4.50	1.85
WS208	CLAY	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	1013	Rising	0.1	0.1	1.00-5.00	4.20	1.30
		25/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1016	Steady	0.1	0.1		4.20	1.85
WS210	SAND	13/04/2022	Well destroyed and unable to be repaired.													
		26/04/2022														
WS213	SAND / CLAY	13/04/2022	0.5	0.1	0.0005	0.6	0.1	0.0006	19.3	1014	Rising	0.1	0.1	0.50-1.50	1.60	1.00
		26/04/2022	0.1	0.1	0.0001	0.2	0.1	0.0002	19.9	1023	Steady	0.1	0.1		1.60	1.10
WS216	CLAY	13/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.5	1013	Rising	0.1	0.1	1.00-2.00	2.40	1.00
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1024	Steady	0.1	0.1		2.40	1.20
WS217	CLAY	13/04/2022	0.3	0.1	0.0006	0.1	0.1	0.0002	19.3	1012	Rising	0.2	0.2	0.50-3.00	3.20	1.40
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1024	Steady	0.1	0.1		3.20	1.75



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WS218	CLAY / SAND	13/04/2022	Damaged and repaired for following visit.											1.00-2.00	-	-
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1024	Steady	0.1	0.1		1.85	1.60
WS221	CLAY	13/04/2022	Damaged and repaired for following visit.											2.00-4.00	-	-
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	1024	Steady	0.1	0.1		3.70	3.35
WS223	SAND / CLAY	13/04/2022	Well destroyed and unable to be repaired.											1.00-3.50	-	-
		26/04/2022													-	-
WS225	CLAY / SAND	13/04/2022	Damaged and repaired for following visit.											0.50-3.50	-	-
		26/04/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1023	Steady	0.1	0.1		2.65	1.20
RB105	CLAY / GRAVEL	13/04/2022	Well destroyed and unable to be repaired.											0.50-5.00	-	-
		26/04/2022													-	-

Notes

CIRIA Characteristic Situation

Q_{hg}

CS1

<0.07

Typical Max CO₂ <5 % Typical Max CH₄ <1 %

Values in **BOLD** exceed CS1 Thresholds

CS2

<0.7

Flow rate not to exceed 70 l/hr otherwise consider increase to CS3

Values in **BLUE** denote water above level of response zone (flooded)

CS3

<3.5

CS4

<15

Quantitative Risk Assessment required to evaluate scope of protective measures



4.5. SUMMARY OF MONITORING RESULTS

4.5.1. GROUNDWATER

The water level within several of the monitoring wells was recorded to be above the top of the response zone (flooded) on a number of occasions, as summarised in Table 4.9, thus rendering some of the monitoring data unreliable. Therefore, each time a flooded well was encountered, the well was bailed and left to re-equilibrate. Wells were re-monitored after a period of 20–30 minutes.

Table 4.9 FLOODED MONITORING WELL DATA

Well	Visit 1 13/04/2022	Visit 2 25/04/2022 – 26/04/2022
WS117	-	Y
WS218	-	Y
WS221	-	Y

WS107, WS116, WS117, and WS216 were flooded on one occasion, whilst WS202 and WS204 were flooded on two occasions and therefore can not be utilised within the assessment.

Within remaining monitoring wells, groundwater levels were observed to generally decrease over the monitoring period.

4.5.2. BAROMETRIC PRESSURE

Visit 1 was undertaken during a period of relatively high, rising pressure, with pressure recorded to be between 1011-1014 mbar during the monitoring.

Visit 2 was undertaken during a period of steady pressure noted to be relatively high pressure, with pressures recorded to be between 1016-1023 mbar.

It is therefore considered that the visits have been undertaken over representative conditions. Further atmospheric pressure dynamics are expected to be captured during the remaining monitoring visits.

4.5.3. GAS FLOW

Throughout the monitoring period to date, flow rates were recorded to be between 0.1 l/hr (limit of detection (LOD)) and 0.2 l/hr.

4.5.4. GAS CONCENTRATIONS

Methane concentrations were recorded at concentrations ranging from 0.1% v/v (LOD) to 0.7% v/v. No elevated concentrations have been identified during the monitoring completed to date.

Carbon dioxide concentrations recorded within the monitoring wells to date range from 0.1% v/v (LOD) and a maximum peak concentration of 1.2% v/v. No elevated concentrations have been identified during the monitoring completed to date.



4.6. CONCLUSION

The determined Characteristic Situation for each standpipe for each visit is presented in Table 4.10. This indicates that based on the peak flow rates the site can currently be classified as Characteristic Situation (CS)1 – Very Low Gas Risk.

TABLE 4.10 GAS RISK PROFILE AND LOCATION

WELL	DATE	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH ₄ (%V/V)	MAX CH ₄ Q _{hg} (l/hr)	MAX CO ₂ (%V/V)	MAX CO ₂ Q _{hg} (l/hr)	CHARACTERISTIC SITUATION	NHBC TRAFFIC LIGHT
WS101	13/04/2022	1.60	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.85	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS102	13/04/2022	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.50	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS103	13/04/2022	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS105	13/04/2022	1.80	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.70	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS107	13/04/2022	Damaged and repaired for following visit.							
	26/04/2022	0.95	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS110	13/04/2022	Well destroyed and unable to be repaired.							
	26/04/2022								
WS111	13/04/2022	0.87	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	26/04/2022	1.00	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS113	13/04/2022	1.50	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	26/04/2022	1.45	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS116	13/04/2022	0.50	0.1	0.7	0.0007	0.1	0.0001	CS1	Green
	25/04/2022	1.20	0.1	0.1	0.0002	0.1	0.0001	CS1	Green
WS117	13/04/2022	0.60	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	3.85	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS119	13/04/2022	1.50	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	2.10	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS120	13/04/2022	Dry	0.1	0.3	0.0003	0.1	0.0001	CS1	Green
	25/04/2022	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS121	13/04/2022	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS122	13/04/2022	1.32	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.55	0.1	0.1	0.0001	0.1	0.0001	CS1	Green



WELL	DATE	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH ₄ (%V/V)	MAX CH ₄ Q _{hg} (l/hr)	MAX CO ₂ (%V/V)	MAX CO ₂ Q _{hg} (l/hr)	CHARACTERISTIC SITUATION	NHBC TRAFFIC LIGHT
WS123	13/04/2022	1.40	0.1	0.4	0.0004	1.2	0.0012	CS1	Green
	25/04/2022	2.00	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS202	13/04/2022	1.27	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.70	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS203	13/04/2022	1.12	0.2	0.2	0.0002	1.2	0.0024	CS1	Green
	25/04/2022	1.50	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
WS204	13/04/2022	1.35	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.85	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS208	13/04/2022	1.30	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/04/2022	1.85	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS210	13/04/2022	Well destroyed and unable to be repaired.							
	26/04/2022								
WS213	13/04/2022	1.00	0.1	0.5	0.0005	0.6	0.0006	CS1	Green
	26/04/2022	1.10	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
WS216	13/04/2022	1.00	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	26/04/2022	1.20	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS217	13/04/2022	1.40	0.2	0.3	0.0006	0.1	0.0002	CS1	Green
	26/04/2022	1.75	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS218	13/04/2022	Damaged and repaired for following visit.							
	26/04/2022	1.60	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS221	13/04/2022	Damaged and repaired for following visit.							
	26/04/2022	3.35	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS223	13/04/2022	Well destroyed and unable to be repaired.							
	26/04/2022								
WS225	13/04/2022	Damaged and repaired for following visit.							
	26/04/2022	1.20	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
RH101	13/04/2022	Well destroyed and unable to be repaired.							
	26/04/2022								

E3P has assessed the previous variables and come to the following conclusions:

- Ground gas monitoring to date suggests that the site can be predominantly classified as CS1, and it is considered that gas protection measures will not be required.
- The site is predominantly glaciofluvial deposits and till of SANDS and CLAY at depths of 0.10m bgl to 7.00 bgl.



- ✿ Made Ground has been encountered in localised areas at a maximum depth of 1.20m bgl but more generally was encountered at a depth less than 0.60m bgl.
- ✿ With the absence of any persistent gas source and gas generation potential, it is considered by E3P that the site can be classified as CS1, and therefore no gas protection measures are required. The final ground gas regime will be confirmed following the completion of the ground gas monitoring regime.

It is recommended that the full ground gas assessment and recommended protection measures (if applicable) are agreed with the local authority prior to their adoption on site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

4.7. POTABLE WATER SUPPLY

This section provides a summary of the site investigation data with reference to the selection of potable water supply pipework. The assessment is made with reference to the UK Water Industry Research (UKWIR) publication "Guidance on the selection of Water Supply Pipes to be used in Brownfield Sites"

TABLE 4.11 PIPELINE SELECTION PE THRESHOLD CONCENTRATIONS

Contaminant Group	PE-threshold (mg/kg)	Concentrations at <u>Current</u> pipeline depth (mg/kg)
Total VOC	0.5	<LOD
Total BTEX And MTBE	0.1	N/A
Total SVOCs (Excluding PAH and those substances marked with an *)	2	<LOD
EC5-EC10 Aliphatic and Aromatic Hydrocarbons	2	<1.2
EC10-EC16- Aliphatic and Aromatic Hydrocarbons	10	<6.0
EC16-EC40 Aliphatic and Aromatic Hydrocarbons	500	19
Phenols (From SVOC Analysis)*	2	N/A
Cresols and Chlorinated Phenols (From SVOC Analysis)	2	N/A
Ethers*	0.5	N/A
Nitrobenzene*	0.5	N/A
Ketones*	0.5	N/A
Aldehydes*	0.5	N/A
Amines	Fail	N/A
Other Consideration		
Are there any exceedances of the PE threshold outside of the pipeline depth?	No	
Is free product present in soil and groundwater?	None identified.	
Could hydrocarbon impact at greater depth than current pipeline depth be mobilised by rising groundwater levels?	No – heavy end hydrocarbon impact and low solubility PAH has not been identified within any chemical analysis across the site.	



Will soils impacted with above determinands likely be utilised elsewhere on site?	None identified.
Will soils be imported to site as part of any future earth works	Currently unknown, however it is likely materials will be required to be imported to site in order to create the development platform along with roadways. The importation of materials may affect the WIR Risk Assessment which should be updated after completion.

Notes - Pipe line depth normally between 0.75m–1.35m

Based on the assessment of current site conditions it is likely that PE pipe will be required at the proposed development, however an updated UKWIR should be completed following enabling works as conditions may vary following importation of materials.



4.8. CONCEPTUAL SITE MODEL

Following the completion of the intrusive site investigation, chemical analysis and risk assessment, the conceptual model shown in Table 4.12 has been prepared for the site.

TABLE 4.12 CONCEPTUAL MODEL

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL1 PL2	Heavy Metals, non-volatile PAH (Made Ground/infilled features)	Dermal contact. Dermal contact and ingestion.	Future site users. Off-site receptors.	Unlikely	Very Low	Negligible
Discussion: No exceedances of heavy metals or non-volatile PAHs have been identified with the soil analysis completed on site to date. Recommendation: No further assessment required. The installation of a suitable growing medium will be required in areas of soft landscaping. A cover system will likely be required in areas of retained Made Ground.						
PL3	ACM in Made Ground	Inhalation of dust.	Future site users. Buildings. Off-site land users.	Unlikely	Low	Low
Assessment: Asbestos has not been identified within the samples analysed. However, asbestos cement sheeting was identified on site in the north of the site south of the off-site dwelling. These stockpiles should be dealt with in accordance with Control of Asbestos Regulations (2012). Recommendation: During the remediation and enabling works these should be removed from site by a licensed asbestos removal contractor. Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 4.1. All works associated with these materials should be completed in accordance with the Control of Asbestos Regulations (2012) and industry best practice as detailed in CIRIA733 (Asbestos in Soil and Made Ground: A guide to understanding risk).						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL4	Volatile Contaminants such as hydrocarbons (Made Ground)	Inhalation of vapours. Migration through permeable strata and preferential pathways.	Future site users. Off-site receptors.	Unlikely	Very Low	Negligible
Assessment: No elevated concentrations of volatile contaminants such as hydrocarbons, mercury or naphthalene have been identified during the site investigation.						
Recommendation: No further assessment is required.						
PL4	Methane, carbon dioxide (potentially infilled features on and within 250 m of the site)	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future site users. Buildings. Off-site land users.	Low likelihood	Low	Low
Assessment: Localised areas Made Ground and organic deposits have been identified as potential sources of hazardous ground gas in the south west and centre of the site. Glacial till will likely restrict migration of any ground gas into shallow foundations.						
Recommendation: Preliminary monitoring suggests that the site can be classified as CS1/Green, however this will be confirmed on completion of the monitoring.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL5	Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (Made Ground)	Surface runoff. Migration through permeable strata and preferential pathways. Perched waters migration.	Groundwater (Principal aquifer). Surface water (Spa Brook).	Likely	Moderate	Low
Assessment: Elevated concentrations of heavy metals against EQS screening have been identified within leachate and groundwater samples from a stream in the north of the site. Glacial till across the site may reduce downward migration into the underlying bedrock aquifer. No elevated concentrations were identified within a surface water sample from a stream/ditch in the north of the site; an m-BAT assessment has been identified which confirmed the elevated concentrations of copper and nickel were not bioavailable. There is not considered to be a risk to the underlying Principal Aquifer as both leachate and groundwater analysis did not identify any elevated concentrations against DWS screening values. Recommendation: Sampling of surface water required during remediation and enabling works to ensure no detrimental effect to on-site surface water bodies should they remain as part of the proposed development.						
PL6	Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Unlikely	Low	LOW
Assessment: The soils at the site meet generally meet Class DS-1, AC-1s. Elevated sulphate concentrations meeting Class DS-2, AC-1s were noted within Made Ground deposits within WS225 at 0.60 m bgl. Recommendation: Concrete should be designed in accordance with the chemical testing results.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL7	Organic contaminants such as hydrocarbons, solvents (Made Ground)	Ingestion of tainted water supply.	Future site users. Water pipes.	Unlikely	Low	Low
Assessment: An initial review of chemical data against UK WIR parameters show no exceedances at pipeline depth and PE pipe would likely be viable.						
Recommendation: Based on the assessment of current site conditions, it is likely that PE pipe will be suitable on site. This will need to be confirmed with a UKWIR risk assessment post remediation as conditions may differ than those currently on-site.						
PL8	Phytotoxic contaminants (Made Ground)	Direct Contact (plant uptake).	Flora.	Very Unlikely	Very Low	Negligible
Assessment: Contamination has not been encountered within shallow Made Ground across the site which may be taken up by flora in soft landscaping.						
Recommendation: Installation of a growing medium or clean cover system where Made Ground is present within any areas of soft landscaping to prevent plant uptake of contaminants.						

Main exposure pathways:

PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants.



5. GEOTECHNICAL ASSESSMENT

5.1. PROPOSED DEVELOPMENT

E3P understands that Satnam Group has been granted outline planning permission for the development of the Peel Hall Site for a predominantly residential lead end-use that will comprise of circa 1200 dwellings with associated infrastructure with some commercial and retail development within the masterplan.

5.2. SUMMARY OF GROUND CONDITIONS

MADE GROUND

Made Ground was encountered in 22 exploratory hole locations at depths from ground level to a maximum proven depth of 1.20 bgl (TP124). However, the majority of Made Ground encountered was encountered to a depth <1.00mbgl.

Where encountered the Made Ground generally comprised of a reworked topsoil of a dark brown sandy clay or a clayey fine to medium sand. This was often underlain by a reworked slightly gravelly sandy clay or a greyish brown clayey fine to medium sand with gravel of mudstone, sandstone and occasionally brick and rare glass, asphalt, clinker and ash. Within TP211 the reworked clay also contained cobbles of brick.

Underlying the topsoil in TP106, a gravelly sand was encountered with gravel of sandstone, mudstone and rare fragments of brick and clinker. The deepest area of Made Ground encountered in the central area of the site just south of the drainage ditch within TP124 comprised of a greyish brown clayey fine to medium sand, with a land drain identified at 0.70m bgl.

In the area to the south of Peel Hall, within WS225, Made Ground is comprised of a grey mottled brown slightly gravelly sandy clay, with gravel of clinker, ash sandstone, mudstone and fragments of brick.

A Depth of Made Ground Plan is presented as Drawing 15-740-006 in Appendix III.

TOPSOIL

Natural topsoil was encountered within the majority of the exploratory hole locations with the exception of those identified as reworked topsoil as described above.

Topsoil is generally comprised of a brown sandy CLAY with frequent rootlets or a dark brown clayey fine to medium SAND with frequent rootlets.

DRIFT

Drift deposits were encountered within all exploratory hole locations.

Drift deposits were varied across the site but generally comprised of either firm to stiff brown sandy slightly gravelly CLAY with gravel of mudstone and sandstone or loose to dense clayey slightly gravelly grey or brown fine to medium SAND.



Loose sands were identified within WS102, WS103, WS104, WS105, WS106, WS110, WS115, WS120, WS121, WS122, WS201, WS205, WS206, WS220, WS224, CP101 and CP102. Loose sands were identified between 0.25-5.45m bgl.

Very soft or soft CLAY was identified within SA107 at 0.30-1.00mbgl and TP148 at 1.20-2.50mbgl; the materials within TP148 are likely to be attributed to possible pond fill on site as it comprised of dark grey CLAY with frequent organic matter.

Other drift deposits containing organic matter was identified within TP103, WS123, WS204, WS208 and WS212 at depths of between 0.10 -3.30mbgl.

Silty CLAY drift deposits were identified within RB101, RB103 and RB105.

SOLID

Weathered red sandstone recovered as a GRAVEL was encountered across the site, within exploratory hole locations, CP103, RB101, RB103, RB104, and RB105 at depths between 3.80 m bgl to 7.25 mbgl.

WS213 refused at 1.86mbgl. on suspected weathered bedrock.

GROUNDWATER

Groundwater was encountered during the site investigation between 0.30-5.10m bgl.

Running sands were encountered across the site at depths of between 0.50m and 2.30mbgl.

Saturated drift deposits have been noted across the site.

5.3. SITE PREPARATION

The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the *Manual of Contract Documents for Highway Works (MCHW)*. This should include the following:

-  Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill.
-  Removal of all concrete hardstanding where applicable.
-  Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
-  Buried structures and old foundations have been encountered on site in the northern central sector. These should be excavated from below the proposed development footprint with the resulting void backfilled.
-  Backfilling of drainage ditches where not remaining as part of the proposed development.



5.4. FOUNDATION CONDITIONS AND ASSESSMENT OF POTENTIAL BEARING CAPACITIES

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, E3P has undertaken an assessment of the net safe allowable bearing pressure (ABP) within the underlying natural stratum to assist in the detailed design of foundations and infrastructure and determine the target founding stratum. The results of this assessment are summarised in Table 5.1.

TABLE 5.1 SUMMARY OF ABP

GRANULAR SOILS			
Description	Depth (Range m bgl)	Relative Density	Allowable Bearing Pressure (kN/m ²)
SAND	1.00 – 5.00	Loose	70 - 95
SAND	1.00 – 5.00	Medium Dense	1.00 - 286
SAND	2.00 – 7.00	Dense	157 - 456
GRAVEL (One location)	7.00	Medium Dense	406
GRAVEL	4.00 – 7.00	Dense	325 - 422
COHESIVE SOILS			
Description	Depth (range m bgl)	Undrained Shear Strength (Cu) (kN/m ²)	Allowable Bearing Pressure (kN/m ²)
Firm low strength CLAY	1.00–4.00	20–39	41–80
Stiff medium strength CLAY	1.00-5.00	40-73	82-151
Very stiff high strength CLAY	1.00-5.00	75-143	115-295
Very stiff very high strength CLAY	1.00-5.00	151-237	310-488

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe net allowable bearing pressure, the suitable target founding stratum has been identified as the underlying stiff to very stiff glacial till and medium dense to dense sands.

However, given the significant variable deposits on site, and localised topography changes, prior to the detailed design of suitable foundation solutions, a programme of remediation and enabling works will be required to prepare the development platform suitable for construction. Buried obstructions associated with the former buildings in the north of the site will require removal in their entirety.

Upon completion of the enabling works, it is likely that the most cost-effective option for the majority of the site would be a combination of shallow strip foundations, mass trench fill foundations and to re-engineer the ground using vibro stone columns (VSCs) to support a doubly reinforced shallow strip foundation.



However, it should be noted that across the site, running sands have been identified along with saturated drift deposits that results in the reduction in the calculated safe ABP by 50%. As such, a driven piled foundation solution may be required in these areas or the utilisation of VSC utilising a bottom feed.

Soft CLAY deposits with a $C_u < 30 \text{ kN/m}^2$ have been identified in SA107 between 0.30-1.00m and TP148 between 1.20-2.50m. Within these areas, along with areas of ponds and drainage ditches to be infilled, a driven piled foundation solution would be required. Where loose SANDs are present it is likely that VSCs can be utilised.

A high pressure gas main is present along the northern boundary of the site; additionally service infrastructure is noted in the central and western sectors of the site; as such consideration of the use of VSC within these areas will be required, and where not suitable driven piled foundations may be required as an alternative.

The final plot specific foundation will largely be determined by the proposed elevation of the structure and the interaction with the shallow saturated stratum.

Table 5.2 demonstrates the suitability of ground improvement for the proposed development.

TABLE 5.2 GROUND IMPROVEMENT DESIGN RISK MATRIX

RISK ITEM	COMMENT	PASS/FAIL
Soft clays with an undrained shear strength less than 30 kN/m^2	CLAY soils are generally firm to very stiff with $C_u > 50 \text{ kN}$. Isolated areas of softer clay soils were encountered with $C_u < 30 \text{ kN/m}^2$; however, it is considered that these will either be piled or soft material excavated to remove the organic deposits.	PASS
Ground with peat layers close to foundation level or the base of the stone column, or where intermediate layers of peat are thicker than 200 mm, either as a single layer or the sum of the thicknesses of individual layers throughout the length of the stone column	None identified.	PASS
Voided filled ground, e.g. old water tanks, pottery, glass bottles, concrete rubble or brick fill of unsuitable grading	Made Ground identified in the south east and central sector of the site will require processing to render the site suitable for VSC. The below ground obstructions in the northern central sector of the site will require excavation and processing into a graded aggregate suitable for vibro treatment.	PASS – on completion of enabling works
Loose or non-engineered fill not previously subject to rising or fluctuating water levels saturation	None identified.	PASS



RISK ITEM	COMMENT	PASS/FAIL
Filled ground still settling or expected to settle under its own weight or due to the effects of surcharging/upfilling where there is a high organic content or where decay is continuing	None identified.	PASS
Fill, containing degradable material where organic material forms more than 15% of fill by volume	None identified.	PASS
Clays with a plasticity index greater than 40%	Within TP148 at 1.60mbgl a plasticity index greater than 40% was identified; this is considered an anomaly and not representative of the site as a whole. The area should be delineated and affected materials removed.	PASS – on completion of enabling works.
Highly sensitive soils liable to collapse or remoulding	Loose and running sands have been identified across the site. Trail Pits and window samples were noted to collapse.	PASS
Cohesive soils with trees in influencing distance	Plots within tree influence will require modelling and will either be subject to a piled or mass trench-fill solution.	PASS
Overall Risk Rating and Suitability for Vibratory Ground Improvement		PASS

Foundation depths should take account of the presence of existing and proposed trees, with foundations deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirements of NHBC standards.

At this time it is not possible to accurately define the foundation types due to the absence of a detailed tree survey and a proposed development plan; however, based on our extensive experience of similar sites, we would anticipate that the final foundation solution would be a combination of the following:

- ✿ Shallow strip foundations bearing on stiff to very stiff sandy CLAY or medium dense to dense SANDS at circa 1.00 m bgl;
- ✿ Trench fill to support reinforced strip foundations in areas of variable ground and/or potential tree influence;
- ✿ Re-engineer of Made Ground for use of VSC to support a doubly reinforced shallow strip foundations;
- ✿ Driven piled foundation in areas of former ponds should they be retained and areas of soft CLAYS; and,
- ✿ Driven piled or VSC by bottom feed foundation solution in areas of running sands and saturated deposits.



It is recommended that, at working drawing stage, a foundation schedule is prepared for the development taking account of the physical change of natural clay soils and the current/proposed locations of trees.

5.5. GROUND FLOOR SLABS

Current building control regulations require that where infilled ground is present to depths in excess of 600 mm, or where the substratum is variable in terms of the structure and settlement potential, or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance, it is considered that for the majority of substructures, the underlying stratum would have in excess of 600 mm of cohesive soils and, as such, a suspended floor slab will be required.

Where a cast in-situ suspended slab is utilised with no subfloor void, appropriate compressible material (heave precautions) will be required in the construction of the substructure.

5.6. HEAVE PRECAUTIONS

The site has been proven to be underlain by clay soils, which are susceptible to volumetric instability due to fluctuations in moisture content, particularly within influencing distance of trees as per the NHBC/LABC conjectured zones of influence.

The site has been noted to be underlain by low to medium volume change potential clays, with a single localised location classified as high, however this is considered to be an anomaly.

A conservative approach should be followed and the site should be deemed to be of medium volume change potential therefore heave precautions are required to the internal face of the external load-bearing walls (within tree influence).

If a ground beam is to be constructed within the zone of tree influence, heave precautions are required to the underside of this and edge beams.

If the ground floor slab is to be constructed with a beam and block floor, a minimum subfloor void of 250 mm is required within any structures located in the zone of conjectured tree influence.

If the ground floor slab is constructed with a cast in-situ suspended floor slab, then heave precautions that can tolerate 50 mm of clay swelling are required within any part of the floor slab to be located within the zone of influence of a tree.

A summary of heave precautions is presented in Table 5.3.



TABLE 5.3 SUMMARY OF HEAVE PRECAUTIONS

		MINIMUM VOID DIMENSION FOR FOUNDATIONS, GROUND BEAMS AND SUSPENDED IN-SITU CONCRETE GROUND FLOORS		MINIMUM VOID DIMENSIONS UNDER PRECAST CONCRETE AND SUSPENDED TIMBER FLOORS
Plasticity Index of Soil	Required Foundation Depth (m)	Thickness of Void Former Against Side of Foundation or Ground Beam (mm)	Thickness of Void Former on Underside of Edge Beam and Floor Slab (mm)	Void Dimension (mm)
High Plasticity (> 40)	> 2.5	Engineer Design		Engineer Design
	2.0–2.5	35	150	300
	1.5–2.0	25	75	
Moderate Plasticity (20–40)	> 2.5	Engineer Design		Engineer Design
	2.0–2.5	25	100	250
	1.5–2.0	25	50	
Low Plasticity (< 20)	2.0–2.5	N/A	50	200
	> 2.0	No Special Precautions		

5.7. HIGHWAYS CONSTRUCTION

A programme of remediation and enabling works will be required to remediate the proposed road subgrade in accordance with the requirements of the Manual of Contract Documents for Highway Works Volume 1 Specification For Highway Works (Series 600-Earthworks) for a method compaction.

It is considered that the material can be re-engineered using method compaction to achieve a CBR in excess of 5% if works are completed in favourable climatic conditions.

5.8. DRAINAGE

12 BRE365 Soakaway tests have been completed however, an infiltration rate was only able to be calculated within SA102 where the test was completed within SAND drift deposits; the infiltration rate was noted to be good to moderate within this location. In the remaining locations, and especially where CLAY drift deposits were present, the soakage potential was significantly reduced.

It is considered there is a limited potential that soakaway drainage may be suitable for the proposed development. However, the application of soakaway drainage will ultimately be dependent on the specific requirements of the development. All soakaways should be designed in accordance with BRE Special Digest 365 – *Soakaway Design*.



5.9. CONCRETE DURABILITY

Based upon the results of the chemical analyses it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with the recommendations provided in BRE *Special Digest 1* (2005).

Elevated sulphate concentrations meeting Class DS-2, AC-2 were noted within the Made Ground deposits in WS225 at 0.60 m bgl. However, upon completion of site enabling works it will, in all likelihood, be DS1 AC1s.

5.10. EXCAVATIONS

Trial pits were variable in stability within granular natural strata deposits; however, it is considered that near-surface excavations will be feasible.

Site observations indicated that excavations should be feasible in the near surface with normal plant; however, obstructions were identified in the near surface, including former foundations and former floor slabs in the area to the south of the residential unit in the northern central area of the site. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works.

However, due to the depth and variability of the granular deposits and likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97.

If local pumping of groundwater is required during the advancement of excavations for the proposed foundations then consideration should be given to the potential for dewatering gravels in the surrounding areas that may cause structural damage to building substructures in close proximity to the site.

TABLE 5.4 CIVIL ENGINEERING EXCAVATION RISK MATRIX

RISK ITEM	PRESENT	COMMENT
Running Sands	Yes	Running sand has been identified in TP101, TP105, TP107, TP110, TP112, TP114, TP115, TP120, TP124, TP140, TP146, TP203, TP205, TP206, TP207, TP209, TP215 and TP216. The running sands were identified at depths ranging from 0.50 – 2.30 m bgl. Excavations for a traditional spread foundation will not be viable within saturated stratum (without dewatering) due to the inability to cast the concrete foundation.
Minor Water Ingress	Yes	Minor water ingress will require localised dewatering/sump pumping during the construction of site drainage infrastructure. Ingress of water into foundation excavation will potentially flood foundation excavations, limiting the viability of spread foundations to be constructed.
Shallow Bedrock	Yes	Bedrock has been recovered as a weathered SANDSTONE sandy gravel between 1.86m-5.20m bgl.



5.11. CONSTRUCTION ACTIVITY AND INSPECTION

The following activities and inspections should be incorporated into the site works:

- ✿ Due to the variability of the soils at the site, it is recommended that sufficient allowance is made for the inspection of formations and sub-formations to foundations and pavement construction.
- ✿ Excavations where access is required should be subject to a risk assessment from a competent person and, where appropriate, mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 should be utilised.
- ✿ It is considered that dewatering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond.
- ✿ Where access to confined spaces is required, appropriate mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.
- ✿ The presence of potential contamination and mitigation measures should be addressed as part of the construction stage health and safety plan and should include measures to design out the risks, reduce their impact and, finally, to include the use of personnel protective equipment (PPE).



5.12. GEOTECHNICAL RISK REGISTER

POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Bedrock		On site	100	Bedrock has been recovered as a weathered SANDSTONE sandy gravel between 1.86m-5.20m bgl.
Obstructions		Northern Central Area	10	Below ground obstructions have been identified in the northern central sector of the site and will require grubbing out in their entirety in order to construct the proposed development.
Trench collapse		All	100	Loose and running sand are present on site that are subject to collapse. All excavations should be supported or battered back in accordance with guidance contained in CIRIA R97.
Mature trees		Centre and boundaries of the site	35	Arboriculture survey required to determine areas of potential tree influence. Foundations will locally require deepening in areas of tree influence.
Volume change potential clay		On site	100	The site has been assessed to be underlain by low to medium volume change potential clays. A conservative approach should be followed and the site should be deemed to be of medium volume change potential therefore heave precautions are required to the internal face of the external load-bearing walls (within tree influence). An isolated area of high volume change potential has been identified within TP148 and this area should be delineated during remediation and enabling works with further testing completed.
Running sands		On site	40	Running sands have been identified within TP101, TP105, TP107, TP110, TP114, TP115, TP120, TP124, TP146, TP203, TP205, TP206, TP207, TP209, TP215 and TP216 between depths of 0.50-2.30m bgl.
Ground dissolution		N/A	N/A	Data searches indicate negligible risk.



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POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Concrete design		-	100	Concrete classification will be DS-1 AC-1s. Elevated sulphate concentrations meeting Class DS-2, AC-1s were noted within Made Ground deposits in WS225 at 0.60 m bgl.
Low-permeability ground		On site	90	Soakaways have only proven effective in one localised area within the north of the site however locations across the remainder of the site were unable to calculate an infiltration coefficient and therefore soakaways are unlikely to be deemed suitable.
Services/sensitive structures		On site	30	A review of online records has identified identifying a LHP (High Pressure) gas main in the north west of the site transecting the site in a west to east direction along the northern boundary. In addition to a low pressure gas main is present along Peel Cottage Lane and Radley Lane in the north east of the site. Electricity infrastructure is present in the north east of the site, within the centre of the site comprising overhead power lines and along the eastern boundaries. A surface water sewer is present along the south-western boundary and within the north-western corner of the site is a combined public sewer, foul sewer, surface water sewer and an abandoned sewer. Surface water sewers are present in the east of site located within the playing fields. Comms clean water pipes are present in Peel Cottage Lane and surrounding roadways of the site. BT infrastructure is present in the west of the site. BT infrastructure is also present along Peel Cottage Lane and the surrounding roadways of the site. Within the south east of the site, BT has been identified crossing the north of the community centre and recreation ground. Consideration of the above services should be sought when deciding the appropriate foundation solution for the site.
Abnormal foundation solutions		On site	50	Loose granular deposits, running sands and localised areas of soft clays have been identified on which may require an abnormal foundation solution (VSC or Piled).



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POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Areas not investigated		All	10	During the site investigation, the site was noted to be waterlogged in large areas of the site and as such access to these areas was restricted. Additionally, areas within the south-east, south and northern central sectors of the site comprised areas of Himalayan Balsam and Giant Hogweed which stopped access to these areas. Areas of dense woodland restricted access to the northern central sector of the site, along with electricity infrastructure and a residential property. Works were restricted along the northern boundary of the site due to the presence of a high pressure gas main. Overhead electricity infrastructure was also present across the central sector of the site.
Surface water features		On site Centre and North	25	Spa Brook is present in the centre of the site, furthermore several unnamed ditches and tributaries of Spa Brook are present on site. Several ponds are present on site.
Historically infilled ponds		On site	40	Several historically infilled ponds are present across the site. These will require delineation during remediation and enabling works.



5.13. FURTHER WORKS

Based on the findings of the intrusive site investigation, the following additional works are recommended to be completed in due course:

-  Further investigation of inaccessible areas.
-  Plot-specific foundation schedule (upon receipt of the final development levels).
-  CL:AIRE DoW CoP Materials management plan.
-  Pre-commencement geotechnical materials testing to confirm earthworks design;
-  Geotechnical earthworks strategy (infrastructure).
-  Remediation and enabling works strategy.
-  Construction phase Surface Water Management Plan.
-  Full three-dimensional earthworks cut/fill model;
-  Settlement Analysis for earthworks design; and,
-  Build Phase Mitigation Plan and design of specialist ground gas mitigation measures.



6. CONCLUSIONS AND RECOMMENDATIONS

6.1. CONTAMINATED LAND ASSESSMENT

Human Health	A Tier I human health risk assessment has been undertaken using the chemical analysis results of the soils and comparing them to the relevant Tier I criteria. This assessment has not identified the presence of any exceedances. Therefore, the site has been classified as low risk to human health. Asbestos sheeting has been identified in the northern central sector of the site. During the remediation and enabling works these should be removed from site by a licensed asbestos removal contractor. Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 4.1. Isolated areas of Made Ground on site will require segregating during the enabling works and further analysis undertaken to determine its suitability for retention on-site. Where retained it is likely a cover system will be required; the remainder of the site can be constructed using the installation of a 300mm growing medium. Chemical analysis of the natural clay drift deposits and natural topsoil has identified these soils acceptable for use as subsoil and topsoil within the proposed garden areas subject to validation testing.
Controlled Waters	Low risk to controlled waters.
Ground Gas	Characteristic Situation 1 (pending completion of gas monitoring).
Potable Water	The assessment for the current ground conditions indicates that PE pipeline would be suitable. However, post-remediation and enabling works ground conditions may be different from those identified during this site investigation. This will need to be confirmed following the completion of a UKWIR risk assessment following remediation and enabling works.



6.2. GEOTECHNICAL ASSESSMENT

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe net allowable bearing pressure, the suitable target founding stratum has been identified as the underlying stiff to very stiff glacial till and medium dense to dense sands.

Buried obstructions in the north of the site will require removal in their entirety during a phase of remediation and enabling works. Running sands, loose SANDs and saturated drift deposits have been identified across the site. Isolated areas of soft CLAYs have also been identified at the site.

Based on the above, it is anticipated that the proposed development can be constructed on a combination of shallow strip, mass trench fill, and the re-engineer of Made Ground and loose SANDs for the use of vibro stone columns to support a doubly reinforced shallow strip foundation. Where saturated deposits and running sands are present a bottom feed VSC foundation solution will be required or driven piled foundations. Driven piled foundations will be required in areas of soft CLAYs and in the vicinity of former ponds and where drainage ditches are currently present but will be infilled as part of the proposed development.

Foundation depths should take account of the presence of existing and proposed trees, with foundations deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirements of NHBC standards.

It is recommended that at working drawing stage a foundation schedule is prepared for the development, taking account of the physical change of natural clay soils and the current/proposed locations of trees.

END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme



Peel Hall

Phase II Geoenvironmental Site Assessment
May 2022

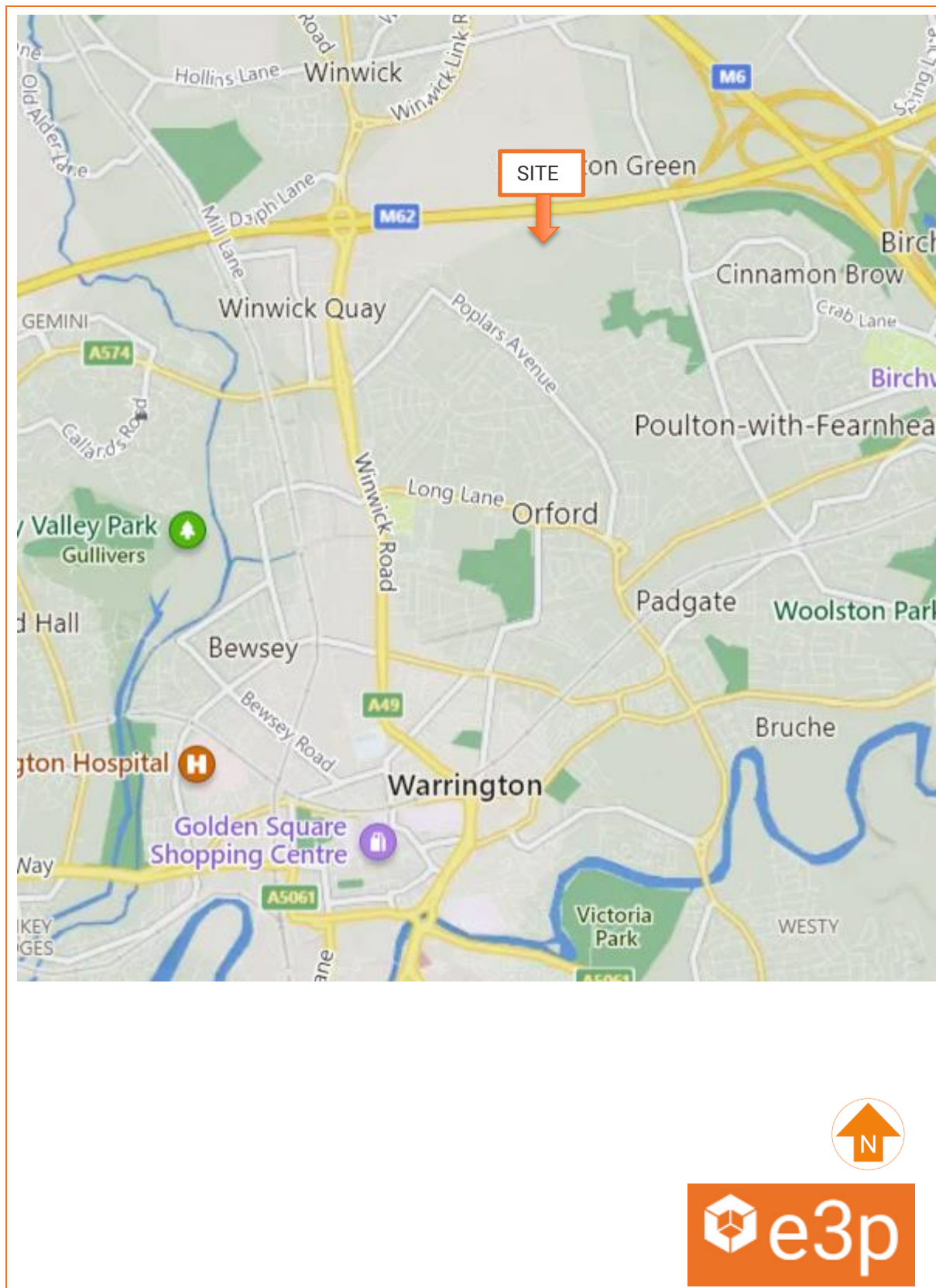
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection

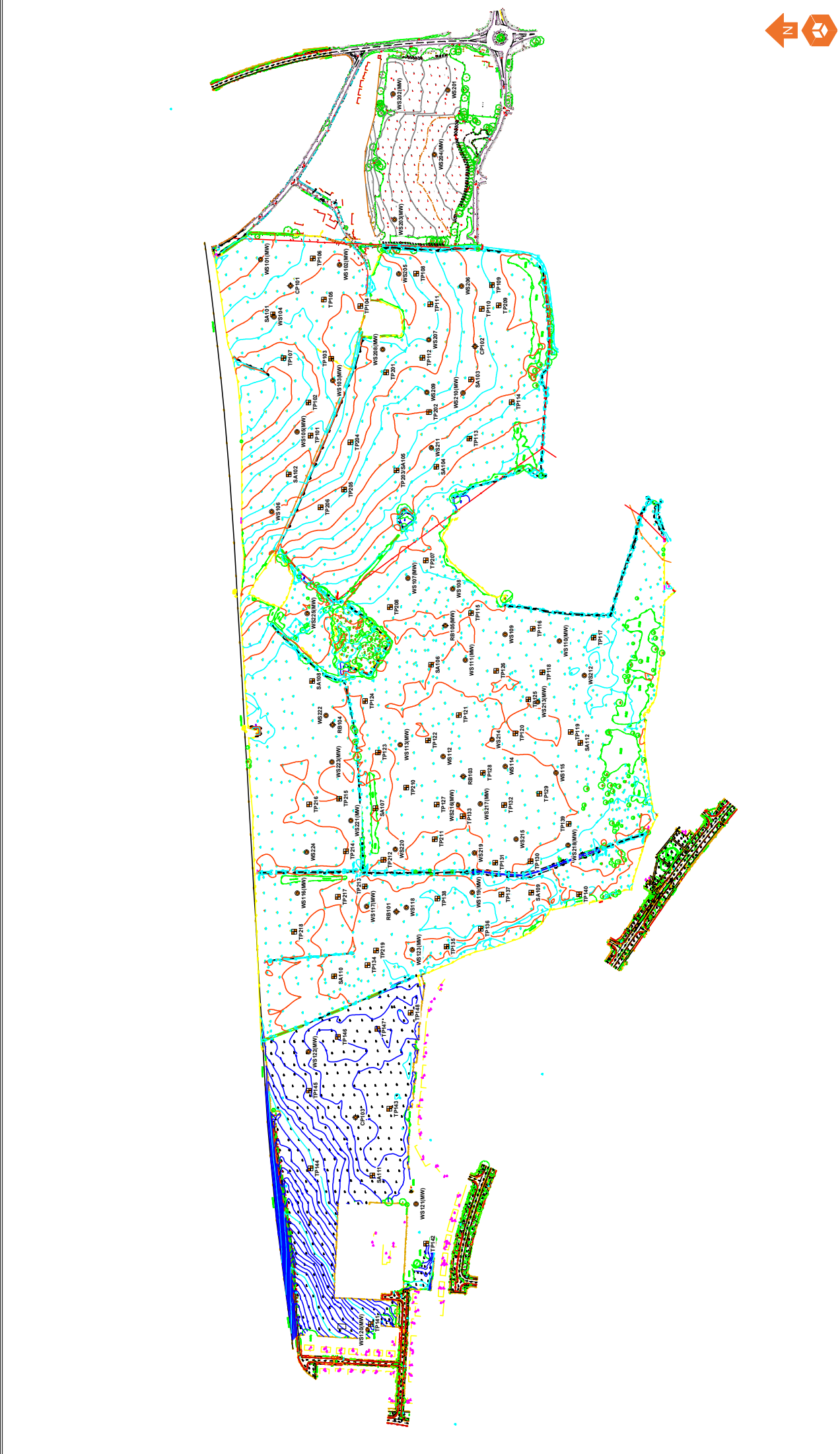


APPENDIX III

DRAWINGS

DRAWING 15-740-001 – SITE LOCATION PLAN





Location Symbols

Approximate Window Sample Probehole Location

Approximate Window Sample Probehole Location with Infill

Approximate Trial Pit Location

Approximate Cable Percussive Borehole Location

Approximate Soakaway Trial Location

Approximate Rotary Borehole Location

Notes:

Client:

Satnam Group

Job No:

15-740

Date:

24.05.2022

Drawing No:

005

Scale:

NTS@ A3

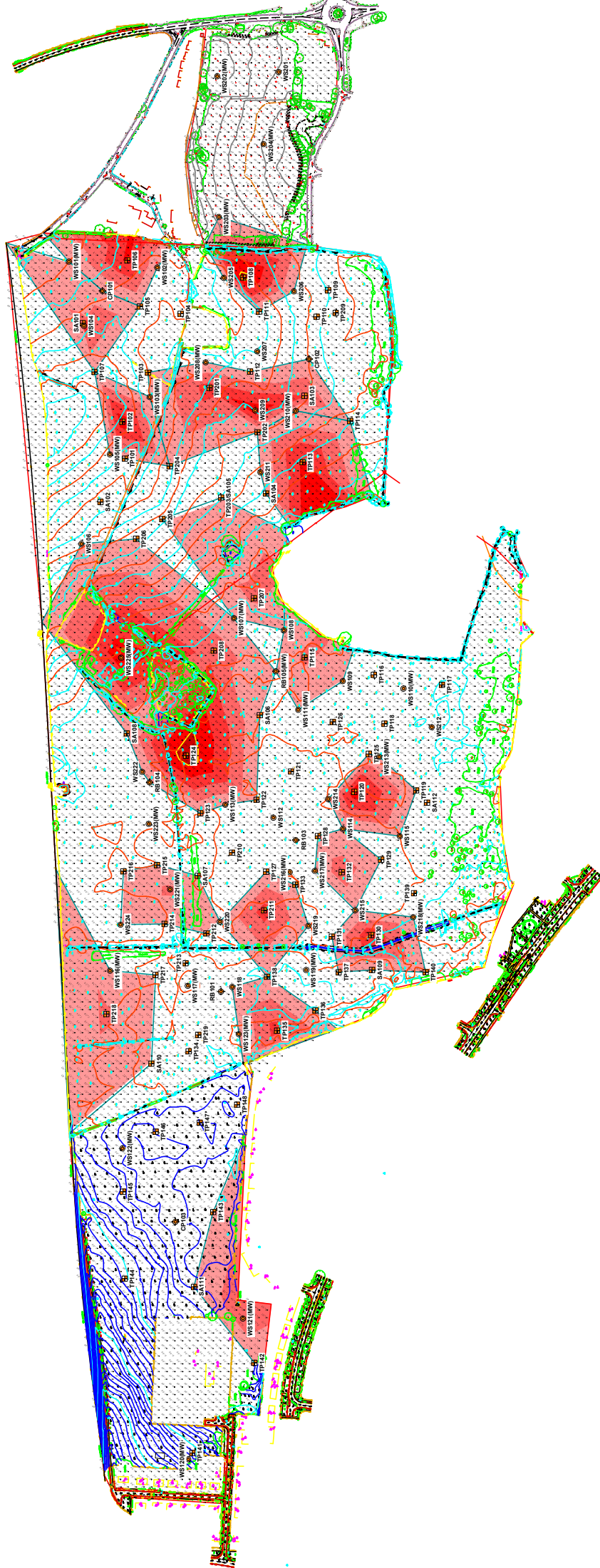
Job Title:

Peel Hall, North Warrington

Exploratory Hole Location Plan

Environmental Engineering
Peel Hall, North Warrington
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
Email: info@e3p.co.uk
Website: www.e3p.co.uk

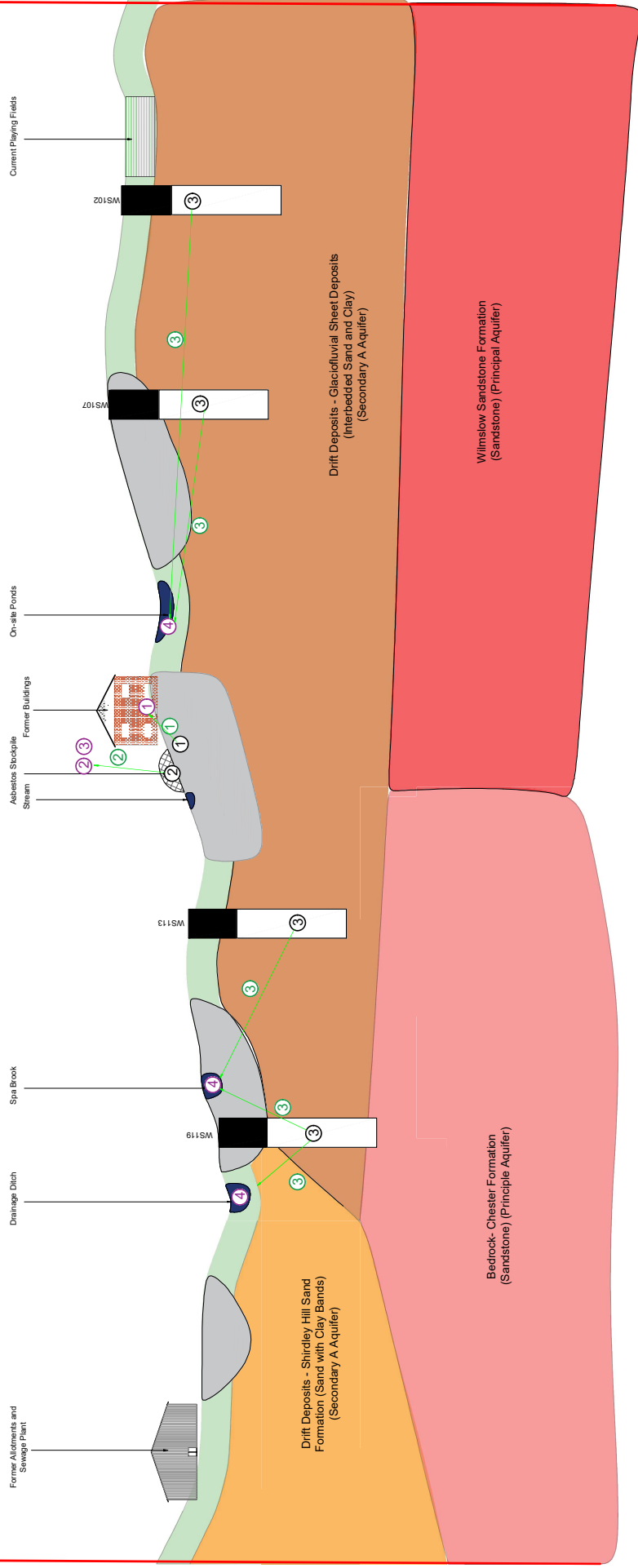
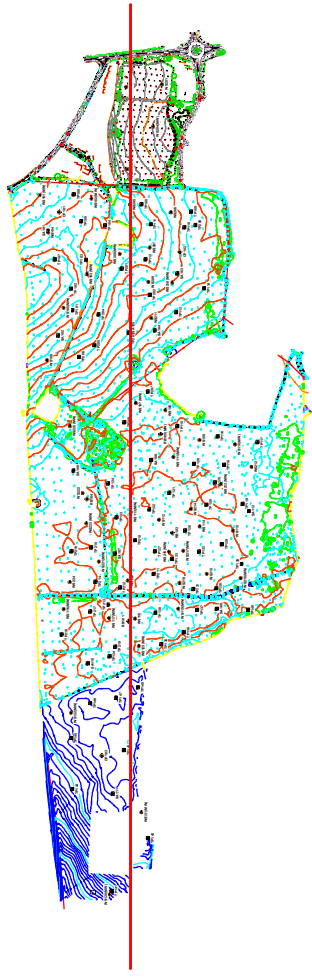
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Location Symbols: - Approximate Window Sample Probehole Location - Approximate Trial Pit Location - Approximate Cable Penetration Probehole Location - Approximate Slatway Test Location Mass Ground Depth (m) - Depth of Mass Ground 0.01 - 0.24m - Depth of Mass Ground 0.25 - 0.49m - Depth of Mass Ground 0.50 - 0.74m - Depth of Mass Ground 0.75 - 0.99m - Depth of Mass Ground 1.00 - 1.24m - Depth of Mass Ground 1.25 - 1.49m - Depth of Mass Ground > 1.50m										Notes:		Client:		Satnam Group		Job No: 15-740 Drawing No: 006		Date: 24.05.2022 Scale: NTS@ A3		Environmental Engineering Ltd Partnership Ltd Taylor Road, Trafford Park Umslin, Manchester M16 7JL E-mail: info@e3p.co.uk Website: www.e3p.co.uk	
										Job Title:		Depth of Made Ground Plan		The client must not amend any drawing, design or other intellectual property produced by E3p Ltd without permission in writing from E3p Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3p Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.							
										Job Title:		Peel Hall, North Warrington									
										P1		REV C		24.05.2022		EB		BH		Checked	
										P1		REV B		23.05.2022		EB		BH		Drawn	
										P1		REV A		14.04.2022		EB		BH		Revised	

W

E



Geology Key

- Topsoil
- Drift Deposits - Shirdley Hill Formation
- Drift Deposits - Glaciofluvial
- Bedrock - Chester Formation
- Bedrock - Wilmslow Sandstone Formation
- Metall Ground

Scavengers

- Made Ground - Subgrains
- Asbestos
- Heavy Metals in Groundwater

Receptors

- Buildings
- Future End Users
- Construction Workers
- Surface Water Features

Pathways

- Subgrain Attack
- Dust Inhalation
- Lateral / Downward Migration

Notes:

Phase	REV	Date	Drawn	Checked
P1	REV B	24.05.2022	EB	BH
P1	REV A	11.05.2022	EB	BH

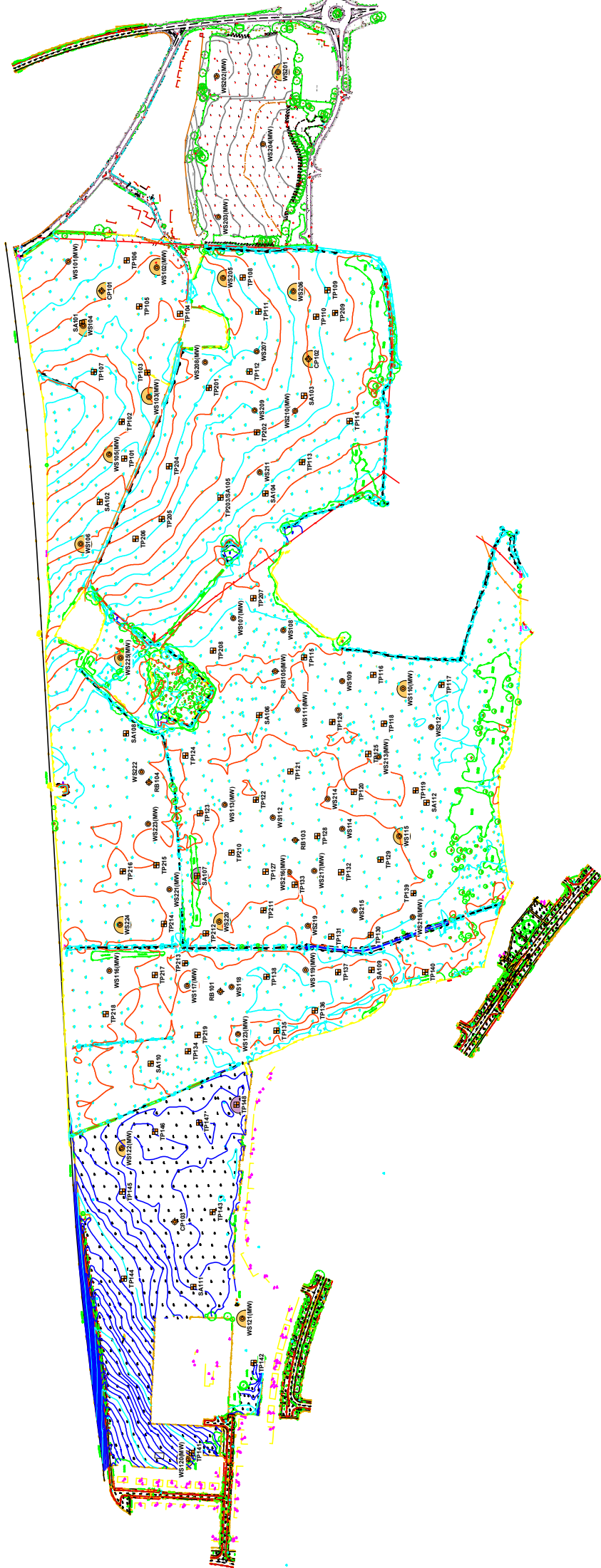
Client:	Salmam Group	Job No:	15-740	Date:	24.05.2022
Job Title:	Peel Hall, North Warrington	Drawing No:	010	Scale:	NTS@ A3

Conceptual Site Model	
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Environmental Engineering
Peel Hall, North Warrington
Tadpole Road, Turfport Park
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Location Symbols:  Approximate Window Sample Probehole Location  Approximate Trial Pit Location  Approximate Cable Percussive Borehole Location  Approximate Soilway Test Location  Loose SANDS  Soft CLAY	Notes:		Client:		Safnam Group	Job No: 15-740	Date: 24.05.2022	Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 Email: info@e3p.co.uk Website: www.e3p.co.uk	
								Drawing No: 014	Scale: NTS@ A3
			Job Title:		Peel Hall, North Warrington	Drawing Title: Loose Sands and Soft Clay Plan			
			Phase	Issue	Date	Drawn	Checked		
		P1	REV B	24.05.2022	EB	BH			
		P1	REV A	11.05.2022	EB	BH			



Location Symbols

Notes:

Client:

Satnam Group

Job No:

15-740

Date:

24.05.2022

Drawing No:

016

Scale:

NTS@ A3

Job Title:

Peel Hall, North Warrington

Phase

Issue

Date

Drawn

Checked

P1

REVA

24.05.2022

EB

BH

Environmental Engineering
Peel Hall, North Warrington
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APPENDIX IV PHOTOGRAPHS

PLATE 1 SPA BROOK IN THE CENTRE OF THE SITE



PLATE 2 VIEW OF SITE FACING SOUTH IN THE CENTRE OF THE SITE



PLATE 3 VIEW OF SITE FACING WEST FROM THE CENTRE OF THE SITE



PLATE 4 SEASONAL WETLANDS IN THE CENTRE OF THE SITE



PLATE 5 REMAINING STRUCTURE FROM THE FORMER SEWAGE DISPOSAL IN THE SOUTH WEST OF THE SITE



PLATE 6 VIEW OF SITE FACING SOUTH EAST



PLATE 7 **VEGETATION STOCKPILE**



PLATE 8 **STREAM TO THE SOUTH OF PEEL HALL**



PLATE 9 ASBESTOS SHEET CEMENT SOUTH OF PEEL HALL



PLATE 10 VIEW OF SITE IN THE NORTH OF THE SITE



PLATE 11 OVERHEADS ON SITE



PLATE 12 TRAIL PIT IN THE NORTH OF THE SITE



PLATE 13 TRAIL PIT IN THE WEST OF THE SITE



PLATE 14 UNSTABLE TRIAL PIT



PLATE 15 GROUND CONDITIONS



PLATE 15 GROUND CONDITIONS



PLATE 16 WELL INSTALL



PLATE 17 WELL INSTALL IN THE PLAYING FIELDS



APPENDIX V

E3P EXPLORATORY HOLE LOGS

Project Name: Peel Hall

Project No.
15740

Co-ords: 361815.82 - 391864.37
Level: 17.78

Date
21/03/2022

Location: Warrington

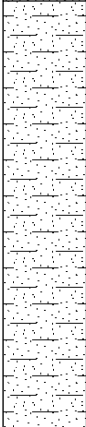
Dimensions (m): 2.20

Scale
1:30

Client: Satnam Group

Depth
2.10

Logged
G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.40	17.38		Dark brown slightly gravelly very sandy CLAY with frequent rootlets. Gravel is fine subangular to subrounded of sandstone and mudstone. (TOPSOIL).	
							Brown slightly clayey very gravelly fine to medium SAND. Gravel is fine subangular to subrounded of mudstone and sandstone.	1
				2.10	15.68		End of Pit at 2.10m	2
								3
								4

Trial Pit Photographs



Trial Pit 101



Trial Pit 101 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.80m bgl - seepage. 3. Running sand identified at 1.80m bgl. 4. Unstable from 0.65m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361863.84 - 391867.46 Level: 19.02	Date 21/03/2022
Location: Warrington	Dimensions (m): 2.30 Depth 1.80		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.35	18.67		MADE GROUND: Dark brown slightly gravelly sandy clay with frequent rootlets. Gravel is fine subangular to subrounded of sandstone and mudstone. (Reworked Topsoil).	
	0.55	HVP	63				MADE GROUND: Brown slightly gravelly sandy clay. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. (Land drain 0.50m bgl). (Reworked clay).	
	0.80	HVP	85					
	1.00	D		0.90	18.12			
	1.00	HVP	126				Stiff medium strength brown mottled grey slightly gravelly sandy CLAY with occasional lenses of brown fine to medium SAND. Gravel is fine to medium subangular to subrounded of coal, mudstone and sandstone.	1
	1.40	HVP	89					
	1.50	ES						
	1.70	HVP	113					
				1.80	17.22		End of Pit at 1.80m	2
								3
								4

Trial Pit Photographs



Trial Pit 102



Trial Pit 102 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361927.71 - 391834.33 Level: 17.59	Date 21/03/2022
Location: Warrington	Dimensions (m): 2.20 Depth 1.90		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼ 0.60	0.20	ES		0.25	17.34		Dark brown slightly gravelly clayey fine to medium SAND with frequent rootlets. Gravel is fine subangular to subrounded of mudstone and sandstone. (TOPSOIL). Dark brown clayey fine to medium SAND.	1
▼ 1.90	1.80	ES		1.20	16.39		Grey clayey fine to medium SAND with rare pockets of organic matter.	2
				1.90	15.68		End of Pit at 1.90m	3
								4

Trial Pit Photographs



Trial Pit 103

Remarks: 1. Complete. 2. Water strike encountered at 0.60 - perched and at 1.90m bgl - slow ingress. 3. Unstable from 0.80m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362004.20 - 391791.94 Level: 17.58	Date 21/03/2022
Location: Warrington	Dimensions (m): 1.80 Depth 1.70		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	17.28		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50 0.60	ES HVP	65				Firm medium strength brown mottled grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of coal, mudstone and sandstone. Circa 1.00m bgl becomes stiff high strength.	1
	1.00	HVP	77					
	1.50 1.50	D HVP	100	1.70	15.88			
							End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



Trial Pit 104

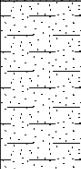


Trial Pit 104 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362013.60 - 391844.89 Level: 17.70	Date 21/03/2022
Location: Warrington		Dimensions (m): 1.90 Depth 2.00	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.40	17.30		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
 0.60							Dark grey silty clayey fine to medium SAND.	1
 0.90				1.10	16.60		Light brown slightly clayey fine to medium SAND.	
				2.00	15.70		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 105

Trial Pit 105 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.60m bgl- perched. 3. Running sand identified at 0.90m bgl. 4. Unstable from 0.50m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362073.47 - 391861.12 Level: 17.09	Date 21/03/2022
Location: Warrington	Dimensions (m): 2.40 Depth 1.90		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40	ES		0.30	16.79		MADE GROUND: Dark brown sandy clay with frequent rootlets. (Reworked Topsoil).	
				0.80	16.29		MADE GROUND: Reddish brown clayey gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with rare fragments of brick and clinker.	
	1.00	HVP	65				Firm medium strength reddish brown mottled grey slightly gravelly very sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. Circa 1.40m bgl becomes stiff high strength.	1
	1.40	HVP	95					
	1.80	HVP	114	1.90	15.19			
							End of Pit at 1.90m	2
								3
								4

Trial Pit Photographs

	
Trial Pit 106	Trial Pit 106 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361928.49 - 391903.71
Level: 19.15

Date
21/03/2022

Location: Warrington

Dimensions (m): 2.00

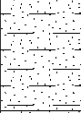
Scale
1:30

Client: Satnam Group

Depth
2.10

0.60

Logged
G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.80	0.25			0.25	18.90		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
							Brown clayey fine to medium SAND.	
	0.80	ES		0.70	18.45		Light brown slightly clayey fine to medium SAND.	1
	1.00	B						
				2.10	17.05		End of Pit at 2.10m	2
								3
								4

Trial Pit Photographs



Trial Pit 107



Trial Pit 107 Spoil

Remarks: 1. Complete. 2. Running sand identified at 1.80m bgl. 3. Unstable from 1.10m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362051.23 - 391710.64 Level: 15.87	Date 21/03/2022
Location: Warrington	Dimensions (m): 3.80 0.60		Scale 1:30
Client: Satnam Group	Depth 1.85		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30	15.57		MADE GROUND: Dark brown very clayey fine to medium sand with frequent rootlets. (Reworked Topsoil).	
							MADE GROUND: Greyish brown clayey fine to medium sand. (Land drain 0.70m bgl).	
	1.25	HVP	55	1.10	14.77		Firm medium strength grey mottled brown slightly gravelly sandy CLAY. Gravel is fine subangular to rounded of mudstone, sandstone, and coal. Circa 1.60m bgl. becomes stiff high strength.	1
	1.60	HVP	75					
	1.80	HVP	81	1.85	14.02			
							End of Pit at 1.85m	2
								3
								4

Trial Pit Photographs



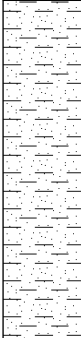
Trial Pit 108

Trial Pit 108 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362034.71 - 391600.48 Level: 14.02	Date 21/03/2022
Location: Warrington	Dimensions (m): 2.10 Depth 1.75		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.35	13.67		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.60	HVP	81				Stiff high strength reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	1
	1.10 1.20	HVP ES	90					
	1.40	HVP	99					
	1.60	HVP	91					
				1.75	12.27		End of Pit at 1.75m	2
								3
								4

Trial Pit Photographs



Trial Pit 109



Trial Pit 109 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 362000.05 - 391615.36
Level: 14.49

Date
21/03/2022

Location: Warrington

Dimensions (m): 2.00

Scale
1:30

Client: Satnam Group

Depth
2.20

Logged
G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.70	0.30	ES		0.35	14.14		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.80	B		1.10	13.39		Light greyish brown slightly clayey fine to medium SAND.	1
							Grey slightly clayey fine to medium SAND.	
	1.90	HVP	81	1.80	12.69		Stiff high strength reddish brown mottled dark grey slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	2
	2.10	HVP	93	2.20	12.29		End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 110



TP110 Spoil

Remarks: 1.Complete. 2. Running sand identified at 1.70m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362006.82 - 391690.15 Level: 16.19	Date 21/03/2022
Location: Warrington	Dimensions (m): Depth 1.90		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	15.89		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50	HVP	75				Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of coal, mudstone and sandstone.	
	0.70	D						
	0.90	HVP	92					
	1.10	ES						
	1.50	HVP	89					
	1.80	HVP	96					
				1.90	14.29		End of Pit at 1.90m	

Trial Pit Photographs



Trial Pit 111



Trial Pit 111 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361928.89 - 391701.61 Level: 15.68	Date 21/03/2022
Location: Warrington	Dimensions (m): 1.80 0.60		Scale 1:30
Client: Satnam Group	Depth 1.40		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	15.38		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	1.00	ES					Brown slightly clayey fine to medium SAND. (Running sand identified at 1.30m bgl)	1
	1.20	B						
				1.40	14.28		End of Pit at 1.40m	2
								3
								4

Trial Pit Photographs



Trial Pit 112

Trial Pit 112 Spoil

Remarks: 1. Terminated due to instability. 2. Collapsed to a depth of 1.40m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361811.30 - 391633.41 Level: 12.86	Date 22/03/2022
Location: Warrington	Dimensions (m): 2.00 0.60		Scale 1:30
Client: Satnam Group	Depth 2.20		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.70	0.10	ES		0.25	12.61		MADE GROUND: Dark brown slightly clayey fine to medium SAND with frequent rootlets. (Reworked Topsoil).	
	0.50	HVP	52				MADE GROUND: Brown mottled grey very sandy CLAY. (Land drain 0.65m bgl). (Reworked CLAY).	
				0.80	12.06		Firm medium strength light grey very sandy CLAY with frequent lenses of fine to medium SAND.	1
	1.20	HVP	65					
	1.80	HVP	63					2
	2.00 2.00	D HVP	66	2.20	10.66		End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 113



Trial Pit 113 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.70m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall Project No. 15740 Co-ords: 361864.71 - 391571.72 Date 22/03/2022

Location: Warrington Dimensions (m): 2.20 Scale 1:30

Client: Satnam Group Depth 2.30 Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.20	0.60	ES		0.25	12.82		Dark brown very sandy CLAY with frequent rootlets. (TOPSOIL).	
							Light brown slightly silty very clayey fine to medium SAND.	
				0.90	12.17		Light grey clayey fine to medium SAND. (Running sand identified from 1.20m bgl).	1
				2.30	10.77		End of Pit at 2.30m	2
								3
								4

Trial Pit Photographs



Trial Pit 114



Trial Pit 114 Spoil

Remarks: 1. Complete. 2. Running sand identified at 1.20m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361557.60 - 391630.96 Level: 10.48	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.50 0.60 1.50		Scale 1:30
Client: Satnam Group	Depth 1.75		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼ 0.70 ▼ 1.10	0.20	ES		0.30	10.18		MADE GROUND: Very dark brown slightly gravelly clayey fine to medium sand with frequent rootlets. Gravel is fine subangular to subrounded of sandstone and rare fragments of brick. (Topsoil). Light greyish brown clayey fine to medium SAND. (Running sand identified at 1.10m bgl).	
	1.40	ES		1.30	9.18		Firm medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and coal.	
	1.50	HVP	53					
	1.70	HVP	59	1.75	8.73		End of Pit at 1.75m	

Trial Pit Photographs



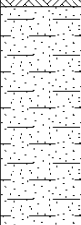
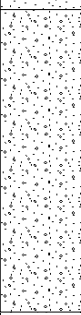
Trial Pit 115

Trial Pit 115 Spoil

Remarks: 1. Terminated due to instability. 2. Water strike encountered at 0.70m bgl - moderate ingress. 3. Running sand identified at 1.10m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361534.99 - 391541.10 Level: 10.19	Date 22/03/2022
Location: Warrington		Dimensions (m): 1.70 Depth 2.30	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.50				0.20	9.99		Very dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
							Light greyish brown slightly gravelly clayey fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.	1
	1.20	B		1.10	9.09		Reddish brown slightly clayey gravelly fine to medium SAND. Gravel fine to coarse subangular to subrounded of sandstone and mudstone.	2
	1.70	ES		2.30	7.89		End of Pit at 2.30m	3
								4

Trial Pit Photographs



Trial Pit 116

Trial Pit 116 Spoil

Remarks: 1. Complete 2. Water strike encountered at 0.50m bgl - seepage. 3. Unstable from 0.90m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361521.99 - 391452.70 Level: 10.14	Date 22/03/2022
Location: Warrington	Dimensions (m): 2.15 Depth 2.40		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.60  1.90	0.10	ES		0.20	9.94		Very dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
							Greyish brown slightly gravelly clayey fine to medium SAND.	
	1.20	HVP	85	1.00	9.14		Stiff high strength brown slightly gravelly sandy CLAY with rare cobbles. Gravel is fine subangular to subrounded of sandstone and mudstone. Cobbles are subangular of sandstone.	1
	1.50	HVP	92					
	1.70	HVP	92					
				1.80	8.34		Reddish brown clayey fine to medium SAND.	2
				2.40	7.74		End of Pit at 2.40m	3
								4

Trial Pit Photographs



Trial Pit 117



Trial Pit 117 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.90m bgl - slow ingress. 3. Unstable between 0.40-1.00m bgl. Seepage at 0.60m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361471.62 - 391527.27 Level: 10.40	Date 22/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 2.20		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.60	0.20			0.20	10.20		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
				0.50	9.90		Light greyish brown clayey fine to medium SAND with rare gravel of mudstone.	
	0.80	D					Firm medium strength greyish brown slightly gravelly very sandy CLAY. Gravel is fine subangular to subrounded of mudstone, sandstone, and coal. Circa 1.60m bgl becomes stiff high strength.	
	1.00	HVP	69					1
	1.60	HVP	84					
	1.90	ES		1.80	8.60		Reddish purple clayey fine to medium SAND.	2
				2.20	8.20		End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 118

Trial Pit 118 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.60m bgl - seepage. 3. Eastern wall unstable.

Stability: Unstable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361384.83 - 391485.97
Level: 10.54

Date
22/03/2022

Location: Warrington

Dimensions (m): 2.20

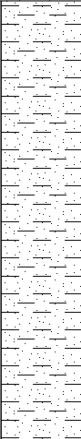
Scale
1:30

Client: Satnam Group

Depth
2.25

0.80

Logged
G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.40	0.20	ES		0.30	10.24		Dark grey sandy CLAY with frequent rootlets. (TOPSOIL).	1 -
	0.50	HVP	70				Firm medium strength grey mottled brown very sandy CLAY. Circa 0.80m bgl. becomes stiff high strength.	
	0.80	HVP	90					
	1.40	HVP	92	2.10 2.25	8.44 8.29		Reddish brown clayey fine to medium SAND.	2 -
	1.90	HVP	92				End of Pit at 2.25m	
								3 -
							4 -	

Trial Pit Photographs



Trial Pit 119



Trial Pit 119 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.40m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361383.04 - 391566.35 Level: 10.58	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.90 Depth 2.30 0.60		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.60  0.90				0.25	10.33		MADE GROUND: Dark brown clayey fine to medium sand with frequent rootlets. (Reworked Topsoil).	
				0.90	9.68		MADE GROUND: Light grey clayey fine to medium sand. (Land drain 0.60m bgl).	
	1.10 1.20	HVP ES	56				Firm medium strength light brownish grey sandy CLAY.	1
	1.40	HVP	59	1.50	9.08		Reddish brown slightly gravelly clayey fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	2
				2.30	8.28		End of Pit at 2.30m	3
								4

Trial Pit Photographs

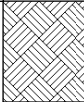


Trial Pit 120

Trial Pit 120 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.60 - land drain, slow ingress and at 0.90m bgl - moderate ingress. 3. Running sand identified at 0.90m bgl. 4. Unstable from 0.50m bgl. 5. Trial pit collapsed to 1.50m bgl.
Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361409.50 - 391648.66 Level: 10.58	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.80 0.60		Scale 1:30
Client: Satnam Group	Depth 2.05		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.10	0.30	ES		0.40	10.18		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.50	HVP	61				Firm medium strength brown slightly sandy slightly gravelly CLAY with rare lenses of medium to coarse mudstone gravel. Gravel is fine subangular to subrounded of mudstone, sandstone, and coal. Circa 1.00m bgl becomes stiff high strength.	
	1.00	HVP	86					1
	1.40	HVP	96					
	1.80	HVP	112	2.05	8.53		End of Pit at 2.05m	2
								3
								4

Trial Pit Photographs



Trial Pit 121

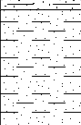
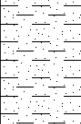
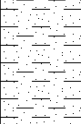


Trial Pit 121 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.10m bgl - slow ingress.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361372.63 - 391693.44 Level: 10.52	Date 22/03/2022
Location: Warrington	Dimensions (m): 2.00 0.60		Scale 1:30
Client: Satnam Group	Depth 2.15		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.80	0.20			0.20	10.32		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.40	B					Greyish brown slightly gravelly clayey fine to medium SAND. Gravel is fine to medium subrounded of mudstone and sandstone.	
	0.70			0.70	9.82		Stiff high strength grey slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone, sandstone and coal.	1
	1.00	HVP	77					
	1.50	ES						
	1.50	HVP	96					
	1.80	HVP	113					
	2.00	HVP	109					2
	2.15			2.15	8.37		End of Pit at 2.15m	3
								4

Trial Pit Photographs



Trial Pit 122

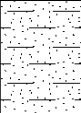
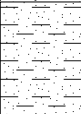


Trial Pit 122 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.80m bgl - moderate ingress.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361355.05 - 391766.31 Level: 10.58	Date 22/03/2022
Location: Warrington		Dimensions (m): 2.40 Depth 2.00	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.35	10.23		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.70	ES					Greyish brown slightly gravelly clayey fine to medium SAND. Gravel is fine subrounded of mudstone and sandstone.	
▼ 0.80	1.00	HVP	85	0.80	9.78		Stiff high strength slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone.	1
	1.40	HVP	107					
▼ 1.85	1.80	HVP	100					
				2.00	8.58		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 123



Trial Pit 123 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.80m bgl - perched above the CLAY and at 1.85m bgl - slow ingress.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361429.98 - 391785.02 Level: 10.57	Date 22/03/2022
Location: Warrington	Dimensions (m): 2.30 Depth 2.20		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.70  1.50	0.20	ES		0.30	10.27		MADE GROUND: Dark brown clayey fine to medium sand with frequent rootlets. (Reworked Topsoil).	
							Greyish brown clayey fine to medium SAND. (Land drain 0.70m bgl). (Running sand identified at 1.50m bgl).	1
	1.40	HVP	90	1.20	9.37		Stiff high strength slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone.	2
	1.80	HVP	113	2.20	8.37		End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 124

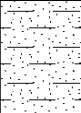
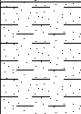
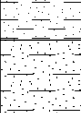


Trial Pit 124 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.70m bgl - land drain, seepage. 3. Running sand identified at 1.50m bgl. 4. Unstable from 0.45m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361432.28 - 391547.65 Level: 10.54	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.70 Depth 2.00		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.40	0.35			0.35	10.19		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
				0.80	9.74		Greyish brown clayey fine to medium SAND.	
	1.00	HVP	75				Stiff high strength grey mottled brown slightly gravelly very sandy CLAY. Gravel is fine to medium subangular to subrounded of mudstone and sandstone.	1
	1.30	ES		1.40	9.14		Reddish brown slightly clayey fine to medium SAND.	
	2.00			2.00	8.54		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 125



Trial Pit 125 Spoil

Remarks: 1. Complete. 2. Water strike at 1.40m bgl - perched above the CLAY - seepage.

Stability: Stable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361473.92 - 391594.35
Level: 10.42

Date
22/03/2022

Location: Warrington

Dimensions (m): 1.60

Scale
1:30

Client: Satnam Group

Depth
2.25

Logged
G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.15	ES		0.30	10.12		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
				1.20	9.22		Light grey slightly gravelly clayey fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.	1
				1.40	9.02		Very stiff brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone.	
							Reddish brown slightly clayey fine to medium SAND.	2
				2.25	8.17		End of Pit at 2.25m	3
								4

Trial Pit Photographs



Trial Pit 126



Trial Pit 126 Spoil

Remarks: 1. Complete. 2. Unstable from 0.45m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361279.40 - 391680.83 Level: 10.56	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 1.95 0.60		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.26		Dark grey sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50	HVP	66				Firm medium strength grey slightly sandy slightly gravelly CLAY with occasional lenses of red fine to medium SAND. Gravel is fine subangular to subrounded of sandstone and mudstone. Circa 1.00m bgl becomes stiff high strength.	1
	0.90 1.00	ES HVP	83					
	1.50	HVP	88					
	1.80	HVP	95					
				1.95	8.61		End of Pit at 1.95m	2
								3
								4

Trial Pit Photographs



Trial Pit 127

Trial Pit 127 Spoil

Remarks: 1.Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361325.62 - 391613.71 Level: 10.88	Date 23/03/2022
Location: Warrington		Dimensions (m): 1.90 Depth 2.05	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.30	10.58		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50	HVP	79				Stiff high strength grey mottled brown CLAY.	
	0.90	HVP	92					1
	1.40	HVP	85					
	1.80	HVP	94	2.05	8.83			
 1.95							End of Pit at 2.05m	2
								3
								4

Trial Pit Photographs



Remarks: 1. Complete. 2. Water strike encountered at 1.95m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361295.12 - 391531.52
Level: 10.76

Date
23/03/2022

Location: Warrington

Dimensions (m): 1.60

Scale
1:30

Client: Satnam Group

Depth
1.80

Logged
G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.46		Light grey slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
 0.60	0.60	HVP	79				Stiff high strength grey mottled brown slightly sandy CLAY.	
	1.20	ES						
	1.30	HVP	85					
	1.50	HVP	92					
 1.65				1.80	8.96		End of Pit at 1.80m	

Trial Pit Photographs



Trial Pit 129



Trial Pit 129 Spoil

Remarks: 1. Complete. 2. Water strike (seepage) encountered at 0.60m bgl and 1.65m bgl. 3. 0.00-0.30m bgl encountered as saturated.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361196.94 - 391544.44 Level: 10.68	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.10 0.60		Scale 1:30
Client: Satnam Group	Depth 1.85		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20	10.48		MADE GROUND: Dark brown sandy clay with frequent rootlets. (Reworked Topsoil).	
	0.50	HVP	107				MADE GROUND: Firm brown slightly sandy clay. (Land drain 0.40m bgl). (Reworked Clay).	
				0.70	9.98			
	1.00	D					Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and coal.	1
	1.50	ES						
				1.85	8.83		End of Pit at 1.85m	2
								3
								4

Trial Pit Photographs



Trial Pit 130



Trial Pit 130 Spoil

Remarks: 1. Complete. 2. CLAY too friable to complete Hand Shear Vane test.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361194.95 - 391595.64 Level: 10.99	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.90 0.60		Scale 1:30
Client: Satnam Group	Depth 1.80		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.15	10.84		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.40	HVP	116				Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and coal.	
	0.90	HVP	118					
	1.20	HVP	113					
				1.80	9.19			
							End of Pit at 1.80m	

Trial Pit Photographs



Trial Pit 131



Trial Pit 131 Spoil

Remarks: 1. Complete. 2. Beyond 1.40m bgl CLAY became to friable to complete Hand Shear Vane test.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361276.57 - 391583.22 Level: 11.05	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 2.00		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.40				0.35	10.70		MADE GROUND: Dark brown sandy clay with frequent rootlets. (Topsoil).	
				0.40	10.65			MADE GROUND: Grey mottled brown slightly sandy clay. (Land drain at 0.40m bgl). Stiff high strength grey mottled brown slightly sandy CLAY.
	0.60	HVP	83					
	0.75	ES						
	1.00	HVP	101					1
	1.40	HVP	126					
	1.90	HVP	140	2.00	9.05			
							End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 132



Trial Pit 132 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.40m bgl - land drain, slow ingress.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361262.38 - 391643.01 Level: 10.74	Date 23/03/2022
Location: Warrington		Dimensions (m): 1.80 Depth 2.05	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.25	10.49		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
				0.50	10.24		Brown clayey fine to medium SAND.	
	0.70	HVP	83				Stiff high strength brown mottled grey slightly sandy CLAY.	1
	1.30	HVP	106					
	1.70	HVP	118					
	2.00	HVP	126	2.05	8.69			2
							End of Pit at 2.05m	3
								4

Trial Pit Photographs



Trial Pit 133

Trial Pit 133 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361045.93 - 391781.58 Level: 11.15	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.80 0.60		Scale 1:30
Client: Satnam Group	Depth 1.90		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.10	0.20			0.20	10.95		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50	HVP	83				Stiff high strength grey mottled brown slightly sandy CLAY.	
	1.00	ES						1
	1.10	HVP	114					
	1.40	HVP	116					
	1.80	HVP	120	1.90	9.25			
	End of Pit at 1.90m							2
								3
								4

Trial Pit Photographs



Trial Pit 134



Trial Pit 134 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.10m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361072.74 - 391666.66 Level: 10.54	Date 23/03/2022
Location: Warrington		Dimensions (m): 2.00 Depth 2.10	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.20	10.34		MADE GROUND: Dark brown sandy clay with frequent rootlets (Reworked Topsoil).	
 0.40	0.40	HVP	57	0.60	9.94		MADE GROUND: Firm dark brown slightly sandy clay. (Land drain 0.40m bgl).	
 0.80	0.90	HVP	64				Firm medium strength grey CLAY.	1
	1.20	D						
	1.40	HVP	70					
	2.00	HVP	60	2.10	8.44		End of Pit at 2.10m	2
								3
								4

Trial Pit Photographs



Trial Pit 135

Trial Pit 135 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.40m bgl - land drain, moderate ingress and at 0.80m bgl - fast ingress with an organic odour.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361098.94 - 391616.85 Level: 11.20	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.80 0.60		Scale 1:30
Client: Satnam Group	Depth 2.00		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.90		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.60	HVP	94				Stiff high strength brown slightly sandy CLAY.	
	0.80	ES						1
	1.20	HVP	101					
	1.40	HVP	99					
	1.70	HVP	97					
				2.00	9.20		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 136



Trial Pit 136 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361148.67 - 391586.76 Level: 11.06	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.10 0.60 Depth 1.70		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.15	10.90		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL). Stiff high strength brown slightly sandy CLAY.	
	0.40	HVP	96					
	0.90	HVP	100					
	1.30	HVP	103					
	1.60	HVP	107	1.70	9.36		End of Pit at 1.70m	

Trial Pit Photographs



Trial Pit 137



Trial Pit 137 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361142.76 - 391679.79 Level: 11.12	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.00 0.60		Scale 1:30
Client: Satnam Group	Depth 1.75		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20	10.92		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50 0.60 0.60	HVP D ES	96				Stiff high strength brown mottled grey slightly sandy CLAY.	
	1.00	HVP	112					1
	1.50	HVP	144					
				1.75	9.37			
							End of Pit at 1.75m	2
								3
								4

Trial Pit Photographs



Trial Pit 138



Trial Pit 138 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361251.20 - 391489.04 Level: 10.56	Date 24/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 2.10		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.25	10.30		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.45	D		0.50	10.06		Firm light grey very sandy CLAY.	
	0.80	HVP	79				Stiff high strength brown mottled grey slightly sandy slightly gravelly CLAY with occasional lenses of brown fine to medium sand. Gravel is fine subangular to subrounded of mudstone, coal, and sandstone.	1
	1.20	HVP	85					
	1.70	HVP	86					
				2.10	8.46			2
							End of Pit at 2.10m	3
								4

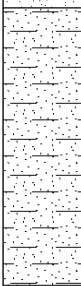
Trial Pit Photographs

	
Trial Pit 139	Trial Pit 139 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361148.82 - 391473.71 Level: 9.63	Date 24/03/2022
Location: Warrington		Dimensions (m): 1.90 Depth 2.40	Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40			0.40	9.23		Dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine subrounded of mudstone. (TOPSOIL).	
	0.80	D					Stiff brown slightly mottled grey slightly gravelly very sandy CLAY. Gravel is fine to medium subrounded of mudstone and sandstone.	1
	1.60	ES		1.30	8.33		Reddish brown slightly gravelly clayey fine to medium SAND. Gravel is fine subangular to subrounded of sandstone.	2
	2.00	B						
	2.40			2.40	7.23		End of Pit at 2.40m	3
								4

Trial Pit Photographs



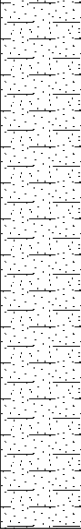
Trial Pit 140

Trial Pit 140 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 2.30m bgl - seepage. 3. Running sand identified at 2.30m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 360524.04 - 391776.73 Level: 14.26	Date 24/03/2022
Location: Warrington	Dimensions (m): 2.10 0.60		Scale 1:30
Client: Satnam Group	Depth 2.40		Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 2.10	0.20	ES		0.30	13.96		Dark brown slightly gravelly clayey fine to medium SAND with frequent rootlets. Gravel is fine subangular to subrounded of sandstone. (TOPSOIL).	
	1.50	B					Brown slightly clayey fine to medium SAND.	1
				2.40	11.86		End of Pit at 2.40m	2
								3
								4

Trial Pit Photographs



Trial Pit 141

Trial Pit 141 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 2.10m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 360641.23 - 391696.27 Level: 10.83	Date 24/03/2022
Location: Warrington	Dimensions (m): 1.70 Depth 2.00		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.30	10.53		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.70	B		1.10	9.73		Light greyish brown slightly clayey fine to medium SAND.	1
	1.40	HVP	73				Firm medium strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. Circa 1.80m bgl becomes stiff high strength.	
	1.80	HVP	100	2.00	8.83		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



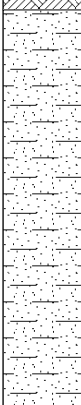
Trial Pit 142

Trial Pit 142 Spoil

Remarks: 1. Terminated due to instability. 2. Unstable from 0.40m bgl. 3. Trial pit collapsed to a depth of 1.60m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 360837.22 - 391749.70 Level: 10.10	Date 24/03/2022
Location: Warrington	Dimensions (m): 2.20 Depth 1.90		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	9.80		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
							Light greyish brown slightly clayey fine to medium SAND.	1
	1.80	ES		1.90	8.20		End of Pit at 1.90m	2
								3
								4

Trial Pit Photographs



Trial Pit 143

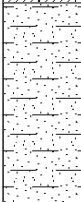
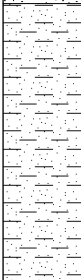


Trial Pit 143 Spoil

Remarks: 1. Terminated due to instability. 2. Unstable from 0.40m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 360750.56 - 391864.58 Level: 12.24	Date 24/03/2022
Location: Warrington	Dimensions (m): 2.30 Depth 2.20		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30	11.94		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
							Light greyish brown slightly clayey fine to medium SAND.	1
	1.30 1.40	D HVP	69	1.10	11.14		Firm medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. Circa 1.90m bgl becomes stiff high strength.	2
	1.90	HVP	110	2.20	10.04		End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 144

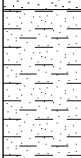


Trial Pit 144 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 360863.55 - 391866.81 Level: 10.93	Date 24/03/2022
Location: Warrington	Dimensions (m): 1.70 Depth 1.70		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.25	10.68		Dark brown very clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
							Light grey slightly clayey fine to medium SAND.	
	1.40 1.50	HVP ES	110	1.10	9.83		Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone.	1
				1.70	9.23		End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



Trial Pit 145



Trial Pit 145 Spoil

Remarks: 1. Terminated due to instability. 2. Unstable from 0.35m bgl.

Stability: Unstable.

				Trial Pit Log				TrialPit No TP146 Sheet 1 of 1	
Project Name: Peel Hall				Project No. 15740		Co-ords: 360941.58 - 391824.48 Level: 10.34		Date 24/03/2022	
Location: Warrington						Dimensions (m): 1.80 0.60		Scale 1:30	
Client: Satnam Group						Depth 1.75		Logged G. CALVERT	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.45	0.20	ES		0.30	10.04		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	1 2 3 4
							Light brownish grey clayey fine to medium SAND. (Running sand identified at 1.45m bgl).	
							Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone.	
						End of Pit at 1.75m		
	1.70	HVP	81	1.60 1.75	8.74 8.59			

Trial Pit Photographs



Trial Pit 146 Spoil



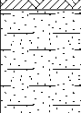
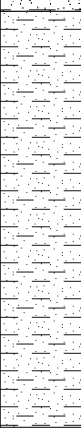
Trial Pit 146 Spoil

Remarks: 1. Terminated due to instability. 2. Running sand identified at 1.45m bgl. 3. Unstable from 0.35m bgl.

Stability: **Unstable.**



Project Name: Peel Hall	Project No. 15740	Co-ords: 360954.70 - 391768.69 Level: 10.36	Date 24/03/2022
Location: Warrington	Dimensions (m): 2.30 Depth 2.40		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.80				0.30	10.06		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.50	B					Light brownish grey slightly clayey fine to medium SAND.	
	0.75			0.75	9.61			
	0.90	ES					Firm medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone. Circa 1.70m bgl becomes stiff high strength.	1
	1.20	HVP	62					
	1.70	HVP	83					
	2.00	HVP	83					2
	2.30	HVP	94	2.40	7.96		End of Pit at 2.40m	3
								4

Trial Pit Photographs



TP147



TP147 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.80m bgl - see page.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 360976.68 - 391718.67 Level: 10.33	Date 24/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 2.50		Scale 1:30
Client: Satnam Group			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.25	0.20	ES		0.30	10.02		Very dark brown sandy CLAY with frequent root and rootlets. (TOPSOIL).	
	0.60	HVP	83				Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone.	1
	1.40	HVP	16	1.20	9.12		Very soft very low strength dark grey CLAY with frequent organic matter. (Suspected infilled pond).	
	1.60	D						
	1.80	ES						
	1.80	HVP	15					2
				2.50	7.82		End of Pit at 2.50m	3
								4

Trial Pit Photographs



Trial Pit 148

Trial Pit 148 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.25m bgl - slow ingress. 3. CLAY becomes too soft to complete Hand Shear Vane tests beyond 1.50m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361907.85 - 391754.43 Level: 16.11	Date 21/03/2022
Location: Warrington		Dimensions (m): 0.60 1.00	Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20			0.20	15.91		MADE GROUND: Dark brown clay with frequent rootlets. (Reworked topsoil).	
	0.40	ES		0.60	15.51		MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of brick and sandstone.	
	1.00	HVP	92				Stiff high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone.	1
	1.50	HVP	94					
	1.80			1.80	14.31		End of Pit at 1.80m	2
								3
								4

Trial Pit Photographs



Trial Pit 201



Trial Pit 201 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361850.02 - 391692.27
Level: 14.60

Date
21/03/2022

Location: Warrington

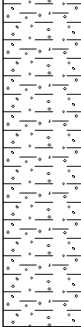
Dimensions (m): 1.00

Scale
1:30

Client: Satnam Group

Depth
1.60

Logged
H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	14.30		Dark brown sandy CLAY with frequent rootlets (TOPSOIL).	
	0.60	ES					Stiff high strength brown grey mottled slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	1
	1.00	HVP	111					
	1.50	HVP	102	1.60	13.00		End of Pit at 1.60m	2
								3
								4

Trial Pit Photographs



Trial Pit 202



Trial Pit 202 Spoil

Remarks: 1. Complete.

Stability: Stable.

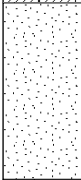
Project Name: Peel Hall	Project No. 15740	Co-ords: 361765.53 - 391738.72 Level: 13.81	Date 22/03/2022
Location: Warrington		Dimensions (m): 2.10 0.70	Scale 1:30
Client: Satnam Group		Depth 2.00	Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼ 1.90				0.30	13.51		Dark brown sandy CLAY with frequent rootlets (TOPSOIL).	
							Firm dark brown sandy CLAY.	
				0.60	13.21		Brown clayey fine to medium SAND.	
				2.00	11.81		End of Pit at 2.00m	
								1
								2
								3
								4

Remarks: 1. Complete. 2. Running sand at 1.90 m bgl. 3. BRE365 Soakaway testing undertaken in trial pit.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361806.02 - 391806.26 Level: 16.28	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.00 0.60		Scale 1:30
Client: Satnam Group	Depth 1.50		Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30	15.98		Dark brown slightly gravelly fine to medium SAND with frequent rootlets. Gravel is fine to medium subangular to subrounded of sandstone (TOPSOIL).	
							Light brown fine to medium SAND.	
				1.00	15.28		Brown fine to medium SAND.	1
				1.50	14.78		End of Pit at 1.50m	2
								3
								4

Trial Pit Photographs



Trial Pit 204



Trial Pit 204 Spoil

Remarks: 1. Terminated due to instability.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361737.47 - 391815.62 Level: 15.22	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.50 0.60		Scale 1:30
Client: Satnam Group	Depth 1.50		Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.40	0.10	ES		0.30	14.92		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
				0.50	14.72		Brown slightly clayey fine to medium SAND.	
	0.70	B					Brown fine to medium SAND.	1
				1.50	13.72		End of Pit at 1.50m	2
								3
								4

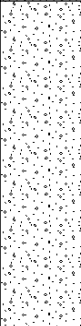
Trial Pit Photographs



Remarks: 1. Terminated due to instability. 2. Running sand encountered at 1.40m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361711.68 - 391849.75 Level: 15.25	Date 22/03/2022
Location: Warrington		Dimensions (m): 1.50 Depth 1.70	Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.70	1.00	ES		0.40	14.85		Dark brown fine to medium SAND with frequent rootlets. (TOPSOIL).	1
							Light brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
				1.70	13.55		End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



Trial Pit 206

Trial Pit 206 Spoil

Remarks: 1. Complete. 2. Running sand at 1.70m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361634.41 - 391696.80 Level: 11.26	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.50 0.60		Scale 1:30
Client: Satnam Group	Depth 1.80		Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.90				0.20	11.06		MADE GROUND: Dark brown slightly sandy gravelly clay with frequent rootlets. (Reworked topsoil).	
	0.40	ES		0.30	10.96		MADE GROUND: Dark brown slightly sandy gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone and brick with rare fragments of glass. Brown slightly gravelly clayey fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mudstone and sandstone.	
	0.80	ES						
	1.50	HVP	100	1.00	10.26		Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded of mudstone and sandstone.	1
	1.80	HVP	135	1.80	9.46		End of Pit at 1.80m	2
								3
								4

Trial Pit Photographs



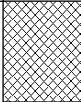
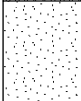
Trial Pit 207

Trial Pit 207 Spoil

Remarks: 1. Complete. 2. Running sand at 0.90m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361566.35 - 391748.94 Level: 10.83	Date 22/03/2022
Location: Warrington		Dimensions (m): 1.00 0.60	Scale 1:30
Client: Satnam Group		Depth 2.00	Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.40	0.10	ES					MADE GROUND: Dark brown slightly sandy clay with frequent rootlets. (Reworked Topsoil).	
	0.50	B		0.40	10.43		Light brown fine to medium SAND.	
	0.90	ES		0.80	10.03		Stiff brown sandy CLAY.	1
				2.00	8.83		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 208

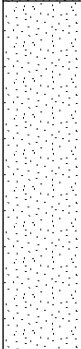


Trial Pit 208 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.40m bgl, land drain - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 362005.18 - 391590.76 Level: 13.85	Date 22/03/2022
Location: Warrington	Dimensions (m): 1.00 Depth 1.80		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.10	0.20	ES		0.40	13.45		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.80	ES		1.80	12.05		Brown fine to medium SAND.	1
							End of Pit at 1.80m	2
								3
								4

Trial Pit Photographs



Trial Pit 209



Trial Pit 209 Spoil

Remarks: 1. Complete. 2. Running sand encountered at 1.10m bgl.

Stability: Unstable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361304.05 - 391725.20
Level: 10.61

Date
23/03/2022

Location: Warrington

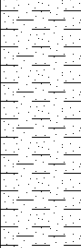
Dimensions (m): 1.00

Scale
1:30

Client: Satnam Group

Depth
1.70

Logged
H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.70	0.20	ES		0.40	10.21		Dark brown sandy CLAY with frequent rootlets (TOPSOIL)..	
				0.70	9.91		Light brown slightly clayey fine to medium SAND.	
	1.00	HVP	55				Firm medium strength brown sandy CLAY. Circa 1.50m bgl becomes stiff high strength.	1
	1.50	HVP	89	1.70	8.91		End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



Trial Pit 210

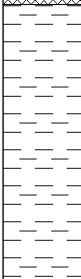


Trial Pit 210 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.70m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361229.03 - 391683.70 Level: 10.41	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.50 Depth 1.70		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	ES		0.30	10.11		MADE GROUND: Dark brown slightly sandy CLAY with frequent rootlets. (Reworked topsoil).	
				0.60	9.81		MADE GROUND: Brown clay with occasional cobbles. Cobbles are subangular to angular of brick.	
				1.70	8.71		Stiff brown CLAY.	1
							End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



Trial Pit 211



Trial Pit 211 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361199.00 - 391758.52 Level: 10.71	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.50 Depth 1.40 0.60		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼ 1.40	0.20	ES		0.30	10.41		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
	0.50	HVP	127				Stiff high strength brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
	1.00	HVP	122					1
				1.40	9.31		End of Pit at 1.40m	2
								3
								4

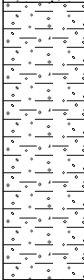
Trial Pit Photographs

	
Trial Pit 212	Trial Pit 212 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.40m bgl (seepage). 3. Clay too friable to complete Hand Shear Vane tests after 1.00m bgl.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361160.38 - 391785.66 Level: 10.70	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.50 0.60		Scale 1:30
Client: Satnam Group	Depth 1.60		Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40	ES		0.30	10.40		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
				0.50	10.20		Light brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
	1.00 1.00	B HVP	103				Stiff high strength brown grey mottled slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	1
	1.50	HVP	130	1.60	9.10		End of Pit at 1.60m	2
								3
								4

Trial Pit Photographs



Trial Pit 213

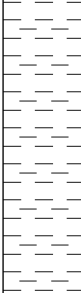


Trial Pit 213 Spoil

Remarks: 1. Complete.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361212.32 - 391813.06 Level: 10.57	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 1.70 0.60		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30	10.27		Dark brown fine to medium SAND with frequent rootlets (TOPSOIL).	
				0.50	10.07		Light brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
							Stiff high strength brown CLAY.	
	1.00	HVP	148					1
	1.50	HVP	160					
 1.70				1.70	8.87		End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



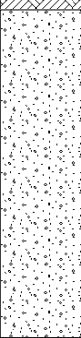
Trial Pit 214

Trial Pit 214 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.70m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361287.85 - 391822.59 Level: 10.55	Date 23/03/2022
Location: Warrington	Dimensions (m): Depth 1.60		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.50	0.10	ES		0.30	10.25		Dark brown fine to coarse SAND with frequent rootlets. (TOPSOIL).	
	0.80	B		1.60	8.95		Light brown slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	1
							End of Pit at 1.60m	2
								3
								4

Trial Pit Photographs



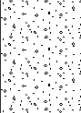
Trial Pit 215

Trial Pit 215 Spoil

Remarks: 1. Terminated due to instability. 2. Running sand encountered at 0.50m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361279.74 - 391866.33 Level: 10.43	Date 23/03/2022
Location: Warrington	Dimensions (m): 1.50 Depth 2.00 0.60		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.70	0.30			0.30	10.13		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
	0.50	ES					Light brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
	0.80			0.80	9.63			
	1.00	HVP	93				Stiff high strength brown CLAY.	1
	1.50	HVP	95					
	2.00	HVP	150	2.00	8.43		End of Pit at 2.00m	2
								3
								4

Trial Pit Photographs



Trial Pit 216

Trial Pit 216 Spoil

Remarks: 1. Complete. 2. Running sand encountered at 0.70m bgl.

Stability: Unstable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361145.12 - 391824.53 Level: 10.46	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 1.70		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.70	0.20	ES		0.30	10.16		Dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. (TOPSOIL).	
	0.50	HVP	130				Stiff high strength brown CLAY.	
	1.00	HVP	89					1
	1.50	HVP	135					
				1.70	8.76		End of Pit at 1.70m	2
								3
								4

Trial Pit Photographs



Trial Pit 217



Trial Pit 217 Spoil

Remarks: 1. Complete. 2. Water encountered in the bottom of the pit at 1.70m bgl - seepage.

Stability: Stable.

Project Name: Peel Hall	Project No. 15740	Co-ords: 361094.50 - 391888.20 Level: 10.76	Date 23/03/2022
Location: Warrington	Dimensions (m): 2.00 Depth 1.80		Scale 1:30
Client: Satnam Group			Logged H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 0.30	0.20	ES		0.30	10.46		MADE GROUND: Dark brown gravelly clay with frequent rootlets. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. (TOPSOIL).	
							Stiff brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
	1.20	B		1.80	8.96		End of Pit at 1.80m	

Trial Pit Photographs



Trial Pit 218



Trial Pit 218 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 0.30m bgl, land drain - seepage.

Stability: Stable.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361067.11 - 391769.19
Level: 11.15

Date
23/03/2022

Location: Warrington

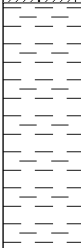
Dimensions (m): 2.00

Scale
1:30

Client: Satnam Group

Depth
1.30

Logged
H. MASON

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.85		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
	0.50 0.50	ES HVP	106				Stiff high strength brown grey mottled CLAY.	1
	1.00	HVP	127					
				1.30	9.85		End of Pit at 1.30m	2 3 4

Trial Pit Photographs



Trial Pit 219



Trial Pit 219 Spoil

Remarks: 1. Complete. 2. Slow to excavate through stiff CLAY.

Stability: Stable.

Borehole Log

Borehole No.

WS101

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362070.98 - 391937.54

Hole Type
WS

Location: Warrington

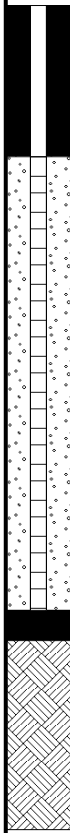
Level: 16.52

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30	16.22		Dark brown sandy CLAY with frequent rootlets (TOPSOIL).	
					0.80	15.72		Brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of brick, coal, and sandstone.	
		1.00	ES	N=8 (3,3/2,2,2,2)				Stiff medium strength brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	1
		1.40							
		2.00		N=9 (2,3/3,2,2,2)	1.80	14.72		Brown fine to medium SAND.	2
					2.00	14.52		Stiff medium strength brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone. (Becoming firm low strength at circa 4.00m bgl, and then becoming stiff medium strength circa 5.00m bgl).	
		3.00		N=11 (2,2/3,3,3,2)					3
		4.00		N=9 (3,3/2,3,2,2)					4
		5.00		N=12 (3,4/4,3,2,3)					5
					5.45	11.07		End of borehole at 5.45 m	6

Remarks

1. Complete. 2. Water strike encountered at 3.00m bgl. 3. Monitoring well installed. 4. Response zone 1.00 m - 4.00 m bgl. 5. Saturated from 3.00m bgl.

Borehole Log

Borehole No.

WS102

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362064.14 - 391822.18

Hole Type
WS

Location: Warrington

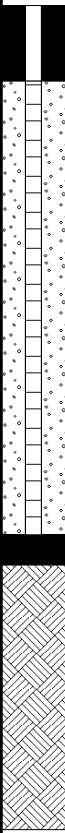
Level: 17.71

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.30	17.41		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	
								Orange slightly clayey fine to medium SAND.	
		1.00		N=9 (2,2/2,2,2,3)	0.90	16.81		Loose orange fine to medium SAND.	1
					1.20	16.51		Loose brown fine to medium SAND. (Becoming medium dense circa 2.00m bgl).	
		2.00		N=11 (4,4/3,4,2,2)					2
		3.00		N=15 (4,4/5,3,3,4)					3
		4.00		N=16 (4,5/5,4,4,3)					4
		5.00		N=14 (3,2/4,4,3,3)					5
					5.45	12.26		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered at 2.00 m bgl. 3. Monitoring well installed. 4. Response zone 0.50 - 3.50 m bgl. 4. Saturated SAND from 2.00m bgl.

Borehole Log

Borehole No.

WS103

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361895.94 - 391832.63

Hole Type
WS

Location: Warrington

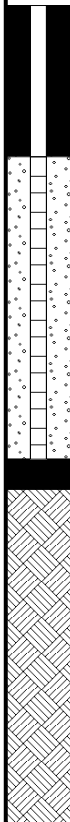
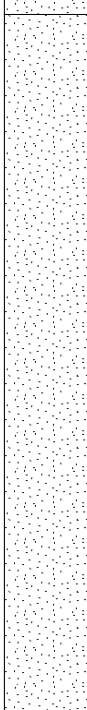
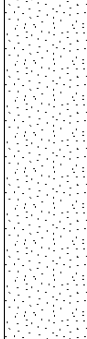
Level: 17.76

Scale
1:50

Client: Satnam Group

Dates: 22/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES	N=12 (1,2/2,3,3,4)	0.30	17.46		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	1
		0.90			0.80	16.96		Light brown fine to medium SAND.	
		1.00						Medium dense brown fine to medium SAND. (Becoming loose circa 2.00m bgl and then becoming medium dense circa 4.00m bgl).	
		2.00							
		3.00							
		4.00		N=13 (2,2/3,3,4,3)					4
		5.00							5
					5.45	12.31			6
								End of borehole at 5.45 m	7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 1.00 - 3.00 m bgl.

Borehole Log

Borehole No.

WS104

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361988.84 - 391917.51

Hole Type
WS

Location: Warrington

Level: 17.85

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30	17.55		MADE GROUND: Dark brown slightly gravelly clay with frequent rootlets. Gravel is fine to medium subangular to subrounded of brick.	
					0.60	17.25		MADE GROUND: Brown gravelly clay. Gravel is fine to coarse subangular to subrounded of brick, sandstone, and mudstone.	
		1.00		N=11 (2,2/3,2,3,3)				Medium dense brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	1
		2.00		N=12 (3,3/2,3,4,3)	2.00	15.85		No return. Assumed to be medium dense brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	2
		3.00		N=11 (4,4/3,2,3,3)	3.00	14.85		Loose brown fine to medium SAND. (Becoming medium dense circa 4.00m bgl).	3
		4.00		N=22 (4,5/5,4,6,7)					4
		5.00		N=20 (5,5/6,5,4,5)					5
					5.45	12.40		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered at 2.00 m bgl. 3. Saturated SAND from 2.00m bgl.

Borehole Log

Borehole No.

WS105

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361821.37 - 391883.87

Hole Type
WS

Location: Warrington

Level: 18.31

Scale
1:50

Client: Satnam Group

Dates: 22/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	ES		0.30	18.01		Dark brown fine to medium SAND with frequent rootlets (TOPSOIL).	
					0.80	17.51		Light brown fine to medium SAND.	
		1.00		N=7 (1,2/2,2,1,2)				Loose brown fine to medium SAND. (Becoming medium dense circa 3.00m bgl).	1
		2.00		N=10 (1,1/2,2,2,4)					2
		3.00		N=19 (1,3/4,4,5,6)					3
		4.00		N=23 (4,4/5,5,6,7)					4
		5.00		N=27 (4,5/6,6,7,8)					5
					5.45	12.86		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 0.50 - 2.50 m bgl. 4. Water strike at 1.00m and 3.00mbgl.

Borehole Log

Borehole No.

WS106

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361705.22 - 391920.83

Hole Type
WS

Location: Warrington

Level: 16.90

Scale
1:50

Client: Satnam Group

Dates: 22/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30	16.60		Dark brown CLAY with frequent rootlets (TOPSOIL).	
					0.50	16.40		Dark brown sandy CLAY.	
		1.00		N=8 (1,1/2,2,2,2)				Loose light brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone. (Becoming medium dense circa 3.00m bgl).	1
		2.00		N=8 (1,2/2,2,2,2)					2
		3.00		N=12 (2,2/2,3,3,4)					3
		4.00		N=15 (2,3/3,3,4,5)					4
		5.00		N=22 (4,4/5,6,5,6)					5
					5.45	11.45		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike at 2.00m bgl.



Borehole Log

Borehole No.

WS107

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361608.59 - 391722.68

Hole Type
WS

Location: Warrington

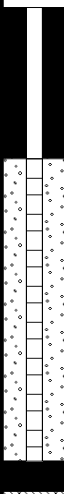
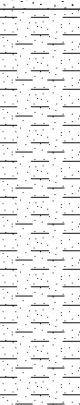
Level: 10.99

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	Elev. (m)
		Depth (m)	Type	Results					
		0.20	ES		0.30	10.69		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	1
					0.60	10.39		Grey fine to medium SAND.	
		1.00			N=6 (1,2/2,1,2,1)		Firm low strength brown sandy CLAY. (Becoming very stiff high strength circa 2.00m bgl and then becoming very stiff very high strength circa 3.00m bgl).		
		2.00		N=17 (2,3/3,4,4,6)					
		3.00		50 (15,10/50 for 95mm)					
				3.25	7.74		End of borehole at 3.25 m		

Remarks

1. Refused in very stiff CLAY. 2. Monitoring well installed. 3. Response zone 1.00 - 3.00m bgl.



Borehole Log

Borehole No.

WS108

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361593.00 - 391657.73

Hole Type
WS

Location: Warrington

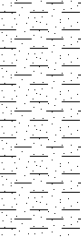
Level: 10.95

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30			0.30	10.65		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	
		1.00		N=10 (2,3/2,2,3,3)				Stiff medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone sandstone and coal.	1
		2.00		N=12 (3,3/4,2,3,3)	2.00	8.95		Medium dense reddish brown slightly clayey fine to coarse SAND. (Becoming dense circa 3.00m bgl).	2
		2.40	ES						
		3.00		50 (50 for 75mm/50 for 40mm)	3.12	7.83		End of borehole at 3.12 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 3.12m bgl.



Borehole Log

Borehole No.

WS109

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361526.88 - 391581.27

Hole Type
WS

Location: Warrington

Level: 10.26

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=15 (2,3/4,4,4,3)	0.30	9.96		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	1
		1.00			0.60	9.66		Light grey slightly clayey fine to medium SAND.	
									
		2.00		N=26 (6,5/6,6,7,7)					
		2.60		50 (50 for 75mm/50 for 75mm)	2.75	7.51			
								End of borehole at 2.75 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 2.75m bgl.



Borehole Log

Borehole No.

WS110

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361517.29 - 391502.37

Hole Type
WS

Location: Warrington

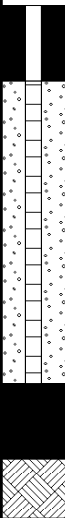
Level: 10.19

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25			0.25	9.94		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	
		0.60			0.60	9.59		Light brownish grey clayey fine to medium SAND.	
		1.00		N=9 (2,2/3,2,2,2)				Loose light brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone. (Becoming medium dense circa 2.00m bgl).	1
		1.40	ES						
		2.00		N=11 (3,3/2,2,3,4)					2
		3.00		50 (12,14/50 for 235mm)	3.00	7.19		Dense reddish brown slightly clayey fine to coarse SAND.	3
		3.39			3.39	6.80	End of borehole at 3.39 m		4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 3.39m bgl. 2. Water strike encountered at 1.00m bgl. 3. Monitoring well installed. 4. Response zone 0.50 - 2.50m bgl. 4. Saturated SAND at 1.00m and 2.00m bgl.

Borehole Log

Borehole No.

WS111

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361489.62 - 391639.26

Hole Type
WS

Location: Warrington

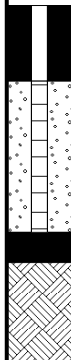
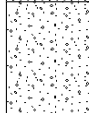
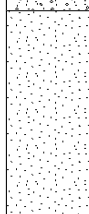
Level: 10.37

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.20	10.17		Dark brown CLAY with frequent rootlets (TOPSOIL).	
		1.00		N=13 (1,1/3,3,3,4)	1.00	9.37		Brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	1
		2.00		50 (4,8/50 for 230mm)	2.38	7.99		Medium dense reddish brown fine to medium SAND. (Becoming dense circa 2.00m bgl).	2
								End of borehole at 2.38 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND. 2. Monitoring well installed. 3. Response zone 0.50 - 1.50 m bgl.



Borehole Log

Borehole No.

WS112

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361349.59 - 391671.37

Hole Type
WS

Location: Warrington

Level: 10.61

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	ES		0.30	10.31		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
					0.60	10.01		Light greyish brown slightly clayey fine to medium SAND.	
		1.00		N=8 (1,2/2,1,2,3)				Stiff medium strength brown slightly sandy CLAY. (Becoming very stiff high strength circa 2.00m bgl).	1
		2.00		N=19 (2,3/3,3,4,9)					2
		2.70		50 (13,12/50 for 85mm)	2.70	7.91			
					2.94	7.67		Dense reddish brown clayey fine to coarse SAND.	3
								End of borehole at 2.94 m	
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 2.94m bgl. 2. Water strike encountered at 2.00m bgl.



Borehole Log

Borehole No.

WS113

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361366.40 - 391733.91

Hole Type
WS

Location: Warrington

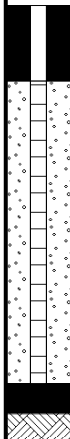
Level: 10.63

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES					Dark brown fine to medium SAND with frequent rootlets. (TOPSOIL).	
					0.30	10.33		Light grey fine to medium SAND.	
					0.60	10.03			
		1.00		N=6 (1,1/1,1,2,2)				Firm low strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of mudstone, sandstone and coal. (Becoming stiff medium strength circa 2.00m bgl).	1
		2.00		N=15 (1,2/2,3,4,6)					2
		2.60		50 (8,12/50 for 165mm)				Dense reddish brown slightly clayey fine to coarse SAND.	3
					2.80 2.92	7.83 7.71		End of borehole at 2.92 m	
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 2.92m bgl. 2. Monitoring well installed. 3. Response zone 0.50 - 2.50mbgl.

Borehole Log

Borehole No.

WS114

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361335.01 - 391581.22

Hole Type
WS

Location: Warrington

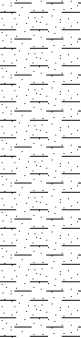
Level: 11.02

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25			0.25	10.77		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	
		0.80						Stiff medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone sandstone and coal. (Becoming very stiff high strength circa 2.00m bgl).	1
		1.00	ES	N=10 (3,2/3,3,2,2)					
		2.00		N=18 (4,3/4,5,5,4)					2
		2.60			2.60	8.42		Dense reddish brown slightly clayey fine to coarse SAND.	3
		3.00		50 (6,9/50 for 230mm)					
		3.38			3.38	7.64		End of borehole at 3.38 m	
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 3.38m bgl. 2. Water strike encountered at 3.00m bgl. 3. Saturated SAND from 3.00m bgl.



Borehole Log

Borehole No.

WS115

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361325.51 - 391507.27

Hole Type
WS

Location: Warrington

Level: 10.53

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=8 (1,1/2,2,2,2)	0.30	10.23		Dark brown slightly sandy CLAY with frequent rootlets (TOPSOIL).	1
					0.60	9.93		Grey fine to medium SAND.	
		1.00						Loose reddish brown slightly clayey fine to coarse SAND. (Becoming dense circa 2.00m bgl).	
		1.50	U						
		2.00		50 (5,8/50 for 235mm)	2.39	8.14		End of borehole at 2.39 m	
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 2.39m bgl. 2. Water strike encountered at 2.00m bgl. 3. Saturated SAND from 2.00m bgl.



Borehole Log

Borehole No.

WS116

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361150.74 - 391883.46

Hole Type
WS

Location: Warrington

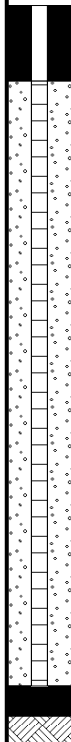
Level: 10.60

Scale
1:50

Client: Satnam Group

Dates: 25/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30	10.30		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
								Light brownish grey clayey fine to medium SAND.	
		1.00 1.20	ES	N=12 (1,2/2,3,3,4)	0.90	9.70		Stiff medium strength brown mottled grey CLAY.	1
		2.00		N=10 (2,2/2,3,2,3)	2.10	8.50		Stiff medium strength brown slightly sandy very gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. (Becoming firm low strength circa 3.00m bgl and then becoming very stiff very high strength circa 4.00m bgl).	2
		3.00		N=9 (1,1/2,2,2,3)					3
		4.00		N=48 (5,9/14,15,10,9)	4.40 4.50	6.20 6.10		Brown clayey fine to medium SAND.	4
		4.80		50 (25 for 20mm/50 for 225mm)	5.10	5.50		Very stiff very high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	5
								End of borehole at 5.10 m	
									6
									7
									8
									9
									10

Remarks

1. Refused due to sandstone cobble at 5.10m bgl. 2. Water strike encountered at 4.20m bgl. 3. Monitoring well installed. 4. Response zone 0.50m bgl - 4.50m bgl. 5. Saturated from 4.00m bgl.

Borehole Log

Borehole No.

WS117

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361131.22 - 391782.57

Hole Type
WS

Location: Warrington

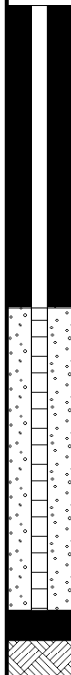
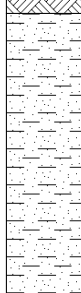
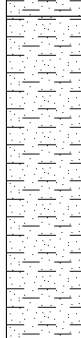
Level: 10.55

Scale
1:50

Client: Satnam Group

Dates: 25/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.35	10.20		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	1
		0.50	U					Firm low strength dark brown mottled grey slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone. Circa 2.00m bgl becomes stiff medium strength.	
		1.00		N=7 (1,1/1,2,2,2)	2.30	8.25		Stiff medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone. (Becoming very stiff very high strength circa 4.00m bgl).	2
		2.00		N=9 (1,2/2,2,2,3)					
		3.00		N=16 (3,2/3,3,5,5)					
		4.00		N=50 (5,6/8,11,16,15)	4.45	6.10		End of borehole at 4.45 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to sandstone cobble at 4.45m bgl. 2. Water strike encountered at 3.20m bgl. 3. Monitoring well installed. 4. Response zone 2.00m - 4.00m bgl. 5. Saturated from 3.00m bgl.

Borehole Log

Borehole No.

WS118

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361129.72 - 391725.10

Hole Type
WS

Location: Warrington

Level: 11.03

Scale
1:50

Client: Satnam Group

Dates: 25/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30	10.73		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL). Brown mottled grey CLAY.	
					0.80	10.23		Stiff medium strength brown mottled grey slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. (Becoming very stiff very high strength circa 4.00m bgl).	1
		1.00	ES	N=13 (2,2/3,3,3,4)					
		1.60							
		2.00		N=12 (2,2/2,3,3,4)					
		3.00	N=14 (1,2/3,3,4,4)						
		4.00	50 (4,10/50 for 290mm)						
					4.44	6.59		End of borehole at 4.44 m	
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to very stiff CLAY or possible sandstone cobble.

Borehole Log

Borehole No.

WS119

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361151.63 - 391628.98

Hole Type
WS

Location: Warrington

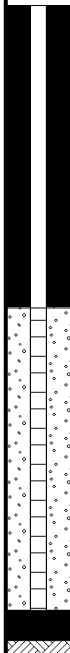
Level: 10.97

Scale
1:50

Client: Satnam Group

Dates: 25/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	10.77		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
		0.40	ES					Very stiff high strength brown mottled grey slightly sandy CLAY.	
		1.00		N=15 (2,2/3,4,4,4)					1
		1.50	ES						
		2.00		N=23 (3,4/4,5,6,8)	1.80	9.17			2
		3.00		N=27 (7,6/8,5,6,8)				Very stiff high strength brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine subangular of mudstone and sandstone. (Becoming very stiff very high strength circa 4.00m bgl).	3
		4.00		50 (7,10/50 for 160mm)	4.31	6.66			4
								End of borehole at 4.31 m	5
									6
									7
									8
									9
									10

Remarks

1. Refused due to dense SAND at 4.31m bgl. 2. Monitoring well installed. 3. Response zone 2.00m - 4.00m bgl.

Borehole Log

Borehole No.

WS120

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 360517.57 - 391783.05

Hole Type
WS

Location: Warrington

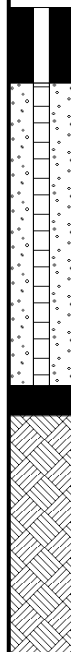
Level: 14.72

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30	14.42		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL). Brown fine to medium SAND.	
									
		1.00		N=8 (2,2/2,2,2,2)	0.90	13.82		Loose light brownish grey clayey fine to medium SAND. (Becoming medium dense circa 2.00m bgl).	1 –
		1.30	ES						
		2.00		N=19 (2,3/3,4,5,7)					
					2.80	11.92		Brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	3 –
		3.00		N=16 (3,3/3,4,5,4)	3.20	11.52			
								Medium dense light brownish grey clayey fine to medium SAND.	
		4.00		50 (5,9/50 for 155mm)	3.70	11.02		Very stiff very high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	4 –
					4.31	10.41			
End of borehole at 4.31 m									
								5 –	
								6 –	
								7 –	
								8 –	
								9 –	
								10 –	

Remarks

1. Refused due to very stiff CLAY at 4.31m bgl. 2. Water strike encountered at 2.00m bgl and 3.00m bgl. 3. Well collapsed to 2.50m bgl. 4. Monitoring well installed. 5. Response zone 0.50m - 2.50m bgl. 6. Saturated SAND at 3.20-3.70m bgl.

Borehole Log

Borehole No.

WS121

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 360698.80 - 391710.90

Hole Type
WS

Location: Warrington

Level: 10.96

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.40 0.55	10.56 10.41		MADE GROUND: Black slightly sandy gravel with rare rootlets. Gravel is fine of mudstone and sandstone with fragments of asphalt, clinker and ash. Dark brown very sandy CLAY. Loose light brownish grey clayey fine to medium SAND.	1
		1.00		N=9 (2,1/2,2,2,3)					
		2.00		N=5 (2,2/1,1,1,2)					2
		3.00		N=16 (2,3/3,4,4,5)	2.80 3.10	8.16 7.86		Brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone. Medium dense brown slightly clayey fine to medium SAND.	3
		4.00		N=7 (1,1/1,2,2,2)	4.00	6.96		No return. Assumed to be loose brown slightly clayey fine to medium SAND. (Becoming medium dense circa 5.00m bgl).	4
		5.00		N=17 (3,3/3,4,4,6)	5.45	5.51		End of borehole at 5.45 m	5
									6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered at 2.00 m bgl. 3. Well collapsed to 2.00m bgl. 4. Monitoring well installed. 5. Response zone 1.00m - 2.00m bgl.

Borehole Log

Borehole No.

WS122

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 360919.94 - 391867.38

Hole Type
WS

Location: Warrington

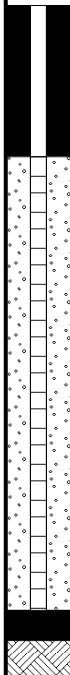
Level: 10.64

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.35			0.35	10.29		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
		0.80	ES					Loose light grey slightly clayey fine to medium SAND.	1
		1.00		N=6 (2,2/2,1,1,2)					
		2.00		N=12 (2,2/2,3,3,4)	2.00	8.64		Stiff medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular of sandstone and mudstone. (Becoming very stiff, very high strength circa 4.00m bgl).	2
		2.50	U						
		3.00		N=13 (2,2/3,3,3,4)					3
		4.00		N=50 (7,11/11,11,11,17)					4
		4.45			4.45	6.19		End of borehole at 4.45 m	5
									6
									7
									8
									9
									10

Remarks

1. Refused due to very stiff CLAY. 2. Water strike encountered at 1.80m bgl. 3. Monitoring well installed. 4. Response zone 1.00m - 4.00m bgl.

Borehole Log

Borehole No.

WS123

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361068.35 - 391716.35

Hole Type
WS

Location: Warrington

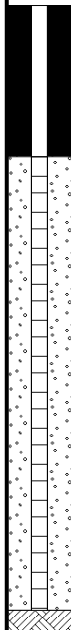
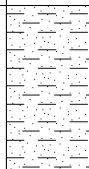
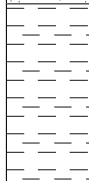
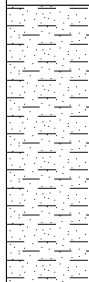
Level: 10.20

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	ES					Grey mottled brown slightly gravelly sandy CLAY with occasional pockets of organic matter. Gravel is fine subangular of sandstone.	
		1.00		N=4 (1,1/1,1,1,1)	1.10	9.10		Firm low strength grey CLAY with rare organic matter.	1
		1.50	ES						
		2.00		N=5 (0,0/1,1,1,2)	2.30	7.90		Very stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone. (Becoming very stiff very high strength circa 3.80m bgl).	2
		3.00		N=33 (3,3/5,5,13,10)					3
		3.80		50 (11,10/50 for 230mm)	4.18	6.02		End of borehole at 4.18 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused due to very stiff CLAY at 4.18m bgl. 2. Water strike encountered at 3.00m bgl. 3. Monitoring well installed. 4. Response zone 1.00-4.00m bgl.

Borehole Log

Borehole No.

WS201

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362318.18 - 391664.59

Hole Type
WS

Location: Warrington

Level: 15.48

Scale
1:50

Client: Satnam Group

Dates: 21/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.50	14.98		Dark brown sandy CLAY with frequent rootlets (TOPSOIL).	
		0.80	ES	N=11 (2,2/3,2,3,3)	1.10	14.38		Orangey brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	1
		1.00						Medium dense brown fine to medium SAND. (Circa 2.00m bgl becomes loose).	2
		2.00		N=10 (1,2/2,3,2,3)	2.60	12.88			
		3.00						Loose brown slightly clayey fine to medium SAND.	3
		3.60		N=11 (2,3/3,3,3,2)	3.60	11.88		Brown sandy CLAY.	
		4.00						Medium dense brown fine to medium SAND.	4
		5.00		N=13 (2,2/2,3,3,5)	4.00	11.48			
				N=19 (3,3/4,5,5,5)	5.45	10.03		End of borehole at 5.45 m	5

Remarks

1. Complete. 2. Water strike encountered at 1.00 m bgl.

Borehole Log

Borehole No.

WS202

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362314.07 - 391743.22

Hole Type
WS

Location: Warrington

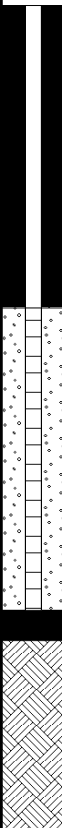
Level: 16.17

Scale
1:50

Client: Satnam Group

Dates: 21/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20	15.96		Dark brown CLAY with frequent rootlets (TOPSOIL).		
		0.60	ES		0.80	15.36		Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone.		
		1.00		N=13 (2,3/3,3,3,4)				Stiff medium strength brown grey mottled gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone, coal, and mudstone. (Becoming very stiff high strength circa 2.00 m bgl).	1	
		2.00		N=29 (3,6/5,6,7,11)					2	
		3.00		N=17 (3,3/5,4,4,4)	3.10	13.06			3	
		4.00		N=35 (4,6/10,9,8,8)					4	
		5.00		N=57 (4,6/9,11,13,24)	5.45	10.72			5	
		End of borehole at 5.45 m								6
										7
										8
								9		
								10		

Remarks

1. Complete. 2. Water strike encountered at 3.00m bgl. 3. Monitoring well installed. 4. Response zone 2.00m - 4.00 m bgl. 5. SAND saturated from 3.10m - 5.45m bgl.

Borehole Log

Borehole No.

WS203

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362129.91 - 391742.24

Hole Type
WS

Location: Warrington

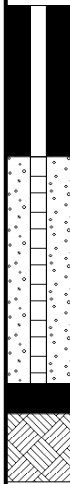
Level: 15.68

Scale
1:50

Client: Satnam Group

Dates: 21/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.20	15.48		Dark brown gravelly CLAY with frequent rootlets (TOPSOIL).	1
		0.70						Very stiff high strength brown mottled grey slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	
		1.00		N=15 (4,3/3,4,5,3)					
		2.00		N=17 (4,4/3,5,5,4)	2.00	13.68		Brown gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, coal, and mudstone.	2
		2.20			2.20	13.48		Medium dense brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. (Becoming dense circa 2.70m bgl).	3
		2.70		N=55 (7,8/12,13,17,13)					
					3.15	12.53		End of borehole at 3.15 m	
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble of sandstone. 2. Monitoring well installed. 3. Response zone 1.00m - 2.50m bgl.

Borehole Log

Borehole No.

WS204

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362224.42 - 391683.16

Hole Type
WS

Location: Warrington

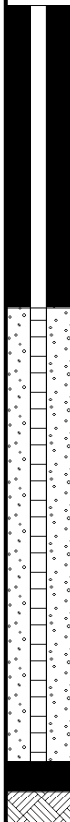
Level: 14.76

Scale
1:50

Client: Satnam Group

Dates: 21/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.20	14.56		Dark brown CLAY with frequent rootlets (TOPSOIL).	
		1.00	ES	N=13 (3,3/2,4,4,3)				Stiff medium strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and coal.	1
		1.10							
		2.00		N=13 (2,3/3,4,3,3)	2.20	12.56		Stiff medium strength dark brown slightly gravelly CLAY with pockets of organic material. Gravel is fine to coarse subangular to subrounded of coal, and sandstone.	2
		3.00		N=14 (3,4/4,3,3,4)	3.30	11.46			3
		4.00		N=15 (4,4/3,3,4,5)	4.00	10.76		Stiff medium strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and coal.	4
		5.00		N=18 (3,5/4,4,5,5)	5.45	9.31		Medium dense dark brown fine to medium SAND.	5
								End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered at 3.00 m bgl. 3. Monitoring well installed. 4. Response zone 1.00m - 5.00m bgl. 5. Saturated from 3.00m bgl.

Borehole Log

Borehole No.

WS205

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362052.11 - 391735.55

Hole Type
WS

Location: Warrington

Level: 16.76

Scale
1:50

Client: Satnam Group

Dates: 22/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.35	16.41		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
		1.00		N=9 (3,2/2,2,3,2)				Loose light brown slightly clayey fine to medium SAND.	1
		2.00		N=9 (2,2/2,3,2,2)	2.40	14.36			2
		3.00		N=10 (3,3/2,2,3,3)	3.20	13.56		Brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone, sandstone and coal.	3
		4.00		N=8 (3,3/2,2,2,2)				Loose brown slightly clayey fine to medium SAND.	4
		5.00		N=11 (3,4/4,3,2,2)	5.45	11.31			5
								End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered at 4.00m bgl. 3. Saturated SAND from 4.00m bgl.

Borehole Log

Borehole No.

WS206

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362033.81 - 391644.15

Hole Type
WS

Location: Warrington

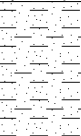
Level: 15.04

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
H. MORGAN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.40	14.64		Dark brown gravelly very sandy CLAY. Gravel is fine to medium subangular to rounded of sandstone and mudstone. (TOPSOIL)	1
		1.00		N=9 (1,2/2,2,2,3)	1.20	13.84		Loose orangey brown fine to medium SAND.	
		2.00		N=8 (2,1/2,2,2,2)	2.50	12.54		Loose brown fine to medium SAND.	2
		3.00		N=6 (1,2/1,1,2,2)	3.45	11.59		Firm low strength brown silty very sandy CLAY.	3
								End of borehole at 3.45 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Terminated due to blowing sands and unable to advance casing. 2. Water strike encountered at 1.50 m bgl.



Borehole Log

Borehole No.

WS207

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361956.35 - 391692.74

Hole Type
WS

Location: Warrington

Level: 16.14

Scale
1:50

Client: Satnam Group

Dates: 22/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES	N=9 (1,2/2,2,2,3)	0.30	15.84		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
		1.00						Stiff medium strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of mudstone and sandstone.	
		2.00			2.00	14.14		Medium dense brown clayey fine to medium SAND.	
		2.20						Brown sandy CLAY.	
		3.00			3.10	13.04		Medium dense brown clayey fine to medium SAND.	
		4.00			4.00	12.14		Stiff medium strength brown sandy CLAY.	
		5.00							
					5.45	10.69			
								End of borehole at 5.45 m	

Remarks

1. Complete.



Borehole Log

Borehole No.

WS208

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361942.59 - 391760.81

Hole Type
WS

Location: Warrington

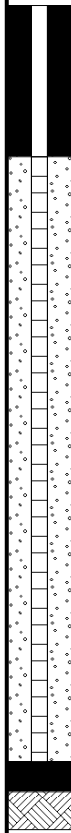
Level: 16.43

Scale
1:50

Client: Satnam Group

Dates: 22/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10	16.33		Brown sandy CLAY with frequent rootlets. (TOPSOIL).	
		0.30			0.30	16.13		Brown slightly sandy CLAY with organic matter.	
		0.50	U		0.40	16.03		Brown fine to medium SAND.	
		1.00		N=7 (1,2/2,2,1,2)	1.00	15.43		Firm low strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal.	1
		2.00		N=20 (3,3/4,5,5,6)	2.00	14.43		Firm low strength brown gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal.	2
		3.00		N=19 (3,4/5,4,5,5)	3.00	13.43		Very stiff high strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal.	3
		4.00		N=24 (3,4/5,6,6,7)	4.00	12.43		No return. Assumed to be very stiff, high strength brown gravelly CLAY.	4
		5.00		N=28 (4,5/6,7,8,7)	5.00	10.98		Very stiff high strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal.	5
					5.45			End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 1.00m - 5.00m bgl.

Borehole Log

Borehole No.

WS209

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361878.35 - 391695.00

Hole Type
WS

Location: Warrington

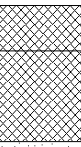
Level: 15.21

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
H. MORGAN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30			0.30	14.91		MADE GROUND: Dark brown gravelly very sandy clay. Gravel is fine to medium subangular to rounded of sandstone and mudstone. (Topsoil).	
		1.00			0.90	14.31		MADE GROUND: Orangey brown gravelly very sandy clay. Gravel is fine to medium subangular to rounded of sandstone and mudstone. (Land drain at 0.90m bgl).	1
		1.10	ES	N=11 (2,3/3,3,3,2)	1.20	14.01		Orangey brown gravelly very sandy CLAY. Gravel is fine to medium sub-angular to rounded of sandstone and mudstone.	
		2.00		N=13 (2,2/3,3,3,4)				Stiff medium strength brown very sandy gravelly CLAY. Gravel is subangular to rounded of sandstone and mudstone. (Becoming very stiff very high strength circa 4.00 m bgl).	2
		3.00		N=17 (2,3/3,4,5,5)					3
		4.00		50 (4,5/50 for 230mm)	4.38	10.83			4
								End of borehole at 4.38 m	5
									6
									7
									8
									9
									10

Remarks

1. Refused in very stiff CLAY at 4.38m bgl. 2. Water strike encountered at 0.90m bgl due to a land drain and at 4.00m bgl - seepage.

Borehole Log

Borehole No.

WS210

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361879.53 - 391643.08

Hole Type
WS

Location: Warrington

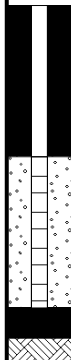
Level: 14.63

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
H. MORGAN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES	N=14 (3,3/3,4,4,3)	0.30	14.33		Dark brown gravelly very sandy CLAY with frequent rootlets. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. (TOPSOIL). Greyish brown slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. Medium dense orangish brown fine to coarse SAND. (Becoming dense circa 2.00 m bgl).	1
		0.60			0.60	13.83			
		1.00			1.00				
		2.00			2.00				
		2.38		50 (6,9/50 for 230mm)	2.38	12.25		End of borehole at 2.38 m	2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 2.38m bgl. 2. Water strike encountered at 1.80m bgl. 3. Monitoring well installed. 4. Response zone 1.00m - 2.00 m bgl.

Borehole Log

Borehole No.

WS211

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361799.98 - 391688.15

Hole Type
WS

Location: Warrington

Level: 13.39

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
H. MORGAN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	ES	N=8 (1,2/1,2,2,3)	0.40	12.99		Dark brown gravelly very sandy CLAY. Gravel is fine to medium subangular to rounded of sandstone and mudstone. (TOPSOIL).	1
		0.70			0.70	12.69		Firm brown very sandy CLAY.	
		1.00			1.00			Stiff medium strength orangish brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal.	
		1.10			1.10				
		2.00			1.90	11.49		Stiff medium strength brown gravelly very sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and coal.	
		3.00			2.90	10.49		Medium dense brown slightly gravelly fine to coarse SAND.	
		4.00			3.80	9.59		Very stiff very high strength brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
					4.38	9.01			
								End of borehole at 4.38 m	

Remarks

1. Refused in very stiff CLAY at 4.38m bgl. 2. Water strike encountered at 2.00m bgl.

Borehole Log

Borehole No.

WS212

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361470.17 - 391466.85

Hole Type
WS

Location: Warrington

Level: 10.10

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30	9.80		Dark brown CLAY with frequent rootlets. (TOPSOIL).	1
								Brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
		1.00		N=10 (3,2/2,2,3,3)	1.00	9.10		Stiff medium strength dark brown CLAY with frequent organics.	
					1.30	8.80		Brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
		2.00		N=28 (4,4/7,7,8,6)	2.00	8.10		Medium dense brown fine to medium SAND. (Becoming dense circa 2.70m bgl).	
		2.70		50 (11,16/50 for 165mm)	3.02	7.08			2
								End of borehole at 3.02 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 3.02m bgl.

Borehole Log

Borehole No.

WS213

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361428.59 - 391533.82

Hole Type
WS

Location: Warrington

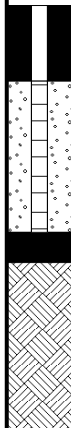
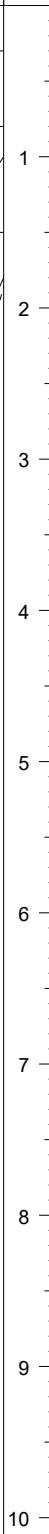
Level: 10.48

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
			ES	N=13 (1,1/2,2,4,5)	0.30	10.18		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
		0.90			0.80	9.68		Light brown slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded of sandstone.	
		1.00			1.00	9.48		Brown gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone.	
								Medium dense brown fine to medium SAND.	
		1.50			1.50	8.98		Very stiff very high strength brown gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone.	
					1.80	8.68		Red fine to coarse SAND.	
					1.86	8.62		End of borehole at 1.86 m	

Remarks

1. Refused on suspected weathered bedrock. 2. Monitoring well installed. 3. Response zone 0.50 - 1.50 m bgl.



Borehole Log

Borehole No.

WS214

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361373.22 - 391599.63

Hole Type
WS

Location: Warrington

Level: 10.42

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=8 (1,1/2,2,2,2) 50 (7,10/50 for 160mm)	0.30	10.12		Dark brown CLAY with frequent rootlets. (Topsoil).	1
		0.50	U					Brown CLAY.	
		1.00			1.00	9.42		Stiff medium strength brown sandy CLAY. (Becoming very stiff very high strength circa 1.80m bgl).	
		1.80			2.11	8.31		End of borehole at 2.11 m	
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in very stiff CLAY at 2.11m bgl.



Borehole Log

Borehole No.

WS215

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361232.86 - 391569.34

Hole Type
WS

Location: Warrington

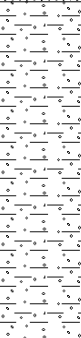
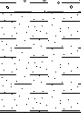
Level: 11.03

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	10.82		Brown CLAY with frequent rootlets. (TOPSOIL).	
		1.00		N=12 (1,2/2,3,3,4)				Stiff medium strength brown grey mottled slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	1
		2.00 2.10	ES	N=14 (1,2/3,3,3,5)					2
		3.00		50 (7,8/50 for 160mm)	2.50 3.16	8.52 7.86		Very stiff very high strength brown grey mottled slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	3
								End of borehole at 3.16 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Water strike encountered at 3.00m bgl.

Borehole Log

Borehole No.

WS216

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361278.00 - 391649.46

Hole Type
WS

Location: Warrington

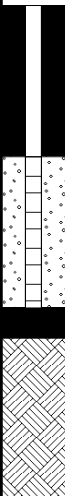
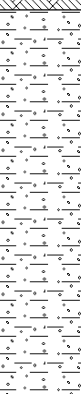
Level: 10.44

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.40	10.04		Brown CLAY with frequent rootlets. (TOPSOIL).	
		1.00		N=14 (3,3/2,3,4,5)				Stiff medium strength brown grey mottled gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal. (Becoming very stiff very high strength circa 2.00m bgl).	1
		2.00		N=47 (5,8/10,14,13,10)					2
		2.50	U						
		2.80		N=53 (7,8/16,19,12,6)	3.00	7.44		Dense brown red fine to medium SAND.	3
					3.25	7.19		End of borehole at 3.25 m	
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 3.25m bgl. 2. Water strike encountered at 2.80m bgl. 3. Monitoring well installed. 4. Response zone 1.00m - 2.00m bgl. 5. Saturated SAND from 3.00m bgl.

Borehole Log

Borehole No.

WS217

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361280.17 - 391617.39

Hole Type
WS

Location: Warrington

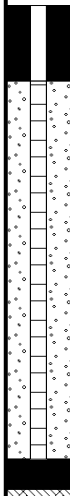
Level: 10.77

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	10.57		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
		1.00 1.00	ES	N=10 (1,2/2,3,2,3)				Stiff medium strength brown grey mottled gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. (Becoming very stiff high strength circa 2.00m bgl).	1
		2.00		N=17 (4,4/3,4,5,5)					2
		2.90		50 (10,13/50 for 225mm)	3.00	7.77		Dense red gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	3
		3.28			3.28	7.49		End of borehole at 3.28 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 3.28m bgl. 2. Water strike encountered at 2.00m bgl. 3. Monitoring well installed. 4. Response zone 0.50m - 3.00m bgl. 5. Saturated from 2.00m bgl.

Borehole Log

Borehole No.

WS218

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361220.86 - 391491.54

Hole Type
WS

Location: Warrington

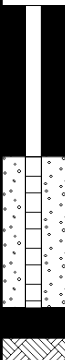
Level: 9.72

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES					Dark brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and coal. (TOPSOIL).	
					0.40	9.32			
					0.80	8.92		Dark brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of coal and sandstone.	
		1.00		N=7 (1,1/2,1,1,3)				Firm low strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	1
					1.80	7.92			
		2.00		50 (3,3/50 for 230mm)				Dense red gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	2
					2.38	7.34		End of borehole at 2.38 m	
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 2.38m bgl. 2. Water strike encountered at 1.00m bgl. 3. Monitoring well installed. 4. Response zone 1.00m - 2.00m bgl.

Borehole Log

Borehole No.

WS219

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361208.78 - 391625.43

Hole Type
WS

Location: Warrington

Level: 10.21

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.30	9.91		Dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is fine to fine to medium subangular to subrounded of sandstone and mudstone. (TOPSOIL).	
					0.80	9.41		Brown sandy CLAY.	
		1.00		N=5 (1,1/1,1,1,2)				Firm low strength brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. (Becoming stiff medium strength circa 2.00m bgl).	1
		2.00		N=14 (2,2/3,3,3,5)					2
		2.80		50 (9,11/50 for 230mm)	3.00	7.21		Dense reddish brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	3
					3.18	7.03		End of borehole at 3.18 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 3.18m bgl. 2. Water strike encountered at 2.80m bgl.

Borehole Log

Borehole No.

WS220

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361215.27 - 391742.33

Hole Type
WS

Location: Warrington

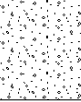
Level: 10.28

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60	ES	N=9 (1,2/2,3,2,2)	0.30	9.98		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	1
		1.00			1.50	8.78		Loose brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	
		2.00			2.45	7.82		Very stiff high strength brown CLAY.	
		3.00			3.15	7.12		Dense brown slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	
								End of borehole at 3.15 m	
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 3.15m bgl. 2. Water strike encountered at 2.00 m bgl. 3. Saturated from 2.00m bgl.

Borehole Log

Borehole No.

WS221

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361255.53 - 391805.71

Hole Type
WS

Location: Warrington

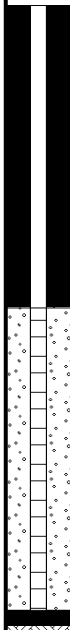
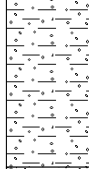
Level: 10.37

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.30	10.07		MADE GROUND: Brown slightly gravelly clay with frequent rootlets. Gravel is fine to coarse subangular to subrounded of brick. (TOPSOIL). Stiff medium strength brown grey mottled slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	1
		0.50	U						
		1.00		N=11 (1,1/2,3,3,3)					
		2.00		N=10 (1,1/2,2,2,4)	3.00 3.10	7.37 7.27		Red gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone. Very stiff high strength brown grey mottled slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone. (Circa 3.70m bgl becomes very stiff very high strength). Red gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	2
		3.00		N=22 (2,2/3,6,6,7)					
		3.70		N=50 (10,10/10,12,14,14)					
					4.00 4.15	6.37 6.22		End of borehole at 4.15 m	3
									4
									5
									6
									7
									8
									9
									10
									11

Remarks

1. Refused in dense SAND at 4.15m bgl. 2. Monitoring well installed. 3. Response zone 2.00m - 4.00m bgl.

Borehole Log

Borehole No.

WS222

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361406.52 - 391839.76

Hole Type
WS

Location: Warrington

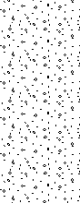
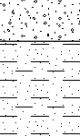
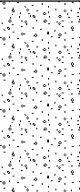
Level: 10.73

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description					
		Depth (m)	Type	Results									
					0.30	10.43		Dark brown CLAY with frequent rootlets. (Topsoil).					
		0.80	ES	N=14 (1,2/3,4,4,3)				Medium dense brown slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	1				
		1.00											
					1.80	8.93							
					2.00	8.73			2				
		2.00	N=18 (2,2/4,4,4,6)		2.00	8.73		Brown sandy CLAY.					
					2.30	8.43							
		3.00	N=18 (3,4/4,4,4,6)		3.00	7.73		Medium dense brown slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone. (Circa 4.00m bgl becomes dense).	3				
		4.00	50 (4,8/50 for 230mm)						4				
					4.38	6.35							
End of borehole at 4.38 m									5				
									6				
									7				
									8				
									9				
									10				

Remarks

1. Refused in dense SAND at 4.38m bgl. 2. Water strike encountered at 0.50m bgl.

Borehole Log

Borehole No.

WS223

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361344.03 - 391832.33

Hole Type
WS

Location: Warrington

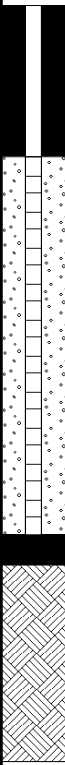
Level: 10.69

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.40	10.29		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
								Brown slightly clayey fine to medium SAND.	
		1.00		N=13 (2,2/3,3,3,4)	1.00	9.69		Medium dense brown gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	1
					1.60	9.09		Very stiff high strength brown sandy CLAY.	2
		2.00		N=18 (3,4/4,4,4,6)	2.40	8.29		Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
		3.00		N=22 (4,5/5,6,5,6)	3.00	7.69		No return. Assumed to be medium dense brown gravelly fine to coarse SAND (becoming dense circa 5.00 m bgl).	3
									
		4.00		N=25 (6,7/7,5,6,7)					4
									
		5.00		50 (50 for 75mm/50 for 75mm)	5.15	5.54			5
								End of borehole at 5.15 m	
									6
									7
									8
									9
									10

Remarks

1. Complete 2. Water strike encountered at 1.00m bgl. 3. Monitoring well installed. 4. Response zone 1.00m - 3.50m bgl. 5. Saturated throughout.

Borehole Log

Borehole No.

WS224

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361210.54 - 391869.53

Hole Type
WS

Location: Warrington

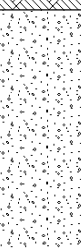
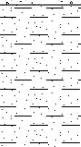
Level: 10.69

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40			0.40	10.29		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
		1.00		N=9 (1,2/2,3,2,2)				Loose brown gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone.	1
		1.60	ES						
		2.00		N=12 (3,3/2,3,3,4)	2.00	8.69		Stiff medium strength brown sandy CLAY.	2
		2.50	U						
		3.00		N=10 (2,2/3,3,2,2)	3.00	7.69		Loose brown gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded of sandstone. (Becoming medium dense circa 5.00 m bgl).	3
		4.00		N=11 (4,3/3,2,3,3)					4
		5.00		N=13 (5,4/4,3,3,3)					5
					5.45	5.24		End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered at 2.00m bgl. 3. Saturated from 2.00m bgl.

Borehole Log

Borehole No.

WS225

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361555.36 - 391867.13

Hole Type
WS

Location: Warrington

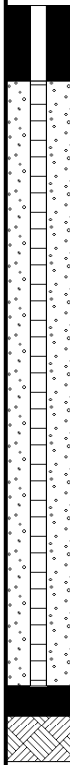
Level: 23.85

Scale
1:50

Client: Satnam Group

Dates: 28/03/2022 -

Logged By
G. CALVERT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=10 (1,1/2,2,3,3)	0.20	23.65		MADE GROUND: Dark brown slightly clayey fine to medium sand with occasional rootlets and fragments of brick.	1
		0.60			0.90	22.95		MADE GROUND: Grey mottled brown slightly gravelly sandy clay. Gravel is fine to medium subangular to subrounded of clinker, ash sandstone, mudstone and fragments of brick.	
		1.00			1.20	22.65		Grey mottled brown very slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	
		1.70			1.70	22.15		Medium dense light brownish grey slightly clayey fine to medium SAND.	
		2.00	ES	N=12 (2,3/3,3,3,3)	2.00	21.85		Grey mottled brown very slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	2
		2.40			2.40	21.85		Medium dense brown slightly clayey fine to medium SAND. (Becoming loose circa 3.00 m bgl).	
		3.00			3.00	21.85			3
		3.80			3.80	20.05			
		4.00			4.00	19.55		Stiff medium strength brown very sandy CLAY.	4
		4.30			4.30	19.55		Dense brown slightly clayey fine to medium SAND.	
		4.70			4.70	18.85			5
		5.00			5.00	18.85		End of borehole at 5.00 m	
									6
									7
									8
									9
									10

Remarks

1. Refused in dense SAND at 5.01m bgl. Water strike encountered at 2.20m bgl and 4.00m bgl. 3. Monitoring well installed. 4. Response zone 0.50m - 4.50m bgl.

Project Name: Peel Hall

Project No.
15740

Co-ords: 361991.91 - 391919.32
Level: 17.81

Date
21/03/2022

Location: Warrington

Dimensions (m): 2.50

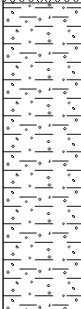
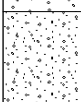
Scale
1:30

Client: Satnam Group

Depth
2.00

0.50

Logged
R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	17.51		MADE GROUND: Dark brown slightly sandy clay with frequent rootlets. (Reworked Topsoil).	
							Firm light brown slightly gravelly CLAY. Gravel is fine to coarse subangular to angular of sandstone.	1
				1.60	16.21		Light brown yellowish gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
				2.00	15.81		End of Pit at 2.00m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable



Trial Pit Log

TrialPit No
SA102
Sheet 1 of 1

Project Name: Peel Hall	Project No. 15740	Co-ords: 361759.47 - 391896.05 Level: 17.28	Date 21/03/2022
Location: Warrington		Dimensions (m): Depth 1.40	Scale 1:30
Client: Satnam Group		0.50 	Logged R. WEBSTER

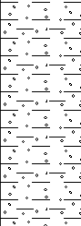
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	16.98		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
							Light brown orangey fine SAND.	1
				1.40	15.88		End of Pit at 1.40m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable



Project Name: Peel Hall	Project No. 15740	Co-ords: 361897.45 - 391630.99 Level: 14.71	Date 21/03/2022
Location: Warrington		Dimensions (m): 2.00	Scale 1:30
Client: Satnam Group		Depth 1.80	Logged R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	14.41		MADE GROUND: Dark brown slightly sandy clay with frequent rootlets. (Reworked topsoil).	
				0.50	14.21		MADE GROUND: Light brown orangey sandy clay. (Reworked clay).	
							Stiff orangey brown slightly gravelly CLAY. Gravel is fine to coarse subangular to angular of sandstone.	1
				1.50	13.21		Yellowish orange gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
				1.80	12.91		End of Pit at 1.80m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable



e3p

Trial Pit Log

TrialPit No
SA104
Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740Co-ords: 361770.58 - 391681.25
Level: 12.88Date
22/03/2022

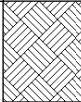
Location: Warrington

Dimensions (m): 0.65 2.20

Scale
1:30

Client: Satnam Group

Depth
1.60Logged
R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.40	12.48		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
				1.60	11.28		Brownish yellow fine to medium slightly clayey medium to coarse SAND with pockets of brown sandy CLAY.	1
							End of Pit at 1.60m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable





Trial Pit Log

TrialPit No
SA106
Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361482.85 - 391689.90
Level: 10.43

Date
22/03/2022

Location: Warrington

Dimensions (m):

2.00

Depth
1.30

0.80

Scale
1:30

Logged
R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.13		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
				0.50	9.93		Yellowish orange slightly silty fine to medium SAND.	
							Orangey brown slightly silty gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	1
				1.30	9.13		End of Pit at 1.30m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable





Trial Pit Log

TrialPit No
SA107
Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361274.07 - 391769.84
Level: 10.52

Date
23/03/2022

Location: Warrington

Dimensions (m):

2.00

Depth
1.50

0.65

Scale
1:30

Logged
R. WEBSTER

Client: Satnam Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.22		Dark brown slightly clayey medium SAND with frequent rootlets. (TOPSOIL).	
							Soft light brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	
				1.00	9.52		Light brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	1
				1.50	9.02		End of Pit at 1.50m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable





e3p

Trial Pit Log

TrialPit No
SA108
Sheet 1 of 1

Project Name: Peel Hall	Project No. 15740	Co-ords: 361458.93 - 391862.03 Level: 10.71	Date 23/03/2022
Location: Warrington	Dimensions (m): Depth 1.50		Scale 1:30
Client: Satnam Group	0.70 		Logged R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.41		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
							Stiff brown mottled blue CLAY.	1
				1.50	9.21		End of Pit at 1.50m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable



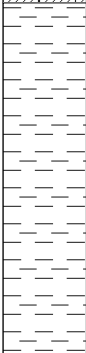


e3p

Trial Pit Log

TrialPit No
SA109
Sheet 1 of 1

Project Name: Peel Hall	Project No. 15740	Co-ords: 361151.44 - 391543.24 Level: 10.78	Date 23/03/2022
Location: Warrington		Dimensions (m): Depth 1.70	Scale 1:30
Client: Satnam Group			Logged R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.48		Dark brown CLAY with frequent rootlets. (TOPSOIL).	
							Stiff brown blue mottled grey CLAY.	1
				1.70	9.08		End of Pit at 1.70m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable





Trial Pit Log

TrialPit No
SA110
Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361029.86 - 391829.99
Level: 10.75

Date
24/03/2022

Location: Warrington

Dimensions (m):

1.80

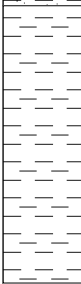
Scale
1:30

Client: Satnam Group

Depth
1.80

0.70

Logged
R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.45		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
				0.70	10.05		Stiff orangey yellow sandy CLAY.	
				1.80	8.95		Light brown orangey CLAY.	1
							End of Pit at 1.80m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable



Project Name: Peel Hall	Project No. 15740	Co-ords: 360740.13 - 391774.59 Level: 10.38	Date 24/03/2022
Location: Warrington		Dimensions (m): 0.70 1.70	Scale 1:30
Client: Satnam Group		Depth 1.40	Logged R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30	10.08		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
				0.50	9.88		Yellowish brown gravelly fine to medium SAND with pockets of firm brown sandy CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	
				1.10	9.28		Brownish orange slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	1
				1.40	8.98		Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	
							End of Pit at 1.40m	2
								3
								4

Remarks: 1. Complete.

Stability: Stable



e3p

Trial Pit Log

TrialPit No
SA112
Sheet 1 of 1Project
Name: Peel HallProject No.
15740Co-ords: 361369.00 - 391472.00
Level:Date
24/03/2022

Location: Warrington

Dimensions
(m):

1.80

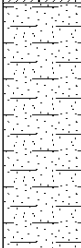
Scale
1:30

Client: Satnam Group

Depth
1.70

0.80

Logged
R. WEBSTER

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			Dark brown sandy CLAY with frequent rootlets. (TOPSOIL).	
							Yellowish orange slightly clayey fine to medium SAND.	1
				1.30			Firm orangey brown slightly sandy CLAY.	
				1.70			End of Pit at 1.70m	2
								3
								4

Remarks: 1. Complete

Stability: Stable



Borehole Log

Borehole No.

CP101

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 362033.70 - 391893.51

Hole Type
CP

Location: Warrington

Level: 17.15

Scale
1:50

Client: Satnam Group

Dates: 23/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30	16.85		Dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	
					0.70	16.45		Reddish brown sandy CLAY.	
		1.00		N=8 (2,2/2,1,2,3)				Loose brown fine to medium SAND.	1
		2.00		N=9 (2,2/2,3,2,2)					2
		3.00		N=21 (2,3/4,5,6,6)	3.20	13.95			3
		4.00		N=21 (3,4/4,5,6,6)				Very stiff high strength brown CLAY.	4
		5.00		52 (7,14/52 for 110mm)	4.80	12.35		Dense brown fine to medium SAND.	5
		6.00		50 (25 for 25mm/50 for 35mm)					6
					6.50	10.65		End of borehole at 6.50 m	7
									8
									9
									10

Remarks

1. Refused in dense SAND at 6.50m bgl. 2. Water strike at 3.00m bgl.

Borehole Log

Borehole No.

CP102

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361945.35 - 391625.05

Hole Type
CP

Location: Warrington

Level: 14.61

Scale
1:50

Client: Satnam Group

Dates: 24/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40	14.21		Dark brown clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
		1.00		N=7 (2,2/2,2,1,2)				Loose brown fine to medium SAND.	1
		2.00		N=9 (2,2/3,2,2,2)					2
		3.00		N=10 (2,2/1,2,5,2)					3
		4.00		N=18 (2,3/4,4,4,6)	4.10	10.51		Very stiff high strength firm brown CLAY. (Becoming very stiff very high strength circa 5.00 m bgl).	4
		5.00		N=45 (3,3/4,6,6,29)	5.50	9.11			5
		6.00		50 (25 for 20mm/50 for 20mm)	6.00	8.61		Greyish brown fine to medium SAND with frequent bands of brown sandy CLAY.	6
		7.00		50 (25 for 10mm/50 for 25mm)	7.00	7.61		Dense greyish brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	7
								End of borehole at 7.00 m	7
									8
									9
									10

Remarks

1. Refused in dense SAND at 7.00m bgl. 2. Water strike at 3.00 m bgl.

Borehole Log

Borehole No.

CP103

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 360824.57 - 391798.81

Hole Type
CP

Location: Warrington

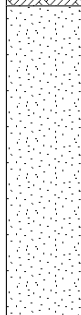
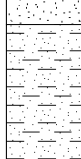
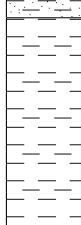
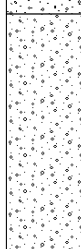
Level: 10.32

Scale
1:50

Client: Satnam Group

Dates: 25/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30	10.02		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL).	
		1.00		N=14 (2,2/3,4,4,3)				Medium dense brown fine to medium SAND.	1
		2.00		N=13 (2,2/2,5,3,3)					2
					2.50	7.82		Stiff medium strength brown sandy CLAY.	3
		3.00		N=15 (2,3/4,3,4,4)					
					3.50	6.82		Very stiff high strength brown CLAY.	4
		4.00		N=21 (3,4/4,5,6,6)					
					5.10	5.22		Dense reddish brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	5
		5.00		N=43 (4,5/10,10,11,12)					
					5.40	4.92		Dense reddish brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. (Weathered sandstone bedrock). (Becoming medium dense circa 7.00 m bgl).	6
		6.00		50 (25 for 95mm/50 for 40mm)					
					7.00	3.32		End of borehole at 7.00 m	7
		7.00		50 (25 for 20mm/50 for 30mm)					8
									9
									10

Remarks

1. Refused in dense GRAVEL at 7.00m bgl (weathered sandstone bedrock). 2. Water strike encountered at 0.50m bgl and 5.10m bgl.

Borehole Log

Borehole No.

RB101

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361123.68 - 391739.48

Hole Type
CP

Location: Warrington

Level: 10.92

Scale
1:50

Client: Satnam Group

Dates: 30/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	10.72		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL). Firm to stiff brown silty CLAY.	
		1.00		N=30 (3,5/6,7,8,9)	1.00	9.92		Very stiff very high strength brown silty CLAY.	1
		2.00		N=15 (2,3/4,3,3,5)	1.90	9.02		Stiff medium strength firm brown silty CLAY.	2
		3.00		N=15 (1,2/3,4,4,4)					3
		4.00		50 (3,5/50 for 275mm)	4.20	6.72			4
		5.00		50 (9,2/50 for 195mm)					5
		6.00		50 (10,12/50 for 160mm)					6
		7.00		40 (25 for 85mm/40 for 95mm)	7.25	3.67		Dense reddish brown slightly sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. (Weathered sandstone bedrock).	7
								End of borehole at 7.25 m	
									8
									9
									10

Remarks

1. Refused in GRAVEL at 7.25m bgl (weathered sandstone bedrock).

Borehole Log

Borehole No.

RB103

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361395.41 - 391832.22

Hole Type
CP

Location: Warrington

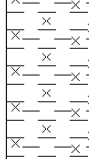
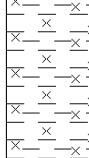
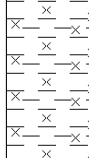
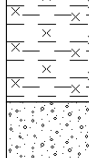
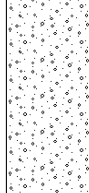
Level: 10.79

Scale
1:50

Client: Satnam Group

Dates: 31/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	10.59		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL). Very stiff high strength brown silty CLAY.	
		1.00		N=17 (2,3/4,4,4,5)					1
		1.50			1.50	9.29		Very stiff high strength brown silty CLAY. (becoming very stiff very high strength circa 3.00 m bgl).	
		2.00		N=29 (3,4/6,7,8,8)					2
		3.00		N=35 (5,6/8,8,9,10)					3
		4.00		N=44 (5,7/9,10,12,13)					4
		4.50			4.50	6.29		Dense reddish brown slightly sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. (Weathered sandstone bedrock).	5
		5.00		50 (10,15/50 for 120mm)					
		6.00		50 (25 for 80mm/50 for 100mm)	6.15	4.64		End of borehole at 6.15 m	6
									7
									8
									9
									10

Remarks

1. Refused in GRAVEL at 6.15m bgl (weathered sandstone bedrock).

Borehole Log

Borehole No.

RB104

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361320.39 - 391642.25

Hole Type
CP

Location: Warrington

Level: 11.02

Scale
1:50

Client: Satnam Group

Dates: 31/03/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	10.82		Dark brown slightly clayey fine to medium SAND with frequent rootlets. (TOPSOIL). Medium dense brown fine to medium SAND.	1
		1.00		N=22 (2,3/4,5,6,7)					2
		2.00		N=18 (2,3/4,4,4,6)					3
		2.60			2.60	8.42		Medium dense brown gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of sandstone.	4
		3.00		N=33 (3,5/7,8,8,10)					5
		3.70			3.70	7.32		Brown sandy CLAY.	6
		4.00		50 (6,10/50 for 195mm)	4.10	6.92		Dense reddish brown slightly sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. (Weathered sandstone bedrock).	7
		5.00		50 (25 for 85mm/50 for 130mm)	5.25	5.77		End of borehole at 5.25 m	8
									9
									10

Remarks

1. Refused in GRAVEL at 5.25m bgl (weathered sandstone bedrock).

Borehole Log

Borehole No.

RB105

Sheet 1 of 1

Project Name: Peel Hall

Project No.
15740

Co-ords: 361829.53 - 391756.43

Hole Type
CP

Location: Warrington

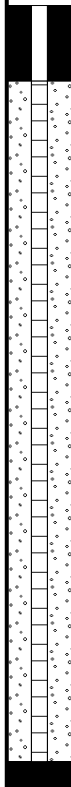
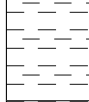
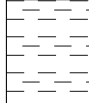
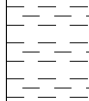
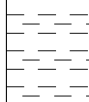
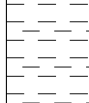
Level: 14.97

Scale
1:50

Client: Satnam Group

Dates: 01/04/2022 -

Logged By
H. MASON

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	14.77		Dark brown sandy CLAY with frequent rootlets. (TOPSOIL). Firm brown CLAY.	
		1.00		N=20 (2,3/5,5,5,5)	1.00	13.97		Very stiff high strength brown CLAY.	1
		2.00		N=25 (3,4/5,7,6,7)					2
		3.00		N=31 (2,4/6,7,8,10)					3
		4.00		50 (25 for 100mm/50 for 125mm)	3.80	11.17		Dense reddish brown slightly sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. (Weathered sandstone bedrock).	4
		5.00		50 (25 for 85mm/50 for 65mm)	5.25	9.72		End of borehole at 5.25 m	5
									6
									7
									8
									9
									10

Remarks

1. Refused in GRAVEL at 5.25m bgl (weathered sandstone bedrock). 2. Monitoring well installed. 3. Response zone 0.50m - 5.00m bgl.

APPENDIX VI

CHEMICAL TESTING

RESULTS



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Analytical Report Number : 22-56893

Replaces Analytical Report Number: 22-56893, issue no. 1
Client references/information amended.

Project / Site name:	Peel Hall	Samples received on:	06/05/2022
Your job number:		Samples instructed on/ Analysis started on:	06/05/2022
Your order number:	001538	Analysis completed by:	13/05/2022
Report Issue Number:	2	Report issued on:	13/05/2022
Samples Analysed:	4 water samples		


Signed:

Anna Goc
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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



Analytical Report Number: 22-56893

Project / Site name: Peel Hall

Your Order No: 001538

Lab Sample Number				2267761	2267762	2267763	2267764
Sample Reference				WS121	WS116	WS113	WS107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022	06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

General Inorganics

pH	pH Units	N/A	ISO 17025	7.3	7.3	7.3	7.1
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	5.05	4.78	7.24	4.19

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	2.3	1.8	1.3	1.4
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	130	130	150	160
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	1	2.4	0.24	0.59
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	0.04	0.04	0.07
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4	< 0.2	0.7	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.8	0.7	1.9	0.8
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	630	440	21	2000
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.8	3.6	3.1	14
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	0.8	0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.8	4	4.1	5.5

Monoaromatics & Oxygenates

Benzene	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
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

TPH1 (C10 - C40) EH_2D_TOTAL_#1_#2	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10



Environmental Science

Analytical Report Number: 22-56893

Project / Site name: Peel Hall

Your Order No: 001538

Lab Sample Number				2267761	2267762	2267763	2267764
Sample Reference				WS121	WS116	WS113	WS107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022	06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

VOCs

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



Environmental Science

Analytical Report Number: 22-56893

Project / Site name: Peel Hall

Your Order No: 001538

Lab Sample Number				2267761	2267762	2267763	2267764
Sample Reference				WS121	WS116	WS113	WS107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022	06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				
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

SVOCs

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-chloroethyl)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	< 0.05
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



Analytical Report Number: 22-56893

Project / Site name: Peel Hall

Your Order No: 001538

Lab Sample Number				2267761	2267762	2267763	2267764
Sample Reference				WS121	WS116	WS113	WS107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022	06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				
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	< 0.10

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

Analytical Report Number : 22-56893

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in 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
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
Monohydric phenols in water - LOW LEVEL 1 ug/l	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
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	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-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
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-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
Low level 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
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
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
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Analytical Report Number : 22-56893

Project / Site name: Peel Hall

Water matrix abbreviations:

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

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



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Analytical Report Number : 22-56904

Project / Site name:	Peelnall	Samples received on:	06/05/2022
Your job number:	15740	Samples instructed on/ Analysis started on:	06/05/2022
Your order number:	001538	Analysis completed by:	12/05/2022
Report Issue Number:	1	Report issued on:	12/05/2022
Samples Analysed:	2 water samples		

Signed:

Claire Brown-Crociquia
Group Customer Services Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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



Analytical Report Number: 22-56904

Project / Site name: Peelnall

Your Order No: 001538

Lab Sample Number				2267809	2267810
Sample Reference				WS119	WS102
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	6.7	6.7
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	16.4	15.5

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	1.4	1.2
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	56	58
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.56	2.74
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.07	0.13
Chromium (dissolved)	µg/l	0.2	ISO 17025	2.3	2.6
Copper (dissolved)	µg/l	0.5	ISO 17025	10	15
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	420	280
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	9.1	10
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.4	1.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	8.6	5.9

Monoaromatics & Oxygenates

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

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_2D_TOTAL_#1_#2	µg/l	10	ISO 17025	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10



Analytical Report Number: 22-56904

Project / Site name: Peelnall

Your Order No: 001538

Lab Sample Number				2267809	2267810
Sample Reference				WS119	WS102
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

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



Analytical Report Number: 22-56904

Project / Site name: Peelnall

Your Order No: 001538

Lab Sample Number				2267809	2267810
Sample Reference				WS119	WS102
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0



Analytical Report Number: 22-56904

Project / Site name: Peelall

Your Order No: 001538

Lab Sample Number				2267809	2267810
Sample Reference				WS119	WS102
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				06/05/2022	06/05/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

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



Analytical Report Number: 22-56904
 Project / Site name: Peelnall

Your Order No: 001538

Lab Sample Number				2267809	2267810			
Sample Reference				WS119	WS102			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				06/05/2022	06/05/2022			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
3&4-Methylphenol				µg/l	0.1	NONE	< 0.10	< 0.10

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



Analytical Report Number : 22-56904

Project / Site name: Peelnaill

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in 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
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
Monohydric phenols in water - LOW LEVEL 1 ug/l	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
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	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-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
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-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
Low level 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
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
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector



Analytical Report Number : 22-56904

Project / Site name: Peelnall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
GC	Gas Chromatography				
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))				
CU	Clean-up - e.g. by Florisil®, silica gel				
1D	GC - Single coil/column gas chromatography				
2D	GC-GC - Double coil/column gas chromatography				
Total	Aliphatics & Aromatics				
AL	Aliphatics				
AR	Aromatics				
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
-	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				



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Analytical Report Number : 22-48408

Project / Site name:	Peel Hall	Samples received on:	28/03/2022
Your job number:	15 740	Samples instructed on/ Analysis started on:	28/03/2022
Your order number:	PO001085	Analysis completed by:	04/04/2022
Report Issue Number:	1	Report issued on:	04/04/2022
Samples Analysed:	1 soil sample		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 22-48408

Project / Site name: Peel Hall

Your Order No: P0001085

Lab Sample Number				2219627
Sample Reference				WS116
Sample Number				None Supplied
Depth (m)				1.20
Date Sampled				25/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	19
Total mass of sample received	kg	0.001	NONE	0.4

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	260
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.058
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	120
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	58.3
Sulphide	mg/kg	1	MCERTS	< 1.0
Total Sulphur	mg/kg	50	MCERTS	120
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6

Total Phenols

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

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

Total PAH

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

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	43
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	44
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67

Analytical Report Number: 22-48408

Project / Site name: Peel Hall

Your Order No: P0001085

Lab Sample Number				2219627
Sample Reference				WS116
Sample Number				None Supplied
Depth (m)				1.20
Date Sampled				25/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10

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



Analytical Report Number : 22-48408
Project / Site name: Peel Hall

* 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 *
2219627	WS116	None Supplied	1.2	Brown clay and sand.

Analytical Report Number : 22-48408

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
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 Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

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

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

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

Analytical Report Number : 22-48408

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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



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Analytical Report Number : 22-48435

Project / Site name:	Peel Hall	Samples received on:	28/03/2022
Your job number:	15-740	Samples instructed on/ Analysis started on:	28/03/2022
Your order number:		Analysis completed by:	05/04/2022
Report Issue Number:	1	Report issued on:	05/04/2022
Samples Analysed:	1 leachate sample - 41 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219751	2219752	2219753	2219754	2219755
Sample Reference				WS201	WS201	WS203	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.80	1.00	0.40
Date Sampled				21/03/2022	21/03/2022	21/03/2022	22/03/2022	22/03/2022
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	16	13	12	14	23
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	7.0	8.2	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	310	64	< 50	< 50	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0069	0.0028	0.0014	0.0025	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	14	5.6	2.7	5	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	6.9	2.8	1.4	2.5	-
Sulphide	mg/kg	1	MCERTS	4.4	1.6	< 1.0	1.1	-
Total Sulphur	mg/kg	50	MCERTS	220	< 50	< 50	< 50	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.6	0.1	0.3	0.1	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

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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Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219751	2219752	2219753	2219754	2219755
Sample Reference				WS201	WS201	WS203	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.80	1.00	0.40
Date Sampled				21/03/2022	21/03/2022	21/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	4.7	6	2.4	2.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	23
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	0.17
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	7.9	32	9.8	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	9.6	19	10	6.6
Lead (aqua regia extractable)	mg/kg	1	MCERTS	65	3.8	8.7	3.6	3.6
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	15	11	20	11	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	6
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	75	23	31	16	17

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Lab Sample Number				2219751	2219752	2219753	2219754	2219755
Sample Reference				WS201	WS201	WS203	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.80	1.00	0.40
Date Sampled				21/03/2022	21/03/2022	21/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219751	2219752	2219753	2219754	2219755
Sample Reference				WS201	WS201	WS203	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.80	1.00	0.40
Date Sampled				21/03/2022	21/03/2022	21/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-

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Project / Site name: Peel Hall

Lab Sample Number				2219751	2219752	2219753	2219754	2219755
Sample Reference				WS201	WS201	WS203	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.80	1.00	0.40
Date Sampled				21/03/2022	21/03/2022	21/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

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Project / Site name: Peel Hall

Lab Sample Number				2219751	2219752	2219753	2219754	2219755
Sample Reference				WS201	WS201	WS203	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.80	1.00	0.40
Date Sampled				21/03/2022	21/03/2022	21/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219756	2219757	2219758	2219759	2219760
Sample Reference				TP208	WS208	WS106	WS103	WS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.20	0.20	0.90	0.40
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
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	12	19	10	12	7.5
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	6.5	7.3	-	6.9
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	120	270	200	-	170
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0062	0.0039	0.0045	-	0.003
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	12	7.8	8.9	-	6
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	6.2	3.9	4.5	-	3
Sulphide	mg/kg	1	MCERTS	2.2	2.5	1.4	-	2.1
Total Sulphur	mg/kg	50	MCERTS	220	200	130	-	81
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.3	1.5	0.9	-	0.5
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

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	< 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	0.4	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.43	< 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	0.83	< 0.80	< 0.80
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Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219756	2219757	2219758	2219759	2219760
Sample Reference				TP208	WS208	WS106	WS103	WS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.20	0.20	0.90	0.40
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.7	11	7.4	2.9	5.1
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	29	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	0.42	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	0.2	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	20	18	-	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	25	25	6.6	9.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	8.3	42	30	4.1	10
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	< 0.3	0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	14	14	16	8.3
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	12	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	41	56	59	31	25

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	6	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	13	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	19	< 10	< 10	< 10	< 10

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219756	2219757	2219758	2219759	2219760
Sample Reference				TP208	WS208	WS106	WS103	WS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.20	0.20	0.90	0.40
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219756	2219757	2219758	2219759	2219760
Sample Reference				TP208	WS208	WS106	WS103	WS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.20	0.20	0.90	0.40
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219756	2219757	2219758	2219759	2219760
Sample Reference				TP208	WS208	WS106	WS103	WS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.20	0.20	0.90	0.40
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219756	2219757	2219758	2219759	2219760
Sample Reference				TP208	WS208	WS106	WS103	WS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.20	0.20	0.90	0.40
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219761	2219762	2219763	2219764	2219765
Sample Reference				TP210	TP211	TP218	WS104	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.20	0.20	1.40
Date Sampled				23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
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	25	22	28	18	12
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.8	8.0	6.4	6.7	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	490	100	430	340	200
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.018	0.012	0.022	0.013	0.052
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	35	25	45	25	100
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	17.5	12.4	22.3	12.6	51.8
Sulphide	mg/kg	1	MCERTS	3.6	1.3	2	2.9	< 1.0
Total Sulphur	mg/kg	50	MCERTS	350	76	250	320	110
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.4	0.6	2.1	2.5	0.4
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

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	0.56	0.34	< 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	0.86	0.73	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.87	0.75	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35	0.39	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.4	0.39	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.29	0.39	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.21	0.23	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.3	0.34	< 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	3.84	3.56	< 0.80
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Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219761	2219762	2219763	2219764	2219765
Sample Reference				TP210	TP211	TP218	WS104	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.20	0.20	1.40
Date Sampled				23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	12	14	12	8.3
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	53	23	19	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	29	30	40	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	45	16	51	70	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	56	17	13	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55	72	57	78	51

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219761	2219762	2219763	2219764	2219765
Sample Reference				TP210	TP211	TP218	WS104	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.20	0.20	1.40
Date Sampled				23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219761	2219762	2219763	2219764	2219765
Sample Reference				TP210	TP211	TP218	WS104	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.20	0.20	1.40
Date Sampled				23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219761	2219762	2219763	2219764	2219765
Sample Reference				TP210	TP211	TP218	WS104	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.20	0.20	1.40
Date Sampled				23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219761	2219762	2219763	2219764	2219765
Sample Reference				TP210	TP211	TP218	WS104	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.20	0.20	1.40
Date Sampled				23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219766	2219767	2219768	2219769	2219770
Sample Reference				WS102	WS214	WS222	WS223	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.80	0.20	0.10
Date Sampled				23/03/2022	23/03/2022	24/03/2022	24/03/2022	21/03/2022
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	16	29	15	20	19
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.3	-	8.0	8.2	-
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	460	-	< 50	410	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0088	-	0.0031	0.0068	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	18	-	6.1	14	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	8.8	-	3.1	6.8	-
Sulphide	mg/kg	1	MCERTS	6.6	-	1.7	< 1.0	-
Total Sulphur	mg/kg	50	MCERTS	350	-	< 50	350	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3	-	0.2	2	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 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	0.23	< 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	0.42	0.23	< 0.05	0.33	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.45	0.25	< 0.05	0.4	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05	0.21	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05	0.2	< 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	1.59	< 0.80	< 0.80	1.14	< 0.80
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Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219766	2219767	2219768	2219769	2219770
Sample Reference				WS102	WS214	WS222	WS223	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.80	0.20	0.10
Date Sampled				23/03/2022	23/03/2022	24/03/2022	24/03/2022	21/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	19	1.8	16	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	85	-	-	75
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.81	-	-	0.57
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.5	-	-	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	-	7.1	28	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	61	35	4.1	38	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	54	3.7	69	47
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	20	5.4	18	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	2.3	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	31	-	-	27
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	65	12	80	66

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219766	2219767	2219768	2219769	2219770
Sample Reference				WS102	WS214	WS222	WS223	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.80	0.20	0.10
Date Sampled				23/03/2022	23/03/2022	24/03/2022	24/03/2022	21/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219766	2219767	2219768	2219769	2219770
Sample Reference				WS102	WS214	WS222	WS223	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.80	0.20	0.10
Date Sampled				23/03/2022	23/03/2022	24/03/2022	24/03/2022	21/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219766	2219767	2219768	2219769	2219770
Sample Reference				WS102	WS214	WS222	WS223	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.80	0.20	0.10
Date Sampled				23/03/2022	23/03/2022	24/03/2022	24/03/2022	21/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219766	2219767	2219768	2219769	2219770
Sample Reference				WS102	WS214	WS222	WS223	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.80	0.20	0.10
Date Sampled				23/03/2022	23/03/2022	24/03/2022	24/03/2022	21/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219771	2219772	2219773	2219774	2219775
Sample Reference				TP106	TP108	TP109	TP112	TP113
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	1.20	1.00	0.10
Date Sampled				21/03/2022	21/03/2022	21/03/2022	21/03/2022	22/03/2022
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	12	16	9.9	16	15
Total mass of sample received	kg	0.001	NONE	1	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.0	-	8.2	-	-
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	150	-	170	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.02	-	0.012	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	41	-	24	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	20.4	-	11.8	-	-
Sulphide	mg/kg	1	MCERTS	2.6	-	< 1.0	-	-
Total Sulphur	mg/kg	50	MCERTS	85	-	81	-	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5	-	0.3	-	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 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	0.29	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 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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Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219771	2219772	2219773	2219774	2219775
Sample Reference				TP106	TP108	TP109	TP112	TP113
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	1.20	1.00	0.10
Date Sampled				21/03/2022	21/03/2022	21/03/2022	21/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.9	13	6.3	2.2	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	81	-	25	84
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.79	-	0.27	0.59
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.2	-	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	-	26	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.9	43	16	15	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	8	76	8.8	6.6	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	15	28	21	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	24	-	9.8	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	24	92	38	39	51
Petroleum Hydrocarbons								
TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Project / Site name: Peel Hall

Lab Sample Number				2219771	2219772	2219773	2219774	2219775
Sample Reference				TP106	TP108	TP109	TP112	TP113
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	1.20	1.00	0.10
Date Sampled				21/03/2022	21/03/2022	21/03/2022	21/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219771	2219772	2219773	2219774	2219775
Sample Reference				TP106	TP108	TP109	TP112	TP113
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	1.20	1.00	0.10
Date Sampled				21/03/2022	21/03/2022	21/03/2022	21/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219771	2219772	2219773	2219774	2219775
Sample Reference				TP106	TP108	TP109	TP112	TP113
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	1.20	1.00	0.10
Date Sampled				21/03/2022	21/03/2022	21/03/2022	21/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

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Lab Sample Number				2219771	2219772	2219773	2219774	2219775
Sample Reference				TP106	TP108	TP109	TP112	TP113
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	1.20	1.00	0.10
Date Sampled				21/03/2022	21/03/2022	21/03/2022	21/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

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Lab Sample Number				2219776	2219777	2219778	2219779	2219780
Sample Reference				TP115	TP116	TP117	TP122	TP124
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.70	0.10	1.50	0.20
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
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	25	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	33	15	34	14	20
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.7	7.1	5.8	-	6.3
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	1400	930	1300	-	560
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.013	0.011	0.019	-	0.0094
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	27	22	38	-	19
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	13.3	11.1	19.2	-	9.4
Sulphide	mg/kg	1	MCERTS	7.2	< 1.0	6.2	-	1.6
Total Sulphur	mg/kg	50	MCERTS	890	380	1300	-	460
Organic Matter	%	0.1	MCERTS	-	-	13	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	6	0.3	-	-	2.3
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	7.6	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	1	< 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	1.4	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.22	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.32	< 0.05	1.4	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.32	< 0.05	1.5	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.82	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.5	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.29	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.51	< 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	7.3	< 0.80	< 0.80
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Project / Site name: Peel Hall

Lab Sample Number				2219776	2219777	2219778	2219779	2219780
Sample Reference				TP115	TP116	TP117	TP122	TP124
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.70	0.10	1.50	0.20
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	3.1	17	5	13
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	39	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	0.96	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	0.3	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	7.4	26	-	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	5.5	40	23	35
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43	4.4	74	11	57
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.5	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	4.3	18	34	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	2.5	2.5	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	30	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	48	12	86	52	69

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Lab Sample Number				2219776	2219777	2219778	2219779	2219780
Sample Reference				TP115	TP116	TP117	TP122	TP124
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.70	0.10	1.50	0.20
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-

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Project / Site name: Peel Hall

Lab Sample Number				2219776	2219777	2219778	2219779	2219780
Sample Reference				TP115	TP116	TP117	TP122	TP124
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.70	0.10	1.50	0.20
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Lab Sample Number				2219776	2219777	2219778	2219779	2219780
Sample Reference				TP115	TP116	TP117	TP122	TP124
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.70	0.10	1.50	0.20
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

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Project / Site name: Peel Hall

Lab Sample Number				2219776	2219777	2219778	2219779	2219780
Sample Reference				TP115	TP116	TP117	TP122	TP124
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.70	0.10	1.50	0.20
Date Sampled				22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219781	2219782	2219783	2219784	2219785
Sample Reference				TP125	TP129	TP131	TP136	TP139
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.20	0.10	0.80	0.10
Date Sampled				22/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
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	18	26	20	26
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	-	7.0	7.7	6.3
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	120	-	420	260	130
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0086	-	0.011	0.031	0.0095
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	17	-	21	63	19
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	8.6	-	10.5	31.3	9.5
Sulphide	mg/kg	1	MCERTS	< 1.0	-	1.1	< 1.0	1.1
Total Sulphur	mg/kg	50	MCERTS	130	-	340	180	320
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6	-	2.4	0.6	2.1
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

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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Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219781	2219782	2219783	2219784	2219785
Sample Reference				TP125	TP129	TP131	TP136	TP139
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.20	0.10	0.80	0.10
Date Sampled				22/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.8	7.2	15	11	14
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	180	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	1.7	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.4	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	-	39	56	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	26	32	32	35
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	15	43	20	57
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	50	38	57	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	51	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	50	63	82	77	83
Petroleum Hydrocarbons								
TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Lab Sample Number				2219781	2219782	2219783	2219784	2219785
Sample Reference				TP125	TP129	TP131	TP136	TP139
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.20	0.10	0.80	0.10
Date Sampled				22/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	-	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	-	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	< 1.0	-

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Project / Site name: Peel Hall

Lab Sample Number				2219781	2219782	2219783	2219784	2219785
Sample Reference				TP125	TP129	TP131	TP136	TP139
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.20	0.10	0.80	0.10
Date Sampled				22/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	-

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Project / Site name: Peel Hall

Lab Sample Number				2219781	2219782	2219783	2219784	2219785
Sample Reference				TP125	TP129	TP131	TP136	TP139
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.20	0.10	0.80	0.10
Date Sampled				22/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219781	2219782	2219783	2219784	2219785
Sample Reference				TP125	TP129	TP131	TP136	TP139
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.20	0.10	0.80	0.10
Date Sampled				22/03/2022	23/03/2022	23/03/2022	23/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-

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

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219786	2219787	2219788	2219789	2219790
Sample Reference				TP140	TP141	TP142	TP143	TP144
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	0.20	0.10	1.80	0.20
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
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	17	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	16	21	14	16
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	MDB	KSZ	N/A	KSZ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	-	5.5	8.2	-
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	480	-	460	100	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.015	-	0.0074	0.0045	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	30	-	15	9	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	15.2	-	7.4	4.5	-
Sulphide	mg/kg	1	MCERTS	< 1.0	-	3	< 1.0	-
Total Sulphur	mg/kg	50	MCERTS	< 50	-	390	< 50	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.1	-	3.3	0.1	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 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	0.45	< 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	0.54	< 0.05	< 0.05	0.28
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.51	< 0.05	< 0.05	0.27
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.3	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.25	< 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	2.05	< 0.80	< 0.80	< 0.80
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Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219786	2219787	2219788	2219789	2219790
Sample Reference				TP140	TP141	TP142	TP143	TP144
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	0.20	0.10	1.80	0.20
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.2	7.4	15	3.9	17
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	55	-	-	81
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.43	-	-	0.73
Boron (water soluble)	mg/kg	0.2	MCERTS	-	< 0.2	-	-	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.7	-	19	5.6	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.2	27	31	3.6	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	2.7	46	48	2.7	84
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	< 0.3	< 0.3	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.5	9.5	14	4.3	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	12	-	-	22
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	14	56	82	12	81

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219786	2219787	2219788	2219789	2219790
Sample Reference				TP140	TP141	TP142	TP143	TP144
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	0.20	0.10	1.80	0.20
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219786	2219787	2219788	2219789	2219790
Sample Reference				TP140	TP141	TP142	TP143	TP144
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	0.20	0.10	1.80	0.20
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219786	2219787	2219788	2219789	2219790
Sample Reference				TP140	TP141	TP142	TP143	TP144
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	0.20	0.10	1.80	0.20
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

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

Analytical Report Number: 22-48435
Project / Site name: Peel Hall

Lab Sample Number				2219786	2219787	2219788	2219789	2219790
Sample Reference				TP140	TP141	TP142	TP143	TP144
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	0.20	0.10	1.80	0.20
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219791
Sample Reference				TP145
Sample Number				None Supplied
Depth (m)				1.50
Date Sampled				24/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	14
Total mass of sample received	kg	0.001	NONE	0.4

Asbestos in Soil	Type	N/A	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	210
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.013
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	26
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	12.8
Sulphide	mg/kg	1	MCERTS	4.6
Total Sulphur	mg/kg	50	MCERTS	110
Organic Matter	%	0.1	MCERTS	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-

Total Phenols

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

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80
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Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219791
Sample Reference				TP145
Sample Number				None Supplied
Depth (m)				1.50
Date Sampled				24/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	42
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10

Analytical Report Number: 22-48435

Project / Site name: Peel Hall

Lab Sample Number				2219791
Sample Reference				TP145
Sample Number				None Supplied
Depth (m)				1.50
Date Sampled				24/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
VOCs				
Chloromethane	µg/kg	1	ISO 17025	-
Chloroethane	µg/kg	1	NONE	-
Bromomethane	µg/kg	1	ISO 17025	-
Vinyl Chloride	µg/kg	1	NONE	-
Trichlorofluoromethane	µg/kg	1	NONE	-
1,1-Dichloroethene	µg/kg	1	NONE	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-
Trichloromethane	µg/kg	1	MCERTS	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-
Benzene	µg/kg	1	MCERTS	-
Tetrachloromethane	µg/kg	1	MCERTS	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-
Trichloroethene	µg/kg	1	MCERTS	-
Dibromomethane	µg/kg	1	MCERTS	-
Bromodichloromethane	µg/kg	1	MCERTS	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-
Toluene	µg/kg	1	MCERTS	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-
Dibromochloromethane	µg/kg	1	ISO 17025	-
Tetrachloroethene	µg/kg	1	NONE	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-
Chlorobenzene	µg/kg	1	MCERTS	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-
Ethylbenzene	µg/kg	1	MCERTS	-
p & m-Xylene	µg/kg	1	MCERTS	-
Styrene	µg/kg	1	MCERTS	-
Tribromomethane	µg/kg	1	NONE	-
o-Xylene	µg/kg	1	MCERTS	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-
Isopropylbenzene	µg/kg	1	MCERTS	-
Bromobenzene	µg/kg	1	MCERTS	-
n-Propylbenzene	µg/kg	1	ISO 17025	-
2-Chlorotoluene	µg/kg	1	MCERTS	-
4-Chlorotoluene	µg/kg	1	MCERTS	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-
tert-Butylbenzene	µg/kg	1	MCERTS	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-
sec-Butylbenzene	µg/kg	1	MCERTS	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-
Butylbenzene	µg/kg	1	MCERTS	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-



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Lab Sample Number				2219791
Sample Reference				TP145
Sample Number				None Supplied
Depth (m)				1.50
Date Sampled				24/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-

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Lab Sample Number				2219791
Sample Reference				TP145
Sample Number				None Supplied
Depth (m)				1.50
Date Sampled				24/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

SVOCs

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



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Lab Sample Number				2219791
Sample Reference				TP145
Sample Number				None Supplied
Depth (m)				1.50
Date Sampled				24/03/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-

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



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Project / Site name: Peel Hall

Lab Sample Number				2219797
Sample Reference				TP106
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				21/03/2022
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	7.7
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0
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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	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	3.4
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.7
Copper (dissolved)	µg/l	0.7	ISO 17025	6
Lead (dissolved)	µg/l	1	ISO 17025	4.1
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.4
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	8

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	10	NONE	< 10



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Project / Site name: Peel Hall

Lab Sample Number				2219797
Sample Reference				TP106
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				21/03/2022
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10

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

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* 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 *
2219751	WS201	None Supplied	0.3	Brown clay and sand with gravel and vegetation.
2219752	WS201	None Supplied	0.8	Brown sand.
2219753	WS203	None Supplied	0.8	Brown clay and sand.
2219754	TP206	None Supplied	1	Brown sand.
2219755	TP207	None Supplied	0.4	Brown sandy loam with gravel and vegetation.
2219756	TP208	None Supplied	0.9	Brown clay and sand with gravel.
2219757	WS208	None Supplied	0.2	Brown clay and sand with gravel and vegetation.
2219758	WS106	None Supplied	0.2	Brown clay and sand with gravel and vegetation.
2219759	WS103	None Supplied	0.9	Brown sand with vegetation.
2219760	WS105	None Supplied	0.4	Brown sandy clay with vegetation.
2219761	TP210	None Supplied	0.2	Brown sandy loam with vegetation.
2219762	TP211	None Supplied	0.5	Brown clay and sand.
2219763	TP218	None Supplied	0.2	Brown clay and sand with gravel and vegetation.
2219764	WS104	None Supplied	0.2	Brown sandy loam with gravel and vegetation.
2219765	WS101	None Supplied	1.4	Brown clay and sand with gravel.
2219766	WS102	None Supplied	0.1	Brown sandy loam with gravel and vegetation.
2219767	WS214	None Supplied	0.1	Brown sandy loam with vegetation.
2219768	WS222	None Supplied	0.8	Brown sand with gravel.
2219769	WS223	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2219770	TP101	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2219771	TP106	None Supplied	0.4	Brown clay and sand with gravel and vegetation.
2219772	TP108	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2219773	TP109	None Supplied	1.2	Brown clay and sand with gravel.
2219774	TP112	None Supplied	1	Light brown sand.
2219775	TP113	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2219776	TP115	None Supplied	0.2	Brown loam and gravel with vegetation and stones.
2219777	TP116	None Supplied	1.7	Brown sand with gravel.
2219778	TP117	None Supplied	0.1	Brown loam with gravel and vegetation.
2219779	TP122	None Supplied	1.5	Brown clay with gravel.
2219780	TP124	None Supplied	0.2	Brown loam with gravel and vegetation.
2219781	TP125	None Supplied	1.3	Brown clay and loam with gravel.
2219782	TP129	None Supplied	1.2	Brown clay.
2219783	TP131	None Supplied	0.1	Brown clay and loam with gravel and vegetation.
2219784	TP136	None Supplied	0.8	Brown clay and loam with gravel and vegetation.
2219785	TP139	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2219786	TP140	None Supplied	1.6	Brown sand with gravel and stones.
2219787	TP141	None Supplied	0.2	Brown loam with gravel and vegetation.
2219788	TP142	None Supplied	0.1	Brown loam with gravel and vegetation.
2219789	TP143	None Supplied	1.8	Light brown sand.
2219790	TP144	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2219791	TP145	None Supplied	1.5	Brown clay and sand with gravel.

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Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
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
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	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
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
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
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
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

Analytical Report Number : 22-48435

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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 Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
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
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

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

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

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

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

Information in Support of Analytical Results

Analytical Report Number : 22-48435

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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List of HWOL Acronyms and Operators

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

Analytical Report Number : 22-48435

Project / Site name: Peel Hall

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP101	None Supplied	S	2219770	c	Total cyanide in soil	L080-PL	c
TP106	None Supplied	S	2219771	c	Sulphide in soil	L010-PL	c
TP106	None Supplied	S	2219771	c	Total cyanide in soil	L080-PL	c
TP108	None Supplied	S	2219772	c	Total cyanide in soil	L080-PL	c
TP109	None Supplied	S	2219773	c	Sulphide in soil	L010-PL	c
TP109	None Supplied	S	2219773	c	Total cyanide in soil	L080-PL	c
TP112	None Supplied	S	2219774	c	Total cyanide in soil	L080-PL	c
WS201	None Supplied	S	2219751	c	Sulphide in soil	L010-PL	c
WS201	None Supplied	S	2219751	c	Total cyanide in soil	L080-PL	c
WS201	None Supplied	S	2219752	c	Sulphide in soil	L010-PL	c
WS201	None Supplied	S	2219752	c	Total cyanide in soil	L080-PL	c
WS203	None Supplied	S	2219753	c	Sulphide in soil	L010-PL	c
WS203	None Supplied	S	2219753	c	Total cyanide in soil	L080-PL	c



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Analytical Report Number : 22-48869

Project / Site name:	Peel Hall	Samples received on:	28/03/2022
Your job number:	15 740	Samples instructed on/ Analysis started on:	31/03/2022
Your order number:		Analysis completed by:	06/04/2022
Report Issue Number:	1	Report issued on:	06/04/2022
Samples Analysed:	3 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 22-48869

Project / Site name: Peel Hall

Lab Sample Number				2222161	2222167	2222168
Sample Reference				WS109	TP207	TP208
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	0.10
Date Sampled				23/03/2022	23/02/2022	23/03/2022
Time Taken				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
Moisture Content	%	0.01	NONE	36	11	32
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.2	7.3	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1700	91	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.066	0.0057	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	130	11	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	65.9	5.7	-
Sulphide	mg/kg	1	MCERTS	18	1.7	-
Total Sulphur	mg/kg	50	MCERTS	650	70	-
Organic Matter	%	0.1	MCERTS	20	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	0.3	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	11	-	-

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.61	< 0.05	1.3
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.89	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.25	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.89	< 0.05	0.26
Pyrene	mg/kg	0.05	MCERTS	0.79	< 0.05	0.28
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.4	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.3	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.4	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.15	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.05	< 0.80	2.1
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Analytical Report Number: 22-48869

Project / Site name: Peel Hall

Lab Sample Number				2222161	2222167	2222168
Sample Reference				WS109	TP207	TP208
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	0.10
Date Sampled				23/03/2022	23/02/2022	23/03/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	4.7	18
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	130
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.93
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	< 0.2	0.7
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	14	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	17	41
Lead (aqua regia extractable)	mg/kg	1	MCERTS	39	7.3	70
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.7	17	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	31
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	38	31	90

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	5.5	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	37	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	43	< 10	< 10

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

Analytical Report Number : 22-48869

Project / Site name: Peel Hall

* 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 *
2222161	WS109	None Supplied	0.1	Brown loam with gravel and vegetation.
2222167	TP207	None Supplied	0.8	Light brown sand with gravel.
2222168	TP208	None Supplied	0.1	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 22-48869

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
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 Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS

Analytical Report Number : 22-48869

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Sample Deviation Report



Analytical Report Number : 22-48869

Project / Site name: Peel Hall

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP207	None Supplied	S	2222167	c	Hexavalent chromium in soil	L080-PL	c
TP207	None Supplied	S	2222167	c	Monohydric phenols in soil	L080-PL	c
TP207	None Supplied	S	2222167	c	Organic matter (Automated) in soil	L009-PL	c
TP207	None Supplied	S	2222167	c	Speciated EPA-16 PAHs in soil	L064-PL	c
TP207	None Supplied	S	2222167	c	Sulphide in soil	L010-PL	c
TP207	None Supplied	S	2222167	c	TPH in (Soil)	L076-PL	c
TP207	None Supplied	S	2222167	c	Total cyanide in soil	L080-PL	c
TP207	None Supplied	S	2222167	c	Total organic carbon (Automated) in soil	L009-PL	c
TP207	None Supplied	S	2222167	c	pH in soil (automated)	L099-PL	c
TP208	None Supplied	S	2222168	c	Total cyanide in soil	L080-PL	c
WS109	None Supplied	S	2222161	c	Sulphide in soil	L010-PL	c
WS109	None Supplied	S	2222161	c	Total cyanide in soil	L080-PL	c



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Analytical Report Number : 22-48911

Project / Site name:	Peel Hall	Samples received on:	30/03/2022
Your job number:	15-740	Samples instructed on/ Analysis started on:	30/03/2022
Your order number:		Analysis completed by:	06/04/2022
Report Issue Number:	1	Report issued on:	06/04/2022
Samples Analysed:	2 leachate samples - 5 soil samples		


Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 22-48911

Project / Site name: Peel Hall

Lab Sample Number				2222452	2222453	2222454	2222455	2222456
Sample Reference				WS120	WS121	WS122	WS123	WS225
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.10	0.80	0.40	0.60
Date Sampled				28/03/2022	28/03/2022	28/03/2022	28/03/2022	28/03/2022
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	8.4	25	14	24	15
Total mass of sample received	kg	0.001	NONE	0.4	0.8	0.4	0.4	0.8

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	7.0
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	-	-	-	-	1500
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	-	-	-	-	0.54
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	-	-	-	-	1100
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	-	-	-	-	539
Sulphide	mg/kg	1	MCERTS	-	-	-	-	12
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	860
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	1.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	< 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	< 1.0	16	3.3	21	17
Barium (aqua regia extractable)	mg/kg	1	MCERTS	9.9	200	17	190	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.08	2.2	0.12	1.3	-
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.8	< 0.2	0.6	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.9
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6.5	82	8.1	43	72

Analytical Report Number: 22-48911

Project / Site name: Peel Hall

Lab Sample Number				2222452	2222453	2222454	2222455	2222456
Sample Reference				WS120	WS121	WS122	WS123	WS225
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.10	0.80	0.40	0.60
Date Sampled				28/03/2022	28/03/2022	28/03/2022	28/03/2022	28/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Lead (aqua regia extractable)	mg/kg	1	MCERTS	1.9	39	3.6	60	140
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	4.4	38	4.8	30	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	2.2	47	3.8	38	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	14	130	9.7	85	430

Petroleum Hydrocarbons

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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



Analytical Report Number: 22-48911

Project / Site name: Peel Hall

Lab Sample Number				2222457	2222458
Sample Reference				WS121	WS225
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.60
Date Sampled				28/03/2022	28/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	7.2	7.2
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	2.8	3.8
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	7.3	< 1.0
Cadmium (dissolved)	µg/l	0.08	ISO 17025	0.2	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.1	1.4
Copper (dissolved)	µg/l	0.7	ISO 17025	20	16
Lead (dissolved)	µg/l	1	ISO 17025	7.5	6.9
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	7.5	5.3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	27	34

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10



Analytical Report Number: 22-48911

Project / Site name: Peel Hall

Lab Sample Number				2222457	2222458
Sample Reference				WS121	WS225
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.60
Date Sampled				28/03/2022	28/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10

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

Analytical Report Number : 22-48911

Project / Site name: Peel Hall

* 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 *
2222452	WS120	None Supplied	1.3	Light brown sand.
2222453	WS121	None Supplied	0.1	Brown sandy loam with gravel and vegetation.
2222454	WS122	None Supplied	0.8	Light brown sand.
2222455	WS123	None Supplied	0.4	Brown clay and loam with gravel and vegetation.
2222456	WS225	None Supplied	0.6	Brown clay and sand with gravel and vegetation.

Analytical Report Number : 22-48911

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
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
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	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
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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 leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
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
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
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 SO4 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

Analytical Report Number : 22-48911

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
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 leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography

Analytical Report Number : 22-48911

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
2D	GC-GC - Double coil/column gas chromatography				
Total	Aliphatics & Aromatics				
AL	Aliphatics				
AR	Aromatics				
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
-	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				



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Analytical Report Number : 22-49117

Project / Site name:	Peel Hall	Samples received on:	30/03/2022
Your job number:	15 740	Samples instructed on/ Analysis started on:	01/04/2022
Your order number:		Analysis completed by:	07/04/2022
Report Issue Number:	1	Report issued on:	07/04/2022
Samples Analysed:	8 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 22-49117
Project / Site name: Peel Hall

Lab Sample Number				2223511	2223512	2223513	2223514	2223515	2223516
Sample Reference				WS217	WS220	WS221	WS224	TP137	WS206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.60	1.00	1.60	0.20	0.30
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	23/03/2022	25/03/2022
Time Taken				None Supplied	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	< 0.1
Moisture Content	%	0.01	NONE	11	16	17	15	21	13
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4	0.4

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	-	-	7.5	-	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	210	-	-	120	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.027	-	-	0.015	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	54	-	-	29	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	27	-	-	14.6	-	-
Sulphide	mg/kg	1	MCERTS	2	-	-	1.2	-	-
Total Sulphur	mg/kg	50	MCERTS	110	-	-	110	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.4	-	-	0.5	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 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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Analytical Report Number: 22-49117
Project / Site name: Peel Hall

Lab Sample Number				2223511	2223512	2223513	2223514	2223515	2223516
Sample Reference				WS217	WS220	WS221	WS224	TP137	WS206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.60	1.00	1.60	0.20	0.30
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	23/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	1.4	13	1.9	13	6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	17	86	-	97	40
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.12	0.6	-	0.84	0.38
Boron (water soluble)	mg/kg	0.2	MCERTS	-	< 0.2	0.7	-	1.6	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	-	-	4.7	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	9.5	27	6.6	30	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.1	2.3	42	4.8	44	29
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	36	3.9	12	5.3	19	7.2
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	3	23	-	37	13
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	9.6	51	9	58	36

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.5	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	180	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	59	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	240	< 10	< 10

Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223511	2223512	2223513	2223514	2223515	2223516
Sample Reference				WS217	WS220	WS221	WS224	TP137	WS206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.60	1.00	1.60	0.20	0.30
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	23/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

VOCs

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

Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223511	2223512	2223513	2223514	2223515	2223516
Sample Reference				WS217	WS220	WS221	WS224	TP137	WS206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.60	1.00	1.60	0.20	0.30
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	23/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-

Analytical Report Number: 22-49117
Project / Site name: Peel Hall

Lab Sample Number				2223511	2223512	2223513	2223514	2223515	2223516
Sample Reference				WS217	WS220	WS221	WS224	TP137	WS206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.60	1.00	1.60	0.20	0.30
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	23/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs

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

Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223511	2223512	2223513	2223514	2223515	2223516
Sample Reference				WS217	WS220	WS221	WS224	TP137	WS206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.60	1.00	1.60	0.20	0.30
Date Sampled				24/03/2022	24/03/2022	24/03/2022	24/03/2022	23/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status			
Benzo(ghi)perylene				mg/kg	0.05	MCERTS	< 0.05	-	-

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

Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223517	2223518
Sample Reference				WS211	WS210
Sample Number				None Supplied	None Supplied
Depth (m)				1.10	0.60
Date Sampled				25/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	10
Total mass of sample received	kg	0.001	NONE	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	-	-
Asbestos Analyst ID	N/A	N/A	N/A		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	7.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	97	110
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.023	0.0074
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	45	15
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	22.5	7.4
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	71	60
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.4	0.4

Total Phenols

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

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80
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Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223517	2223518
Sample Reference				WS211	WS210
Sample Number				None Supplied	None Supplied
Depth (m)				1.10	0.60
Date Sampled				25/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.8	4.8
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	12
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.2	6.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	39	21

Petroleum Hydrocarbons

TPH (C5 - C6) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10

Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223517	2223518
Sample Reference				WS211	WS210
Sample Number				None Supplied	None Supplied
Depth (m)				1.10	0.60
Date Sampled				25/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
VOCs					
Chloromethane	µg/kg	1	ISO 17025	-	-
Chloroethane	µg/kg	1	NONE	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-
Benzene	µg/kg	1	MCERTS	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-
Toluene	µg/kg	1	MCERTS	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-
Styrene	µg/kg	1	MCERTS	-	-
Tribromomethane	µg/kg	1	NONE	-	-
o-Xylene	µg/kg	1	MCERTS	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-



Analytical Report Number: 22-49117
Project / Site name: Peel Hall

Lab Sample Number				2223517	2223518
Sample Reference				WS211	WS210
Sample Number				None Supplied	None Supplied
Depth (m)				1.10	0.60
Date Sampled				25/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-

Analytical Report Number: 22-49117

Project / Site name: Peel Hall

Lab Sample Number				2223517	2223518
Sample Reference				WS211	WS210
Sample Number				None Supplied	None Supplied
Depth (m)				1.10	0.60
Date Sampled				25/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

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



Analytical Report Number: 22-49117
Project / Site name: Peel Hall

Lab Sample Number				2223517	2223518
Sample Reference				WS211	WS210
Sample Number				None Supplied	None Supplied
Depth (m)				1.10	0.60
Date Sampled				25/03/2022	25/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-

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

Analytical Report Number : 22-49117

Project / Site name: Peel Hall

* 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 *
2223511	WS217	None Supplied	1	Brown clay with vegetation and gravel
2223512	WS220	None Supplied	0.6	Brown loam and sand with vegetation and gravel.
2223513	WS221	None Supplied	1	Brown loam and sand with vegetation and gravel.
2223514	WS224	None Supplied	1.6	Brown loam and sand with vegetation and gravel.
2223515	TP137	None Supplied	0.2	Brown loam and sand with vegetation and gravel.
2223516	WS206	None Supplied	0.3	Brown loam and sand with vegetation and gravel.
2223517	WS211	None Supplied	1.1	Brown clay and sand with vegetation and gravel
2223518	WS210	None Supplied	0.6	Brown loam and sand with vegetation and gravel.

Analytical Report Number : 22-49117

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
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 Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
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
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

Analytical Report Number : 22-49117

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Analytical Report Number : 22-49117

Project / Site name: Peel Hall

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP137	None Supplied	S	2223515	c	Total cyanide in soil	L080-PL	c
WS217	None Supplied	S	2223511	c	Sulphide in soil	L010-PL	c
WS217	None Supplied	S	2223511	c	Total cyanide in soil	L080-PL	c
WS220	None Supplied	S	2223512	c	Total cyanide in soil	L080-PL	c
WS221	None Supplied	S	2223513	c	Total cyanide in soil	L080-PL	c
WS224	None Supplied	S	2223514	c	Sulphide in soil	L010-PL	c
WS224	None Supplied	S	2223514	c	Total cyanide in soil	L080-PL	c

**Rebecca Hodnett**

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Analytical Report Number : 22-52815

Project / Site name:	Peel Hall	Samples received on:	20/04/2022
Your job number:	16 240	Samples instructed on/ Analysis started on:	20/04/2022
Your order number:		Analysis completed by:	27/04/2022
Report Issue Number:	1	Report issued on:	27/04/2022
Samples Analysed:	1 water sample		

Signed:

Izabela Wójcik

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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



Analytical Report Number: 22-52815

Project / Site name: Peel Hall

Lab Sample Number				2245084
Sample Reference				House-stream
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.4
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	18

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	4.9
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	130
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	3.41
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.05
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.5
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	2000
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.2
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.7
Zinc (dissolved)	µg/l	0.5	ISO 17025	< 0.5

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

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_2D_TOTAL_#1_#2	µg/l	10	ISO 17025	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10



Analytical Report Number: 22-52815

Project / Site name: Peel Hall

Lab Sample Number				2245084
Sample Reference				House-stream
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 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
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



Analytical Report Number: 22-52815

Project / Site name: Peel Hall

Lab Sample Number				2245084
Sample Reference				House-stream
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	
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
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



Analytical Report Number: 22-52815

Project / Site name: Peel Hall

Lab Sample Number				2245084
Sample Reference				House-stream
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	
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 : 22-52815

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in 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
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
Monohydric phenols in water - LOW LEVEL 1 ug/l	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
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	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-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
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-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
Low level 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
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
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector



Analytical Report Number : 22-52815

Project / Site name: Peel Hall

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
GC	Gas Chromatography				
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))				
CU	Clean-up - e.g. by Florisil®, silica gel				
1D	GC - Single coil/column gas chromatography				
2D	GC-GC - Double coil/column gas chromatography				
Total	Aliphatics & Aromatics				
AL	Aliphatics				
AR	Aromatics				
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
_	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				

Sample Deviation Report



Analytical Report Number : 22-52815

Project / Site name: Peel Hall

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
House-stream	None Supplied	W	2245084	a	None Supplied	None Supplied	None Supplied

APPENDIX VII

ORIGIN OF TIER I GENERIC ASSESSMENT CRITERIA

CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	2014 LQM/CIEH S4ULs
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Suitable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene ⁽ⁱⁱⁱ⁾	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C₅-C₆ (aliphatic)	
TPH C₆-C₈ (aliphatic)	
TPH C₈-C₁₀ (aliphatic)	
TPH C₁₀-C₁₂ (aliphatic)	
TPH C₁₂-C₁₆ (aromatic)	
TPH C₁₆-C₂₁ (aromatic)	
TPH C₂₁-C₃₅ (aromatic)	



APPENDIX VIII

GEOTECHNICAL TESTING

RESULTS



LABORATORY REPORT



4043

Contract Number: PSL22/2345

Report Date: 29 April 2022

Client's Reference: 001138

Client Name: E3P
Taylor Road
Urmston
Manchester
M41 7JQ

For the attention of: Georgia Calvert

Contract Title: Peel Hall

Date Received: 31/3/2022

Date Commenced: 31/3/2022

Date Completed: 29/4/2022

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)

S Eyre
(Senior Technician)

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Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS205		U100	2.50	3.00	Firm brown slightly gravelly very sandy CLAY.
WS208		U100	0.50	1.00	CON
WS216		U100	2.50	3.00	Stiff brown gravelly very sandy CLAY.
WS221		U100	0.50	1.00	Firm brown slightly sandy CLAY.
WS122		U100	2.50	3.00	Firm brown slightly sandy CLAY.
WS119		U100	1.50	2.00	Firm brown slightly gravelly sandy CLAY.
WS115		U100	1.50	2.00	CON
WS113		U100	1.50	2.00	Stiff brown slightly gravelly slightly sandy CLAY.
TP205		B	0.70		Brown slightly gravelly slightly clayey silty SAND.
TP215		B	0.80		Brown slightly gravelly slightly silty SAND.
TP107		B	1.00		Brown slightly gravelly silty SAND.
TP112		B	1.20		Brown slightly gravelly slightly silty SAND.
TP116		B	1.20		Brown slightly gravelly silty SAND.
TP122		B	0.40		Brown gravelly slightly clayey silty SAND.
TP140		B	2.00		Brown very gravelly clayey silty SAND with cobbles.
TP142		B	0.70		Brown slightly gravelly silty SAND.
TP147		B	0.50		Brown slightly gravelly silty SAND.
TP104		D	1.50		Brown mottled grey slightly gravelly sandy CLAY.
TP118		D	0.80		Brown slightly gravelly very sandy CLAY.



4043

PSL

Professional Soils Laboratory

Peel Hall

Contract No:

PSL22/2345

Client Ref:

001138

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP130		D	1.00		Brown mottled grey slightly gravelly very sandy CLAY.
TP138		D	0.60		Brown slightly sandy CLAY.
TP144		D	1.30		Brown slightly gravelly very sandy CLAY.
TP148		D	1.60		Dark brown very clayey PEAT.
WS205		SPT	3.00	3.45	Brown gravelly very sandy CLAY.
WS113		SPT	1.00	1.45	Brown slightly gravelly very sandy CLAY.
WS117		SPT	1.00	1.45	Brown mottled grey slightly gravelly sandy CLAY.
WS119		SPT	1.00	1.45	Brown mottled grey slightly gravelly sandy CLAY.
WS121		SPT	3.00	3.45	Brown sandy CLAY.
WS122		SPT	2.00	2.45	Brown sandy CLAY.
WS123		SPT	2.00	2.45	Brown slightly gravelly sandy CLAY.
WS201		SPT	1.00	1.45	Brown slightly gravelly slightly clayey silty SAND.
WS204		SPT	2.00	2.45	Brown slightly gravelly sandy CLAY.
WS208		SPT	2.00	2.45	Brown slightly gravelly very sandy CLAY.
WS101		SPT	2.00	2.45	Brown slightly gravelly very sandy CLAY.
WS213		SPT	1.00	1.45	Brown slightly gravelly very sandy CLAY.
WS218		SPT	2.00	2.45	Reddish brown gravelly silty SAND.
WS224		SPT	2.00	2.45	Brown slightly gravelly sandy CLAY.
WS211		SPT	1.00	1.45	Brown mottled grey slightly gravelly very sandy CLAY.



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Peel Hall

Contract No:

PSL22/2345

Client Ref:

001138

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m ³ Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP104		D	1.50		15			42	19	23	97	Intermediate Plasticity CI
TP118		D	0.80		17			33	14	19	98	Low Plasticity CL
TP130		D	1.00		14			28	13	15	95	Low Plasticity CL
TP138		D	0.60		31			62	27	35	100	High Plasticity CH
TP144		D	1.30		15			31	15	16	97	Low Plasticity CL
TP148		D	1.60		352			455	217	238	100	Extremely High Plasticity ME
WS205		SPT	3.00	3.45	15			33	15	18	89	Low Plasticity CL
WS113		SPT	1.00	1.45	17			29	14	15	98	Low Plasticity CL
WS117		SPT	1.00	1.45	26			50	23	27	96	High Plasticity CH
WS119		SPT	1.00	1.45	23			53	24	29	97	High Plasticity CH
WS121		SPT	3.00	3.45	22			48	23	25	100	Intermediate Plasticity CI
WS122		SPT	2.00	2.45	23			52	24	28	100	High Plasticity CH
WS123		SPT	2.00	2.45	29			38	19	19	95	Intermediate Plasticity CI
WS201		SPT	1.00	1.45	24				NP			
WS204		SPT	2.00	2.45	24			41	20	21	96	Intermediate Plasticity CI
WS208		SPT	2.00	2.45	11			32	15	17	94	Low Plasticity CL
WS101		SPT	2.00	2.45	8.5			31	14	17	95	Low Plasticity CL
WS213		SPT	1.00	1.45	10			34	16	18	93	Low Plasticity CL
WS218		SPT	2.00	2.45	18				NP			

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.



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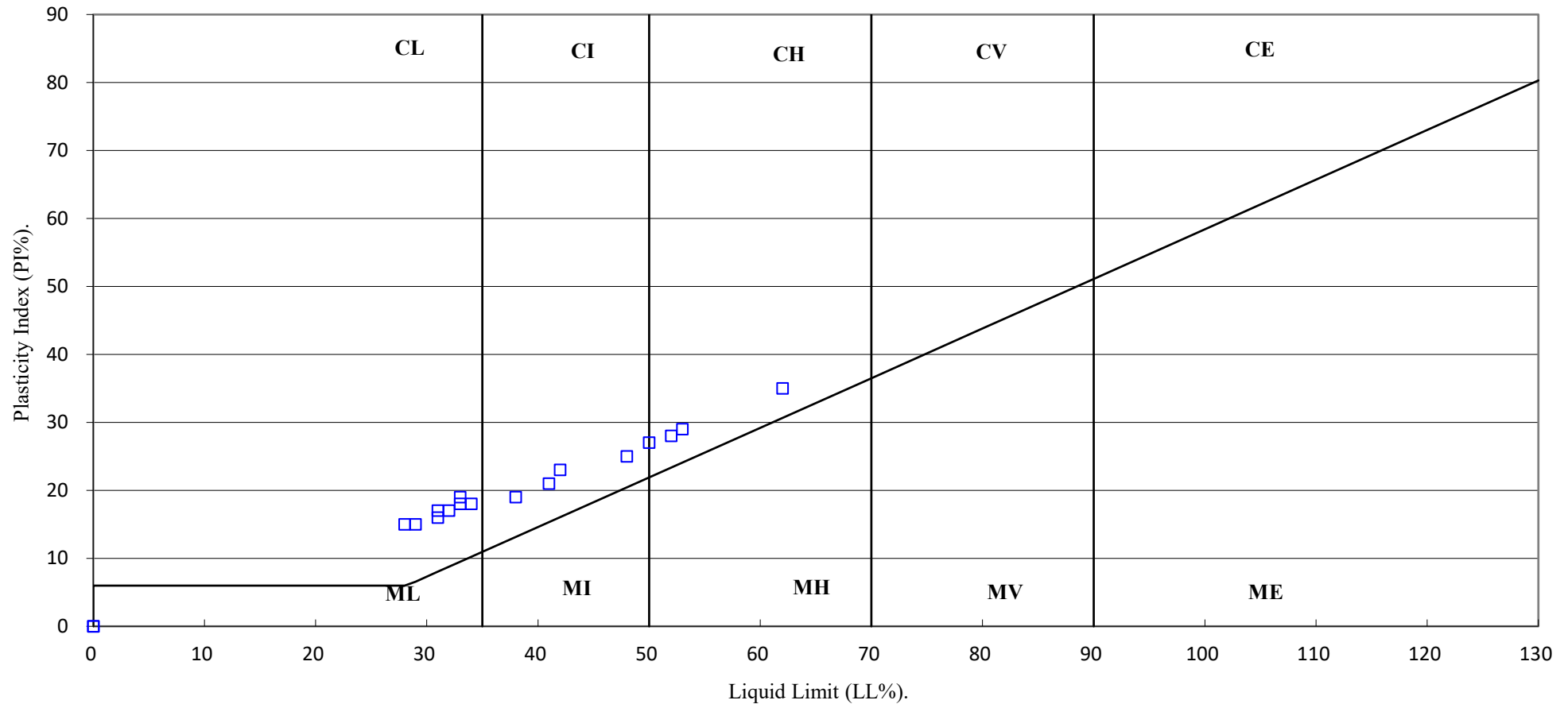
Contract No:

PSL22/2345

Client Ref:

001138

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



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Contract No:

PSL22/2345

Client Ref:

001138

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



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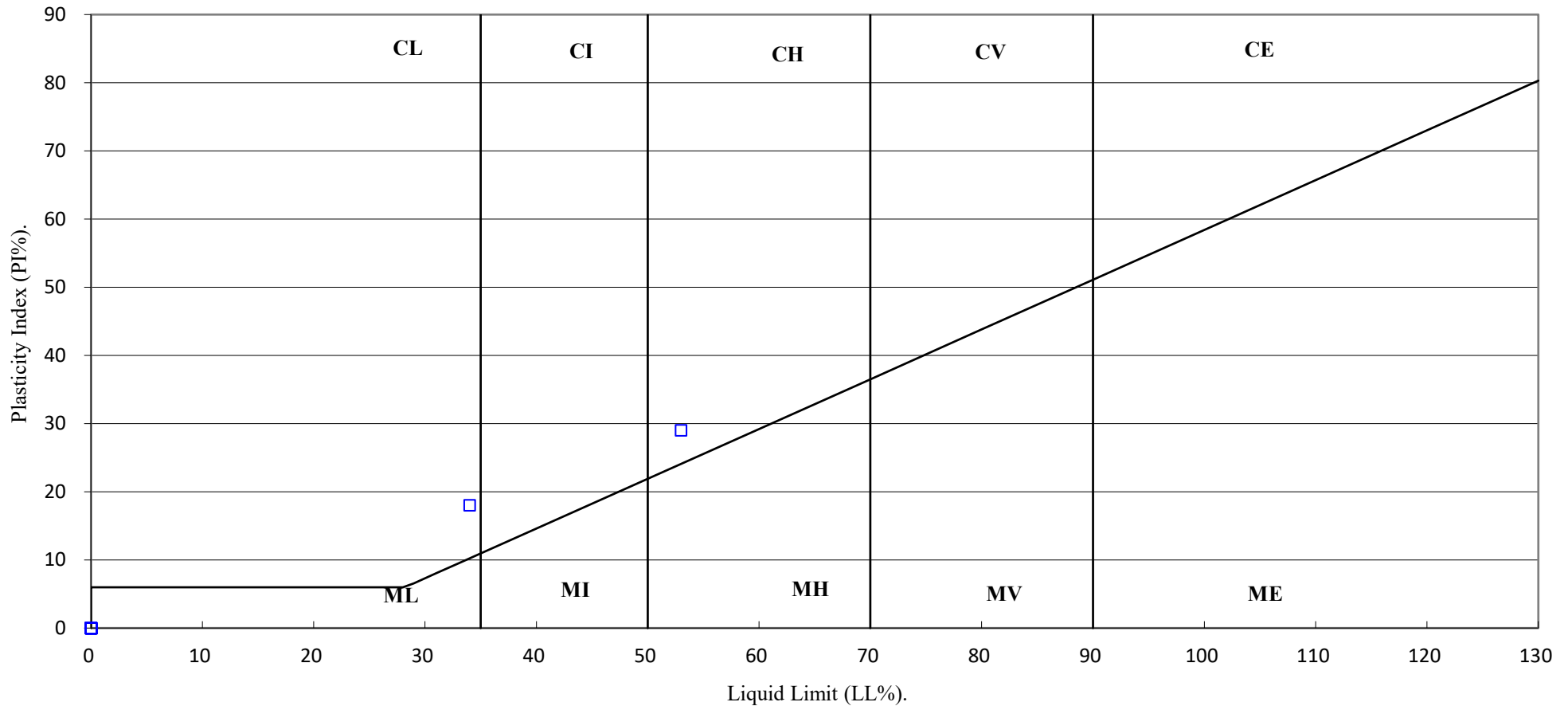
Contract No:

PSL22/2345

Client Ref:

001138

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



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Professional Soils Laboratory

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Contract No:

PSL22/2345

Client Ref:

001138

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

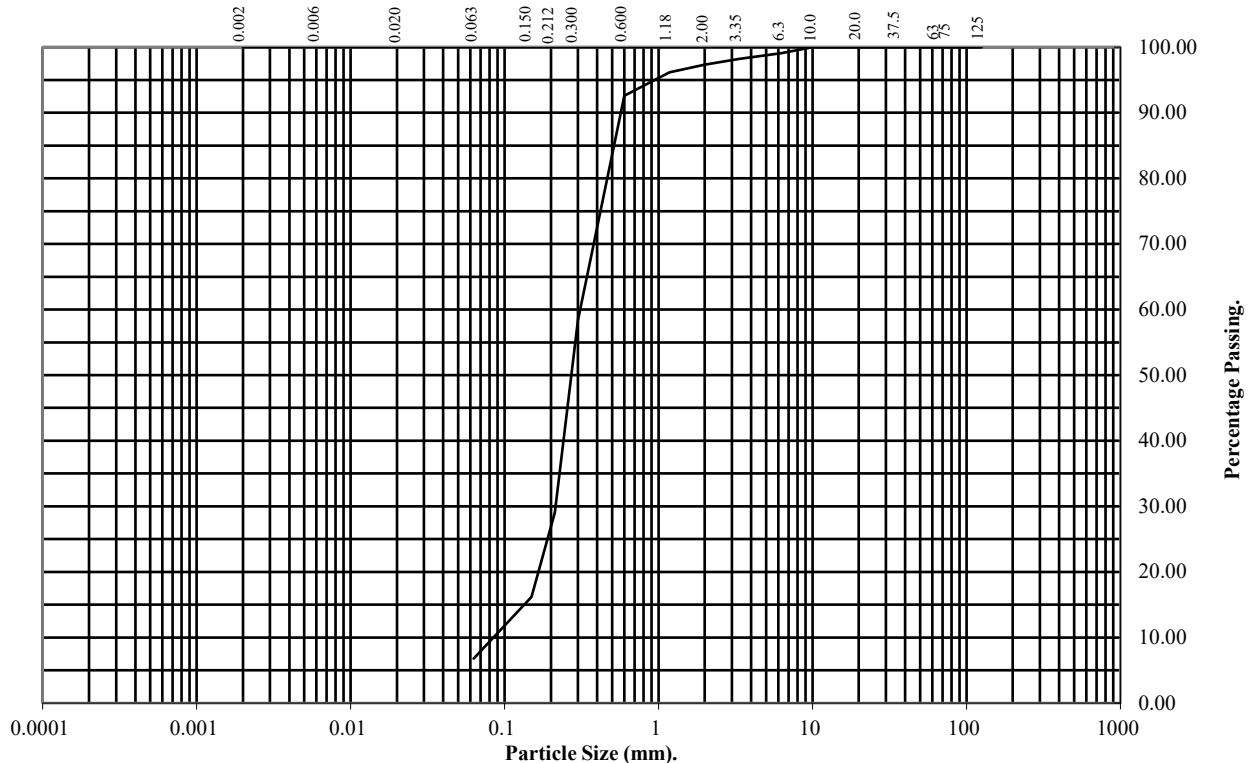
Hole Number: TP107

Top Depth (m): 1.00

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	98
2	97
1.18	96
0.6	93
0.3	58
0.212	29
0.15	16
0.063	7

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	90
Silt/Clay	7

Remarks:

See Summary of Soil Descriptions



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Contract No:
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Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:

TP112

Top Depth (m):

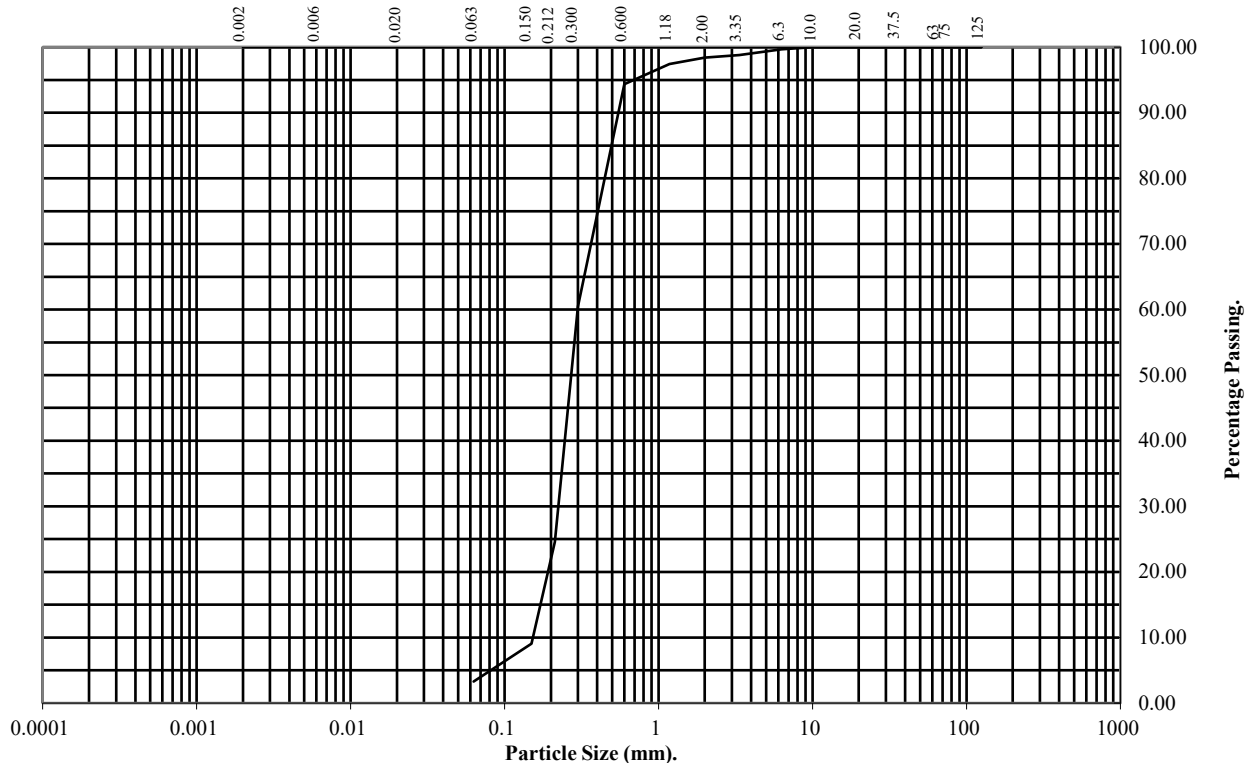
1.20

Sample Number:

Base Depth(m):

Sample Type:

B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	98
1.18	97
0.6	94
0.3	60
0.212	25
0.15	9
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	95
Silt/Clay	3

Remarks:

See Summary of Soil Descriptions



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Peel Hall

Contract No:
PSL22/2345
Client Ref:
001138

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

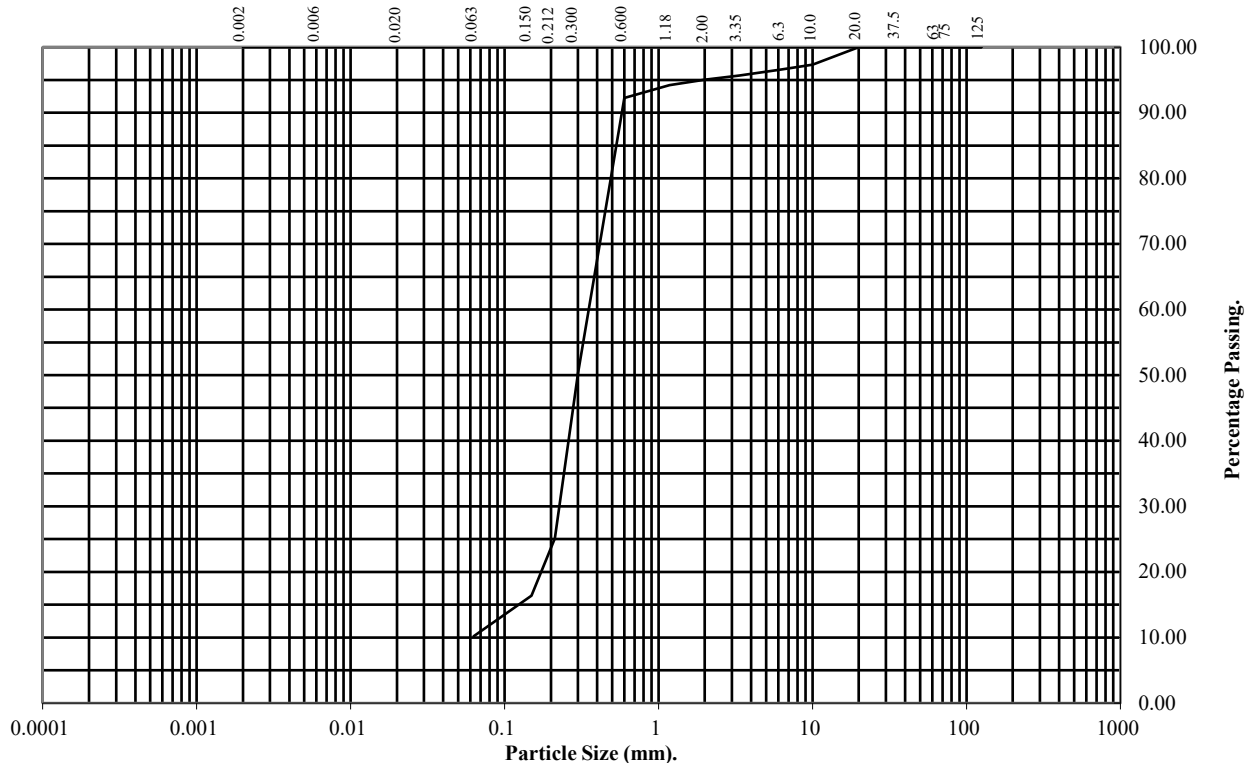
Hole Number: TP116

Top Depth (m): 1.20

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	97
3.35	96
2	95
1.18	94
0.6	92
0.3	50
0.212	25
0.15	16
0.063	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	85
Silt/Clay	10

Remarks:

See Summary of Soil Descriptions



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Peel Hall

Contract No:
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Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

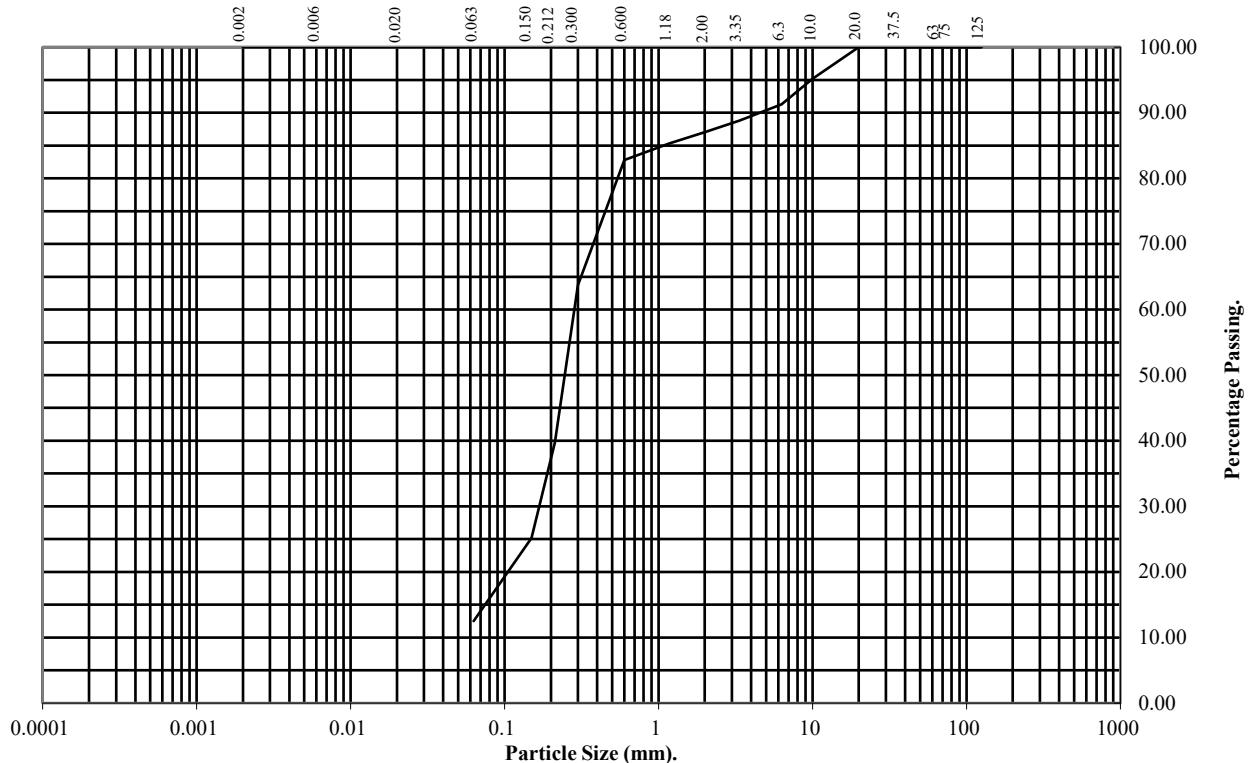
Hole Number: TP122

Top Depth (m): 0.40

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	95
6.3	91
3.35	89
2	87
1.18	85
0.6	83
0.3	64
0.212	40
0.15	25
0.063	13

Soil Fraction	Total Percentage
Cobbles	0
Gravel	13
Sand	74
Silt/Clay	13

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

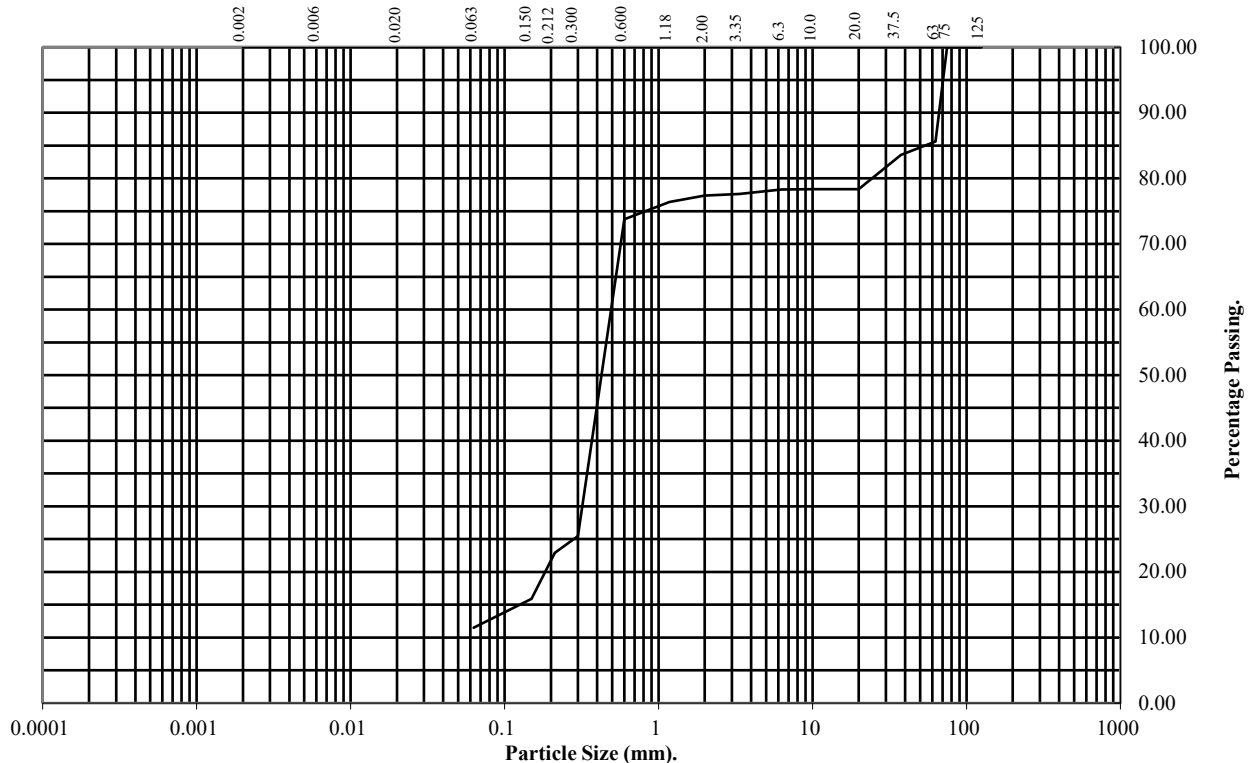
Hole Number: TP140

Top Depth (m): 2.00

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	86
37.5	84
20	78
10	78
6.3	78
3.35	78
2	77
1.18	76
0.6	74
0.3	25
0.212	23
0.15	16
0.063	11

Soil Fraction	Total Percentage
Cobbles	14
Gravel	9
Sand	66
Silt/Clay	11

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

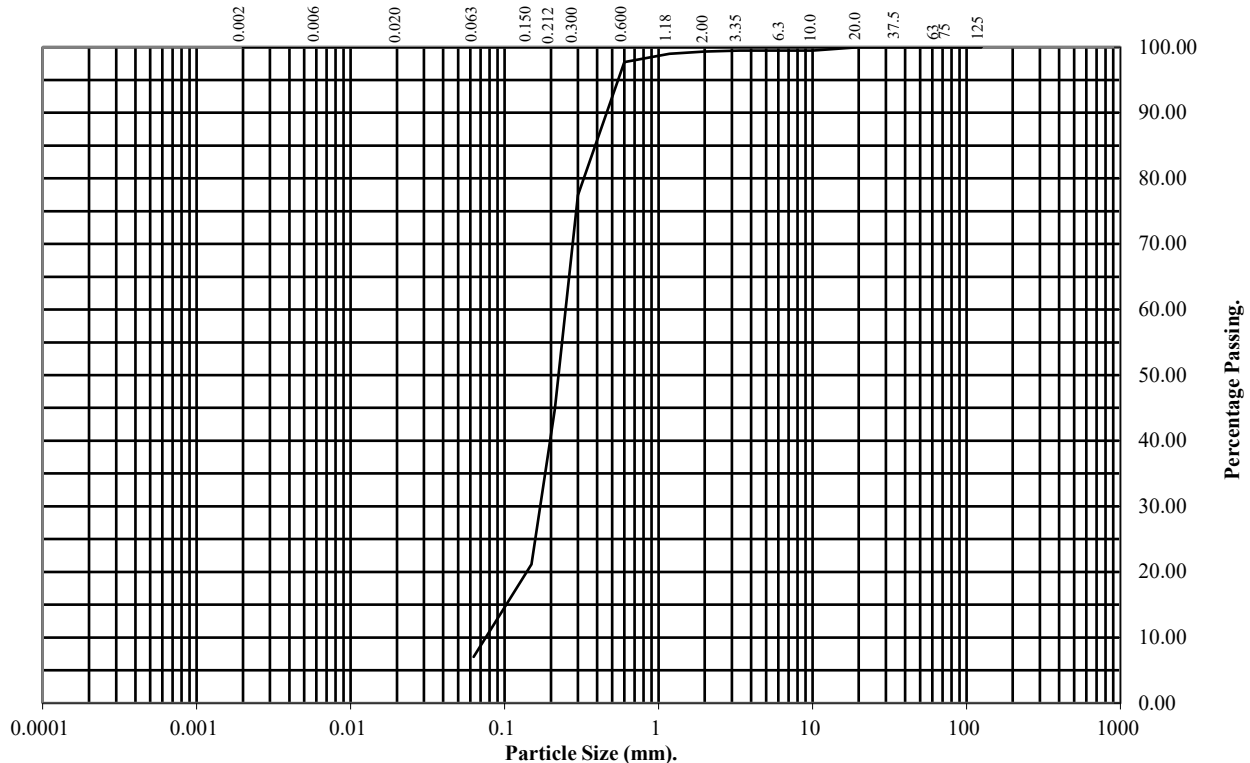
Hole Number: TP142

Top Depth (m): 0.70

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	99
3.35	99
2	99
1.18	99
0.6	98
0.3	77
0.212	45
0.15	21
0.063	7

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	92
Silt/Clay	7

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

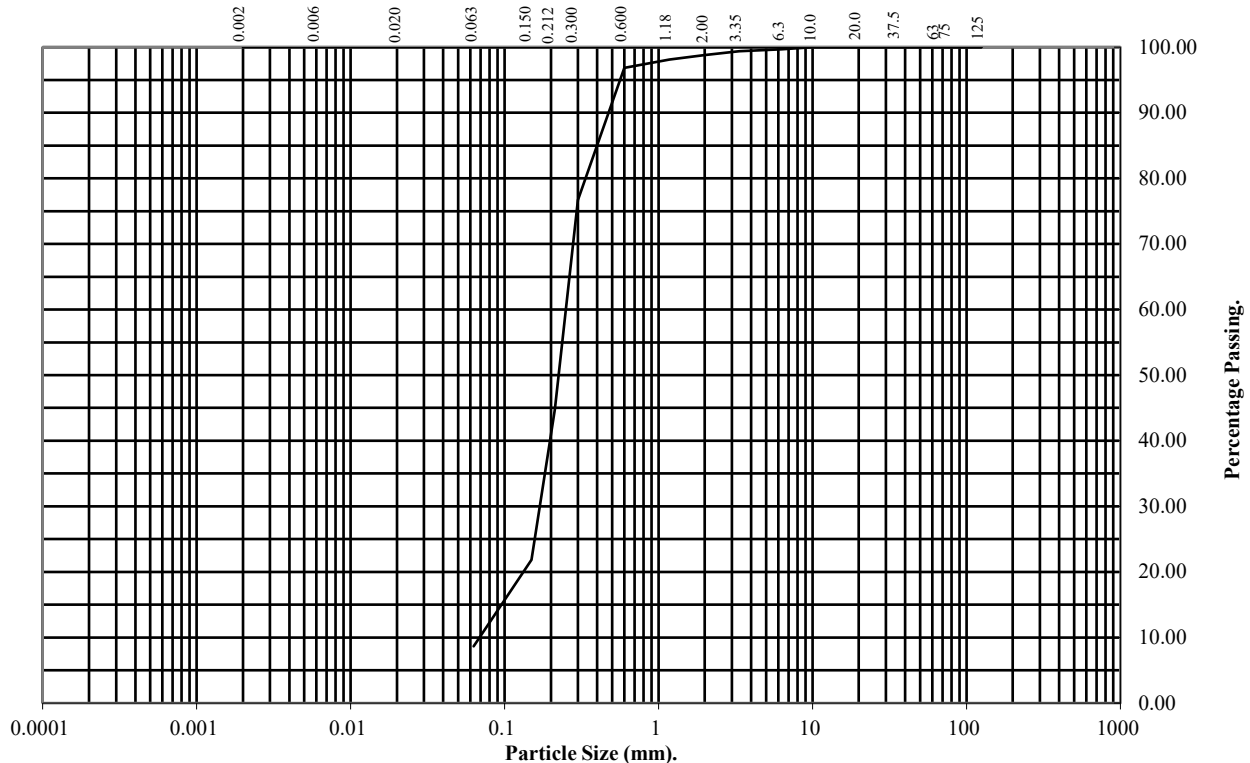
Hole Number: TP147

Top Depth (m): 0.50

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	99
1.18	98
0.6	97
0.3	77
0.212	45
0.15	22
0.063	9

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	90
Silt/Clay	9

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

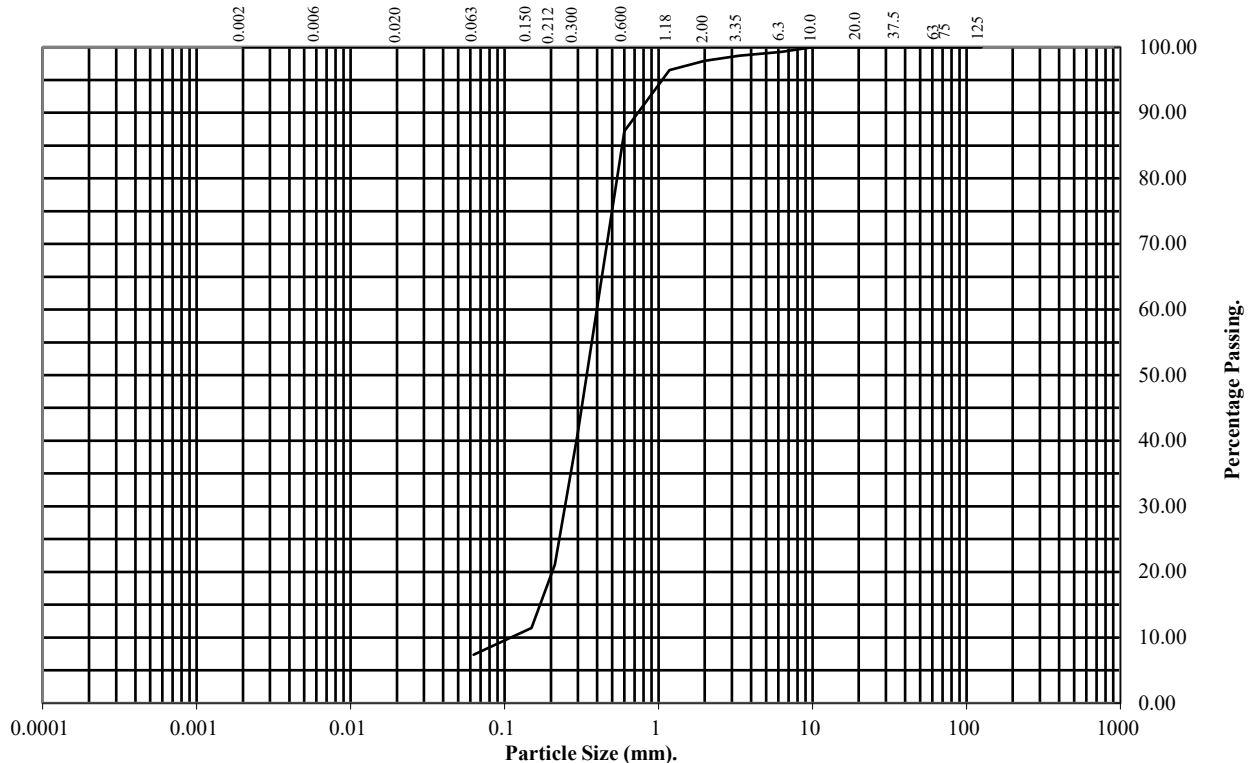
Hole Number: TP205

Top Depth (m): 0.70

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	98
1.18	97
0.6	87
0.3	41
0.212	21
0.15	11
0.063	7

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	91
Silt/Clay	7

Remarks:

See Summary of Soil Descriptions



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Contract No:
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Client Ref:
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PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

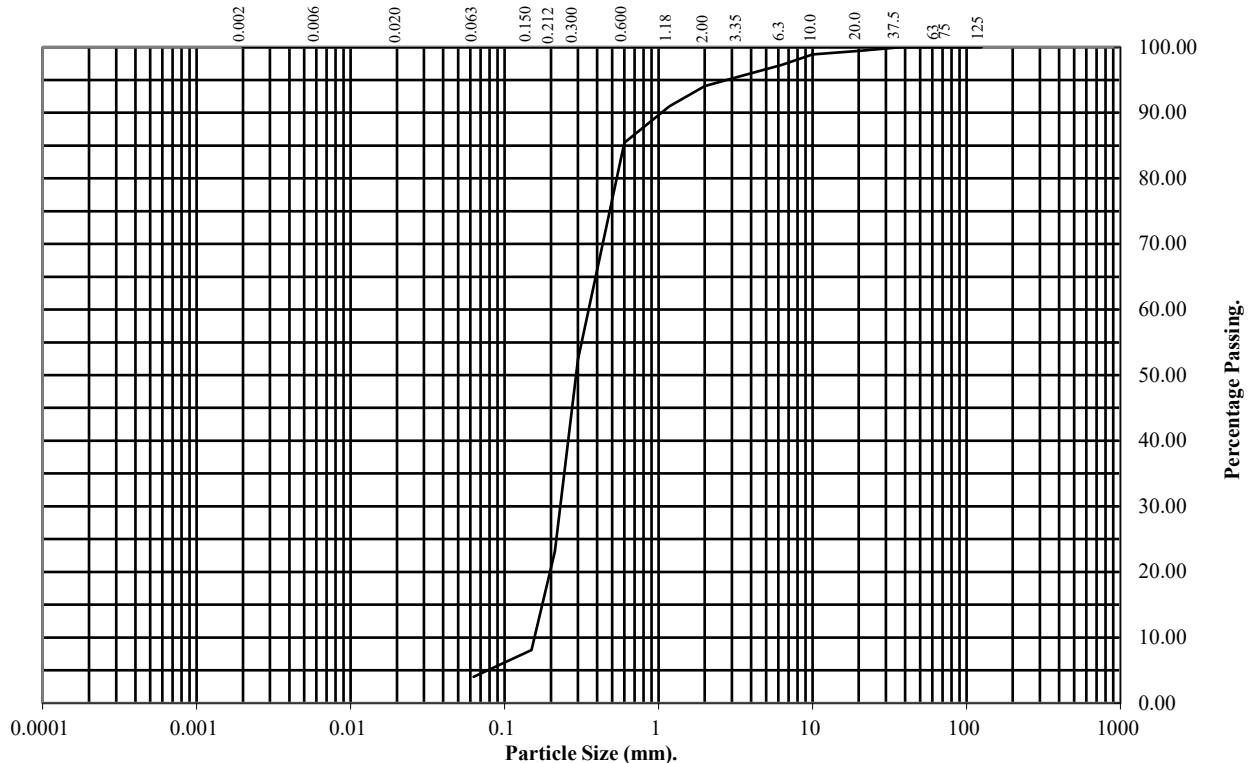
Hole Number: TP215

Top Depth (m): 0.80

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	99
10	99
6.3	97
3.35	96
2	94
1.18	91
0.6	85
0.3	52
0.212	23
0.15	8
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	90
Silt/Clay	4

Remarks:

See Summary of Soil Descriptions



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Client Ref:
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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

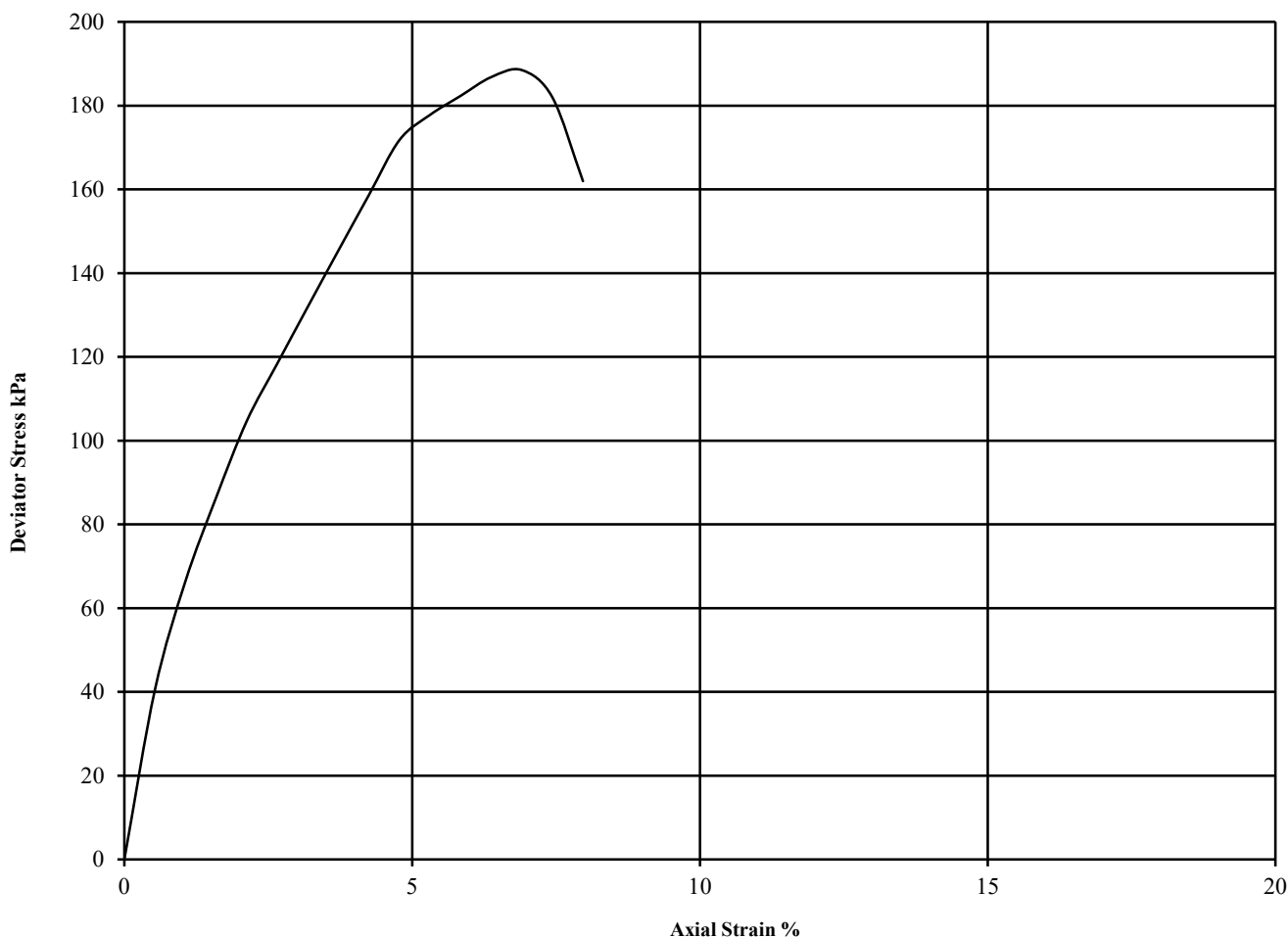
Hole Number: WS113

Top Depth (m): 1.50

Sample Number:

Base Depth (m): 2.00

Sample Type U100



Diameter (mm):		85	Height (mm):		160	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.43 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	24	1.96	1.58	35	188	94	6.9	Brittle	



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Contract No:

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Client Ref:

'001138

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

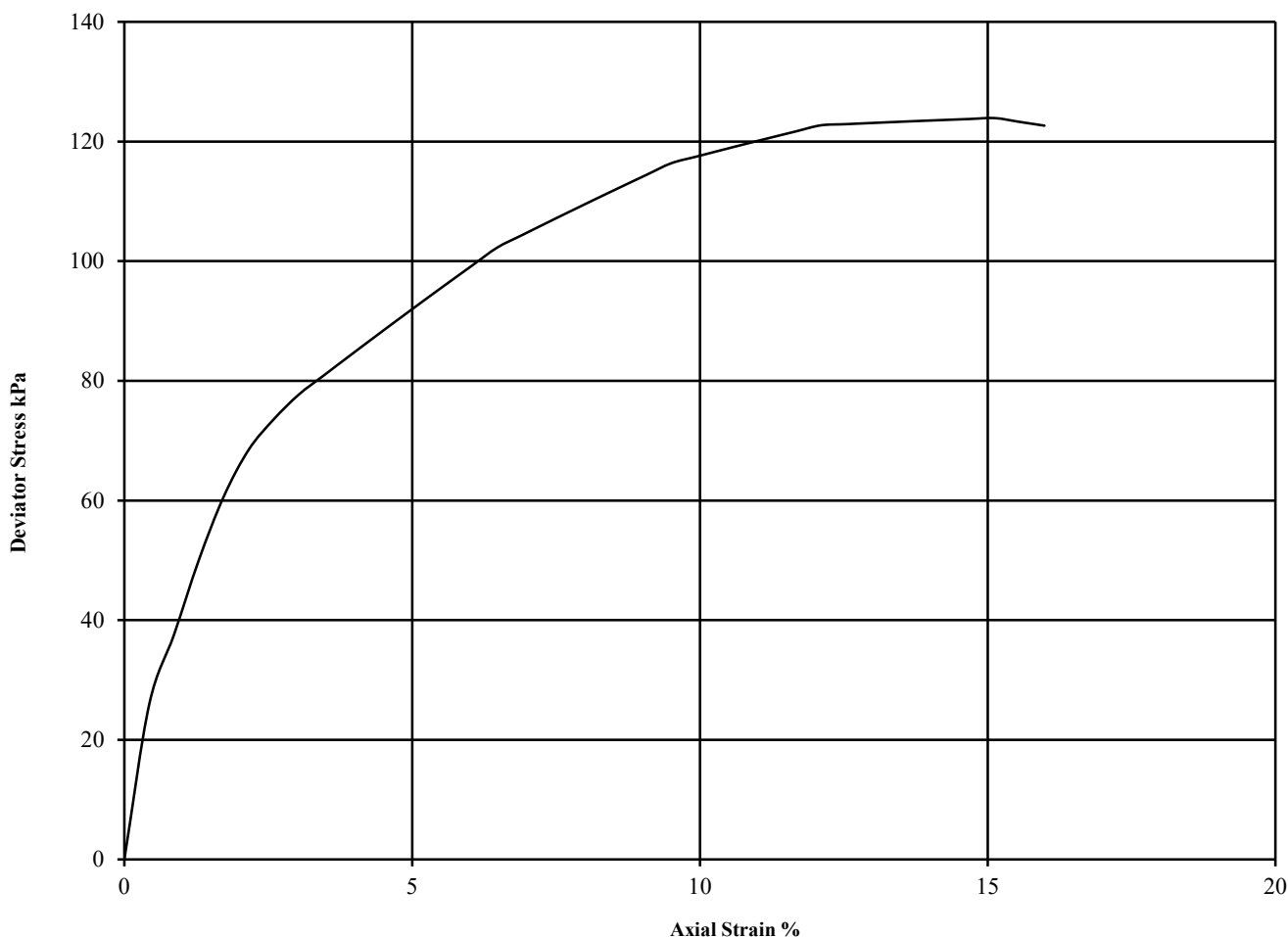
Hole Number: WS119

Top Depth (m): 1.50

Sample Number:

Base Depth (m): 2.00

Sample Type U100



Diameter (mm):		70	Height (mm):		162	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.48 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	18	2.11	1.79	35	124	62	15.1	Plastic	



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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

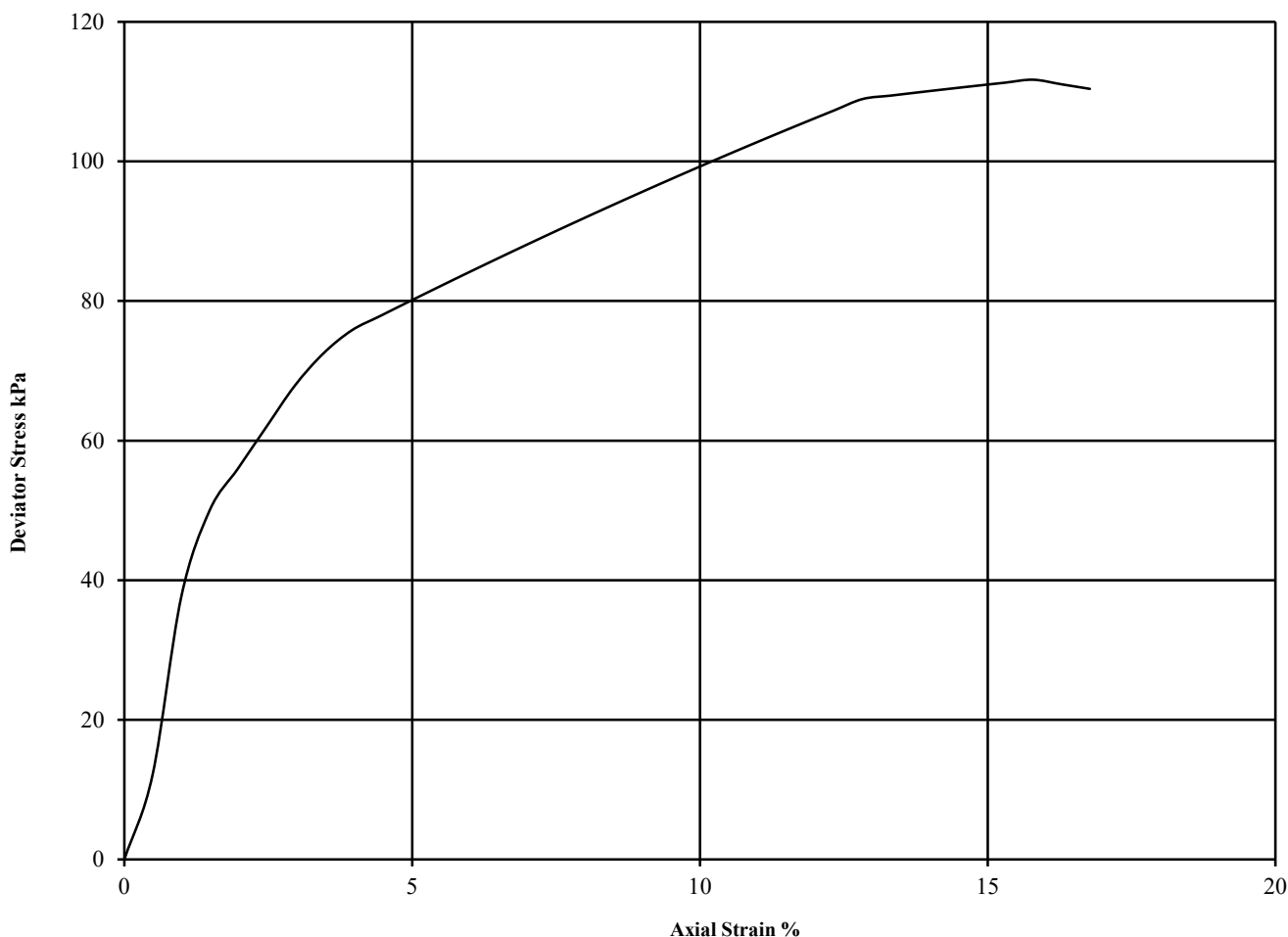
Hole Number: WS122

Top Depth (m): 2.50

Sample Number:

Base Depth (m): 3.00

Sample Type U100



Diameter (mm):		75	Height (mm):		152	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.45 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	30	1.88	1.45	55	112	56	15.8	Plastic	



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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

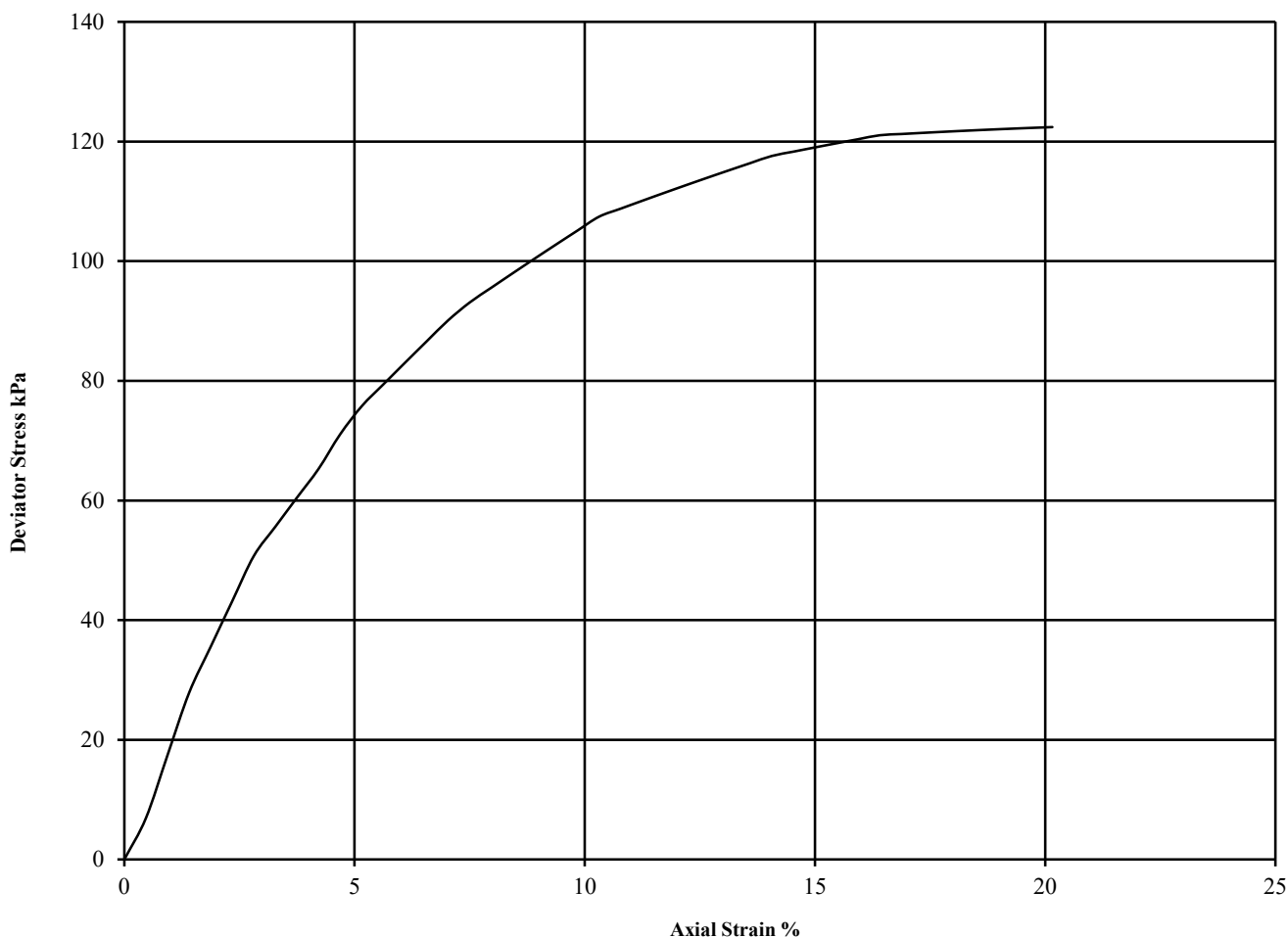
Hole Number: WS205

Top Depth (m): 2.50

Sample Number:

Base Depth (m): 3.00

Sample Type U100



Diameter (mm):		75	Height (mm):		160	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.43 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	13	2.13	1.88	55	122	61	20.2	Plastic	



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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

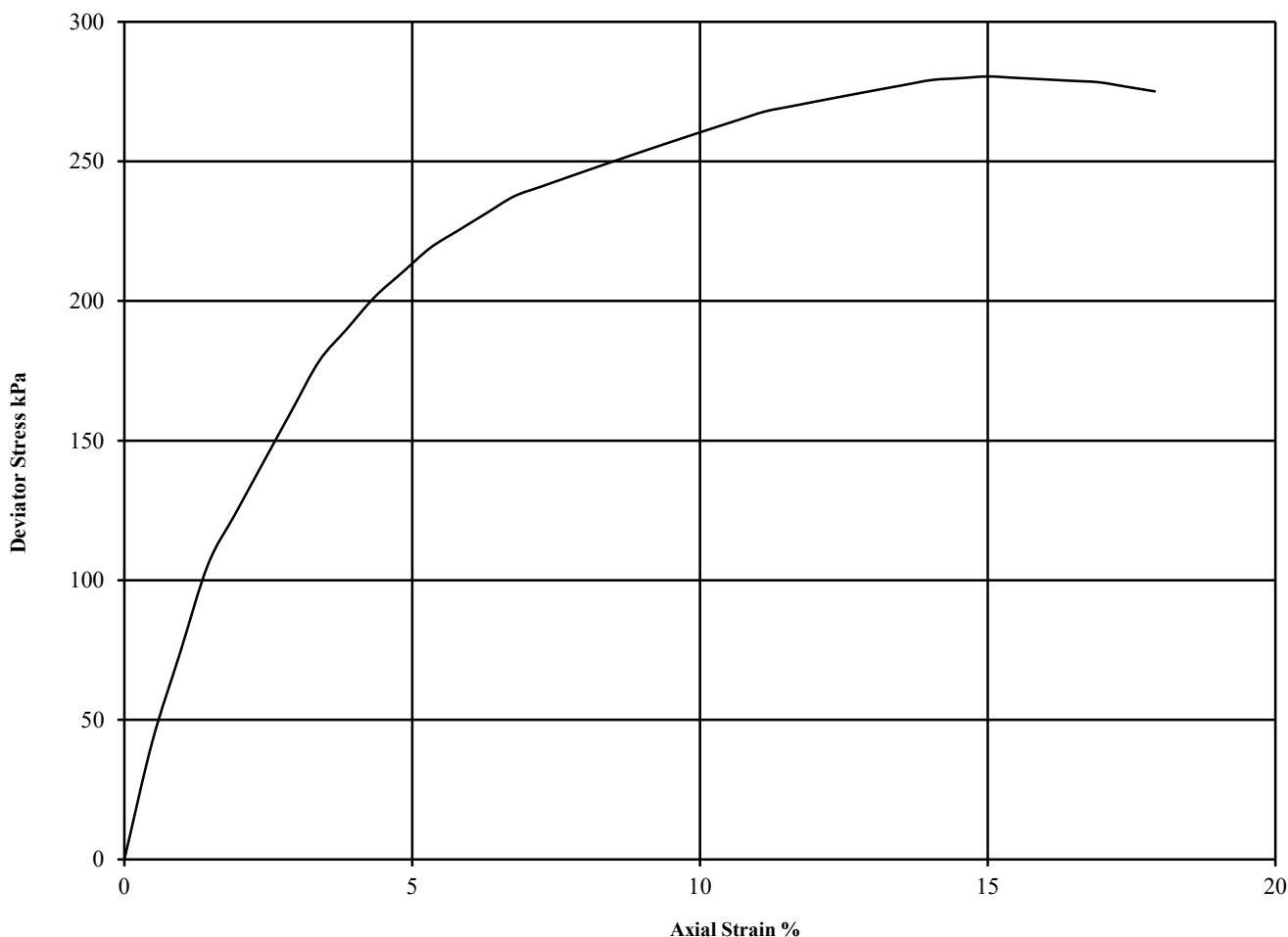
Hole Number: WS216

Top Depth (m): 2.50

Sample Number:

Base Depth (m): 3.00

Sample Type U100



Diameter (mm):		75	Height (mm):		155	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.45 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	13	2.17	1.92	55	280	140	15.0	Intermediate	



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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

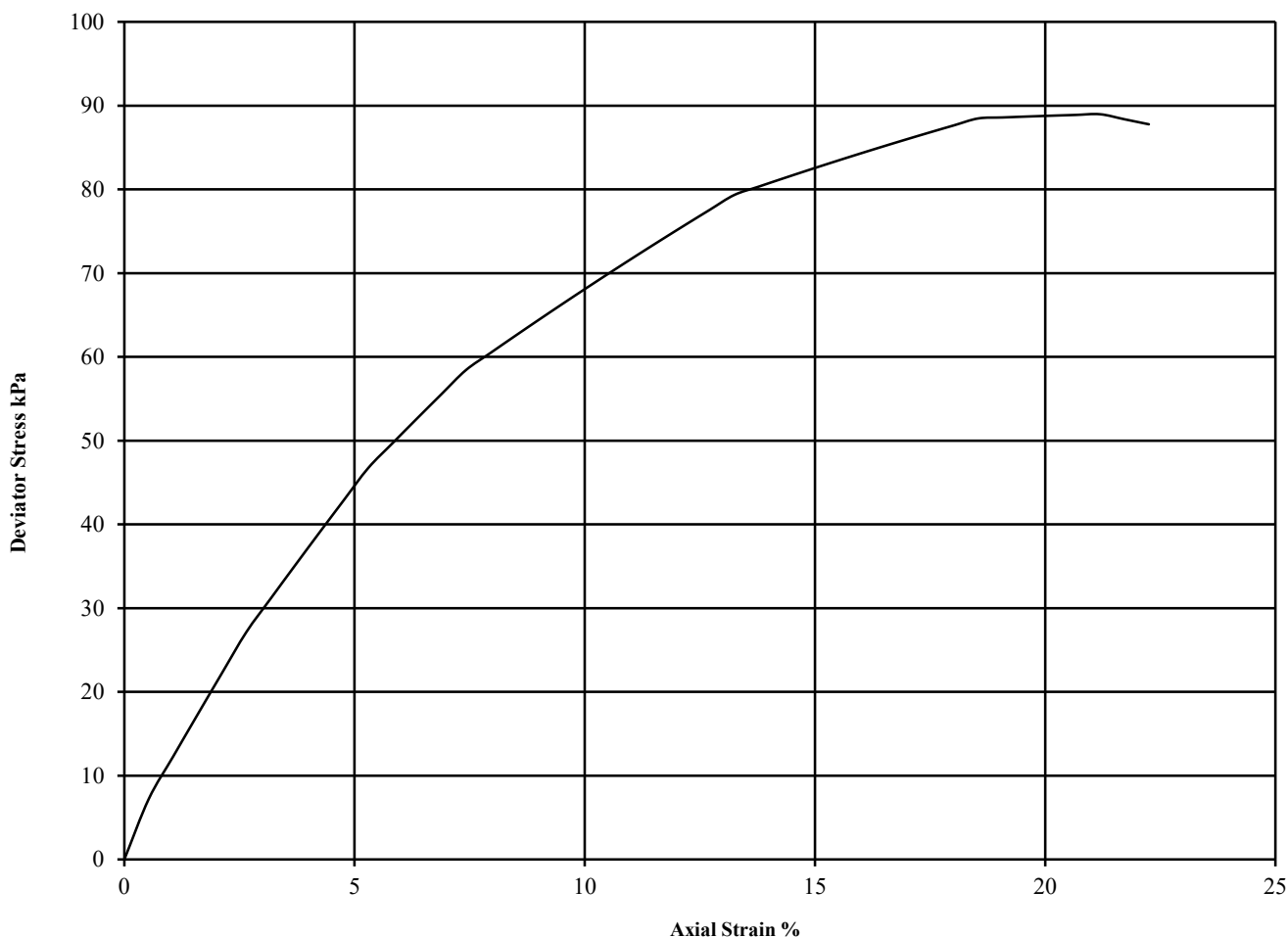
Hole Number: WS221

Top Depth (m): 0.50

Sample Number:

Base Depth (m): 1.00

Sample Type U100



Diameter (mm):		80		Height (mm):		151	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure		Undisturbed Sample
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$				Sample taken from top of tube
										Rate of strain = 2 %/min
										Latex Membrane used 0.2 mm thick,
										Correction applied 0.41
1	35	1.89	1.40	15	89	44	21.2	Plastic		See summary of soil descriptions



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ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: WS208

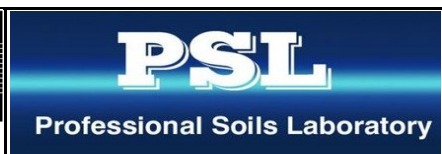
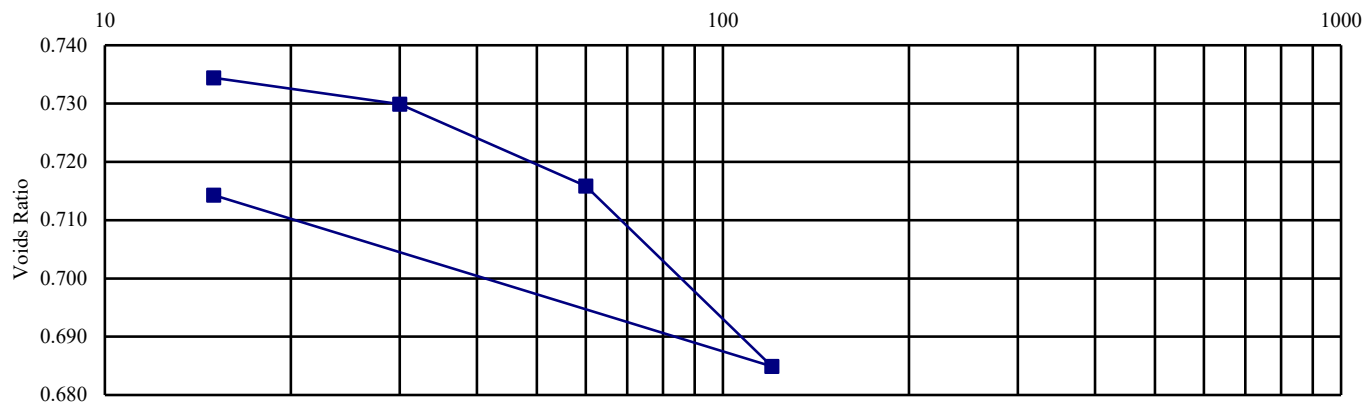
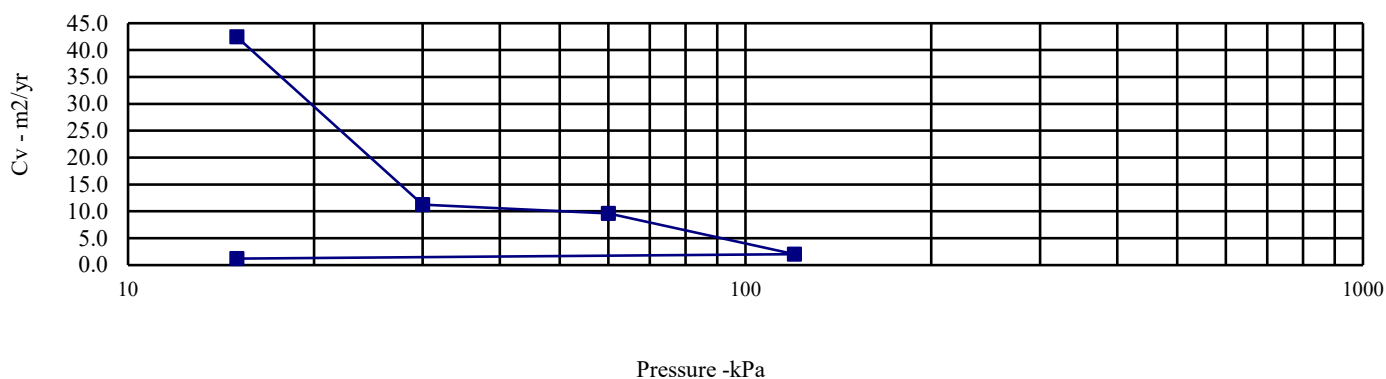
Top Depth (m): 0.50

Sample Number:

Base Depth (m) : 1.00

Sample Type: U100

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	28	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	1.95	0	15	0.259	42.459	Method used to	
Dry Density (Mg/m3):	1.52	15	30	0.173	11.225	determine CV:	T90
Voids Ratio:	0.741	30	60	0.271	9.591	Nominal temperature	
Degree of saturation:	99.9	60	120	0.301	2.045	during test ' C:	20
Height (mm):	20.08	120	15	0.166	1.209	Remarks:	
Diameter (mm)	75.06					See summary of soil descriptions	
Particle Density (Mg/m3):	2.65						
Assumed							



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ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: WS115

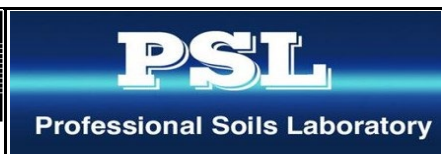
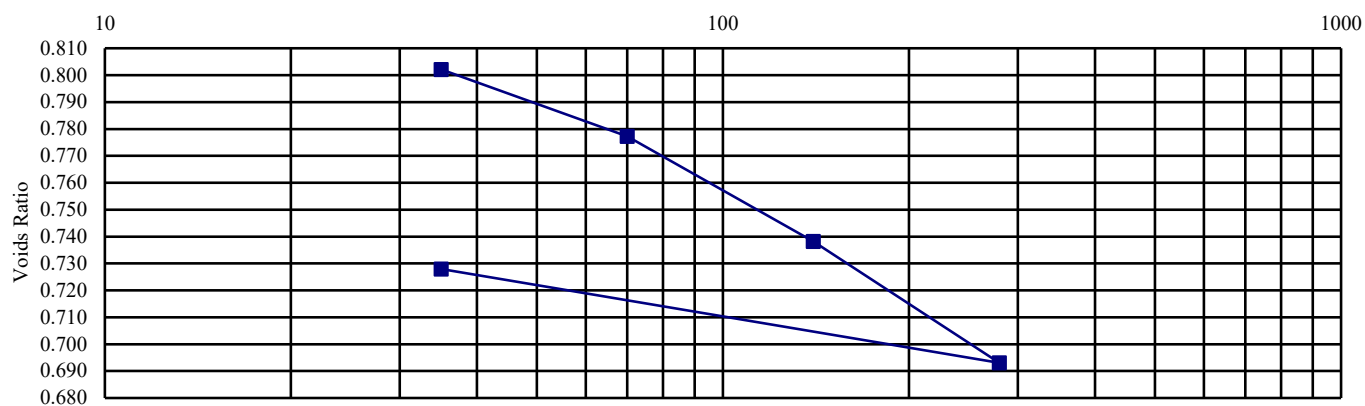
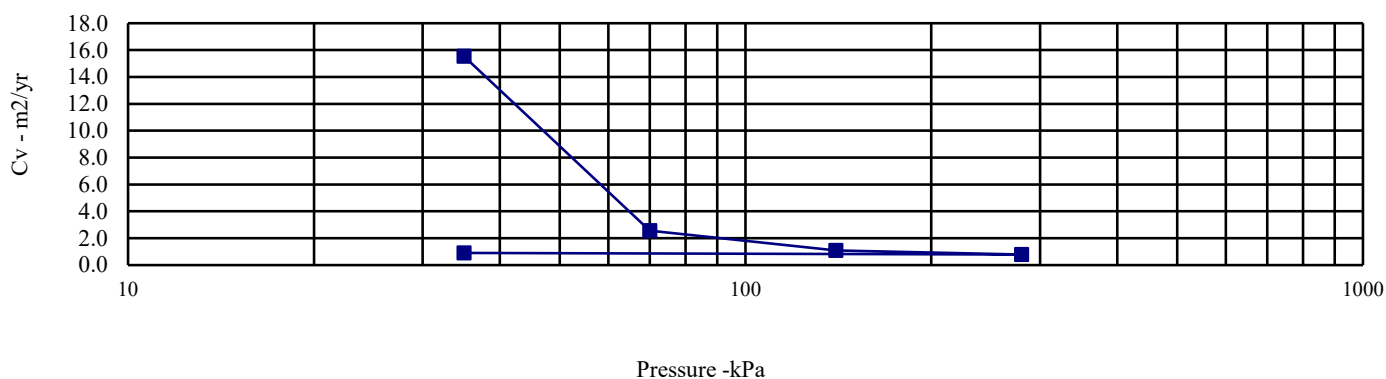
Top Depth (m): 1.50

Sample Number:

Base Depth (m) : 2.00

Sample Type: U100

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	33	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	1.92	0	35	0.496	15.538	Method used to	
Dry Density (Mg/m3):	1.44	35	70	0.394	2.554	determine CV:	T90
Voids Ratio:	0.834	70	140	0.314	1.104	Nominal temperature	
Degree of saturation:	105.0	140	280	0.186	0.787	during test ' C:	20
Height (mm):	20.06	280	35	0.084	0.905	Remarks:	
Diameter (mm)	75.08					See summary of soil descriptions	
Particle Density (Mg/m3):	2.65						
Assumed							



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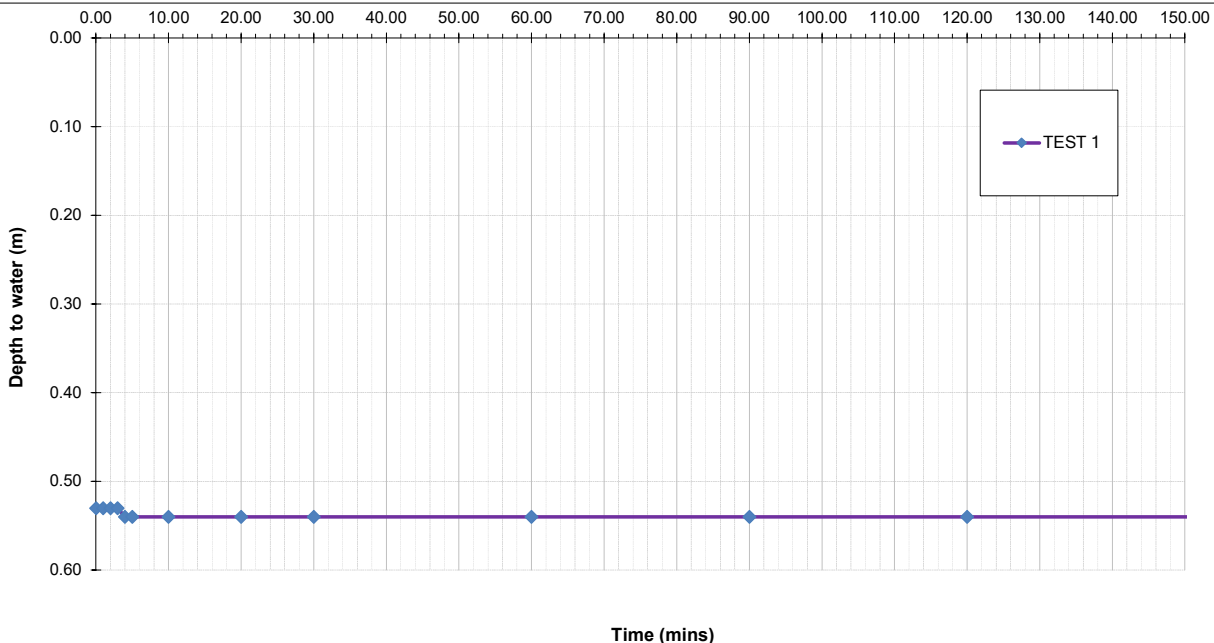
APPENDIX IX SOAKAWAY PERMEABILITY TEST CERTIFICATES



Trial Pit Number:	SA101	
Length:	2.50	m
Width:	0.50	m
Depth:	2.00	m
Groundwater Level:		m

Effective Storage Depth	m	1.47
75% Effective Storage Depth	m	1.10
(i.e. depth below GL)	m	0.90
25% Effective Storage Depth	m	0.37
(i.e. depth below GL)	m	1.63
Effective Storage Depth 75%-25%	m	0.74
Time to fall to 75% effective depth	mins	N/A
Time to fall to 25% effective depth	mins	N/A
V (75%-25%)	m3	0.92
a (50%)	m2	5.66
t (75%-25%)	mins	N/A

DESIGN SOIL INFILTRATION RATE, f	N/A
------------------------------------	-----

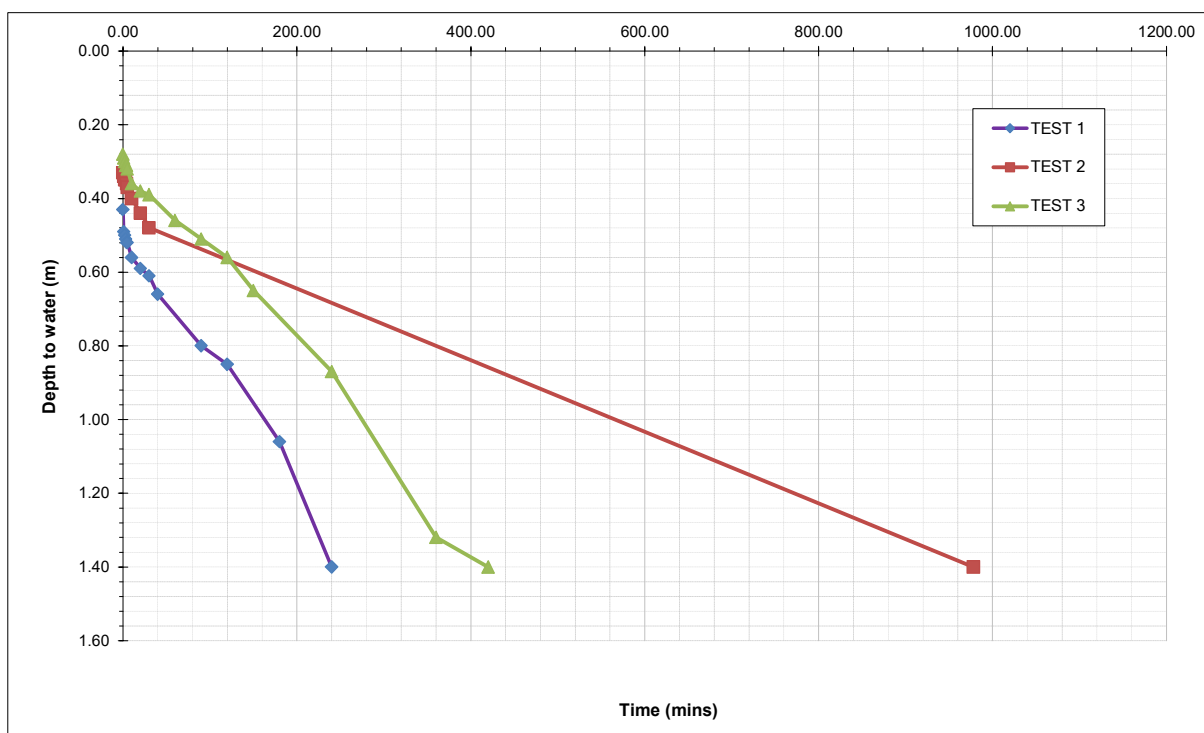




Site:	Peel Hall	Trial Pit Number:	SA102
Job Number:	15-740	Length:	2.20 m
Date of Test:	21/03/2022	Width:	0.50 m
		Depth:	1.40 m
		Groundwater Level:	m

Three tests completed.		TEST 1		TEST 2		TEST 3	
		Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
		0.00	0.43	0.00	0.33	0.00	0.28
		1.00	0.49	1.00	0.34	1.00	0.29
		2.00	0.5	2.00	0.35	2.00	0.30
		3.00	0.51	3.00	0.35	3.00	0.31
		4.00	0.52	4.00	0.36	4.00	0.31
		5.00	0.52	5.00	0.37	5.00	0.32
		10.00	0.56	10.00	0.4	10.00	0.36
		20.00	0.59	20.00	0.44	20.00	0.38
		30.00	0.61	30.00	0.48	30.00	0.39
		40.00	0.66	978.00	1.4	60.00	0.46
		90.00	0.8			90.00	0.51
		120.00	0.85			120.00	0.56
		180.00	1.06			150.00	0.65
		240.00	1.4			240.00	0.87
						360.00	1.32
						420.00	1.40
Effective Storage Depth		m	0.97		1.07		1.12
75% Effective Storage Depth		m	0.73		0.80		0.84
(i.e. depth below GL)		m	0.67		0.60		0.56
25% Effective Storage Depth		m	0.24		0.27		0.28
(i.e. depth below GL)		m	1.16		1.13		1.12
Effective Storage Depth 75%-25%		m	0.49		0.54		0.56
Time to fall to 75% effective depth		mins	44.00		155.00		120.00
Time to fall to 25% effective depth		mins	199.00		700.00		306.00
V (75%-25%)		m3	0.53		0.59		0.62
a (50%)		m2	3.72		3.99		4.12
t (75%-25%)		mins	155.00		545.00		186.00
SOIL INFILTRATION RATE		m/s	1.54E-05		4.51E-06		1.34E-05

DESIGN SOIL INFILTRATION RATE, f	1.54E-05
---	-----------------





e3p

Site: Peel Hall
 Job Number: 15-740
 Date of Test: 21/03/2022

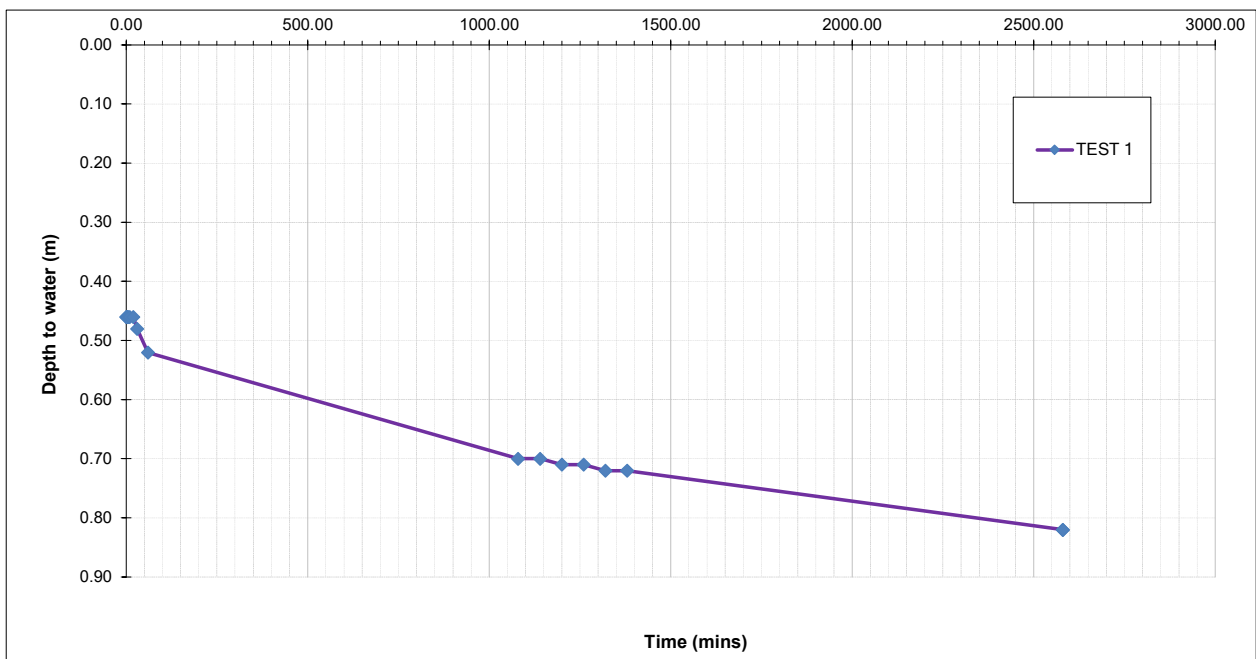
Trial Pit Number: SA103
 Length: 2.00 m
 Width: 0.60 m
 Depth: 1.80 m
 Groundwater Level: m

Test did not reach the 25% effective storage depth within 43 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated.

		TEST 1		TEST 2		TEST 3	
		Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
		0.00	0.46				
		1.00	0.46				
		2.00	0.46				
		3.00	0.46				
		4.00	0.46				
		5.00	0.46				
		10.00	0.46				
		20.00	0.46				
		30.00	0.48				
		60.00	0.52				
		1080.00	0.7				
		1140.00	0.70				
		1200.00	0.71				
		1260.00	0.71				
		1320.00	0.72				
		1380.00	0.72				
		2580.00	0.82				
		2580.00	0.82				
Effective Storage Depth	m		1.34				
75% Effective Storage Depth	m		1.01				
(i.e. depth below GL)	m		0.80				
25% Effective Storage Depth	m		0.34				
(i.e. depth below GL)	m		1.47				
Effective Storage Depth 75%-25%	m		0.67				
Time to fall to 75% effective depth	mins		2325.00				
Time to fall to 25% effective depth	mins		N/A				
V (75%-25%)	m3		0.80				
a (50%)	m2		4.68				
t (75%-25%)	mins		N/A				
SOIL INFILTRATION RATE	m/s		N/A				

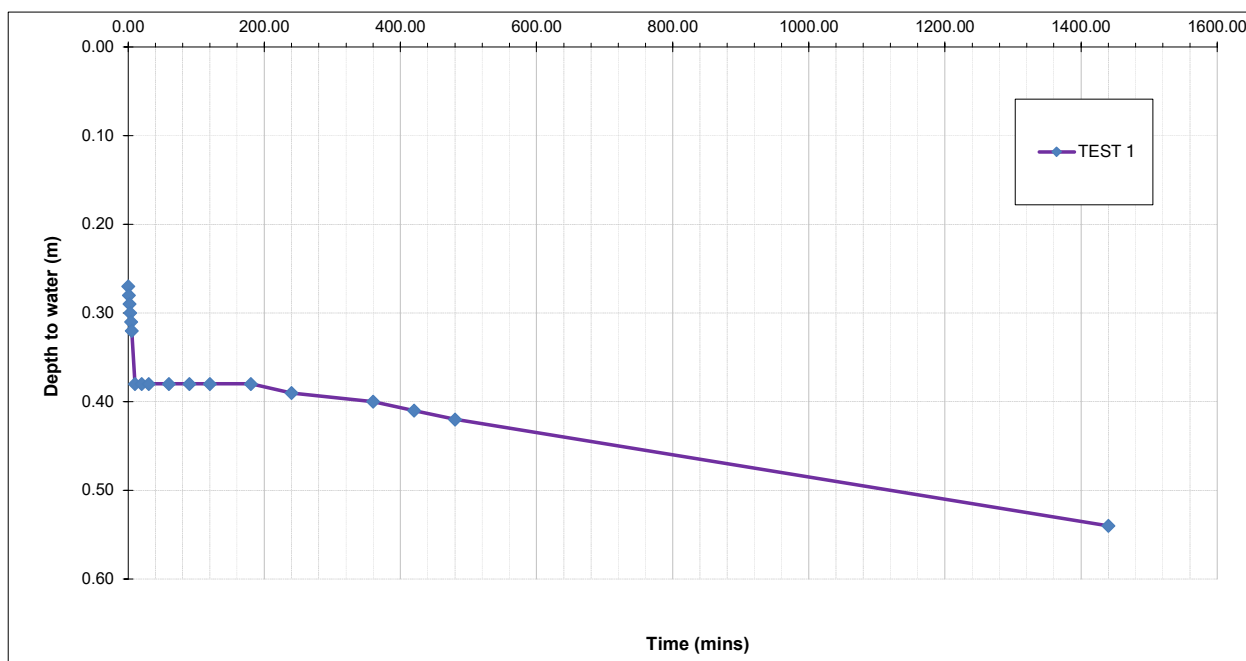
DESIGN SOIL INFILTRATION RATE, f

N/A



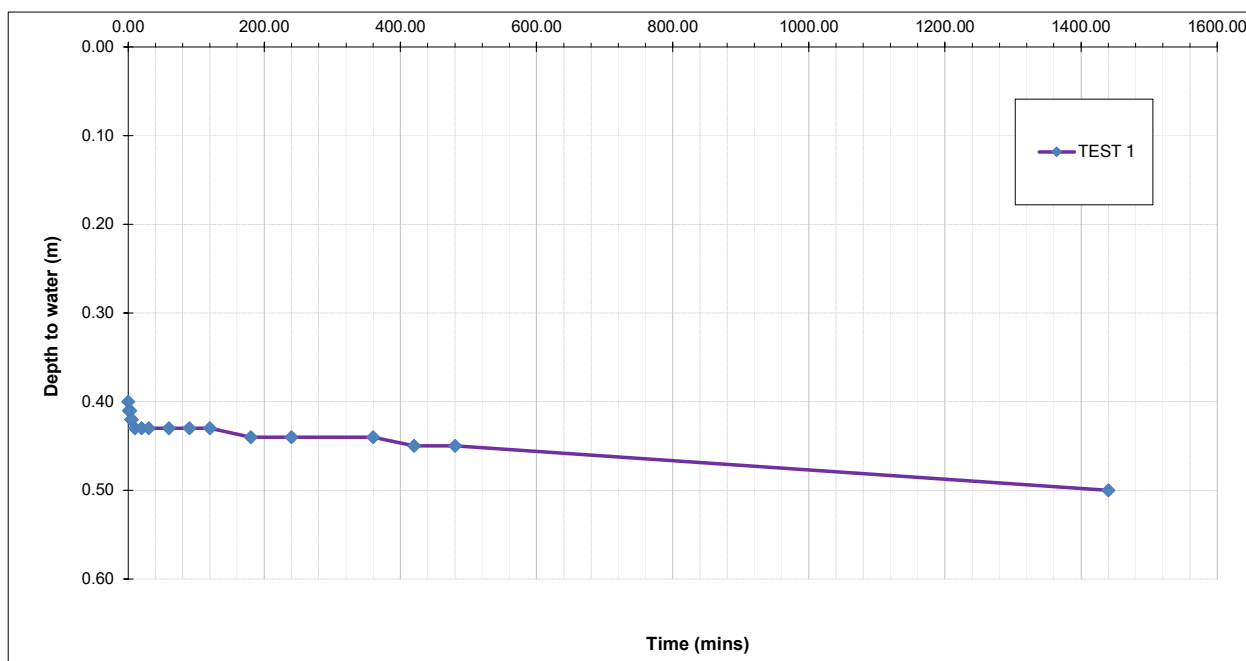
		Site: Peel Hall Job Number: 15-740 Date of Test: 22/03/2022		Trial Pit Number: SA104 Length: 2.20 m Width: 0.65 m Depth: 1.60 m Groundwater Level: m		
Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated.	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.27				
	1.00	0.28				
	2.00	0.29				
	3.00	0.3				
	4.00	0.31				
	5.00	0.32				
	10.00	0.38				
	20.00	0.38				
	30.00	0.38				
	60.00	0.38				
	90.00	0.38				
	120.00	0.38				
	180.00	0.38				
	240.00	0.39				
	360.00	0.40				
420.00	0.41					
480.00	0.42					
1440.00	0.54					
Effective Storage Depth	m	1.33				
75% Effective Storage Depth	m	1.00				
(i.e. depth below GL)	m	0.60				
25% Effective Storage Depth	m	0.33				
(i.e. depth below GL)	m	1.27				
Effective Storage Depth 75%-25%	m	0.67				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.95				
a (50%)	m2	5.22				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

DESIGN SOIL INFILTRATION RATE, f	N/A
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		Site: Peel Hall Job Number: 15-740 Date of Test: 22/03/2022		Trial Pit Number: SA105 Length: 2.10 m Width: 0.70 m Depth: 2.00 m Groundwater Level: m		
Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated.	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.40				
	1.00	0.41				
	2.00	0.41				
	3.00	0.41				
	4.00	0.42				
	5.00	0.42				
	10.00	0.43				
	20.00	0.43				
	30.00	0.43				
	60.00	0.43				
	90.00	0.43				
	120.00	0.43				
	180.00	0.44				
	240.00	0.44				
	360.00	0.44				
420.00	0.45					
480.00	0.45					
1440.00	0.50					
Effective Storage Depth	m	1.60				
75% Effective Storage Depth	m	1.20				
(i.e. depth below GL)	m	0.80				
25% Effective Storage Depth	m	0.40				
(i.e. depth below GL)	m	1.60				
Effective Storage Depth 75%-25%	m	0.80				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	1.18				
a (50%)	m2	5.95				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

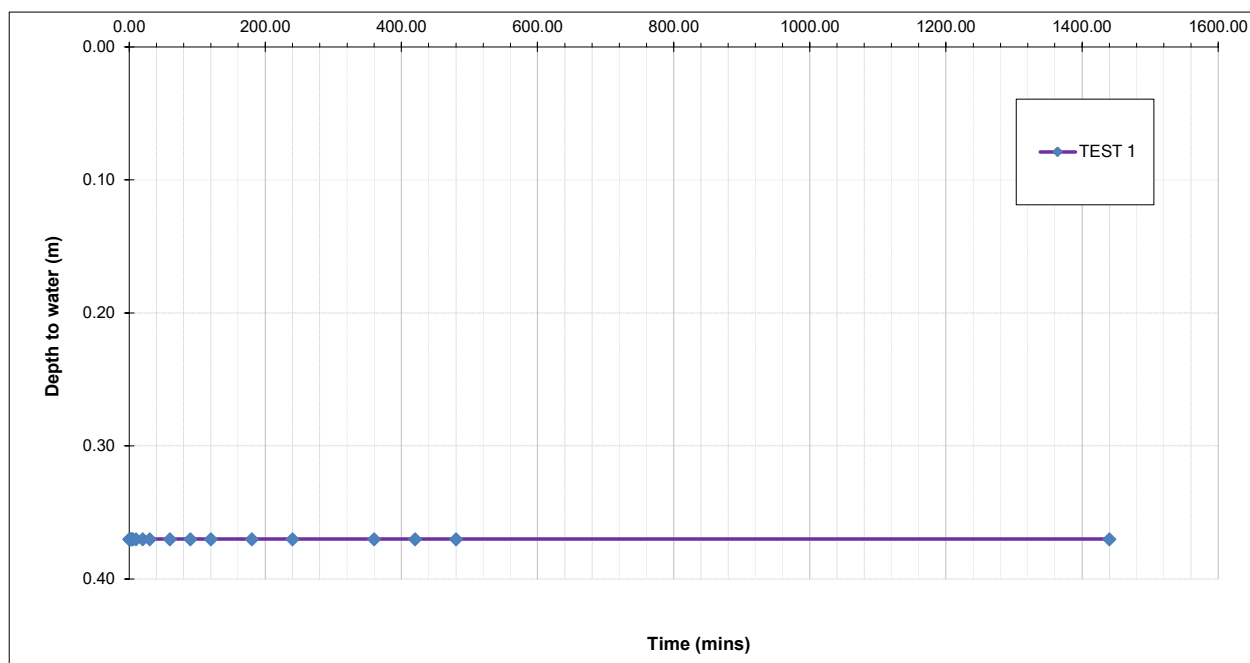
DESIGN SOIL INFILTRATION RATE, f	N/A
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	Site:	Peel Hall	Trial Pit Number:	SA106
	Job Number:	15-740	Length:	2.00 m
	Date of Test:	22/03/2022	Width:	0.80 m
			Depth:	1.30 m
			Groundwater Level:	m

Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated.	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.37				
	1.00	0.37				
	2.00	0.37				
	3.00	0.37				
	4.00	0.37				
	5.00	0.37				
	10.00	0.37				
	20.00	0.37				
	30.00	0.37				
	60.00	0.37				
	90.00	0.37				
	120.00	0.37				
	180.00	0.37				
	240.00	0.37				
	360.00	0.37				
	420.00	0.37				
	480.00	0.37				
	1440.00	0.37				
Effective Storage Depth	m	0.93				
75% Effective Storage Depth	m	0.70				
(i.e. depth below GL)	m	0.60				
25% Effective Storage Depth	m	0.23				
(i.e. depth below GL)	m	1.07				
Effective Storage Depth 75%-25%	m	0.47				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.74				
a (50%)	m2	4.20				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

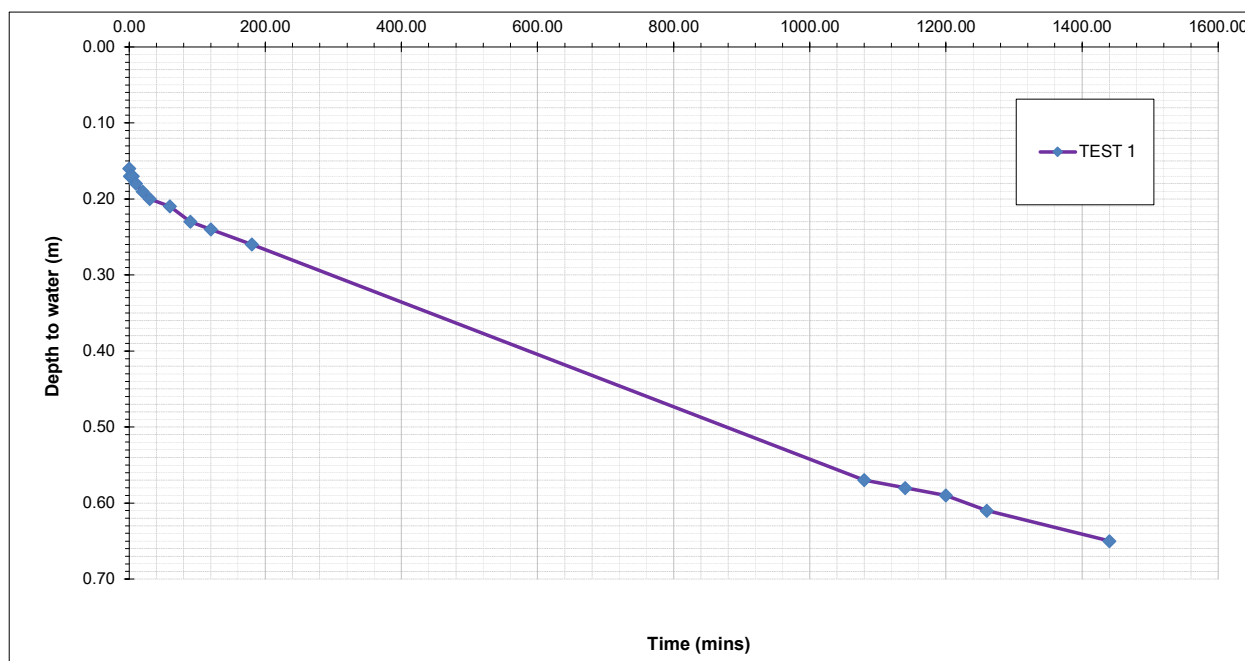
DESIGN SOIL INFILTRATION RATE, f	N/A
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	Site:	Peel Hall	Trial Pit Number:	SA107
	Job Number:	15-740	Length:	2.00 m
	Date of Test:	23/03/2022	Width:	0.65 m
			Depth:	1.50 m
			Groundwater Level:	m

Test did not reach the 25% effective storage depth within 43 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated.	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.16				
	1.00	0.17				
	2.00	0.17				
	3.00	0.17				
	4.00	0.17				
	5.00	0.17				
	10.00	0.18				
	20.00	0.19				
	30.00	0.2				
	60.00	0.21				
	90.00	0.23				
	120.00	0.24				
	180.00	0.26				
	1080.00	0.57				
	1140.00	0.58				
	1200.00	0.59				
	1260.00	0.61				
	1440.00	0.65				
Effective Storage Depth	m	1.34				
75% Effective Storage Depth	m	1.01				
(i.e. depth below GL)	m	0.50				
25% Effective Storage Depth	m	0.34				
(i.e. depth below GL)	m	1.17				
Effective Storage Depth 75%-25%	m	0.67				
Time to fall to 75% effective depth	mins	840.00				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.87				
a (50%)	m2	4.85				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

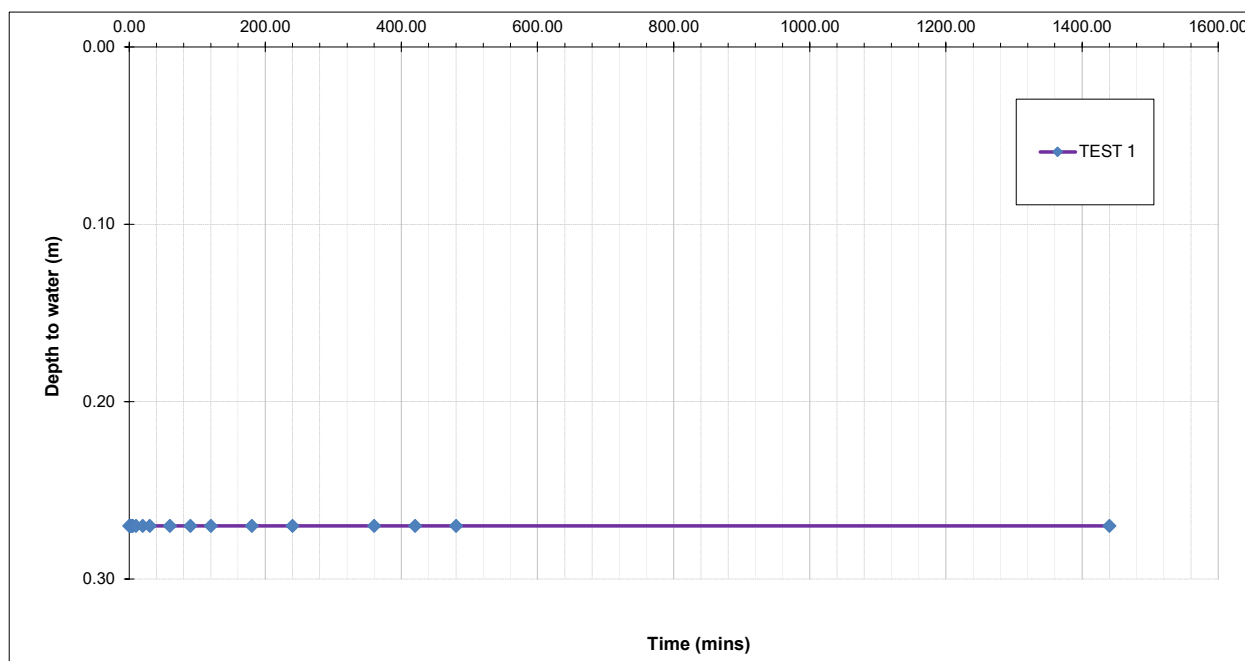
DESIGN SOIL INFILTRATION RATE, f	N/A
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	Site:	Peel Hall	Trial Pit Number:	SA108
	Job Number:	15-740	Length:	2.20 m
	Date of Test:	23/03/2022	Width:	0.70 m
			Depth:	1.50 m
			Groundwater Level:	m

Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.27				
	1.00	0.27				
	2.00	0.27				
	3.00	0.27				
	4.00	0.27				
	5.00	0.27				
	10.00	0.27				
	20.00	0.27				
	30.00	0.27				
	60.00	0.27				
	90.00	0.27				
	120.00	0.27				
	180.00	0.27				
	240.00	0.27				
	360.00	0.27				
	420.00	0.27				
	480.00	0.27				
	1440.00	0.27				
Effective Storage Depth	m	1.23				
75% Effective Storage Depth	m	0.92				
(i.e. depth below GL)	m	0.58				
25% Effective Storage Depth	m	0.31				
(i.e. depth below GL)	m	1.19				
Effective Storage Depth 75%-25%	m	0.62				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.95				
a (50%)	m2	5.11				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

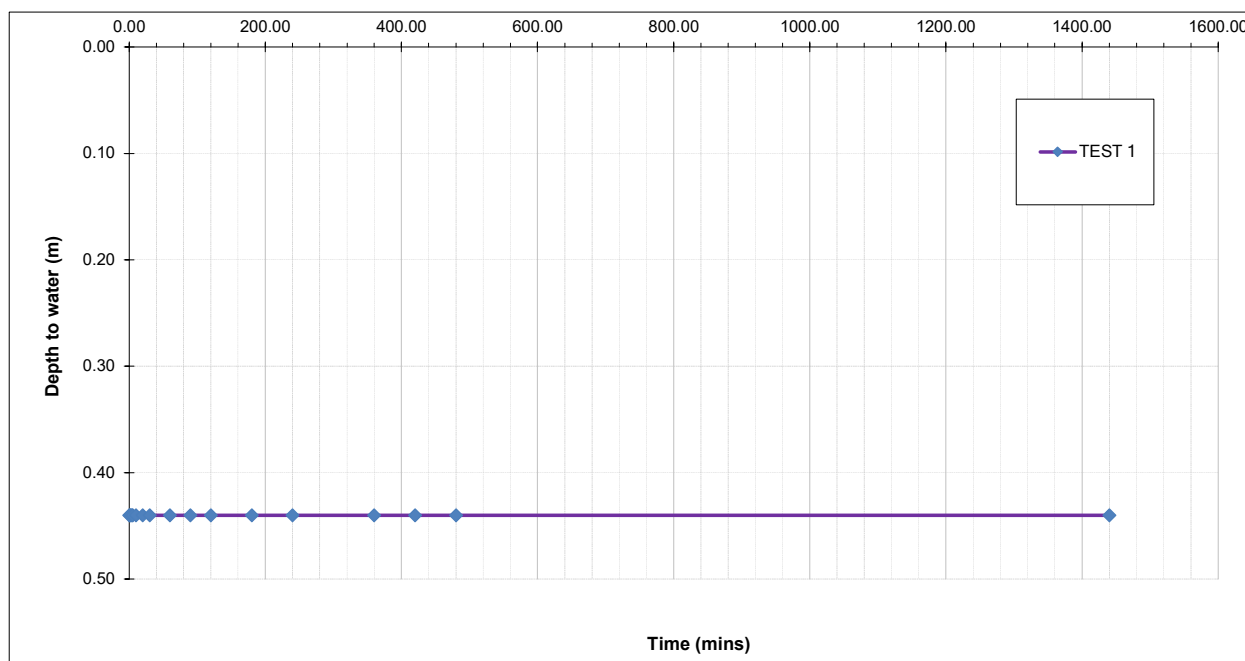
DESIGN SOIL INFILTRATION RATE, f	N/A
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	Site:	Peel Hall	Trial Pit Number:	SA109
	Job Number:	15-740	Length:	1.70 m
	Date of Test:	23/03/2022	Width:	0.70 m
			Depth:	1.70 m
			Groundwater Level:	m

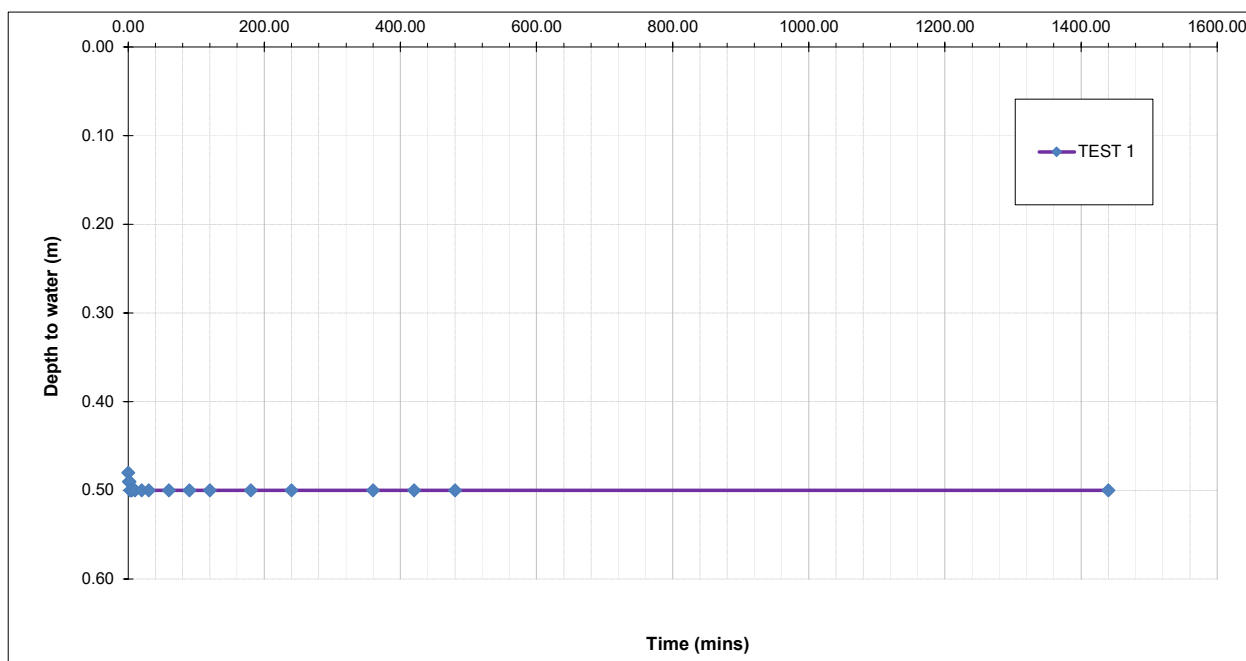
Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.44				
	1.00	0.44				
	2.00	0.44				
	3.00	0.44				
	4.00	0.44				
	5.00	0.44				
	10.00	0.44				
	20.00	0.44				
	30.00	0.44				
	60.00	0.44				
	90.00	0.44				
	120.00	0.44				
	180.00	0.44				
	240.00	0.44				
	360.00	0.44				
	420.00	0.44				
	480.00	0.44				
	1440.00	0.44				
Effective Storage Depth	m	1.26				
75% Effective Storage Depth	m	0.95				
(i.e. depth below GL)	m	0.76				
25% Effective Storage Depth	m	0.32				
(i.e. depth below GL)	m	1.39				
Effective Storage Depth 75%-25%	m	0.63				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.75				
a (50%)	m2	4.21				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

DESIGN SOIL INFILTRATION RATE, f	N/A
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		Site: Peel Hall Job Number: 15-740 Date of Test: 24/03/2022		Trial Pit Number: SA110 Length: 1.80 m Width: 0.70 m Depth: 1.80 m Groundwater Level: m		
Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.48				
	1.00	0.49				
	2.00	0.49				
	3.00	0.5				
	4.00	0.5				
	5.00	0.5				
	10.00	0.5				
	20.00	0.5				
	30.00	0.5				
	60.00	0.5				
	90.00	0.5				
	120.00	0.50				
	180.00	0.5				
	240.00	0.5				
	360.00	0.50				
420.00	0.50					
480.00	0.50					
1440.00	0.50					
Effective Storage Depth	m	1.32				
75% Effective Storage Depth	m	0.99				
(i.e. depth below GL)	m	0.81				
25% Effective Storage Depth	m	0.33				
(i.e. depth below GL)	m	1.47				
Effective Storage Depth 75%-25%	m	0.66				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.83				
a (50%)	m2	4.56				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

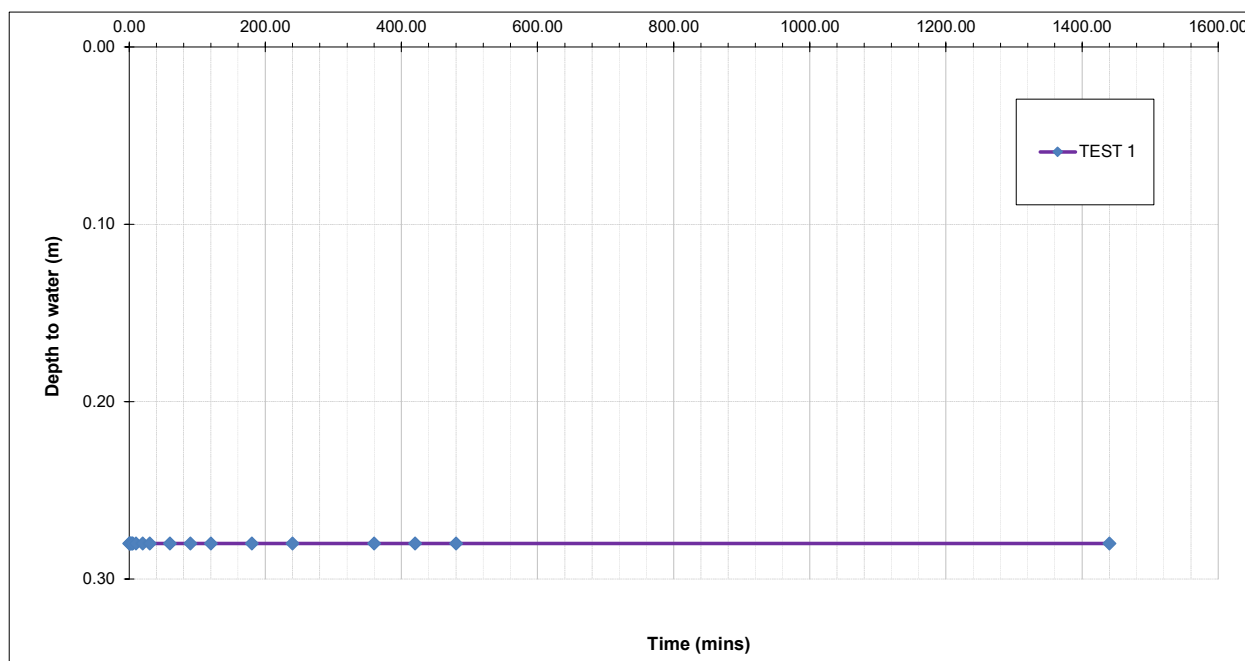
DESIGN SOIL INFILTRATION RATE, f	N/A
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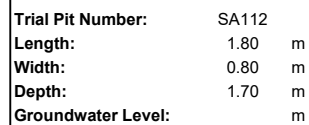


	Site:	Peel Hall	Trial Pit Number:	SA111
	Job Number:	15-740	Length:	1.70 m
	Date of Test:	24/03/2022	Width:	0.70 m
			Depth:	1.40 m
			Groundwater Level:	m

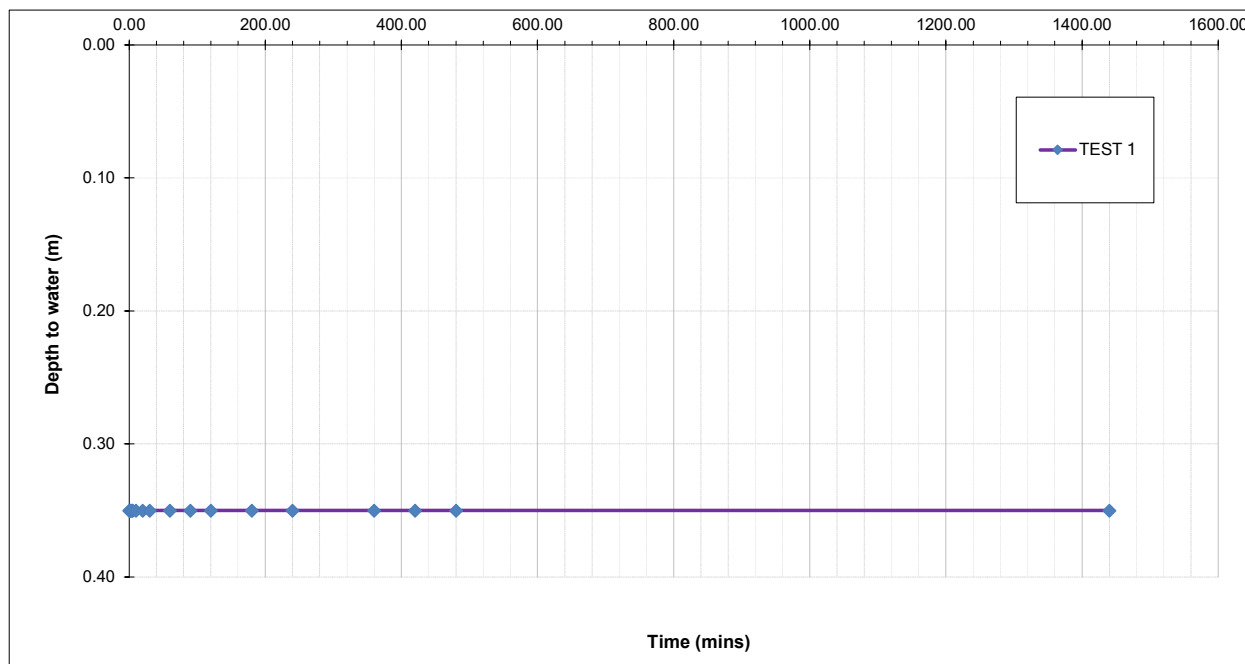
Test did not reach the 25% or 75% effective storage depth within 24 hours and therefore test has been terminated. An infiltration rate has not been able to be calculated	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.00	0.28				
	1.00	0.28				
	2.00	0.28				
	3.00	0.28				
	4.00	0.28				
	5.00	0.28				
	10.00	0.28				
	20.00	0.28				
	30.00	0.28				
	60.00	0.28				
	90.00	0.28				
	120.00	0.28				
	180.00	0.28				
	240.00	0.28				
	360.00	0.28				
	420.00	0.28				
	480.00	0.28				
	1440.00	0.28				
Effective Storage Depth	m	1.12				
75% Effective Storage Depth	m	0.84				
(i.e. depth below GL)	m	0.56				
25% Effective Storage Depth	m	0.28				
(i.e. depth below GL)	m	1.12				
Effective Storage Depth 75%-25%	m	0.56				
Time to fall to 75% effective depth	mins	N/A				
Time to fall to 25% effective depth	mins	N/A				
V (75%-25%)	m3	0.67				
a (50%)	m2	3.88				
t (75%-25%)	mins	N/A				
SOIL INFILTRATION RATE	m/s	N/A				

DESIGN SOIL INFILTRATION RATE, f	N/A
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DESIGN SOIL INFILTRATION RATE, f	N/A
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APPENDIX X

M-BAT ASSESSMENT

Metal Bioavailability Assessment Tool (M-BAT)

Back

Calculate

Clear Data

INPUT DATA											RESULTS (Copper)				RESULTS (Zinc)				RESULTS (Mn)				RESULTS (Ni)			
ID	Location	Waterbody	Date	Measured Cu Concentration (dissolved) (µg l ⁻¹)	Measured Zn Concentration (dissolved) (µg l ⁻¹)	Measured Mn Concentration (dissolved) (µg l ⁻¹)	Measured Ni Concentration (dissolved) (µg l ⁻¹)	pH	DOC	Ca	Site-specific PNEC Dissolved Copper (µg l ⁻¹)	BioF	Bioavailable Copper Concentration (µg l ⁻¹)	Risk Characterisation Ratio	Site-specific PNEC Dissolved Zinc (µg l ⁻¹)	BioF	Bioavailable Zinc Concentration (µg l ⁻¹)	Risk Characterisation Ratio	Site-specific PNEC Dissolved Manganese (µg l ⁻¹)	BioF	Bioavailable Manganese Concentration (µg l ⁻¹)	Risk Characterisation Ratio	Site-specific PNEC Dissolved Nickel (µg l ⁻¹)	BioF	Bioavailable Nickel Concentration (µg l ⁻¹)	Risk Characterisation Ratio
1	WS119	GROUNDWATER	06/05/2022	10	8.8	420	9.1	6.7	16.4	56	27.11	0.04	0.37	0.37	43.50	0.25	2.15	0.20	1655.52	0.07	31.20	0.25	31.15	0.13	1.17	0.29
2	WS102	GROUNDWATER	06/05/2022	15	5.9	280	10	6.7	15.5	58	26.76	0.04	0.56	0.56	41.55	0.26	1.55	0.14	1655.52	0.07	20.80	0.17	30.91	0.13	1.29	0.32
3	HOUSE STREAM	SURFACE WATER	19/04/2022	0.5	0.9	2000	3.2	7.4	18	130	60.70	0.02	0.01	0.01	60.62	0.18	0.08	0.01	7.78	0.17	7.78	0.36	36.39	0.11	0.35	0.09
4	WS121	GROUNDWATER	06/05/2022	0.8	5.8	630	2.8	7.3	5.05	130	23.02	0.04	0.03	0.03	26.56	0.41	2.36	0.22	851.26	0.14	51.05	0.74	18.02	0.22	0.62	0.16
5	WS116	GROUNDWATER	06/05/2022	0.7	4	440	3.6	7.3	4.78	130	21.05	0.05	0.03	0.03	25.99	0.42	1.68	0.15	851.26	0.14	63.58	0.53	17.62	0.23	0.82	0.20
6	WS113	GROUNDWATER	06/05/2022	1.9	4.1	21	3.1	7.3	7.24	150	34.12	0.03	0.06	0.06	31.26	0.35	1.43	0.13	851.26	0.14	3.03	0.02	21.32	0.19	0.58	0.15
7	WS107	GROUNDWATER	06/05/2022	0.8	5.8	2000	14	7.1	4.19	160	16.03	0.06	0.04	0.04	24.46	0.45	2.45	0.22	1751.95	0.17	11.67	0.17	18.81	0.21	2.98	0.74