



Geo-Environmental Assessment

Site 3, Image Business Park, Knowsley L33 7UF

Presented to: Seybourne Estates Limited

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Executive Summary

Brief	Delta-Simons was instructed by Seybourne Estates to undertake a Geo-Environmental Assessment for a parcel of land known as Site 3, Image Business Park, Acornfield Road, Knowsley, L33 7UF. The Site is proposed for a commercial development.
Site Setting	The Site is a vacant plot of land within a multi-occupancy business park, previously the Kodak Estate and was formerly in use for photochemical manufacturing and silver nitrate recovery. Several phases of remediation have been undertaken at the Site in the past. The Site is indicated as being underlain by Made Ground, superficial deposits of the Shirdley Hill Sand Formation (Secondary A Aquifer) and Glacial Till (Secondary Undifferentiated Aquifer). The underlying bedrock is the Chester Formation (Principal Aquifer). The Site is located within a designated groundwater Source Protection Zone (Zone III – Total Catchment) and there are five abstraction wells located on Site. The nearest surface water feature is a pond 20 m to the south.
Ground Conditions	The investigation recorded Made Ground overlying Shirdley Hill Sand Formation, Glacial Till and Chester Formation. Two groundwater bodies have been identified; one within the Glacial Till and one within the Chester Formation.
Land Contamination Assessment	<u>Human Health</u> Widespread significant contamination of the soils has not been identified at the Site. Seven samples of Made Ground tested positive for the presence of asbestos and the presence of additional asbestos within Made Ground cannot be discounted. <u>Controlled Waters</u> No widespread contamination of groundwater was encountered during this investigation with only localised marginal exceedances of some heavy metals and a localised exceedance of individual PAH compounds and hydrocarbons. The marginal exceedances do not pose a significant risk to controlled waters on the basis that the Glacial Till deposits are likely to be low-permeability, thereby protecting the underlying Principal Aquifer and limiting lateral migration of on-site groundwater to nearby watercourses. Any obviously grossly impacted groundwater (and soils) should be removed and verified by an independent engineer for regulatory approval. <u>Ground Gas</u> A Characteristic Situation 2 classification is indicative of low-risk conditions that would require gas protection to buildings. Further ground gas monitoring is considered to be required in order to provide a more robust dataset to adequately characterise the ground gas regime.
Geotechnical Assessment	Based on the ground investigation undertaken, strip/trench fill foundations are considered to be suitable for the proposed development (assumed lightly loaded commercial warehouse type building), founded at a minimum depth of 2.0-2.5 m bgl within the medium dense sand (Shirdley Hill Sand Formation) or firm/stiff clay (Glacial Till). For a strip/trench fill foundation, an allowable bearing pressure of 100 kN/m² is considered appropriate with total settlements not anticipated to exceed 25 mm. All foundation excavations should be inspected by a suitably qualified geotechnical engineer prior to casting to ensure the appropriate depth, founding medium and

	strength characteristics have been achieved and to confirm the absence of any localised cohesive soils. Should the required loads exceed the allowable bearing capacity then an alternative foundation solution should be considered such as piling. Ground improvement (e.g. vibro-stone columns) would not be considered as an appropriate foundation solution given that gas protection measures are required. Index testing results suggest that the Glacial Till deposits encountered on Site can be classified as having a low volume change potential in accordance with NHBC classification. Shirdley Hill Sand Formation encountered at shallow depth is typically granular and; therefore, non-shrinkable. However, there are discontinuous, relatively thin horizons of peat at relatively shallow depths (upper 2 m). It is recommended that a stabilisation/ ground improvement solution (if appropriate) be adopted to support a ground bearing slab. Alternatively, a suspended floor slab could be adopted, transferring loads to foundations and for the installation of ground gas protection measures. In the event that foundations straddle variable material types, suitable reinforcement should be added to the foundation to minimise potential movement and also flexible service connections may be required. Based on the test results and soil descriptions, it is considered that preliminary CBR values of 2 % may be adopted for near surface Made Ground. Plate load CBR tests are recommended at final formation levels.
Recommendations	Based on the results of the preliminary assessment, further ground gas monitoring is considered to be required in order to provide a more robust dataset to adequately characterise the ground gas regime. Additional groundwater monitoring and sampling is recommended to inform the Remediation and Verification Strategy. The following recommendations for the development of the Site are made: ▲ Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures, impacted water/soil removal around DS04 and subsequent verification which will be required. Classification of the ground gas regime should be agreed with the Local Authority, who may request additional monitoring or additional protection to mitigate the risk of elevated ground gases and depleted oxygen. ▲ Depending on the chosen foundation solution, it is recommended that a specialist contractor is consulted to confirm the suitability of the proposed ground improvement techniques. If piling is selected, it is recommended that a specialist contractor is consulted to confirm the precise method of pile installation and applicability of proprietary systems, diameters and depths required would need to be informed based on the results of this investigation. A piling risk assessment and appropriate pile mat design will also be required. ▲ There is potential for as yet undiscovered impacted soil (and groundwater) to be present beneath the Site. Waste disposal classifications and costs should be confirmed with the receiving landfill operator before final decisions are taken to dispose of any excess materials off site. Additional testing may be required in this regard. Made Ground will likely be classified as non-hazardous as a minimum. ▲ Additional hotspots of localised contamination associated with Made Ground cannot be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE)

	provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans. ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development. ▲ Suitable dust suppression techniques and prevention of nuisance/environmental impacts will need to be implemented by the groundworkers during construction works. ▲ The re-use of materials on-site may be possible if required and where the material is chemically and geotechnically suitable for its proposed end location. Material re-use would need to be undertaken under a Materials Management Plan. Any imported material, including topsoil would also be chemically and geotechnical suitable for its proposed end-use. ▲ Future Contractors should undertake their own assessment of UXO risk in relation to their specific proposed scope of works.
This is intended as a summary only. Further detail and the limitations of the assessment are provided within the main body of the Report.	

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APPENDICES

Appendix A – Limitations

Appendix B – List of Previous Reports

Appendix C - Photographic Record, Exploratory Hole Logs, SPT Calibration Certificate and CBR Results

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1.0 Introduction

1.1 Appointment

Delta-Simons Environmental Consultants Limited (“Delta-Simons”) was instructed by Seybourne Estates Limited (the “Client”) to prepare a Geo-Environmental Assessment for Site 3, Image Business Park, Acornfield Road, Knowsley L33 7UF (the “Site”).

1.2 Context & Purpose

The aim of the study was to complete a geo-environmental assessment of the proposed development area. The investigation has obtained information regarding ground conditions, from which risks to end-users, the environment and structures have been assessed, with mitigation measures suggested where necessary. The investigation has also gathered geotechnical information to inform comment on the preliminary design of foundations and infrastructure. The report provides recommendations for further work (where appropriate) based on the findings of the investigation.

1.3 Scope of Works

The scope of the investigation and layout of this report has been designed with consideration of guidance on Land Contamination: Risk Management pages of the [GOV.UK](https://www.gov.uk) web pages, the relevant requirements of the *National Planning Policy Framework (NPPF) (as revised 2021)* (**paragraphs 174 & 183-184**)¹ and the Planning Practice Guidance (Land Affected by Contamination)²

The project was undertaken to an agreed brief as set out in Delta-Simons’ proposal (reference 19-0654.06, dated 5th July 2021).

The detailed scope of works is outlined in Section 3.0.

Specific sections of this Report may generally follow guidance set out in Eurocode 7 for a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007. Eurocode 7 includes specific guidance on the number and spacing of investigation positions, methods of investigation and sample quality to be achieved which may not have been met by this investigation. The Report also includes information which may support a Geotechnical Design Report (GDR) as defined in BS EN 1997-1:2004; however, unless otherwise explicitly stated, the investigation has not been undertaken in accordance with Eurocode 7 and the preliminary geotechnical interpretation, assessments, risk register (if included) and recommendations presented within this Report may not meet the full requirements of a GDR.

1.4 Proposed Development

The Site is a vacant plot of land within a multi-occupancy business park, previously the Kodak Estate. The Site is proposed for redevelopment with a commercial unit.

This Report may be used in support of a Planning Application submission scheduled for early September 2021.

1.5 Existing Information

A Desk Study report relating to the wider Site was previously completed by Delta-Simons:

- ▲ ‘Preliminary Geo-Environmental Risk Assessment: Plots A, B and C, Image Business Park, Acornfield Road, Knowsley L33 7UF’, reference 19-0654.01, dated 08/08//2019; and
- ▲ ‘Preliminary Geo-Environmental Risk Assessment: Image Business Park, Acornfield Road, Knowsley’, reference 21-0160.01, dated 05/03/2021.

Delta-Simons has obtained multiple previous reports prepared by third-parties relating to the Site; a full list is provided in Appendix B, together with brief summaries.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004408/NPPF_JULY_2021.pdf

² <https://www.gov.uk/guidance/land-affected-by-contamination>

1.6 Limitations

The assessment is limited to the issues agreed within the proposal for the works. General notes on limitations associated with this assessment are provided in Appendix A. In addition, there are the following specific limitations that apply to this assessment:

- ▲ The Consultant undertaking the Site inspection maintained a general awareness for evidence of invasive plant species, particularly Japanese Knotweed. While none were observed during the walkover, it should be noted that the Consultant is not a trained ecologist and a separate survey undertaken by an experienced Ecologist would be necessary if a more robust assessment is needed.
- ▲ The Report includes an initial assessment of unexploded ordnance (UXO) risks for the Site using online data sources. A detailed UXO assessment falls outside of the scope of this Report, further specialist assessment may be required.
- ▲ The Report includes a preliminary assessment for the potential for radon gas hazards. A detailed radon assessment falls outside of the scope of this Report, and the requirement for radon mitigation measures in the proposed development should be identified separately to the satisfaction of the Local Authority.

1.7 Data Gaps and Uncertainty

In addition, the following specific data gaps and uncertainty apply to this assessment:

- ▲ It was not possible to investigate the central part of the Site due to the presence of dense vegetation and as such ground conditions beneath these areas remains unknown.
- ▲ Two electrical substations were located in the centre and north-east of the Site and an access road with an active car park was located in the central-eastern part of the Site. No investigation was possible within these areas and as such ground conditions beneath these features remains unknown.
- ▲ Water treatment tanks were located within the southern extremity of the Site. It is understood that these are part of the current water treatment system for the wider industrial estate. No investigation was undertaken in the vicinity of these tanks.
- ▲ Monitoring wells DS02, DS07, DS08A and DS09 remained dry/contained insufficient groundwater throughout the monitoring period and; therefore, it was not possible to obtain groundwater samples for laboratory analysis from these locations.
- ▲ Borehole DS08 collapsed during drilling due to the presence of peat and was redrilled as location DS08A, approximately 1 m to the west.
- ▲ Boreholes DS05 and DS09 refused at relatively shallow depths (1.5 and 1.9 m bgl respectively) due to possible obstructions. A concrete obstruction was identified within borehole DS03 at 0.9 m bgl. This location was abandoned and reattempted as DS03A approximately 2 m to the west. Brick and concrete obstructions were also encountered in trial pits TP02, TP10 and TP11. As a result of these obstructions, ground conditions beneath these locations remain unknown.
- ▲ The investigation scoped and geotechnical assessments provided are specific to a commercial development anticipated and may not be relevant for other development schemes should these be considered in the future.
- ▲ The investigation was designed to provide preliminary information only and further information may be required in due course to discharge Site specific planning conditions/ detailed design.
- ▲ The presence of several services feeding the wider industrial estate and associated easement prevented locations being undertaken in some areas.

2.0 Site Details

2.1 Site Setting

A summary of the current Site status, environmental setting and key historical features is presented below. This has been summarised from the existing report(s) listed in Section 1.5 which should be consulted for further detail.

Co-ordinates	Centred approximately at National Grid Reference 343750, 398737	Elevation	41.0 - 43.7 m AOD
		Area	1.9 Ha
Site Address and Location	The Site is located off Acornfield Road within Image Business Park in Knowsley, approximately 9 miles east of Liverpool. A Site location map is provided as Figure 1.		
Current Site Description	The Site is a vacant plot of land within a multi-occupancy business park, previously the Kodak Estate. The plot is almost entirely covered with concrete, with most above ground structures having been recently demolished. Some small areas of rough ground/vegetation are present at various locations around the plot. The only remaining buildings within Site 3 were the eastern elevations of part of Building 38 (due to its proximity to the overhead gantry which carries the overhead services for the wider estate), 3 No. electrical substations, Building 18 and the telephone exchange building (Building 24) which provides telecoms for the Site and the wider area. In addition to this, it is understood that wastewater treatment tanks in the far south of Site 3 will remain as part of the development. The tanks were partially water-filled and covered with protective netting. It is understood that the Site was formerly in use for photochemical manufacturing and a silver nitrate recovery plant. These activities had largely ceased by 2006-2007.		
Physical Setting	From published British Geological Survey mapping (1:50,000 Sheet Number 84, Wigan), the Site is indicated as being underlain by superficial deposits of the Shirdley Hill Sand Formation (Secondary A Aquifer) and Glacial Till (Secondary Undifferentiated Aquifer). The underlying bedrock is recorded as the Chester Formation (Principal Aquifer) of Triassic Age. On-Site observations and the Envirocheck® Report indicated the presence of Made Ground across the entire Site. There are several BGS borehole records located within the wider industrial estate; the findings of these logs are summarised below: Site 3 ▲ Three window sampler boreholes (SJ49NW1000, SJ49NW1001 and SJ49NW102) were drilled in 2003; ▲ Made Ground was encountered in all locations to a maximum proven depth of 2.6 m bgl. Solvent odours, hydrocarbon odours and black streaks were observed within the Made Ground. A maximum PID reading of 211 ppm was detected in the borehole near the waste-water treatment plant in the southern part of Plot C (now known as Site 3); ▲ Made Ground was underlain by natural sand and clay to depths greater than 3 m bgl; and ▲ Groundwater was encountered during drilling at “shallow” depth in one borehole and a depth of 1.2 m bgl in another.		

	Several phases of intrusive investigation have been undertaken at the Site. It is also understood that remedial works have been undertaken at the Site. Available site investigation reports are summarised in the reports listed in Section 1.5. The EA data also indicates that the Site is located within a designated groundwater Source Protection Zone (Zone III – Total Catchment) and there are five abstraction wells located on Site; three are associated with general cooling and two are for general use (industrial/commercial/public use) associated with the former Kodak Ltd and Ames Goldsmith operations. A water feature is mapped in the southern portion of the Site; although it appears this record actually relates to the waste-water treatment plant. The nearest surface water feature is a drain located approximately 20 m to the south of the Site and there are several drains located within 100 m of the eastern Site boundary. The Site lies within an area where less than 1% of homes are above the National Radiological Protection Board (NRPB) recommended “action level” for radon. BRE211 (2007) indicates that no radon protective measures are necessary in the construction of new buildings at the Site. According to the Zetica website, the Site is at low risk from UXO associated with bombing during WWII. Further enquiries were made with First Line Defence, a UXO specialist, who provided additional information/advice as summarised below: ▲ The Site was reportedly located within the Royal Ordnance Factory (ROF Kirkby) during the war, which was a large factory filling munitions from 1940-1946. Unused/faulty ammunition would often be buried within the ROF factories themselves, and it is not possible to rule out the risk of Allied Military Ordnance remaining on site within most former Royal Ordnance Factories; ▲ Given this use of the site of the site during the war, the risk from Allied Military Ordnance is considered to be present; and ▲ UXO support has been recommended for any intrusive works undertaken at the Site.
Key Historical Features	The Site appears to have been in agricultural use from as early as 1850. No significant changes were observed until the 1950's when several small buildings were recorded in the south of the Site. Additional buildings were recorded by the early 1970's and the Site was largely covered with built development associated with a 'Photographic Material Factory' which extended further outside of the Site boundary to the south and east. Several tanks and filter beds were recorded on Site. The Site was labelled 'Knowsley Industrial Park' in 1993. It is understood that Kodak Ltd occupied the Site until the early 2000's and manufactured photochemicals. The Site has remained approximately in its current configuration since that time. It is understood that the Site was part of Kirkby Royal Ordnance Factory during WWII; however, this is not evident from the historical mapping.

2.2 Preliminary Conceptual Site Model

A Conceptual Site Model (CSM) represents the relationships between contaminant sources, pathways and receptors, to support the identification and assessment of Possible Pollutant Linkages (PPL).

Source(s)	Pathway(s)	Receptor(s)	Risk Rating	Justification & Mitigation (if required)
Made Ground and Current and Historic Industrial Land Use Asbestos Containing Materials within former buildings (now demolished) Warehouses with plant rooms, boiler rooms and electrical equipment Former tanks, of storage chemicals, chemical manufacture	Inhalation/ingestion/dermal contact / direct contact.	Future Site users. Groundworkers during the redevelopment or during any sub-surface maintenance works. Adjacent Site users	Moderate Risk	Activities reported on-Site primarily within Site 3 included photochemical manufacture (including storage and usage) and a silver nitrate recovery plant licensed by the Environment Agency. Given the nature and thickness of Made Ground beneath the Site, it is considered that there is significant potential for a range of common contaminants including heavy metals, PAH, petroleum hydrocarbons, VOC, SVOC and ACM to be present beneath the Site. Remedial works have been previously undertaken by others; however, there remains the potential for gross contamination of soils/groundwater where the main photochemical manufacture and silver nitrate recovery was understood to have taken place. Tanks and pits were known to have been located on Site and one above ground fuel tank was identified within the Site 3 area during Site reconnaissance. There is potential for other tanks, pits, etc to be present. Concentrations of hydrocarbons, VOC and SVOC may be present in areas associated with the fuel tanks, refuelling points, chemical storage and via vehicle leaks in loading/parking areas, etc. Additionally, PCB may also be located within electrical equipment. It is considered that the underlying strata would be protected to some extent by the presence of tarmac/concrete surfacing across much of the Site. However, below ground structures, drainage, service conduits, etc may provide a pathway for contaminants to migrate towards and impact the underlying strata/groundwater. Widespread ACM has been identified within the majority of the buildings within the Site (now demolished).
	Lateral migration and subsequent indoor inhalation of volatile gases/vapours.	Future Site users Groundworkers during the redevelopment or during any sub-surface maintenance works.	Moderate Risk	Made Ground deposits have the potential for ground gas/vapour generation and migration. It is recommended that a ground gas risk assessment is undertaken at the time of any environmental assessment.
	Leaching of contamination into groundwater.	Controlled waters.	Moderate Risk	The Site is underlain by Secondary A aquifer (Shirdley Hill Sand Formation), Secondary Undifferentiated Aquifer (Glacial Till), and Principal Aquifer strata (Chester Formation) and there are surface water features within close proximity to the Site (20 m south and 100 m east). The Site is located within a groundwater SPZ and there are several groundwater abstractions on-Site within 1 km of the Site. It is acknowledged that no contaminative activities have been undertaken at the Site since 2006 and; therefore, there is no on-going replenishment of the source of contamination.

				Significant concentrations of mobile contaminants may be present beneath the Site and; therefore, the risk of migration to controlled waters is considered to be Moderate.
	Direct infiltration in water supply pipes. Direct contact of buried concrete and potentially aggressive ground.	Buried pipes and services Buried concrete	Moderate Risk	Hydrocarbon testing of the shallow soils will be required at the time of any environmental investigation to provide recommendations for the upgrading of any potable service pipes. The Local Water Authority should be consulted to advise on this matter. Aggressive ground chemistry may attack buried concrete and; therefore, there may be a requirement for protection measures to be put in place at the Site.
Infilled Ground	Lateral migration and subsequent indoor inhalation of ground gases	Future Site users	Moderate Risk	It is recommended that a ground gas risk assessment is undertaken at the time of any environmental assessment.
Surrounding Industrial Land	Leaching of contamination into groundwater.	Groundwater beneath the Site and current and future Site users.	Moderate Risk	The proximity and/or nature of the potential sources to the Site means risk from contaminant migration is moderate. An off-site source is known to have impacted groundwater beneath the south-western part of the Site.

Risk Definitions are presented in Appendix H.

3.0 Ground Investigation

3.1 Intrusive Investigation

Delta-Simons carried out intrusive investigation work between 22nd July and 3rd August 2021 to assess the potential linkages identified in the outline conceptual model (see Section 2.2 above) and to provide geotechnical information.

3.2 Ground Investigation and Rationale

3.2.1 Intrusive Works

The ground investigation comprised the following items:

- ▲ Service avoidance exercise and topographic survey of exploratory holes to provide x,y,z co-ordinates;
- ▲ Supervision of all works by a Delta-Simons Geo-Environmental engineer. All intrusive locations were logged to BS 5930:2015+A1:2020 Code of Practice for Site Investigations;
- ▲ Full-time UXO supervision by third-party specialist using a magnetometer for all investigation locations;
- ▲ Excavation of 12 trial pits (TP01 to TP12) to a maximum depth of 3.5 m bgl;
- ▲ In-situ California Bearing Ratio (CBR) tests undertaken within 7 shallow trial pits (TP06 to TP12);
- ▲ Drilling of twelve (12 No.) dynamic sampling boreholes (DS01 to DS10, including DS03A and DS08A) to a maximum depth of 5.45 m bgl;
- ▲ Drilling of seven (7 No.) dynamic sampling boreholes (BH01, BH02 and BH04 to BH08) with rotary follow on to a maximum depth of 14.3 m bgl;
- ▲ Installation of standpipes in selected boreholes (16 No.) to allow future ground gas and groundwater level monitoring and sampling;
- ▲ Collection of soil, rock and groundwater samples for subsequent laboratory testing; and
- ▲ Post ground investigation gas and groundwater monitoring programme over a period of approximately four weeks.

An intrusive exploratory hole location plan is presented as Figure 2.

Specific limitations affecting the proposed scope of works are summarised in Section 1.7.

Delta-Simons exploratory hole engineer verified borehole logs are presented as Appendix C together with a photographic record and the SPT Calibration Certificates, in accordance with BS EN ISO 22476-3:2005+A1:2011 (incorporating corrigendum No. 1 2007), Geotechnical investigation and testing - Field testing - Part 3: Standard penetration test for SPT trip hammers.

3.2.2 Rationale

Location	Rationale	Key Contaminants of Concern
TP01 to TP12 DS01 to DS10 BH01 to BH06	General Site Coverage.	Suite of contaminants listed in Section 3.5.
TP06 to TP12 (CBR's)	Targeting proposed road/pavements.	N/A

3.3 Geotechnical Sampling and In-Situ Testing

3.3.1 Sampling

Sampling comprised disturbed jar/tab and bulk samples as detailed on the borehole logs. Details of undisturbed core sampling, sub-sampling, and preparation detailed on the rotary borehole logs.

3.3.2 In-Situ Tests

SPT tests were undertaken in all boreholes at 1.00 m intervals until 5.00 m bgl within DS01 to DS10 (including DS03A and DS08A) and every 1.5 m in BH01, BH02 and BH04 to BH08. The results of these tests are presented on the borehole logs included as Appendix C. A plot of Uncorrected and Corrected SPT N values versus Depth are included as Figures 3 and 4 respectively.

Hand Shear Vanes (HSV) were undertaken at regular intervals in cohesive soils. The tests were undertaken in accordance with the procedure detailed in Delta-Simons' Standard Operating Procedure on disturbed samples of clay which had been excavated from the trial pits. The test results are shown on the borehole and trial pit logs presented in Appendix C and on Figure 5.

In-situ plate CBR tests were undertaken using a 350 mm diameter plate and the excavator provided the reaction load. The CBR values derived from the tests are included in the results in Appendix C.

3.4 Geotechnical Laboratory Testing

A selection of soil and rock samples were submitted to the UKAS accredited laboratory for a range of geotechnical testing, the results of which are included in Appendix D. The rationale for the laboratory tests undertaken is provided in the table below.

Laboratory Test	Test Standard	Number of Samples Tested	Rationale
Classification			
Water Content	BS1377-2:3 or BS EN ISO 17892-1	12	To assess the potential for cohesive soils to shrink and swell due to changes in the water content of a soil associated with the presence, removal or addition of trees and shrubs.
Liquid and Plastic Limits	BS1377-2:4 – 5 or BS EN ISO 17892-12	12	
Particle Size Analysis	BS1377-2:9.2 & 9.3 or BS EN ISO 17892-4	7	To assess the suitability of the natural soils for re-use as an acceptable earthworks material in accordance with the Specification for Highways Works (SHW) (Series 600).
Compaction			
Water Content / Dry Density Relationship Testing (2.5 kg, 4.5 kg or vibrating hammer)	BS1377-4:3	7	To assess the suitability of the soils for re-use on-site and in order to specify the degree of compaction likely to be required in earthworks.
Soil Strength			
Quick Undrained Triaxial (single stage)	BS1377-7:8 or BS EN ISO 17892-8	8	To derive undrained shear strength (s_u) or cohesion (c_u) of cohesive soils. To assess the bearing capacity of the soil for foundation design purposes.
Rock Testing			
Point Load Test	ISRM 2007	3	Used to provide a strength index to classify rocks for pile design purposes.
Uniaxial Compressive Strength	ISRM 2007	6	To characterise material properties of a rock core sample for pile design purposes.
Geo-Chemical – Soil Samples			
pH	BRE Special Digest 1 or other	16	To assess the soil and groundwater conditions of the Site in accordance with BRE Special Digest 1 Concrete in aggressive ground and specify an
Water-Soluble Sulphate (2:1 water/soil extract)			

Laboratory Test	Test Standard	Number of Samples Tested	Rationale
			appropriate concrete class to resist chemical attack.

3.5 Environmental Sampling and Laboratory Analysis

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite. Records of the samples taken as part of the Site investigation works, including their depths and location, are included within the exploratory hole records in Appendix C.

One groundwater sample was collected from each of the boreholes (DS01, DS03A, DS04 to DS07 and DS08A and BH01, BH02 and BH04 to BH08) between 29th July and 2nd August 2021. The groundwater samples were collected using a dedicated disposable bailer. Samples were stored in accordance with Delta-Simons' quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination. Samples analysed for environmental purposes were placed in chilled cool boxes on site and transported to the laboratory for analysis on completion of the Site investigation works/groundwater sampling visit.

The rationale for chemical analysis is presented in the table below and the results of the chemical laboratory testing are included in Appendix E (soil) and F (groundwater).

Analytes	No. of Samples Tested		Rationale
	Soil	Ground-water	
Asbestos	26	-	Common potential contaminant - Analysed in all samples of Made Ground.
pH, As, Cd, Cu, Cr, Hg, Pb, Ni, Zn, speciated Polycyclic Aromatic Hydrocarbons (PAH)	26	12	Potential contaminants of concern, common to many sites.
Total Petroleum Hydrocarbons, Criteria Working Group Method (TPHCWG), Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	26	12	
Volatile and Semi-Volatile Organic Compounds (VOC and SVOC)	12	12	
Polychlorinated Biphenyls (PCB)	6	-	Targeting areas of potential electrical equipment.
pH, sulphate	26	-	To assess potential for chemical attack on buried concrete.
Soil Organic Matter (SOM)	10	-	To allow comparison of potentially elevated contaminants against their relevant assessment criteria.
Waste Acceptance Criteria (WAC)	6	-	To inform waste acceptance criteria for off-site disposal.

3.6 Monitoring Programme

Four rounds of groundwater level and ground gas monitoring were undertaken on both newly installed wells (DS01 to DS02, DS03A, DS04 to DS07 and DS08A and BH01, BH02 and BH04 to BH08) between 29th July and 24th August 2021.

Measurements of the depth to groundwater within the monitoring wells were taken using an electronic dip meter.

To characterise the ground gas regime at the Site, an infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume. Initial and

steady state concentrations were recorded. The atmospheric pressure before and during monitoring, together with the weather conditions, was recorded.

All monitoring results obtained to date are contained within Appendix G.

4.0 Ground Summary

4.1 Introduction

The sections below summarise the ground and groundwater conditions encountered during the Site investigation.

4.2 Ground Summary

A summary of the observed ground conditions at the Site is provided below:

Strata	Typical Strata Description	Depth Range of Strata Top (m)	Depth Range of Strata Base (m)	Thickness Range (m)	Comments
Concrete	Reinforced concrete.	0.0	0.15 – 0.5	0.15 – 0.50	Concrete covering majority of the Site.
Made Ground	Granular strata with fragments of brick, concrete, limestone, quartzite and rare wood, slag, glass, organic material, clinker, plastic, metal, slate, ceramic and sandstone.	0.0-0.5	1.0 – 2.5	0.45 – 2.10	Unproven at some locations due to the presence of concrete/brick obstructions.
Shirdley Hill Sand Formation	Loose/medium dense locally gravelly sand with gravel consisting of quartzite. Relatively thin, discontinuous horizon of black and dark blackish brown sandy amorphous and plastic pseudo-fibrous peat.	0.4 -2.4	1.0 -2.4	0.1 – 0.95	Peat encountered at DS07, DS08, DS10, TP06, TP12 and BH04 only.
Glacial Till	Firm becoming stiff (locally soft) slightly sandy slightly gravelly clay.	0.45 -2.5	5.0 – 7.5	2.5 – 6.00	Unproven in all trial pits and DS08, DS08A and DS09.
Weathered Chester Formation	Very dense dark reddish-brown sand.	5.8 – 7.5	6.0 – 10.0	1.7 – 4.0	-
Chester Formation	Medium strong dark reddish brown sandstone.	6.0 – 10.0	> 14.30	Not Proven	-

Much of the Site was overlain by concrete ranging in thickness between 0.2 and 0.5 m. Made Ground was encountered at all exploratory locations typically to depths of 1.0 m bgl and locally to 2.5 m bgl. Made Ground depths were unproven at some locations due to the presence of concrete/brick obstructions and other buried obstructions may be present. Made Ground typically comprised granular strata with fragments of brick, concrete, limestone, quartzite and rare wood, slag, glass, organic material, clinker, plastic, metal, slate, ceramic and sandstone.

Shirdley Hill Sand Formation was identified beneath the Made Ground to depths of between 1.0 and 2.4 m bgl. It comprised loose/medium dense locally gravelly sand with gravel consisting of quartzite.

Localised, relatively thin peat deposits were also encountered within TP06, DS07, DS08, DS10, TP12 and BH04, up to a maximum thickness of 0.5 m. Glacial Till was found to underlie these deposits and typically comprised firm becoming stiff (locally soft) slightly sandy slightly gravelly clay to depths of between 5.0 and 7.5 m bgl.

Weathered Chester Formation, comprising very dense dark reddish-brown sand, was encountered to a maximum depth of 9.2 m bgl. This material grades into medium strong sandstone rock at depths of between 6.0 and 10.0 m bgl and extends to at least 14.3 m bgl (maximum depth of investigation). Rock recovery was

generally poor due to the weathered nature of the sandstone. Laboratory point load and unconfined compressive strength tests confirm the on-Site descriptions of medium strong sandstone.

SPT data generally showed an increase in strength with depth with SPT refusal ($N > 50$) encountered generally encountered at depths below 6.0 m bgl (Figure 3 – Uncorrected SPT, Depth and Strata Type and Figure 4 – Corrected SPT, Depth and Strata Type).

Hand shear vane test results obtained from various depths in trial pit excavations and dynamic sampler boreholes ranged between 25.67 and 194.33 kPa (Figure 5 – Hand Shear Vane Results, Depth and Strata Type). On the basis of these findings, the underlying clay strata can be classified as variably medium to very high strength in accordance with Table 9 of BS5930:2015.

4.3 Visual and Olfactory Evidence of Contamination - Soils

No widespread visual or olfactory evidence of potential gross contamination was observed during the investigation. Made Ground materials were noted to contain anthropogenic fragments across much of the Site. Localised visual/olfactory evidence of contamination was observed at the following locations typically coinciding with peat and/or naturally decaying organic matter:

- ▲ BH08 – 0.60 – 2.50 m – organic odour – Shirdley Hill Sand Formation;
- ▲ DS03A – 0.90 – 1.55 m - slight organic odour – Shirdley Hill Sand Formation;
- ▲ DS07 – 1.20 – 1.70 m – organic odour - Shirdley Hill Sand Formation (peat);
- ▲ DS08 – 1.70 – 1.85 m - organic odour - Shirdley Hill Sand Formation (peat);
- ▲ DS08 – 1.85 – 2.00 m – organic odour – Glacial Till;
- ▲ DS08A – 0.45 – 1.00 m - slight organic odour – Shirdley Hill Sand Formation;
- ▲ DS10 – 1.95 – 2.50 m – strong and slight organic odour - Shirdley Hill Sand Formation (peat); and
- ▲ TP10 – 0.30 – 1.40 m – slight hydrocarbon odour – Made Ground.

All environmental samples were screened using the photoionisation detector and the results are included on the exploratory hole logs in Appendix D. Results generally ranged between <0.1 and 13.9 ppm, although one location recorded 72.7 ppm at DS09 at 0.7 m (Made Ground).

4.4 Groundwater

4.4.1 Strikes During Investigations

The groundwater strikes during the ground investigation are summarised below.

Exploratory Hole	Water strike during drilling (m bgl)	Water strike during drilling (m AOD)	Stratum	Comment
DS06	4.00	38.41	Glacial Till	Rose to 3.80 m after 20 minutes
DS08	1.10	40.05	Shirdley Hill Sand Formation	Rose to 1.00 m after 20 minutes
DS08A	1.00	40.15	Shirdley Hill Sand Formation	Rose to 0.70 m after 20 minutes
TP04	0.60	41.79	Made Ground	Slight seepage
TP12	1.50	39.77	Shirdley Hill Sand Formation	Slight seepage
BH07	7.00	34.64	Chester Formation	-
BH08	5.90	35.30	Chester Formation	-

4.4.2 Levels During Monitoring Programme

Groundwater levels were monitored on a total of four occasions between 29th July 2021 and 24th August 2021. Monitoring data and LNAPL measurements are provided in Appendix G and summarised in the table below.

Exploratory Hole	Water level during monitoring Max to Min Range		LNAPL Y/N	Stratum	Flooded Y/N
	m bgl	m AOD.			
DS01	2.12 - 2.48	40.55 - 40.19	N	SHSF/GT	0/4
DS02	Dry	-	N	MG	0/4
DS03A	0.31 - 3.55	42.53 - 39.29	N	SHSF/GT	3/4
DS04	1.21 - 2.22	41.37 - 40.36	N	GT	3/4
DS05	0.20 - 0.68	42.63 - 42.16	N	MG	2/4
DS06	0.24 - 3.10	42.57 - 39.7	N	GT	3/4
DS07	1.10	41.92	N	SHSF	1/4
DS08A	0.62 - 0.88	40.63 - 40.36	N	SHSF	0/3
DS09	0.26 - 1.23	41.68 - 40.71	N	MG	3/4
DS10	1.10 - 1.30	40.16 - 39.96	N	SHSF/GT	0/4
BH01	6.66 - 6.93	36.17 - 35.90	N	CF	4/4
BH04	7.55 - 7.72	35.26 - 35.09	N	CF	3/3
BH05	6.63 - 6.69	36.04 - 35.98	N	GT/CF	0/3
BH06	7.05 - 7.10	35.32 - 35.27	N	CF	3/3
BH07	0.88 - 6.60	40.76 - 35.04	N	CF	3/3
BH08	5.55 - 5.58	35.65 - 35.62	N	SHSF/GT/CF	0/3
MG = Made Ground, SHSF = Shirdley Hill Sand Formation, GT = Glacial Till, CF = Chester Formation					

Two groundwater bodies have been identified; one within the Glacial Till at depths of between approximately 2.50 and 2.92 m bgl (42.28 and 41.84 m AOD) and one within the Chester Formation at depths of between approximately 6.90 and 9.08 m bgl (38.11 and 35.65 m AOD).

Light Non-Aqueous Phase Liquid (LNAPL) was not detected in any of the monitoring wells.

4.5 Visual and Olfactory Evidence of Contamination - water

No widespread significant visual or olfactory evidence of potential gross contamination of groundwater was observed during the investigation. A groundwater sample obtained from DS04 was noted to have an iridescent sheen and a slight hydrocarbon odour.

4.6 Material Properties

The table below summarises the factual material properties based upon the results of in-situ and laboratory test data and where appropriate provides derived geotechnical parameters.

Parameter	Unit	Value or Range (adopted characteristic design parameters)	Justification
Made Ground			
Uncorrected SPT 'N'	Blows	0-51	In Situ Testing
Corrected SPT 'N60'	-	0-60.35	SPT N values corrected for energy ratio (Er) after BS EN ISO 22476-3:2005. Er stated on borehole logs.
CBR	%	1.9-7.5	In Situ Testing
γ _{max} (Maximum Dry Density) 2.5kg	Mg/m ³	1.81-1.86	Laboratory Testing
OMC (Optimum Moisture Content)	%	12-15	Laboratory Testing
NMC (Natural Moisture Content)	%	11	Laboratory Testing
Shirdley Hill Sand Formation			
w (Water Content)	%	62-407	Laboratory Testing
IP (Plasticity Index)	-	14-192	Laboratory Testing
PL (Plastic Limit)	%	60-267	Laboratory Testing
LL (Liquid Limit)	%	74-459	Laboratory Testing
Modified Plasticity Index	%	13.58-192	
Volume Change Potential	-	Low to High	NHBC
Uncorrected SPT 'N'	Blows	5-16	In Situ Testing
Corrected SPT 'N60'	-	5.91-18.13	SPT N values corrected for energy ratio (Er) after BS EN ISO 22476-3:2005. Er stated on borehole logs.
γ _{max} (Maximum Dry Density) 2.5kg	Mg/m ³	1.76-1.80	Laboratory Testing
OMC (Optimum Moisture Content)	%	9.8-13	Laboratory Testing
NMC (Natural Moisture Content)	%	15-16	Laboratory Testing
Glacial Till			
w (Water Content)	%	12-19	Laboratory Testing
IP (Plasticity Index)	-	13-20	Laboratory Testing
PL (Plastic Limit)	%	11-16	Laboratory Testing
LL (Liquid Limit)	%	22-26	Laboratory Testing
Modified Plasticity Index	%	12.61-18	
Volume Change Potential	-	Low	NHBC
Uncorrected SPT 'N'	Blows	2-34	In Situ Testing
Corrected SPT 'N60'	-	2.36-38.53	SPT N values corrected for energy ratio (Er) after BS EN ISO 22476-3:2005. Er stated on borehole logs.

Parameter	Unit	Value or Range (adopted characteristic design parameters)	Justification
cu (Undrained Shear Strength)	kPa	68-280	Laboratory Testing and/or In Situ Testing and/ or Inferred from PI and N-Value after Stroud (1975)
γ _{max} (Maximum Dry Density) 2.5kg	Mg/m ³	1.88-1.90	Laboratory Testing
OMC (Optimum Moisture Content)	%	12-14	Laboratory Testing
NMC (Natural Moisture Content)	%	15-18	Laboratory Testing
Hand Shear Vane at OMC	kPa	25.67-194.33	Laboratory Testing
Weathered Chester Formation			
Uncorrected SPT 'N'	Blows	17-50	In Situ Testing
Corrected SPT 'N ₆₀ '	-	19.26-56.6	SPT N values corrected for energy ratio (Er) after BS EN ISO 22476-3:2005. Er stated on borehole logs.
Chester Formation			
Uncorrected SPT 'N'	Blows	50	In Situ Testing
Corrected SPT 'N ₆₀ '	-	56.6	SPT N values corrected for energy ratio (Er) after BS EN ISO 22476-3:2005. Er stated on borehole logs.
Is(50) (Point Load Strength Index)	MPa	0.78-0.84	Laboratory Testing
Unconfined Compressive Strength	MPa	16.2-30	Laboratory Testing

A plot of uncorrected and corrected SPT N value versus depth per strata is presented as Figure 3 and Figure 4 respectively. A plot of undrained shear strength versus depth per strata is presented as Figure 5. A plasticity chart is presented withing geotechnical test results in Appendix D.

4.7 Geochemical Testing

Geochemical analysis was undertaken on 42 soil samples of Made Ground and natural soils (Shirdley Hill Sand Formation, Glacial Till and Chester Formation) tested for selective contaminants (BRE Special Digest 1:2005 (3rd Edition), Concrete in Aggressive Ground, the results of which are summarised in the table below.

Tests	No. of Tests	Minimum	Maximum
Made Ground			
Soil - pH	26	7.2	11.8
Soil - Water Soluble Sulphate	26	10.5 mg/L	2410 mg/L
Water – pH	12	6.6	12.4
Water - Sulphate	12	33 mg/L	878 mg/L
Shirdley Hill Sand Formation			
Soil - pH	5	6.5	8.3
Soil - Total Sulphur	5	0.088%	0.392%
Soil - Water Soluble Sulphate	5	38.5 mg/L	1380 mg/L

Tests	No. of Tests	Minimum	Maximum
Water – pH	12	6.6	12.4
Water - Sulphate	12	33 mg/L	878 mg/L
Glacial Till			
Soil - pH	3	7.1	8.4
Soil - Total Sulphur	3	0.010%	0.048%
Soil - Water Soluble Sulphate	3	23.3 mg/L	878 mg/L
Water – pH	12	6.6	12.4
Water - Sulphate	12	33 mg/L	878 mg/L
Weathered Chester Formation			
Soil - pH	4	8.7	9.2
Soil - Total Sulphur	4	0.016%	0.068%
Soil - Water Soluble Sulphate	4	22.9 mg/L	81.6 mg/L
Water – pH	12	6.6	12.4
Water - Sulphate	12	33 mg/L	878 mg/L
Chester Formation			
Soil - pH	4	7.5	8.8
Soil - Total Sulphur	4	<0.05%	0.039%
Soil - Water Soluble Sulphate	4	4.8 mg/L	48.7 mg/L
Water – pH	12	6.6	12.4
Water - Sulphate	12	33 mg/L	878 mg/L

Elevated concentrations of sulphate were recorded in groundwater sampled from DS04 (2310 mg/L); however, this is likely to be associated with the contamination identified within the sample and not considered representative of the groundwater beneath the Site. The sample has been removed from the dataset on the basis that the source of contamination is likely to be removed as part of the remediation works to facilitate the proposed redevelopment of the Site.

5.0 Geotechnical Assessment

5.1 Introduction

5.1.1 Summary of Development Proposals

It is understood that the Site is to be developed with a commercial unit including areas of hardstanding for access, loading bays and car parking together with areas of soft landscaping. The proposed development layout is shown on Drawing 1.

At the time of writing, structural and floor loadings and final levels were unknown. Consequently, the information provided below should be treated as preliminary and will be subject to review once a scheme and levels have been finalised.

5.1.2 Preliminary Geotechnical Hazards

The geohazards listed below have been identified to follow guidance presented in the HE document CD622 'Managing Geotechnical Risk' (2019) which aims to identify and manage the geotechnical risks associated with a scheme throughout its lifespan, from planning to construction to maintenance.

The following geohazards are considered to be substantial ground related risks associated with the proposed development. A substantial risk is defined by Delta-Simons in Appendix H.

All potential ground stability records within the Envirocheck® report are deemed to be very low or no hazard. These include:

- ▲ Collapsible Ground;
- ▲ Compressible Ground;
- ▲ Ground Dissolution;
- ▲ Landslides; and
- ▲ Shrinking or Swelling Clay.

The potential for Running Sands is deemed to be very low to low.

Reference to the Coal Authority on-line viewer indicates that the Site is not within a Coal Mining Reporting Area. However, the Envirocheck Report indicates that Coal Mining is 'inconclusive'.

- ▲ Made Ground - the Site is likely to comprise widespread areas of significant thicknesses of Made Ground associated with former/current development. Made Ground is typically variable in nature and strength with a potentially low bearing capacity and unacceptable levels of total/differential settlement may occur.
- ▲ Basements / relict structures / obstructions – given the age and type of the former/existing development, there is a possibility of former basements, foundations, and other buried obstructions beneath the Site. It is also understood that several buried services remain beneath the Site and feed the wider industrial estate.
- ▲ Shrinkable soils - With reference to ground investigation undertaken by others, the near-surface natural ground conditions may comprise shrinkable soils and appropriate foundation precautions may be required. This should be considered as part of the geo-environmental investigation of the Site.
- ▲ Peat/compressible soils - Organic soils including peat have been recorded previously at the Site; these materials have the potential to be compressible and represent soft spots, which may require removal or ground improvement and are not suitable as founding strata. It is anticipated that these materials are limited in extent.
- ▲ UXO - According to the Zetica website, the Site is at low risk from UXO associated with bombing during WWII. The Site was reportedly located within the Royal Ordnance Factory (ROF Kirkby) during the war, which was a large factory filling munitions from 1940-1946. As a result, UXO support has been recommended for any intrusive works undertaken at the Site.

5.2 Ground Model

Much of the Site was overlain by concrete underlain by typically granular Made Ground to depths of 1.0 m bgl but locally to 2.5 m bgl. Several buried obstructions were encountered including brick and concrete.

Shirdley Hill Sand Formation (loose/medium dense sand) was identified beneath the Made Ground to depths of between 1.0 and 2.5 m bgl. Localised, relatively thin peat deposits were also encountered, up to a maximum thickness of 0.5 m. Glacial Till (firm/stiff, locally soft clay) was found to underlie these deposits to depths of between 5.0 and 7.5 m bgl.

Weathered Chester Formation (very dense sand) was encountered to a maximum depth of 9.2 m bgl. This material grades into sandstone rock at depths of between 6.0 and 10.0 m bgl and extends to at least 14.3 m bgl (maximum depth of investigation).

5.3 Enabling Works

5.3.1 Excavations

It is expected that conventional mechanical excavators will readily remove the Made Ground, Shirdley Sand Formation and Glacial Till deposits likely to be encountered in shallow excavations, although a breaker may be required to remove any obstructions including brick and concrete.

All shallow excavations at the Site should be considered unstable, therefore, temporary support of all excavations should be considered when excavating on-Site.

5.3.2 Groundwater

Significant groundwater would not be anticipated during the excavations required as part of the proposed development. However, some perched groundwater residing in Made Ground deposits should be planned for. Local dewatering via sump and pump is anticipated to be suitable, however, treatment prior to disposal to sewer may be required. Formations in natural strata should be well protected from surface water and mechanical degradation.

Should piling be considered, artesian groundwater may be encountered within the Chester Formation (circa 6 -10 m bgl).

5.4 Earthworks

At the time of writing, finished levels were unclear although, it is understood that to some degree earthworks will be required as part of the proposed development; although a significant cut and fill operation is not anticipated.

Shallow earthworks on the Site will likely predominantly encounter Made Ground. From observations of the range of these deposits encountered on Site, following suitable processing, it may be possible to yield an earthworks Class 1A/1B (well/uniformly graded granular) fill. Although some allowance will need to be made the removal of oversize fragments/ disposal of unsuitable materials should be anticipated.

Materials used as fill will need to be placed to a suitable engineering specification with the degree of compaction required will be dependent on end usage and serviceability criteria. For example, a lesser degree of compaction may be suitable for paved areas than for building platforms supporting foundations and ground bearing slabs.

Further earthworks testing would be required prior to completion of a suitably detailed earthworks specification for the works.

Made Ground materials and the Site in general should be damped down during earthworks to mitigate the risk from asbestos fibres, which have been recorded at shallow depths. It is understood that Made Ground materials may be removed and placed elsewhere on-Site within the proposed scheme.

5.5 Foundations

5.5.1 Spread Foundations

Based on the recorded ground conditions, it is evident that there are problematic soils, including highly compressible peat, together with widespread thicknesses of Made Ground, beneath the proposed building at various depths. The Made Ground is not considered suitable as a founding horizon and; therefore, foundations should extend below Made Ground and any soft/loose horizons and peat horizons and into competent Shirdley Hill Sand Formation and/or Glacial Till which are generally encountered below 1.5 m bgl.

Based on the ground investigation undertaken, strip/trench fill foundations are considered to be suitable for the proposed development (assumed lightly loaded commercial warehouse type building), founded at a minimum depth of 2.0-2.5 m bgl within the medium dense sand (Shirdley Hill Sand Formation) or firm/stiff clay (Glacial Till). For a strip/trench fill foundation, an allowable bearing pressure of 100 kN/m² is considered appropriate with total settlements not anticipated to exceed 25 mm.

Whilst in principle, the shallow soils may provide sufficient bearing capacity for the proposed commercial warehouse, the underlying relatively shallow compressible soils (e.g. peat) may result in unacceptable and/or differential settlement. The likelihood of unacceptable and/or differential settlement should be considered further in detailed design.

All foundation excavations should be inspected by a suitably qualified geotechnical engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved and to confirm the absence of any localised cohesive soils.

Should the levels of settlement prove unacceptable for the proposed structure at design stage, then alternative foundations solutions such a ground improvement or piling should be considered. Ground improvement (e.g. vibro-stone columns) would not be considered as an appropriate foundation solution given that gas protection measures are required.

5.5.2 Piles

Piles should extend into competent sandstone (Chester Formation) encountered at depths of approximately 6.0 - 10.0 m bgl. The precise method of pile installation and applicability of proprietary systems, diameters and depths required would need to be informed based on the results of this investigation, by discussions with a piling contractor with suitable experience.

Individual pile/pile group loads will be a function of the surface area of the piles to be employed at the Site and their method of construction.

Normal static and dynamic load testing (including uplift tests) should be considered to achieve satisfactory quality control/assurance in accordance with good practice.

There will be a requirement for the placement of a suitably engineered piling mat, which should be designed and validated by a suitably qualified and experienced engineer. A piling risk assessment will be required.

Pile arisings may require appropriate chemical assessment prior to reuse on-Site or off-site disposal and the recorded and potentially more widespread presence of asbestos should be considered. Shallow and potentially contaminant-impacted groundwater should be considered as part of piling works.

5.5.3 Volume Change Potential

The volume change potential should be considered in any foundation schedule for structures and services located within the influence zone of trees or bushes (proposed, existing or to be removed) and appropriate precautions and/or founding depths should be designed accordingly. In cohesive soils, it is recommended that foundations should be designed in accordance with NHBC Standard Chapter 4.2 "*Building Near Trees*".

Index testing results suggest that the Glacial Till and cohesive Shirdley Hill Sand Formation (where present) deposits encountered on Site can be classified as having a low volume change potential in accordance with NHBC classification. Shirdley Hill Sand Formation encountered at shallow depth is typically granular and

therefore non-shrinkable. However, there are discontinuous, relatively thin horizons of highly compressible peat at relatively shallow depths (upper 2 m).

5.5.4 Floor Slabs

Depending on floor loads/ settlement tolerances required, and due to the presence of Made Ground and compressible strata, ground bearing floor slabs may not be considered appropriate.

It is recommended that a stabilisation/ ground improvement solution (if appropriate) be adopted to support a ground bearing slab. Alternatively, a suspended floor slab could be adopted, transferring loads to foundations and for the installation of ground gas protection measures.

Ground gas protection measures will be required in the proposed development and are discussed in more detail in the following section.

5.5.5 Reinforcement/Service Connections

In the event that foundations straddle variable material types, suitable reinforcement should be added to the foundation to minimise potential movement and also flexible service connections may be required.

5.6 Roads and Pavements

A total of seven in situ CBR tests designated TP06 to TP12 were carried out on proposed roads/car parking areas at the Site. The test results are included in Appendix C. The testing revealed average CBR values ranged between 1.9 % and 7.5 %. Based on these test results, it is recommended that the following CBR values are adopted for preliminary design purposes:

- ▲ Near-surface granular Made Ground: 2%.

Caution would need to be exercised to ensure that any soft/loose areas within the formation are excavated and filled with suitably compacted granular fill.

Near surface soils have the potential to be disturbed by weathering and site traffic. Suitable working methods should therefore be employed to avoid this and therefore reduce the potential to create volumes of unsuitable fill material.

5.7 Chemical Attack on Buried Concrete

Water soluble sulphate concentrations and soil pH values can be summarised as follows for the various materials types:

- ▲ Made Ground: water soluble sulphate concentrations varied from 10.5 mg/l to 2410 mg/l with soil pH values ranging from 7.2 to 11.8;
- ▲ Shirdley Hill Sand Formation: water soluble sulphate concentrations varied from 38.5 mg/l to 1380 mg/l with soil pH values ranging from 6.5 to 8.3;
- ▲ Glacial Till: water soluble sulphate concentrations varied from 23.3 mg/l to 454 mg/l with soil pH values ranging from 7.1 to 8.4;
- ▲ Weathered Chester Formation: water soluble sulphate concentrations varied from 22.9 mg/l to 81.6 mg/l with soil pH values ranging from 8.7 to 9.2 and;
- ▲ Chester Formation: water soluble sulphate concentrations varied from 4.8 mg/l to 48.7 mg/l with soil pH values ranging from 7.5 to 8.8.

In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' (2005), the conditions of the following strata would be classified as follows when considering the most appropriate type of concrete to be used at the site in order to resist chemical attack from elevated sulphate present in the soils (assuming mobile groundwater and non-pyritic soils):

- ▲ Made Ground: Design Sulphate Class DS-3 and ACEC Class AC-3,
- ▲ Shirdley Hill Sand Formation: Design Sulphate Class DS-3 and ACEC Class AC-3,

- ▲ Glacial Till: Design Sulphate Class DS-2 and ACEC Class AC-2; and
- ▲ Chester Sandstone Formation: Design Sulphate Class DS-2 and ACEC Class AC-1.

5.8 Soakaway Drainage

Due to the significant thickness of Made Ground which has been identified on Site, it is considered unlikely that soakaways will be an effective means of surface water drainage. In addition to this, the Environment Agency are unlikely to approve the use of soakaway drainage given the Site's former use as a photochemical processing plant.

6.0 Generic Quantitative Risk Assessment

6.1 Introduction

The presence of hazardous substances in or on a Site is generally only of concern if an actual or potential unacceptable risk exists. Legislation and guidance on the assessment of contaminated sites, consistent with UK best practice, acknowledges the need for a tiered risk-based approach. This section represents a Generic Quantitative Risk Assessment (GQRA) being a comparison of Site contaminant levels against Generic Assessment Criteria.

6.2 Human Health GQRA

The assessment of risks in relation to human health has been undertaken using Generic Assessment Criteria (GAC) as detailed within the appropriate tables. Risks from soil, groundwater and Non-Aqueous Phase Liquids (NAPL) have been considered. The GAC are predominantly based on long term (chronic) risk to health. However, in the limited circumstances where short-term (acute) risks are more pronounced, these GAC have been utilised to ensure a thorough and conservative initial assessment is undertaken.

Based on the proposed light industrial use, the soil and groundwater chemical data has been compared against a residential/commercial/industrial end use GAC for 1% soil organic matter (SOM) content.

6.2.1 Risks from Soil Sources

The laboratory results for contaminants exceeding concentrations compared to their respective GAC are presented in the table below. Laboratory results for soils are included as Appendix E.

Contaminant	Max Conc. (mg/kg)	GAC (mg/kg)	GAC Source	No. Exceed GAC / No. of samples	Location of Exceedances (depth) = Concentration (mg/kg)
Asbestos	0.003	Detected	DS	7/26	DS03 (0.7m) – Chrysotile/Crocidolite fibres; DS10 (0.8 m) – Amosite Loose Fibres; TP08 (0.25 m) – Chrysotile Loose Fibres; TP09 (0.6 m) – Chrysotile Loose Fibres; BH01 (0.4 m) – Chrysotile Loose Fibres; BH07 (0.5 m) – Amosite Loose Fibrous Debris
Notes: DS = In-house GAC derived by Delta-Simons Environmental Consultants Ltd, 2018.					

6.2.2 Soil Analysis Summary

Widespread significant contamination of the soils has not been identified at the Site. None of the site-specific contaminants of concern were recorded at concentrations in excess of their respective GAC.

Seven samples of Made Ground tested positive for the presence of asbestos (chrysotile, amosite, crocidolite fibres/fibrous debris); quantification analysis indicated <0.001 to 0.003 % by weight); and the presence of additional asbestos within soils cannot be discounted at this stage.

6.2.3 Risks from Groundwater Sources

Based on the proposed use of the Site for commercial use, the groundwater chemical data has been compared against a commercial/industrial end use GAC to assess risks from groundwater sources to indoor air and subsequent vapour inhalation indoors.

None of the site-specific contaminants of concern were recorded at concentrations in excess of their detection limits/respective GAC.

Ten samples of Made Ground were obtained during both phases of investigation and were analysed for the presence of leachable metals and the results are included in Appendix E and summarised in the table overleaf.

Contaminant	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC / No. of samples	Location of Exceedances
Arsenic (dissolved)	32	10	DWQS	1	TP12 (0.25m)
Chromium (hexavalent)	16	3.4	WFD	3	DS02 (0.75m), DS08 (0.4m), DS10 (0.8 m)
Notes: DWQS 2016 - The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards] WFD - Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015					

Marginally elevated concentrations of arsenic and chromium were recorded locally. Given that the majority of the Site is anticipated to be covered with building footprint and/or hardstanding, the risks of infiltration and subsequent migration of contaminants is considered to be low.

6.2.4 Risks from Non-Aqueous Phase Liquids (NAPL)

Soil and groundwater exposure models used in generating Generic Assessment Criteria do not account for the potential for NAPL to represent a source of risk to human health, principally due to the production of vapours. Whilst it is possible to calculate theoretical soil saturation limits, in reality, due to co-solubility effects, these are not an appropriate indicator of the presence of NAPL. In order to assess the presence of NAPL, for petroleum hydrocarbons, an assessment criterion of 5,000 mg/kg for Total Petroleum Hydrocarbons has been applied based on professional experience.

The following has been identified in relation to NAPL at the Site:

- ▲ No observations of NAPL were made within the soils observed during drilling;
- ▲ No concentrations of Total Petroleum Hydrocarbons in excess of 5,000 mg/kg were recorded;
- ▲ No NAPL was measured during groundwater monitoring works.

On this basis, there is no evidence of NAPL being present on the Site.

6.3 Controlled Waters/Water Environment GQRA

The approach adopted to assessing risks to Controlled Waters/Water Environment is based principally on considering the concentrations of contaminants identified within the groundwater samples obtained in comparison to relevant GAC.

Given the 'prevent and limit' approach of the Water Framework Directive (2000/60/EC) and the identified receptors, a range of Water Quality Standards (WQS) have been applied as Generic Assessment Criteria (GAC), these include Water Framework Directive standards and thresholds (WFD), the Freshwater Environmental Quality Standards (EQS), the UK Drinking Water Quality Standards (DWQS), WHO Guidelines for Drinking Water Quality or SEPA resource protection values which have been used as initial conservative GAC to assess whether groundwater contamination requires further assessment or discussion in terms of the risks to controlled waters. Where specific water quality standards are not available, Delta-Simons has adopted surrogate values based on professional judgement (DS GAC).

6.3.1 Groundwater Results

The identified controlled water receptors are the underlying Secondary Undifferentiated and Principal Aquifers and as such, the results of groundwater analysis have been compared to the GAC for the protection of surface waters / potable water.

Laboratory results above relevant the applied GAC are summarised in the table below:

Contaminant	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC / No. of samples	Location of Exceedances = Concentration (µg/l)
Metals					
Arsenic	50.2	10	DWQS 2016	7/12	DS03A, DS05, DS06, BH01, BH04, BH05, BH07
Chromium III	25	3.4	WFD 2015b	1/12	DS05
Lead	20	10	DWQS 2016	1/12	DS04
Nickel	770	20	DWQS 2016	7/12	DS03A, DS04, BH01, BH04, BH05, BH06, BH07
Polycyclic Aromatic Hydrocarbons					
Naphthalene	5.05	4.24	WFD 2015b	1/12	DS04
Petroleum Hydrocarbons					
Aliphatic TPH >C12-C16	360	300	WHO 2008	1/12	DS04
Aromatic TPH >C10-C12	170	90	WHO 2008	1/12	DS04
Aromatic TPH >C12-C16	800	90	WHO 2008	1/12	DS04
Aromatic TPH >C16-C21	640	90	WHO 2008	1/12	DS04
Aromatic TPH >C21-C35	910	90	WHO 2008	1/12	DS04
Notes: DWQS 2016 = The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards] WHO 2008 = WHO background documents to Guidelines for Drinking Water Quality, 2003. WHO 2008 = The WHO guidance states that the use of the lowest guidance value for aliphatic hydrocarbons (300 µg/l) for comparison to the total TPH concentration in groundwater will provide a conservative level of protection.					

6.3.2 Groundwater Results Summary

Generally, water quality was noted to be fairly good with marginal exceedances of some metals (arsenic and nickel – widespread and chromium III and lead – localised). It is considered that the marginal exceedances of metals recorded do not pose a significant risk to controlled waters on the basis that the Glacial Till deposits are likely to be low-permeability, thereby protecting the underlying Principal Aquifer and limiting lateral migration of on-site groundwater to nearby watercourses. The Site is located within a groundwater Source Protection Zone and there are nearby abstractions wells although these are noted to be for industrial purposes on the wider estate.

However, groundwater sampled from DS04 recorded exceedances of PAH (naphthalene) and petroleum hydrocarbons (aliphatic C12-16 and aromatic C10-C35) which supports on-Site observations of an iridescent sheen and hydrocarbon odour during sampling.

The identified hydrocarbons fractions comprise the longer chain (C10-C35) aliphatic and aromatic fractions (including PAHs). The aliphatic fractions are considered to have a low to very low relative mobility in groundwater, the aromatic fractions present above the GAC have a moderate to very low mobility in groundwater. High mobility short chain hydrocarbons or VOC contamination has not been identified at the Site above laboratory detection limits.

6.4 Built Environment

6.4.1 Potable Water Supply Pipes

The investigation requirements for the selection of potable water pipe material are set out in UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UKWIR, 2010). This report has very specific and onerous investigation requirements and as such the detailed investigation of each utility route was not within the scope of this investigation.

However, given the presence of organic contamination and the former use of the Site, it is considered likely/prudent to consider the use of barrier pipe materials.

It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy is not likely to be considered fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required at a later date once the route(s) of the supply pipe(s) are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

6.4.2 Building Materials

Risks to building materials associated with aggressive ground conditions is addressed in Section 5.7.

6.5 Waste Management

In recent years a number of mechanisms have aimed to change the way in which waste materials have traditionally been managed (*i.e.* a move away from less sustainable options such as landfill disposal). These include:

- ▲ Legislation and guidance (e.g. the Waste Framework Directive [2008, as amended]; the Waste [England and Wales] Regulations, 2011; the Definition of Waste: Development Industry Code of Practice, Version 2 [DoWCoP; CL:AIRE, 2011]).
- ▲ Fiscal drivers (e.g. the landfill tax escalator).
- ▲ Corporate responsibility campaigns (e.g. WRAP: Halving waste to landfill & Quality Protocol projects; Ellen Macarthur Foundation).

There is now a greater focus on waste re-use, treatment and recovery as organisations try and move their waste materials up the Waste Hierarchy and move to more circular models of material supply and re-use.

In accordance with current industry best practice, guidance and legislation Delta-Simons would always recommend options including managing materials on site through the DoWCoP, waste treatment and waste recovery be considered ahead of landfill disposal. Landfill disposal should be seen as an option of last resort given that in terms of cost, environment and social outcomes it is less sustainable. However, the availability of alternatives to landfill disposal depends on the timescales of the project, proactive involvement of qualified advisors and the nature and status of the materials being considered.

6.6 Waste Classification

In general, the predominant waste material encountered during the construction phase of development schemes will likely be construction and demolition waste, predominantly waste soils and crushed demolition arisings. These may be found *in situ* in the ground or stockpiled on sites and they may be contaminated which may have implications for their classification and subsequent management.

This investigation was not undertaken to advise on the classification or potential management routes for such waste materials. Classification and management of these types of wastes either on to site, off site or within the development are likely to require further investigation and assessment. The extent of such work will depend on the particular management option that is being considered and could, for example, involve the use of waste acceptance criteria (WAC) analyses.

WAC test results are included in Appendix E.

7.0 Bulk Ground Gas Risk Assessment

7.1 Ground Gas Conceptual Site Model

7.1.1 Sources

The following potential sources of ground gas have been identified:

- ▲ Made Ground – encountered across the Site at depths ranging between 1.0 and 2.5 m bgl and comprised a number of deleterious materials including clinker, slag and decaying organic matter and; therefore, represents a potential source of hazardous ground gases. Organic matter content withing tested Made Ground deposits ranged between 1.2 and 11.0 %;
- ▲ Shirdley Hill Sand Formation – thin horizons of organic amorphous and pseudo-fibrous peat deposits were encountered locally at the Site at depths between 0.6 and 2.05 m bgl and represents a potential source of methane generation; and
- ▲ Historical Site use – the Site was formerly used for photochemical manufacturing and a silver nitrate recovery plant until circa 2007 when operations largely ceased. The types of chemical and processes used during these operations represent a potential source of hazardous ground gases and vapours.

7.1.2 Pathways

- ▲ Vertical and lateral migration of ground gas through permeable strata;
- ▲ Potential for gases to enter current and future buildings through voids in the floor including service entry points and cracks and accumulate in confined spaces.
- ▲ Future maintenance/construction workers may come into contact with hazardous ground gases via entry into below ground confined spaces such as excavations or service entries/inspection points.

7.1.3 Receptors

The principal receptors under consideration are future Site users and maintenance/construction workers. Other receptors include adjacent site occupiers and future maintenance/construction workers.

7.2 Duration & Extent of Monitoring

Tables 5.5a and 5.5b within CIRIA C665 detail current recommended monitoring duration and frequency for sites in the UK. Based on the identification of potential sources in the preceding section, the gas generation potential is considered to be low to moderate, whilst the sensitivity of the proposed development is low. On this basis, CIRIA C665 recommends four visits over a minimum one month period.

Gas monitoring has been carried out upon the Site on an initial four occasions for a preliminary assessment of the ground gas regime.

The locations of the monitoring wells are highlighted on Figure 2 and indicate representative coverage across the whole study area.

Barometric pressures during the gas monitoring period ranged from 1007 mBar to 1027 mBar, of which two visits were completed during periods of falling pressure.

7.3 Ground Gas Risk Assessment

7.3.1 Background

Based on the proposed commercial end use, the following documents have been consulted when assessing the gas regime at the Site:

- ▲ CIRIA C665 (2007), Assessing risks posed by hazardous ground gases to buildings.
- ▲ British Standards Institute (BSI, 2019): Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, BS:8485:2015+A1:2019.

The presence of a source of hazardous gas within the ground does not necessarily indicate a risk will be present. Consideration of recorded gas flows together with source concentrations can allow an initial

assessment to be made of the potential both for generation and subsequent migration of gas. A Characteristic Situation (CS) is derived from an assessment of the ground gas data and forms the basis of determining mitigation measures.

7.3.2 Gas Screening Value (GSV)

The Gas Screening Value (gas concentration as a fraction x maximum recorded flow) is used to provide an initial assessment of risks to future Site users. The GSVs calculated for the monitoring wells are presented in the following table.

Location	Maximum Steady Methane (%v/v)	Maximum Steady Carbon Dioxide (%v/v)	Maximum Steady Flow Rate (l/hr)	GSV/Classification				Flooded?
				Methane		Carbon Dioxide		
				GSV	Classification	GSV	Classification	
DS01	<0.1	0.5	<0.1	0.0001	CS1	0.0005	CS1	0 of 4
DS02	<0.1	2.3	<0.1	0.0001	CS1	0.0023	CS1	0 of 4
DS03A	<0.1	<0.1	<0.1	0.0001	CS1	0.0001	CS1	3 of 4
DS04	<0.1	<0.1	<0.1	0.0001	CS1	0.0001	CS1	3 of 4
DS05	<0.1	<0.1	<0.1	0.0001	CS1	0.0001	CS1	2 of 4
DS06	<0.1	<0.1	4	0.004	CS1	0.004	CS1	3 of 4
DS07	<0.1	11.2	<0.1	0.0001	CS1	0.0112	CS1	1 of 4
DS08A	<0.1	<0.1	<0.1	0.0001	CS1	0.0001	CS1	0 of 3
DS09	<0.1	<0.1	<0.1	0.0001	CS1	0.0001	CS1	3 of 4
DS10	<0.1	<0.1	<0.1	0.0001	CS1	0.0001	CS1	0 of 4
BH01	<0.1	1.8	3.3	0.0033	CS1	0.0594	CS1	4 of 4
BH04	1.1	5.4	0.7	0.0077	CS1	0.0378	CS1	3 of 3
BH05	<0.1	5.6	3.6	0.0036	CS1	0.2016	CS2	0 of 3
BH06	<0.1	0.4	<0.1	0.0001	CS1	0.0004	CS1	3 of 3
BH07	0.7	<0.1	<0.1	0.0007	CS1	0.0001	CS1	3 of 3
BH08	<0.1	2.8	1.8	0.0018	CS1	0.0504	CS1	0 of 3
Notes:	Where no discernible flow has been recorded, the instrument limit of detection has been used to generate GSV.							

The gas monitoring recorded elevated concentrations of methane and carbon dioxide and depleted oxygen levels. A maximum Gas Screening Value (GSV) of 0.0077 l/hr has been calculated for methane, which equates to a Characteristic Situation 1 (CS1) and 0.2016 has been calculated for carbon dioxide, which equates to a Characteristic Situation 2 (CS2). In addition, the 'Typical Maximum Concentrations' for a 'CS1' classification have been exceeded in respect of carbon dioxide (5 %) at three borehole locations (DS07, BH04 and BH05).

A Characteristic Situation 2 classification is indicative of low-risk conditions that would require gas protection to buildings.

These recommendations should be agreed with the Local Authority in advance of development works starting on site. Further monitoring is recommended to confirm the ground gas regime and characteristic situation.

7.4 Ground Gas Risk Mitigation

BS:8485 provides a scoring system to determine the appropriate protection measures for a proposed development in accordance with the identified ground gas regime. Table 3 of BS:8485 summarises typical UK building types, which for this development will comprise Type D (industrial or commercial); however, small rooms within these style buildings should be separately categorized as Type C. Table 4 details the points

required for the Characteristic Situation, which for CS2 is 1.5 (Type D) and 2.5 (Type C). This can be achieved by a combination of the following:

Structural barriers (Table 5)

Ventilation (Table 6)

Gas Membrane (Table 7)

The above should be considered in conjunction with the proposed foundation/floorslab design to achieve the minimum score required within BS:8485.

The above assessment relates solely to future Site users. Given the nature of the ground gas regime at the Site, no further works are considered necessary to protect 3rd parties/surrounding occupiers. Entry to excavations/confined spaces should be restricted to personnel with relevant Confined Spaces training and with prior confirmation of atmospheric conditions.

7.5 Radon

The Site is located within an area where radon protective measures are not required.

A detailed radon assessment falls outside of the scope of this Report, and the requirement for radon mitigation measures in the proposed development should be identified separately to the satisfaction of the Local Authority.

7.6 Organic Vapours

No sources of volatile vapours have been identified as part of the ground investigation.

8.0 Revised Conceptual Site Model

A revised CSM is presented in the table below and has been formulated taking into account all of the available data from the Delta-Simons intrusive investigation, suitable for a site with a proposed commercial end use.

Revised Conceptual Site Model				
Source	Pathways	Receptors	Pollutant Linkage?	Discussion and Mitigation
Asbestos in shallow Made Ground PAH and hydrocarbons in groundwater	Direct contact, ingestion and/or inhalation of soil/dust Migration of contaminants into groundwater	Human health – future residents/site users Human health – construction workers	Yes	The majority of the proposed developed is to be covered with hardstanding or the building footprint therefore limiting the contact with any Made Ground deposits. In areas where soft landscaping is proposed, a layer of clean imported topsoil would be required to act as an appropriate cover layer. It is considered that the marginal exceedances of metals recorded do not pose a significant risk to controlled waters on the basis that the Glacial Till deposits are likely to be low-permeability, thereby protecting the underlying Principal Aquifer and limiting lateral migration of on-site groundwater to nearby watercourses. Any hydrocarbon impacted groundwater around DS04 (and soil if present) should be removed off-Site and would require validation by an independent engineer and submission of a validation report to the relevant regulators for approval. The possibility for unrecorded tanks, infrastructure and/or /impacted soil/groundwater cannot be discounted. Additional groundwater monitoring and sampling is recommended to inform the Remediation and Verification Strategy. Short term risks to groundworkers would be mitigated by use of PPE and provision of suitable welfare facilities for robust health and safety precautions. As with all redevelopment works, a 'hotspot' protocol should be in place for groundworkers to act upon during any future redevelopment of the Site. Safe working procedures should be implemented, good standards of personal hygiene should be observed, and appropriate levels of PPE provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans.
		Secondary A Aquifer (Shirdley Hill Sand)	Yes	

Revised Conceptual Site Model				
Source	Pathways	Receptors	Pollutant Linkage?	Discussion and Mitigation
		Formation) overlying Secondary Undifferentiated (Glacial Till) and Principal Aquifer (Chester Sandstone Formation)		A Remediation and Verification Strategy should be produced detailing the proposed measures to mitigate risks as part of the proposed scheme and agreed with the Local Planning Authority ahead of starting construction works.
	Migration of contaminants into surface waters	Drain (20 m south)		
Organic contamination in soils	Direct infiltration in water supply pipes	Drinking water supply pipes	Yes	Hydrocarbons have been identified within shallow soils at the Site. Allowance should be made for the upgrading of any potable service pipes. The Local Water Authority should be contacted to understand their requirements for upgraded water pipes. Buried concrete should be designed in accordance with DS-3,AC-3 (Made Ground and Shirley Hill Sand Formation), DS-2, AC-2 (Glacial Till) and DS-2, AC-1 for Chester Formation.
Made Ground/Peat Deposits	Indoor exposure/explosive hazard via enclosed space accumulation of ground gas	Future site users	Yes	A Characteristic Situation 2 classification is indicative of low risk conditions that would require gas protection to buildings. Based on the results of the preliminary assessment, further ground gas monitoring is considered to be required in order to provide a more robust dataset to adequately characterise the ground gas regime.

Definitions of Risk are presented as Appendix H.

9.0 Conclusions & Recommendations

9.1 Ground Model Summary

The investigation recorded Made Ground overlying Shirdley Hill Sand Formation, Glacial Till and Chester Formation. Two groundwater bodies have been identified; one within the Glacial Till and one within the Chester Formation.

9.2 Geotechnical Summary

Based on the ground investigation undertaken, strip/trench fill foundations are considered to be suitable for the proposed development (assumed lightly loaded commercial warehouse type building), founded at a minimum depth of 2.0-2.5 m bgl within the medium dense sand (Shirdley Hill Sand Formation) or firm/stiff clay (Glacial Till). For a strip/trench fill foundation, an allowable bearing pressure of 100 kN/m² is considered appropriate with total settlements not anticipated to exceed 25 mm.

All foundation excavations should be inspected by a suitably qualified geotechnical engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved and to confirm the absence of any localised cohesive soils.

Should the required loads exceed the allowable bearing capacity then an alternative foundation solution should be considered such as piling. Ground improvement (e.g. vibro-stone columns) would not be considered as an appropriate foundation solution given that gas protection measures are required.

Index testing results suggest that the Glacial Till deposits encountered on Site can be classified as having a low volume change potential in accordance with NHBC classification. Shirdley Hill Sand Formation encountered at shallow depth is typically granular and therefore non-shrinkable. However, there are discontinuous, relatively thin horizons of peat at relatively shallow depths (upper 2 m).

It is recommended that a stabilisation/ ground improvement solution (if appropriate) be adopted to support a ground bearing slab. Alternatively, a suspended floor slab could be adopted, transferring loads to foundations and for the installation of ground gas protection measures.

In the event that foundations straddle variable material types, suitable reinforcement should be added to the foundation to minimise potential movement and also flexible service connections may be required.

Based on the test results and soil descriptions, it is considered that preliminary CBR values of 2 % may be adopted for near surface Made Ground. Plate load CBR tests are recommended at final formation levels.

9.3 Contamination Summary

The investigation has been carried out in order to provide information on the quality of the soil and groundwater beneath the Site in the context of land contamination and provide information on the ground gas regime beneath the Site for a commercial end use. The assessment is being completed prior to the proposed redevelopment of the Site.

Data gaps and uncertainties remain as outlined within Section 1.7.

9.3.1 Human Health

Widespread significant contamination of the soils has not been identified at the Site. None of the site-specific contaminants of concern were recorded at concentrations in excess of their respective GAC. Seven samples of Made Ground tested positive for the presence of asbestos (chrysotile, amosite, crocidolite fibres/fibrous debris); quantification analysis indicated <0.001 to 0.003 % by weight; and the presence of additional asbestos within soils cannot be discounted at this stage.

The main exposure pathway is ingestion, inhalation and direct contact of impacted soil however it's understood that the majority of the proposed development will be covered by the building footprint or associated hardstanding.

In areas where soft landscaping is proposed, a layer of clean imported topsoil would be required to act as an appropriate cover layer.

Short term risks to groundworkers would be mitigated by use of PPE and provision of suitable welfare facilities for robust health and safety precautions.

As with all redevelopment works, a 'hotspot' protocol should be in place for groundworkers to act upon during any future redevelopment of the Site. Safe working procedures should be implemented, good standards of personal hygiene should be observed, and appropriate levels of PPE provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans.

A Remediation and Verification Strategy should be produced detailing the proposed measures to mitigate risks as part of the proposed scheme and agreed with the Local Planning Authority ahead of starting construction works.

9.3.2 Controlled Waters

It is considered that the marginal exceedances of metals recorded do not pose a significant risk to controlled waters on the basis that the Glacial Till deposits are likely to be low-permeability, thereby protecting the underlying Principal Aquifer and limiting lateral migration of on-site groundwater to nearby watercourses.

Any hydrocarbon impacted groundwater around DS04 (and soil if present) should be removed off-Site and would require validation by an independent engineer and submission of a validation report to the relevant regulators for approval. The possibility for unrecorded tanks, infrastructure and/or /impacted soil/groundwater cannot be discounted. Additional groundwater monitoring and sampling is recommended to inform the Remediation and Verification Strategy.

9.3.3 Ground Gas

A Characteristic Situation 2 classification is indicative of low risk conditions that would require gas protection to buildings. Based on the results of the preliminary assessment, further ground gas monitoring is considered to be required in order to provide a more robust dataset to adequately characterise the ground gas regime.

9.3.4 Volatile Vapours

No potential sources of volatile contaminants have been identified.

9.3.5 Built Environment

The ground investigation was not designed to assess ground conditions in full accordance with the UKWIR guidance for water supply pipes. However, based on the general absence of petroleum hydrocarbons including hydrocarbons in the ground, the use of standard plastic infrastructure is likely to be suitable in the event that new water supply pipes are required.

Buried concrete should be designed in accordance with DS-3, AC-3 (Made Ground and Shirley Hill Sand Formation), DS-2, AC-2 (Glacial Till) and DS-2, AC-1 for Chester Formation.

9.4 Recommendations

Based on the results of the preliminary assessment, further ground gas monitoring is considered to be required in order to provide a more robust dataset to adequately characterise the ground gas regime. Additional groundwater monitoring and sampling is recommended to inform the Remediation and Verification Strategy.

The following recommendations for the development of the Site are made:

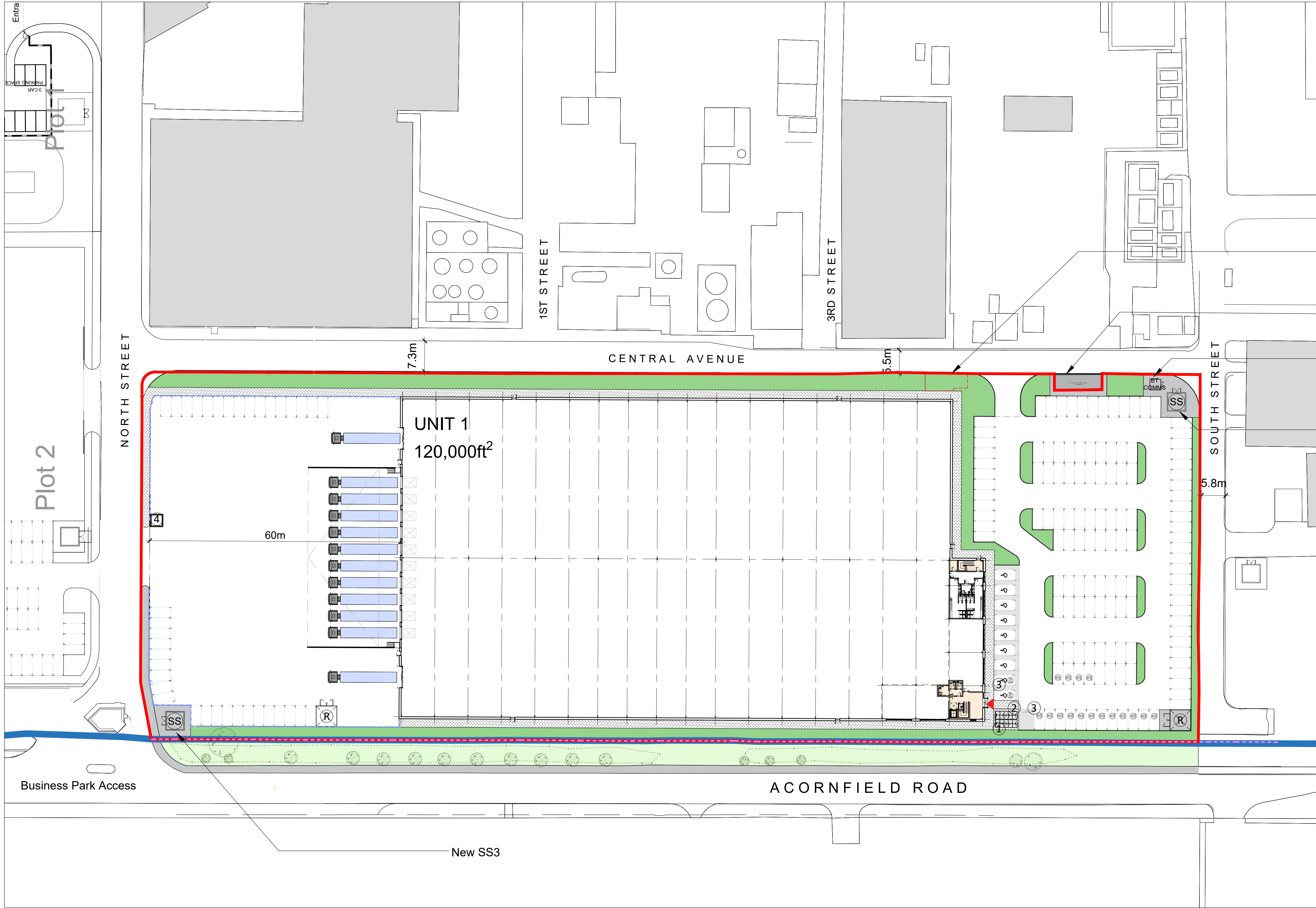
- ▲ Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures, impacted water/soil removal around DS04 and subsequent verification which will be required. Classification of the ground gas regime should be agreed with the Local Authority, who may request additional monitoring or additional protection to mitigate the risk of elevated ground gases and depleted oxygen.
- ▲ Depending on the chosen foundation solution, it is recommended that a specialist contractor is consulted to confirm the suitability of the proposed ground improvement techniques. If piling is selected, it is recommended that a specialist contractor is consulted to confirm the precise method of pile installation and applicability of proprietary systems, diameters and depths required would need to be informed based on the results of this investigation. A piling risk assessment and appropriate pile mat design will also be required.
- ▲ There is potential for as yet undiscovered impacted soil (and groundwater) to be present beneath the Site. Waste disposal classifications and costs should be confirmed with the receiving landfill operator before

final decisions are taken to dispose of any excess materials off site. Additional testing may be required in this regard. Made Ground will likely be classified as non-hazardous as a minimum.

- ▲ Additional hotspots of localised contamination associated with Made Ground cannot be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans.
- ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.
- ▲ Suitable dust suppression techniques and prevention of nuisance/environmental impacts will need to be implemented by the groundworkers during construction works.
- ▲ The re-use of materials on-site may be possible if required and where the material is chemically and geotechnically suitable for its proposed end location. Material re-use would need to be undertaken under a Materials Management Plan. Any imported material, including topsoil would also be chemically and geotechnical suitable for its proposed end-use.
- ▲ Future Contractors should undertake their own assessment of UXO risk in relation to their specific proposed scope of works.

Drawings

Drawing 1 – Proposed Site Plan



01 Proposed Site Plan
1:500@ A1 / 1:1000 @ A3

Disclaimer:
Subject to survey.

Notes:

- KEY**
- Image Business Park
 - Site Boundary Line
(22,227m²/ 5.49acres/ 2.22ha)
- AREA SCHEDULE(GIA)**
- | | |
|-------------------------------------|------------------------------|
| UNIT 1 (GIA) | 120,000ft² |
| Warehouse (Incl. office Undercroft) | 110,700ft ² |
| Office (FF Only) | 4,650ft ² |
| Office (SF Only) | 4,650ft ² |
- Car parking spaces 180
Level Loading Doors 2
Dock Level Doors 10
Cycle Spaces 28
- EXTERNAL MATERIALS:**
- In-situ concrete
 - Concrete block paving
 - Permeable paving
 - Soft Landscaping - Low maintenance grass
 - Existing black chain link fence
 - 2.6m Proposed Black paladin fence
- ① Bicycle Stands
② Motorcycle Parking
③ EV Charging
④ Security Hut
R Refuse Area
SS Substations

Outline of existing
SS2 - to be removed

Bld 18. Plant room
for FIS site

New BT Comms
Room

New SS2

DRAFT

D	SS Moved/ Car P arrangement	09.08.21	HT	HA
C	Increased Yard Size	26.07.21	HT	HA
B	Unit flipped	22.07.21	HT	HA
A	SS/BT comms relocation	19.07.21	HT	HA
-	Draft Issue	08.07.21	HT	HA
Rev:	Notes:	Date:	Dwn:	Iss:

Client:

SEYBOURNE

hale
ARCHITECTURE | DESIGN MANAGEMENT
22c Leathermarket Street, London, SE1 3HP

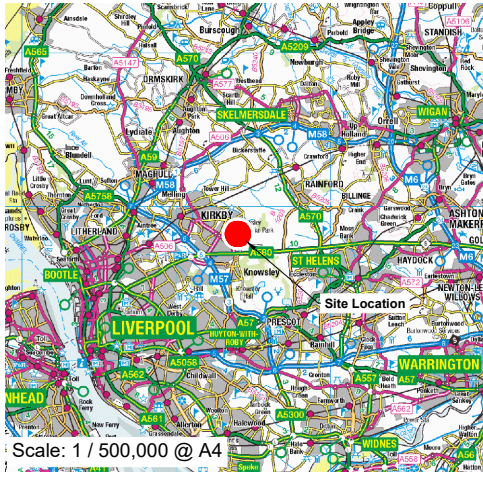
Project:
Imagination 03
Image Business Park, Knowsley

Drawing Title:
Site 3
Proposed Site Plan

Project No: 21066	Scale @ A1/A3: 1:500 / 1:1000	Revision: D
Drawing No: 21066 - PL1102		

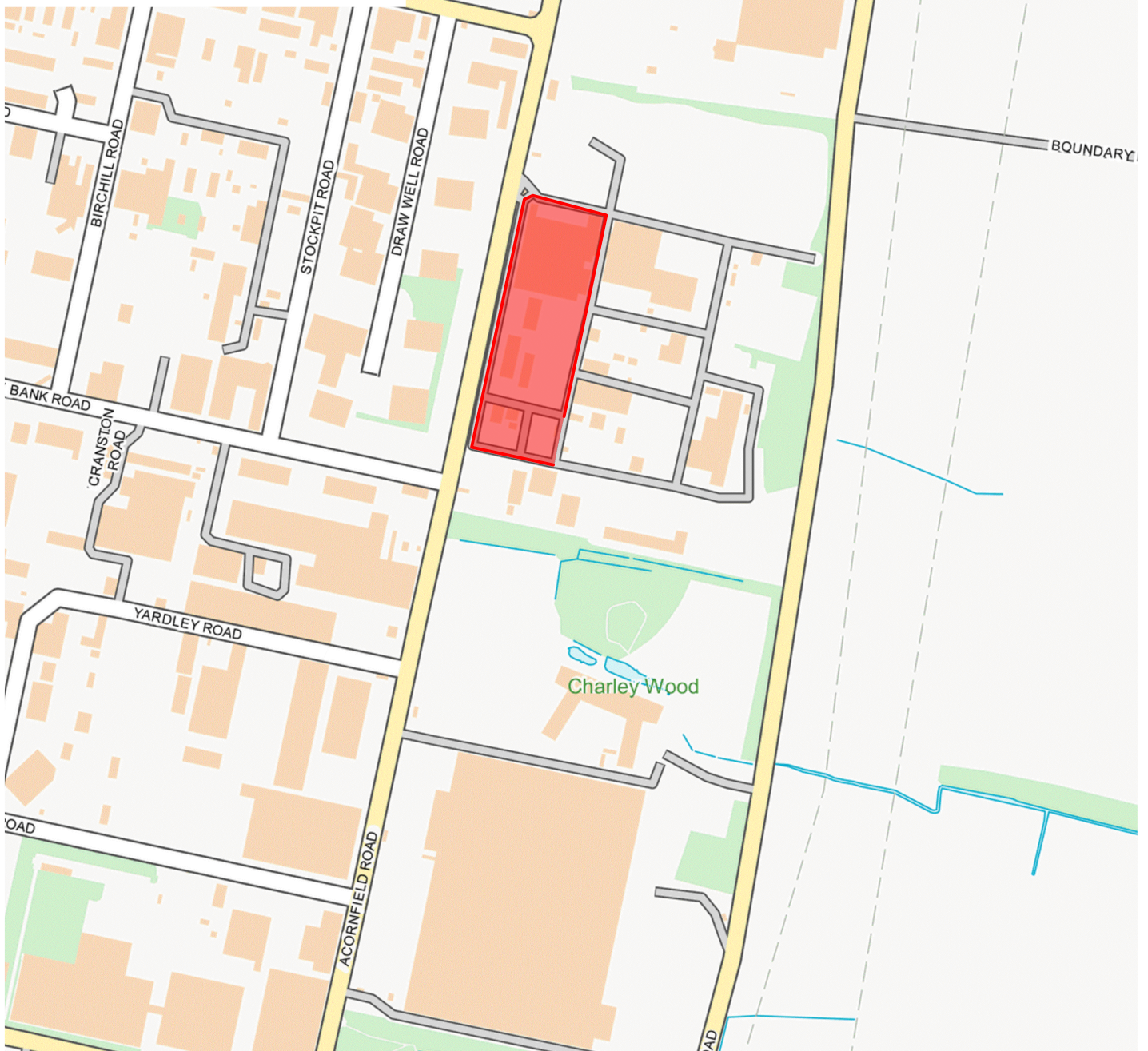
Figures

Figure 1 – Site Location Map



LEGEND

 Site Boundary



Scale: 1 / 10,000 @ A4

Contains OS data © , Crown Copyright and Database Right (2020)

Figure 2 – Exploratory Hole Location Plan

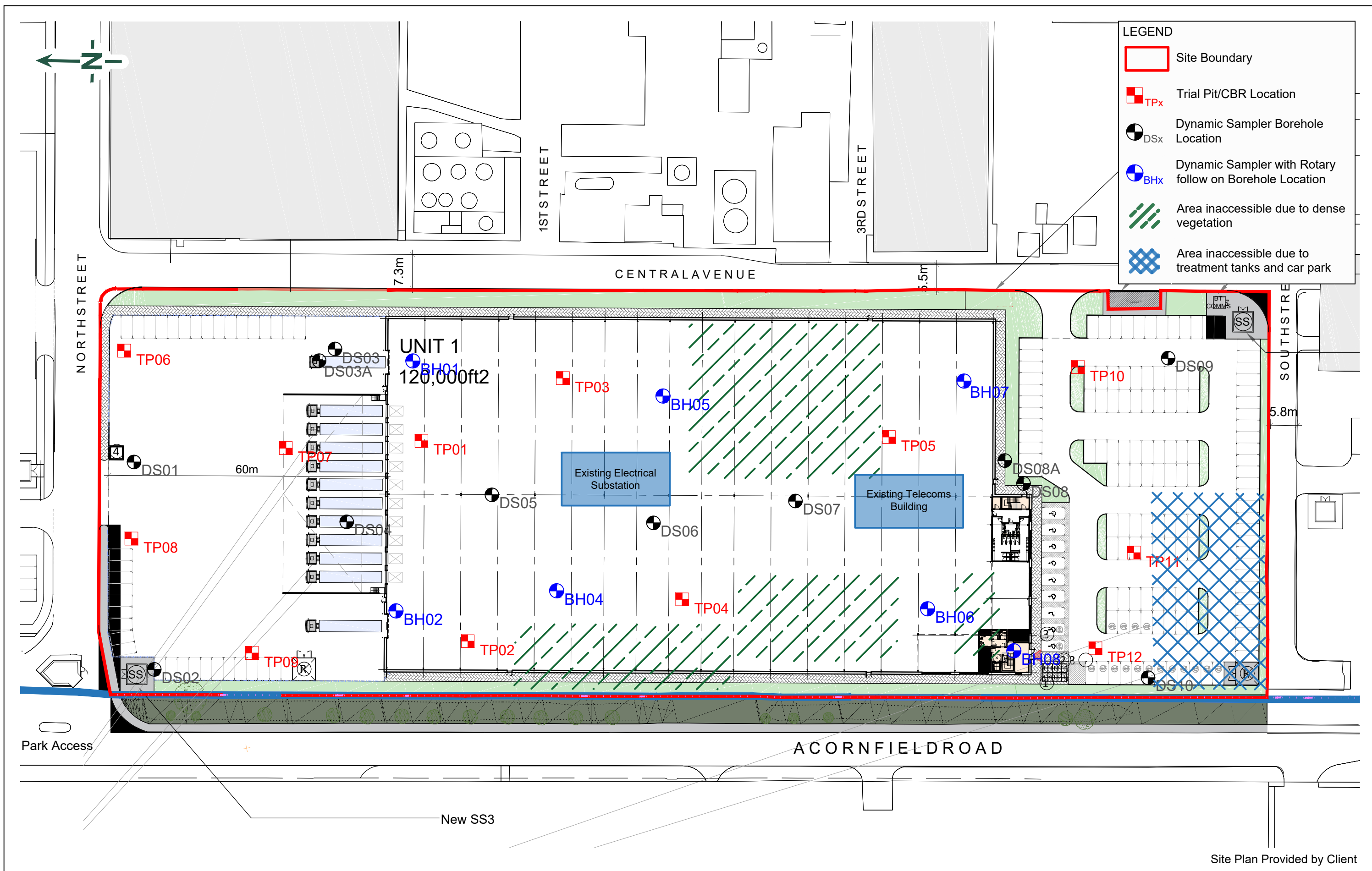


Figure 3 – Uncorrected SPT, Depth and Strata Type

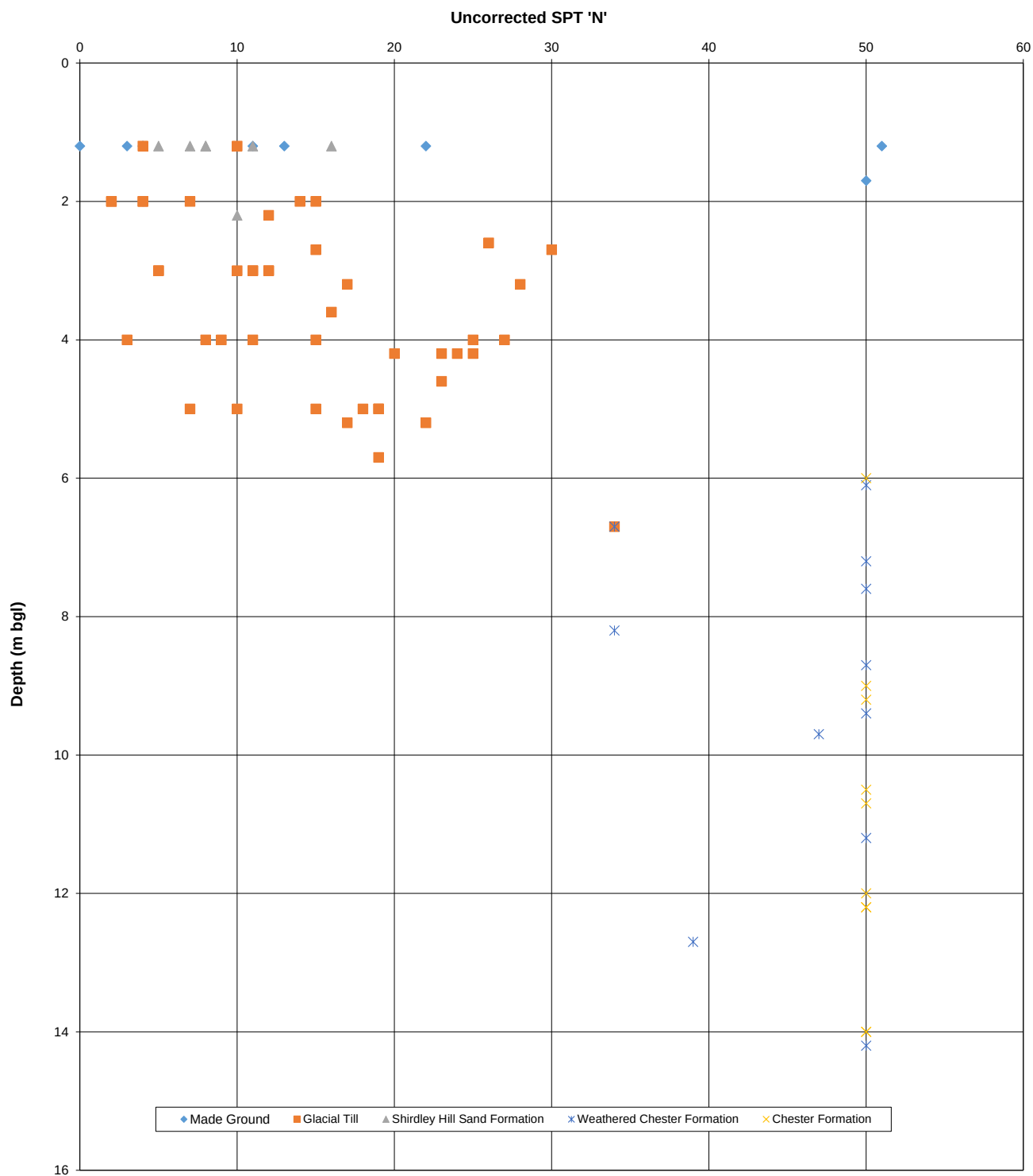
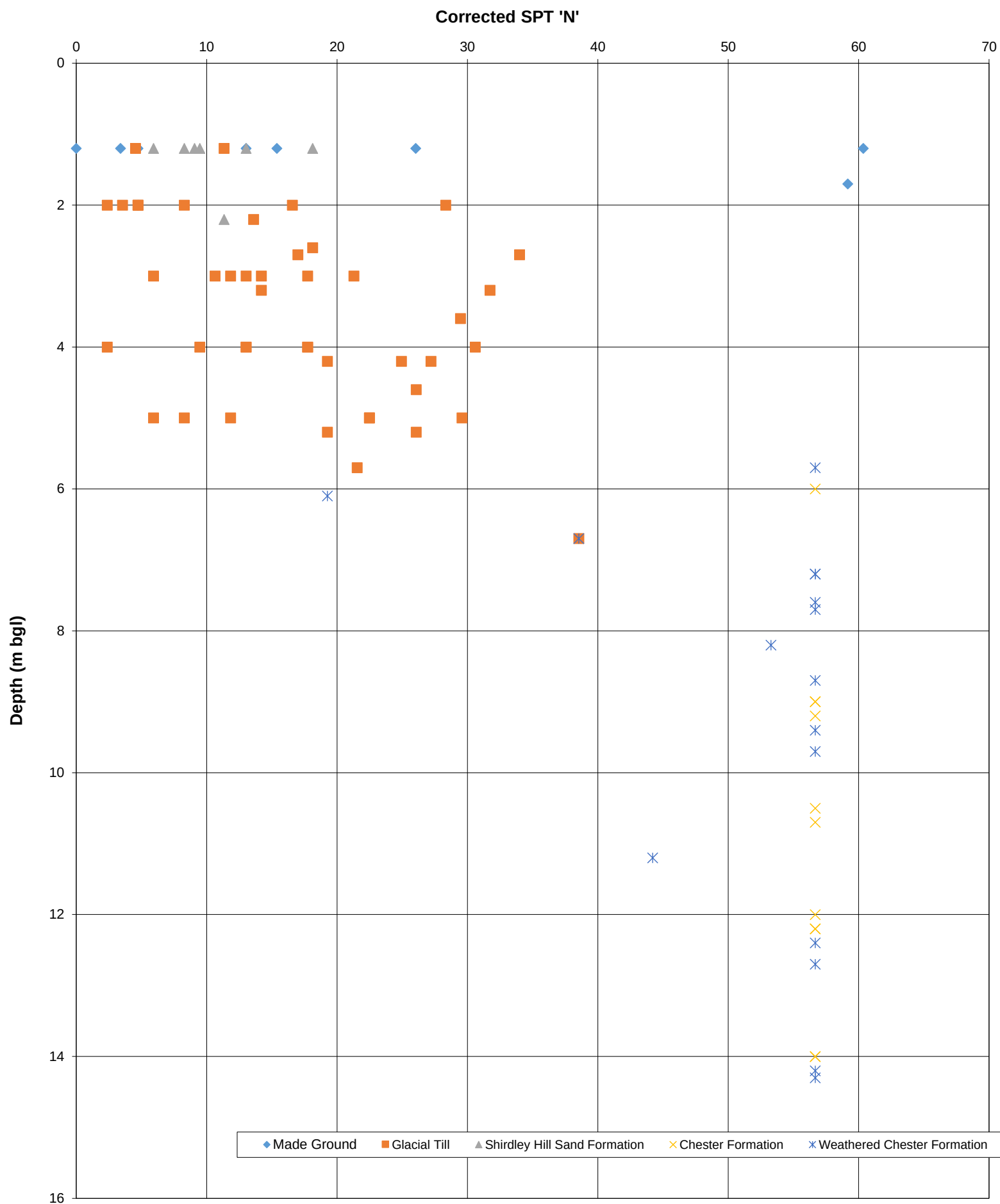


Figure 4 – Corrected SPT, Depth and Strata Type



TITLE:

Corrected SPT, Depth and Strata Type
Site 3, Knowsley
19-0654.06

DWN:

AK

DATE:

24/08/2021

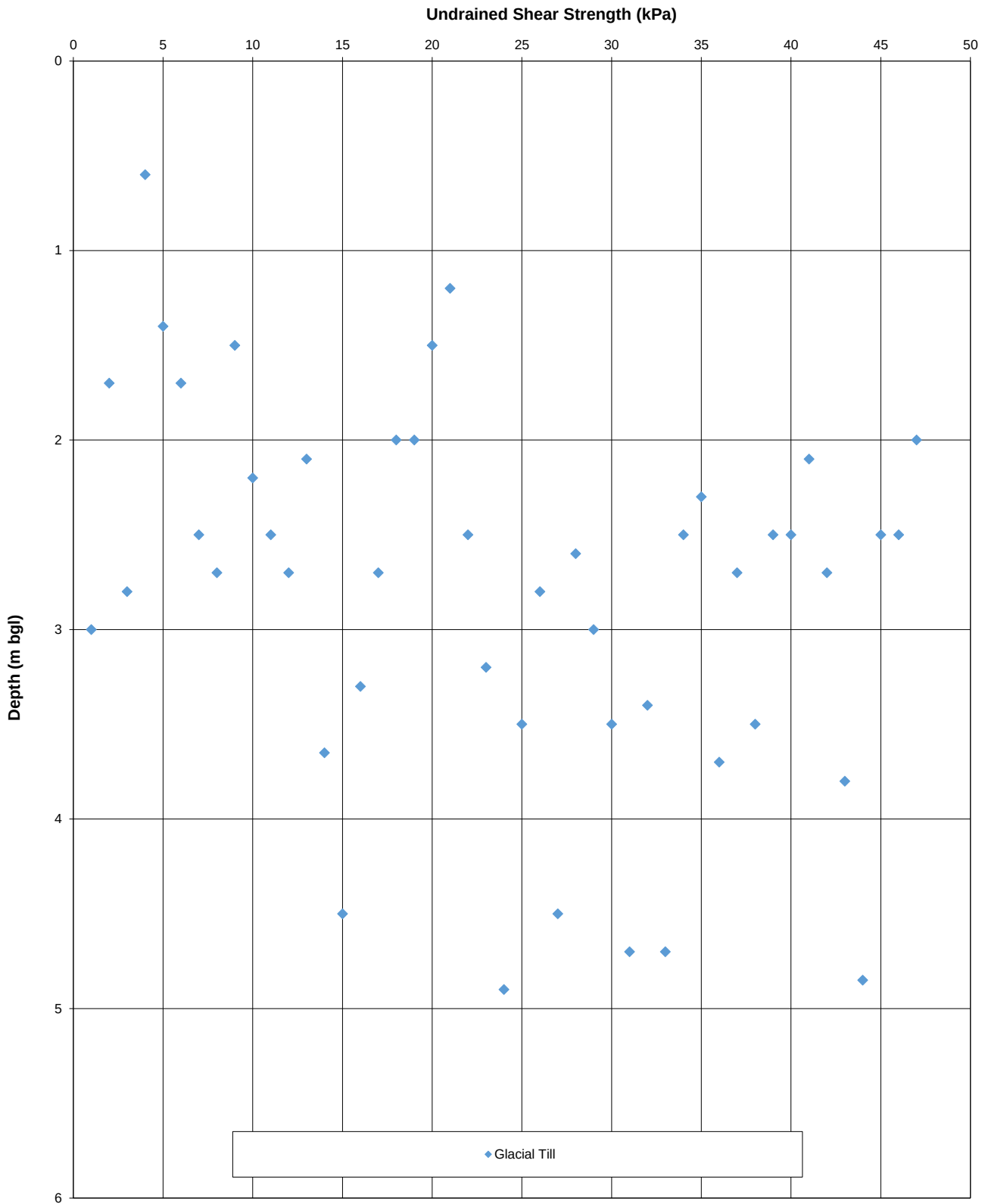
PROJECT NO:

19-0654.06

FIGURE NO:

4

Figure 5 – HSV, Depth and Strata Type



TITLE:

Hand Shear Vane Results, Depth and Strata Type
Site 3, Knowsley
19-0654.06

DWN:

AK

PROJECT NO:

19-0654.06

DATE:

17/08/2021

FIGURE NO:

5

Appendices

Appendix A – Limitations

Limitations

This Report was prepared by Delta-Simons Environmental Consultants Ltd (Delta-Simons) for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. Delta-Simons does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Delta-Simons. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Delta-Simons' Standard Terms and Conditions as included within our proposal to the Client.

The recommendations contained within this Report represent Delta-Simons professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the Report.

Where Delta-Simons has obtained, reviewed and evaluated information in preparing this Report from the Client and others and Delta-Simons conclusions, opinions and recommendations has been reasonably determined using this information, Delta-Simons does not warrant the accuracy of the third-party information provided to it and cannot be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

Site surveys document the conditions encountered at the time of survey only and conditions may change due to natural processes or human intervention. As such, surveys represent an assessment at a specific point in time and Delta-Simons cannot be responsible for adverse conditions which arise or become apparent after the time of the survey or for conditions which sit outside the scope for which the survey or Report was commissioned.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work period and on the results of laboratory and field tests performed during the investigation. Ground conditions are inherently variable such that no investigation can be exhaustive to the extent that all adverse conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed or obtained as part of this assessment. It should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions. Where risk assessment is undertaken, this is based upon the standards, guidance and common practice at the time of the assessment and Delta-Simons cannot be responsible for conditions which become apparent following changes in guidance or practice or advancements in scientific knowledge which change the position in relation to assessment of risk.

No aspect of this Report constitutes a design. Where this information is used in design, the designer should verify the information has been used appropriately.

Where budgets are prepared and presented within the Report, these are for information only to indicate the likely magnitude of a cost and do not represent an invitation to treat for the works. All budgets and programmes presented should be reviewed and verified by appropriately qualified and experienced independent Project Managers and Cost Consultants.

Appendix B – List of Previous Reports

Appendix G - Previous Reports by Others

The following reports pertaining to the Site have been reviewed as part of this assessment, with the key findings summarised below:

▲ **Ground Contamination Review and Remediation Action Plan, Former Kodak Chemicals Ltd Site, Kirkby, UK by WSP April 2007**

WSP were commissioned to undertake an environmental assessment of the entire business park to inform a remediation action plan, in relation to a continued commercial/industrial use.

Ground conditions reportedly comprised:

- Made Ground between 1 and 3 m thickness (maximum 7 m thickness in area of historical landfilling);
- Shirdley Hill Sand (a thin discontinuous sand horizon up to 1 m thick) and Glacial Till (predominantly clay horizon);
- The solid geology (Sherwood Sandstone) was encountered at depths of between 2.5 and 14 m; and
- Two separate groundwater bodies were identified; one perched within the Made Ground/Shirdley Hill Sand and a deeper groundwater body within the Sherwood Sandstone.

Various parts of the Site were reportedly underlain with soils and groundwater impacted with solvents and traces of chlorinated hydrocarbons (CAH) as a result of the historical photochemical manufacture process. The main area of impact was beneath the original chemical manufacturing plant. In addition, a localised area in the north-eastern corner of the site was found to be contaminated with a mixture of fuel hydrocarbons and poly-chlorinated biphenyls (PCBs).

WSP concluded the Site posed a low risk to human health (for continued use) but contamination in the underlying aquifer appeared to have been “derived from or exacerbated by activities undertaken by Kodak Ltd”.

WSP designed a remediation strategy to mitigate pollutant linkages between impacted soils/groundwater and the underlying aquifers. These proposals included the removal of impacted soils, in-situ treatment of soils, on site treatment of soils impacted with organic compounds, containment of PCB affected soils, with limited removal of mobile phase hydrocarbon liquids. The proposals also included collection, pre-treatment, and discharge of the shallow groundwater in the vicinity of excavations and installation of perched groundwater management to divert impacted shallow groundwater into above ground treatment infrastructure.

The implementation of Monitored Natural Attenuation (MNA) programme within the shallow and deep aquifers with a target of a negotiated end point within 12 years was also recommended.

▲ **Former Kodak Chemicals Ltd Site, Voluntary Remediation Strategy by WSP dated December 2007**

At the time of the report, ownership was changing from Kodak Ltd to Acorn Developments Ltd and a small part of the wider site remained operational. The ongoing operations comprised laboratory for paint production, silver nitrate production and PFA and solvent recycling.

As part of the due diligence process, a scope of voluntary remediation works was identified prior to purchase. The report identifies 36 previous reports relating to the site from between April 1974 and May 2007.

The remediation works were designed by WSP to manage/mitigate a pollutant linkage between shallow soil and groundwater contaminants via leaching and vertical migration to deep groundwater.

The main objective of the proposed remediation works was to mitigate the pollutant linkage to the satisfaction of the Environment Agency (EA) and Local Authority and to prevent future migration of petroleum hydrocarbons and polychlorinated biphenyls (PCB) contamination from shallow to deeper groundwater. A secondary objective of remediating TPH and PCB contamination in the toner area by removing the source.

▲ **Proposed Remedial Targets, Former Kodak Site, Kirkby by WSP March 2008**

The purpose of the report was to derive suitable remediation targets for the forthcoming programme of voluntary remedial works. The potential receptors comprise the Sherwood Sandstone aquifer and a hypothetical receptor located 250m off site, which was agreed with EA.

WSP undertook a quantitative risk assessment (QRA) in order to determine acceptable limits of contaminants within the shallow groundmass. The QRA has derived remedial targets for the List 1 substances of concern, comprising benzene, toluene, ethylbenzene, xylene, trichloroethene, dichloroethene, dichloroethane and vinyl chloride.

The QRA considered four contaminated parts of the site, the Former Synchem Area, Bulk Storage Area, Current Synchem and Building 84 and derived soil and groundwater remedial targets for each individual area. Remediation was considered warranted for the Former Synchem and Bulk Storage Areas.

▲ **Factual Report on December 2007 Site Investigation, Former Kodak Site, Kirkby by WSP April 2008**

The aim of the investigation was to assess the presence and extent of contaminants of concern within the strata underlying several buildings including Building 21, 82, 84 Bulk Storage Area and a Calamity Pit both located within Zone 5 (Plot C). A total of 82 window sample holes were drilled to a maximum of 4.9 m bgl. Made Ground was encountered in all exploratory holes to a maximum depth of 3.1 m.

No elevated contaminants of concern in soils/groundwater were identified from the intrusive investigation undertaken in Bulk Storage Area, Building 21 and the Calamity Pit and therefore; no further investigation was considered necessary.

Intrusive works at Building 82 identified localised PCB and TPH contamination within shallow strata, with acetone identified in the vicinity of Building 84.

▲ **2008 Groundwater Monitoring Report, Image Business Park by WSP June 2009**

Report on quarterly groundwater monitoring programme to assess groundwater quality within the perched and deeper groundwater. Quarter 1 and 2 results represent pre-remediation conditions with impact of the remediation starting to show later in the year, however no firm conclusions were reached.

Some monitoring well positions were removed during the soil remediation activities undertaken in Zone 5. It was recommended that these be either replaced or existing alternatives be used. Within Zone 3 acetone had been identified and was required to be remediated. It was recommended that acetone be added to the chemical testing suite within Zone 3 to measure any betterment achieved.

▲ **Image Business Park, Knowsley Industrial Park by Environment Agency October 2009**

A letter from EA to WSP confirmed that they were satisfied that the remediation of historically contaminated soils in Zone 5 had been carried out to the method statement and remedial targets.

However, since the validation report was completed a contamination event occurred due to a leak of effluent from a drain contaminated shallow groundwater to the area of the southern excavation of Zone 5. Further discussion was required as to the impact of this contamination.

▲ **Zone 4 Soils Remediation Validation, Former Kodak Site, Kirkby by WSP November 2009**

The voluntary remediation works were undertaken on the Former Bulk Solvent Storage area within Zone 4.

As part of the due diligence exercise, the existing Site chemical drainage had been identified as a risk area associated with historic contamination, in particular within Zone 4. As such a drainage survey review and intrusive investigation was undertaken as part of these Remediation works. In addition, QRA was undertaken to assess risks to human health and controlled waters, from which remedial targets were derived to validate the remediation of the Bulk Solvent Storage area.

The drainage survey review identified some limited issues which required addressing prior to the drain being brought back into use. Works to address these issues were subsequently undertaken.

One of the trial pits uncovered an area of shallow buried chemical waste, identified as mainly heterocyclic resinous material containing elevated concentration of BTEX and chlorinated solvents. The trial pit was re-excavated and the source material removed with the resultant 36 tonnes of hazardous waste disposed of to landfill.

The validation samples recorded m&p-Xylene concentrations in exceedance of the Zone 4 remedial targets on three sides of the excavation. Therefore, the area was re-excavated and an estimated further 135 tonnes of impacted soil removed and treated on site with further validation sampling undertaken around the extent of the extended excavation.

The resultant Zone 4 excavation was backfilled using the topsoil from the excavation and acceptable soil from Future Industrial Services earth works in Zone 6. Material excavated from the second phase of excavation was deposited within the Zone 5 southern excavation once treatment had reduced the elevated concentrations of contamination to below the remediation targets.

A Dual Phase Vacuum Extraction (DPVE) system was installed within the southern side of the bulk solvent storage area to address other areas of soil and perched groundwater contamination, as existing buildings and services prevented an excavation solution. The system was commissioned in September 2008.

▲ **Image Business Park, Knowsley Industrial Park letter from EA to WSP December 2009**

A letter regarding Zone 4 soils remediation validation, confirmed that the excavation, treatment and disposal of contaminated soils with Zone 4 associated with buried containers and drums had been successfully completed, with the hotspot concentrations below the agreed site soil target levels.

▲ **Image Business Park, Knowsley Industrial Park letter from EA to WSP January 2010**

A letter regarding Zone 5 groundwater validation indicated two rounds of post remediation sampling were undertaken in August and September 2008 and concentrations of BTEX and solvents were below the agreed remedial targets for perched groundwater. No further work was deemed to be required for the historical contamination. However, further work was required to investigate the impact of the new contamination event from November 2008.

▲ **2009 Groundwater Monitoring Report, Image Business Park by WSP March 2010**

A report on quarterly groundwater monitoring programme to assess groundwater quality within the perched and deeper groundwater was produced by WSP. A total of 38 boreholes were monitored 14 deep wells and 22 shallow wells, with two further deep wells located off-site.

Four discrete areas have recorded BTEX within perched groundwater. During 2009 the following trends were noted.

- Within Zone 3, all BTEX compounds have been recorded, although toluene is the most abundant, with concentrations observed to decrease through 2009 from a maximum of 120 mg/l in Q1 to 11 mg/l in Q4. This coincides with operation of the DPVE system within this area.
- Within Zone 4, BTEX concentrations were observed to decrease through 2008 (toluene maximum concentration fell from 600 ug/l to 40 ug/l).
- Within Zone 2, BTEX concentrations remained variable and low, with no overall trend. Within Zone 5, no significantly elevated BTEX concentrations have been recorded since 2008.
- The deep groundwater Quarterly Monitoring network has generally not recorded elevated BTEX concentrations. Detections are however present (below 20 ug/l) in the south-western corner of Site.

The extent and concentrations of CAHs within perched groundwater were less than those in the deep aquifer. Elevated CAH distribution mirrored perched BTEX distribution, impacting the same localised areas. Elevated CAHs within deep groundwater were generally confined within a small area located in the southwestern corner of the Former Kodak site, including Zones 5, 8 and off site.

An acetone contamination event occurred in 2009 meaning acetone was identified in perched groundwater in Zone 4 and 5.

All of the remediation treatment systems have reportedly resulted in a betterment of the perched groundwater quality to date. Concentrations of contaminants were observed to increase during the initial activation months of the systems in some cases, however since reduced to below the initial concentrations.

▲ **Zone 4 Shallow Groundwater Remediation Validation Report, Former Kodak Site, Kirkby by WSP June 2010**

The report related to the former Bulk Solvent Storage Area that was identified by previous investigations to contain elevated concentrations of Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Xylene (BTEX) and Chlorinated Hydrocarbons (CAH) within the Made Ground and the underlying Shirdley Hill Sand.

Further to a remediation options appraisal and the development of a detailed methodology, a DPVE system was trialled, designed and built. The DPVE system was commissioned in September 2008 and decommissioned in August 2009.

The remediation works within Zone 4 were considered to have been completed, with all contaminants of concern below regulatory agreed remedial targets – both within remediation wells and the wider Zone 4 monitoring network.

▲ **Image Business Park, Knowsley Industrial Park letter from EA to WSP July 2010**

A letter from EA to WSP regarding shallow groundwater remediation validation in Zone 4 confirmed the EA were satisfied works were completed in accordance with the DQRA, with works from the contamination incident in November 2008 ongoing.

▲ **Zone 2 Shallow Groundwater Validation Report, Former Kodak Site, Kirkby by WSP September 2010**

Within Zone 2, Building 84 (Former Toner Storage Area) had been identified by previous investigations as containing elevated concentrations of BTEX compounds, in particular Xylene affecting both the soil and perched groundwater within the vicinity. PCBs had also been identified in soils within the Building 84 area, associated with an ashy Made Ground layer located above the perched groundwater.

In order to provide betterment to the perched water, WSP Remediation installed an air sparge/SVE system to target contaminants of concern. The system was operated between September 2009 and February 2010. Since the cessation of active remediation, 6 monthly sampling rounds were completed to validate the remediation.

With the exception of m&p-Xylene (one exceedance and one equal to the Site derived target level) no contaminants of concern were recorded above Site derived target levels. Remediation was considered by WSP to be complete in February 2010.

▲ **Acorn Business Park, Sherwood Sandstone Condition Report by WSP August 2010**

The report was undertaken to summarise the contamination status of the Sherwood Sandstone beneath the Site and assess the risk to controlled waters. The report discussed CAH contamination and concludes that the basis of the likely age of the CAH contamination, the apparently stable contaminant plume geometry and the predictions of the calibrated DQRA, no significant risks to controlled water resources were evident and natural attenuation processes were considered to be operating effectively to limit off-site migration.

No evidence of residual sources of contamination were identified within the shallow soil and perched groundwater horizons and it is concluded that the observed CAH contamination is residual within the Sherwood Sandstone aquifer only. On this basis no further remediation works were proposed for the shallow soil and perched groundwater horizons.

▲ **Zone 3 Shallow Groundwater Validation Report by WSP October 2010**

The report was related to BTEX, acetone and chlorinated solvent contamination impacting shallow groundwater identified around Building 82; a former synthetic chemicals manufacturing building.

Remediation of the contaminants associated with Building 82 by DPVE and total fluids extraction was completed between May 2009 and March 2010. The principal contaminants of concern, with regards to persistent elevated readings were toluene and acetone. The quality of the groundwater was monitored for six months (March to September 2010) after the cessation of active remediation. No contaminants of concern were recorded above their remedial target since April 2010 and Zone 3 was considered by WSP to have been remediated.

▲ **Image Business Park, Knowsley Industrial Park letter from EA to WSP October 2010**

A letter from the EA to WSP on Zone 2 shallow groundwater validation confirmed the EA were satisfied the remediation and validation had been carried out as agreed.

▲ **Image Business Park, Knowsley Industrial Park letter from EA to WSP October 2010**

A letter from the EA to WSP on the Sherwood Sandstone Condition Report, the aim of the report was to analyse the data related to chlorinated hydrocarbons in the sandstone aquifer. No soil source of contamination was identified on Site, along with the dip of the bedrock and with the absence of contamination in the on-Site abstraction borehole the evidence suggested an off-site source of contamination. The EA were satisfied that the remediation targets were met and no further action was required.

▲ **Image Business Park, Knowsley Industrial Park letter from EA to WSP November 2010**

A letter from the EA to WSP agreeing that the remediation and validation works were completed in Zone 3 shallow groundwater.

▲ **Voluntary Remediation Works, Former Kodak Site, Knowsley Industrial Estate by Knowsley Council to WSP November 2010**

A letter from Knowsley Council environmental protection to WSP confirmed that the Local Authority were satisfied with the validation reports for Zones 2,3,4 and 5.

▲ **Kodak Decommissioning report by WSP December 2010**

The report related to the decommissioning of the existing monitoring wells installed by WSP since 2007, removal of the groundwater treatment systems installed for remediation, installation of a concrete pad to cap the air sparge remediation area adjacent to building 84 in Zone 2 and general decommissioning of chambers and wells.

Twelve wells across zone 4, 5 and 6 were retaining for future compliance monitoring and for the new contamination remediation scheme in Zone 5.

▲ **Former Kodak Site, Acornfield Road, Kirkby – Completion by WSP 22nd December 2010**

Confirmation that the works were completed and final invoicing accepted and approved.

Appendix G - Previous Reports by Delta-Simons

Delta-Simons has prepared the following reports pertaining to the Site:

▲ **Preliminary Geo-Environmental Assessment – Plots A, B and C, Image Business Park, Acornfield Road, Knowsley, dated August 2019**

Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Preliminary Geo-Environmental Risk Assessment for industrial property off Acornfield Road, Image Business Park in Knowsley L33 7UF. The report covered Plots A, B and western part of C.

The Site was proposed for redevelopment which is to include the construction of new light industrial/commercial units within the existing business park in Plots A and B.

The Site area was approximately L-shaped and comprised three distinct development areas; Plot A, Plot B and Plot C. Plot A consisted of a vacant plot where the former building has been recently demolished to slab level and Plot B comprised a rectangular-shaped open field – this is currently under construction. Plot C comprised disused buildings formerly associated with Kodak Ltd (photochemical manufacturers) together with an electrical substation and a waste-water treatment plant.

The Site was likely to be underlain by a sequence of Topsoil and/or Made Ground (in locations of former/current buildings and infilled ground) underlain by Shirdley Hill Sand Formation (Secondary A aquifer) and Glacial Till (Secondary Undifferentiated aquifer), and bedrock of the Chester Formation (Principal Aquifer).

The Site was within a designated groundwater Source Protection Zone (Zone III – Total Catchment) and there were fifteen licensed abstraction records from groundwater located within 1 km of the Site. The nearest surface water feature was a drain located approximately 20 m to the south of the Site.

Plot C was in industrial use (photochemical manufacturing facility) from the 1960's until 2006. Activities were reported to include photochemical manufacture (including storage and usage), a silver nitrate recovery plant licensed by the Environment Agency and a small research facility with small-scale laboratories in Plot A. Plot B has remained largely undeveloped; however, anecdotal evidence suggests that it (and parts of Plot C) was partly used to bury waste material by Kodak Ltd.

Given the nature and thickness of Made Ground beneath the Site, it was considered that there was significant potential for a range of common contaminants including heavy metals, PAH, petroleum hydrocarbons, VOC, SVOC and ACM to be present beneath the Site. Previous investigations undertaken at the Site have identified the presence of contaminants within soil/groundwater.

Remedial works have been previously undertaken within the Plot C area; however, there remained a potential for as yet undiscovered contamination of soils/groundwater. On the basis of the available information, gross contamination beneath Plot A and Plot B was considered unlikely. The preliminary risk assessment identified a Moderate risk of soil/groundwater contamination and hazardous ground gas at the Site. Asbestos was confirmed as present within buildings and may also be present within the Made Ground.

The ground conditions were likely to comprise variable thicknesses/compositions of Made Ground, including the possibility of buried obstructions associated with current built development together with an area of deeper Made Ground associated with the former marl pit in Plot B and; therefore, the use of traditional foundations would not be feasible unless either very deep foundations were utilised, or the foundations were designed to span the areas of deeper Made Ground. Pad foundations taken into competent strata could be considered. Alternatively, consideration would need to be given to piling or ground improvement.

It was recommended that an intrusive Site investigation was undertaken to assess the potential for contamination and ground gases to impact on the proposed development. The investigation was recommended to refine the Site-specific ground model and groundwater regime and enable an assessment of foundation and engineering solutions.

▲ **Geo-Environmental Assessment – Plot B, Image Business Park, Acornfield Road, Knowsley, dated August 2019**

Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Geo-Environmental Assessment for Plot B, Image Business Park, Acornfield Road, Knowsley L33 7UF.

Plot B was proposed to be developed with a commercial unit including areas of hardstanding for access, loading bays and car parking together with areas of soft landscaping.

Plot B comprised an open field which was previously used as playing field, within the Image Business Park Estate.

Plot B was in agricultural use from at least 1850 with a small building and marl pit in the north-eastern corner. The marl pit was extended and subsequently infilled by the 1950s. Anecdotal evidence suggests that a munitions factory and buried/burned waste from the adjacent Kodak Ltd operations was present in this area.

Made Ground was generally 1.5 m thick across the majority of Plot B, but locally deeper (to 6.0 m) within the former marl pit/infilled land in the north. A thin layer of the Shirdley Hill Sand Formation was found to directly underlie the Made Ground, which in turn was underlain by Glacial Till, to depths between 6.0 and 9.2 m bgl.

Weathered horizons of the Chester Sandstone Formation were encountered to a maximum depth of 9.2 m bgl, where sandstone rock extended to at least 15.0 m bgl (maximum depth of investigation).

Two groundwater bodies were identified within the Made Ground and Glacial Till/Shirdley Sandstone interface.

Contamination Assessment - Human Health

Widespread significant contamination was not identified. However, loose asbestos fibres were recorded in the shallow Made Ground in one exploratory hole location.

Clean imported topsoil will be required in proposed landscaped areas, to act as an appropriate cover layer.

The risks to ground and construction workers will be mitigated through the adoption of robust health and safety practices and the use of PPE.

Contamination Assessment - Controlled Waters

No widespread contamination of groundwater was encountered during this investigation.

Contamination Assessment - Ground Gas

Preliminary ground gas monitoring indicated the Site could be provisionally classified as CS3 and that protection measures were required.

Based on the ground conditions encountered by intrusive investigation the Made Ground was considered to be too variable in composition and unpredictable in engineering response to external forces in its existing condition for conventional foundations, particularly where greater depths of the deposits are located in the vicinity of the former marl pit/landfill. An alternative form of foundation or improvement of the deep Made Ground was recommended in the form of ground improvement or piling. Densification of the Made Ground by means of vibro-compaction or vibro-stone columns could effectively create a suitably engineered medium on which to bear the proposed development and was considered to be a more cost-effective option to piling.

Suspended floor slabs were recommended where untreated Made Ground is greater than 600 mm thick.

Due to the significant thickness of Made Ground identified in Plot B, it was considered unlikely that soakaways would be an effective means of surface water drainage. Should soakaways be considered in the design, they would only be suitable in localised areas with and confirmatory infiltration testing.

Buried concrete may be designed in accordance with Design Sulphate Class DS-1 and ACEC Class AC-1, however, further testing was suggested in order to confirm the values obtained.

Recommendations

The following recommendations for supplementary works were made:

- Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures and subsequent verification which will be required. Classification of the ground gas regime should be agreed with the Local Authority, who may request additional monitoring or additional protection to mitigate the risk of elevated ground gases and depleted oxygen.
- Depending on the chosen foundation solution, it was recommended that a specialist contractor was consulted to confirm the suitability of the proposed ground improvement techniques or for the adoption of piles.
- Waste classification was not undertaken as part of the scope of works. Should off-Site disposal of materials be proposed, then specific additional investigations may be needed to classify the materials in accordance with current regulatory requirements. Made Ground was likely to be classed as non-hazardous as a minimum.
- Additional hotspots of localised contamination associated with Made Ground could not be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised. The recommendation should be captured in Site health and safety documentation and in maintenance plans.
- Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.

▲ Geo-Environmental Assessment – Plot A, Image Business Park, Acornfield Road, Knowsley, dated November 2019

Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Geo-Environmental Assessment for Plot A, Image Business Park, Acornfield Road, Knowsley L33 7UF.

Plot A was proposed for commercial development however, a development plan was not available.

Plot A comprised a parcel of derelict land which was most recently used as commercial premises occupied by Eastman Chemical Ltd, that was demolished to slab level in early 2019. Plot A was in agricultural use from as early as 1850. By the early 1970's, a building was recorded in the south that was later extended by 1994 with the addition of an electrical substation in the north-western corner. Plot A has remained approximately in that configuration until August 2019.

Made Ground was encountered between 1.0 to 1.5 m in depth across the Site. A thin layer of the Shirdley Hill Sand Formation was found to directly underlie the Made Ground which in turn was underlain by Glacial Till to depths between 3.20 and 8.0 m bgl.

Weathered horizons of the Chester Formation were encountered underlying the Glacial Till grading into weak becoming medium strong sandstone rock at an approximate depth of 9.0 m bgl and extending to at least 15.0 m bgl (maximum depth of investigation).

Two groundwater bodies were identified within the Shirdley Hill Sand Formation and Chester Formation.

Contamination Assessment - Human Health

Widespread significant contamination was not identified. However, given the presence of Made Ground clean imported topsoil would be required in proposed landscaped areas, to act as an appropriate cover layer.

The risks to ground and construction workers would be mitigated through the adoption of robust health and safety practices and the use of PPE.

Contamination Assessment- Controlled Waters

No widespread contamination of groundwater was encountered during the investigation.

Contamination Assessment - Ground Gas

Preliminary ground gas monitoring indicated Plot A could be provisionally classified as CS2 and that protection measures were required.

Geotechnical Assessment

Traditional spread foundations were considered to be suitable for Plot A, founded at a minimum depth of 1.5 m bgl within the medium dense sand (Shirdley Hill Sand Formation) or firm clay (Glacial Till). An allowable bearing capacity of 100 kN/m² was recommended (limited to less than 25 mm settlement) for a lightly loaded structure.

Where foundations straddle different strata types, suitable reinforcement should be added to the foundation to minimise potential movement and also flexible service connections may be required.

Suspended floor slabs were recommended where untreated Made Ground is greater than 600 mm thick.

Given that significant thicknesses of Made Ground have been identified, it was considered that if soakaway drainage is considered, this would only be suitable, and subject to confirmatory testing, in certain areas.

Buried concrete may be designed in accordance with Design Sulphate Class DS-1 and ACEC Class AC-1, however, further testing is suggested in order to confirm the values obtained.

Recommendations

The following recommendations for supplementary works were made. Specific recommendations relating to the proposed development plan may also be appropriate, once the design has been finalised:

- Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures and subsequent verification which will be required. Classification of the ground gas regime should be agreed with the Local Authority, who may request additional monitoring or additional protection to mitigate the risk of elevated ground gases and depleted oxygen.
- Waste classification was not undertaken as part of the scope of works. Should off-Site disposal of materials be proposed, then specific additional investigations may be needed to classify the materials in accordance with current regulatory requirements. Made Ground was likely to be classed as non-hazardous as a minimum.
- Although not encountered during the investigation, hotspots of localised contamination associated with Made Ground could not be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans.
- Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.

▲ Remediation and Verification Strategy – Plot B, Image Business Park, Acornfield Road, Knowsley, dated February 2020

Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Remediation and Verification Strategy, prior to the commencement of development at Plot B, Image Business Park, Acornfield Road, Knowsley.

The scope of works undertaken for this assessment was:

- Identify the requirements for remediation in the context of the identified contamination and the proposed redevelopment;
- Detail the remediation measures to be undertaken;

- Identify the scope of any additional assessment works and in relation to verification of the remediation works to be undertaken; and
Confirm the duties of specific parties (where known) for different aspects of the remediation and verification.

Planning Permission was granted for the redevelopment of Plot B for commercial use (Knowsley Council Ref. 19/00520/FUL). The Planning Decision Notice issued by Knowsley Council (ref. 19/00520/FUL) in September 2019 imposed a number of conditions on the proposed development. Condition 3 of the Permission related to contamination risk and remediation.

Remediation Requirements and Methodology

Following Delta-Simons contamination assessments, the following construction phase remediation mitigation measures were considered appropriate:

- Detail the remediation measures to be undertaken;
- Ground improvement will be undertaken (vibro-stone columns to approximately 5 m depth) and pad foundations utilised for the proposed building;
- Additional, unidentified localised areas of contamination may exist at the Site and an appropriate 'hotspot' protocol should be in place for groundworkers to act upon should such contamination be identified during the construction process;
- Groundworkers who are required to perform sub-surface work at the Site should be made aware of the known Asbestos Containing Materials (ACM) and low-level contaminants in soil and groundwater and the possibility of encountering additional localised low levels of contamination (including further ACM). Therefore, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) and respiratory protective equipment (RPE) utilised where necessary;
- Should soils be required to be disposed of from Site, the results of the chemical analysis (classification testing (including asbestos) and WAC testing required) should be forwarded to the proposed receiving facility who will determine what criteria they will accept the waste from Site as;
- Clean imported topsoil and subsoil material should be placed in soft landscaped areas;
- Confirmation should be sought from the Local Water Authority as to whether they will require upgraded pipework to be installed for new service installations; and
- Installation of ground gas protection measures consummate with Characteristic Situation CS3.

The validation report should comprise the following items of verification that the Remediation Strategy has been complied with:

1. Details of ground improvement and floor slab construction for the scheme;
2. Details and verification of any hotspots encountered (Main Contractor and Delta-Simons) or confirmation that hotspots have not been encountered;
3. Waste disposal tickets for any reduced level dig spoil. (Client's Contractor);
4. Chemical information, volume and origin details including transport tickets for imported topsoil/subsoil (to be supplied by Main Contractor);
5. Photographic evidence of the installation and thickness of the topsoil/subsoil and in-situ chemical testing (to be undertaken by the Environmental Consultant);
6. Water supply pipe specification information (Client's Contractor);
7. As built drawings, photographs and certification of the installation of the ground gas membrane as per CIRIA C735 (Contractor's Specialist);
8. Specification of the concrete used during construction (Client's Contractor);
9. Details of ground improvement undertaken (Client's Contractor); and

10. Verification Report containing the above (Delta-Simons).

Plot B is currently under construction and verification activities and reporting are on-going.

▲ **Letter to Local Authority re: 19/00520/FUL - Plot B, Image Business Park, Acornfield Road, Knowsley – Ground Gas Regime Review, dated 29th June 2020**

Comments about the gas assessment and proposed protection measures were received from Knowsley Metropolitan Borough Council (KMBC), presenting their view that the classification of CS3 was considered to be insufficiently conservative:

'To date we have not received sufficient supporting information to demonstrate that the ground gas site characterisation and assessment is in accordance with BS8485. We advise that an appropriate risk based justification (based on current guidance and best practice) for the proposed adoption of Characteristic Situation 3 gas protection measures must be provided to, and agreed by the Local Planning Authority in writing prior to gas protection measures being installed onsite. The assessment must take into account the acknowledged limitations in the gas monitoring dataset. Details must also be provided as to how the proposed gas protections measures are to be validated'.

The Delta-Simons letter therefore sought to address those concerns with a review of the lines of evidence considered relevant to the Site.

The proposed development included a commercial unit including area of hardstanding for parking together with areas of soft landscaping. It is understood that ground improvement (vibro-stone columns) were used on to support the proposed building on pad foundations.

Enabling and construction works had commenced and the previously installed boreholes were not present in order to undertake additional monitoring.

Delta-Simons considered that it was reasonable to suggest that the monitoring completed, while limited, has generated sufficient information to conclude a suitably conservative assessment of worst-case ground gas risk for Plot B.

A classification of CS3 previously calculated as the worst-case gassing regime, requiring protection measures to be installed beneath the proposed building and predominantly to mitigate the elevated methane concentrations generally recorded in borehole BH3.

The recorded gas concentrations and flow rates have been shown to decrease during the monitoring period. In particular the worst-case gas flow rate is not considered to be representative of general Site conditions.

No obvious source of the ground gas was identified as contaminant concentrations were low and the Made Ground deposits contained limited organic and deleterious materials. Earthworks had been undertaken across Plot B as part of the enabling and construction works and ground improvement undertaken.

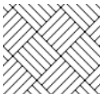
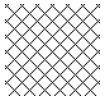
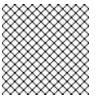
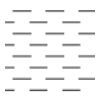
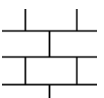
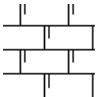
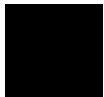
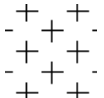
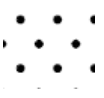
Noting the high volume change potential of the warehouse and so relatively low sensitivity, and additional protection used below the office, gas protection commensurate with CS3 was considered to be sufficiently conservative for the scheme and the membrane and associated installation materials have been sourced from a reputable supplier and installation verification will be undertaken by an appropriately accredited company in accordance with current guidance.

Noting that, based on the data to date, the calculated GSV is an order of magnitude below the threshold for CS4, it is reasonable to suggest that the gassing regime was unlikely to increase to the extent that measures for a CS4 scenario would be warranted.

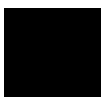
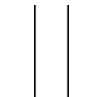
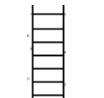
Appendix C - Photographic Record, Exploratory Hole Logs, SPT Calibration Certificate and CBR Results

KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Topsoil		Made Ground		Bituminous Material
	Concrete		Clay		Silt
	Sand		Gravel		Peat
	Cobbles		Boulders		Mudstone
	Siltstone		Sandstone		Limestone
	Chalk		Coal		Breccia
	Conglomerate		Igneous		Metamorphic
	Pyroclastic (volcanic ash)		Gypsum		Shale
	Ironstone		Bedrock (Unidentified)		Void

INSTALLATION/BACKFILL LEGENDS

	Sand		Gravel		Bentonite/Grout
	Arisings		Concrete		Plain Pipe
	Slotted Pipe				

Legend symbols in general accordance with BS 5930:2015+A1:2020 and standard industry practice.

SAMPLE TYPES

ACM	Asbestos Containing Material Sample
B	Bulk Disturbed Sample
BLK	Block Sample
C	Core Sample
CBR	Undisturbed Sample for California Bearing Ratio Test – 154mm diameter
D	Disturbed Sample - Tub
ES	Soil Sample for Environmental Testing
EW	Water Sample for Environmental Testing
G	Gas Sample
U	Undisturbed Driven Tube Sample – 70/102mm diameter, 450mm long
W	Water Sample

TEST TYPES

CPT	Cone Penetrometer Test (kN/m ²)
FID	Flame Ionisation Detector Test (ppm)
HV	In-Situ Hand Shear Vane Test (kN/m ²)
PID	Photoionisation Detector Test (ppm)
SPT (S)	Standard Penetration Test – Split Spoon Sampler
SPT (C)	Standard Penetration Test – Solid 60 Degree Cone

CORE DETAILS

If	Fracture Spacing (mm) – Minimum, Average, Maximum
NI	Non-Intact where >25 fracture spacings per metre
TCR	Total Core Recovery (%)
SCR	Solid Core Recovery (%)
RQD	Rock Quality Designation (%)
AF	Air Flush Return (%)
WF	Water Flush Return (%)
NIDD	Non-Intact - Drilling Disturbed
AZCL	Assessed Zone of Core Loss

WATER COLUMN DETAILS

	Water Strike
	Water Level

ARCHWAY ENGINEERING (UK) LIMITED

AINLEYS INDUSTRIAL ESTATE, ELLAND, WEST YORKSHIRE HX5 9JP

TEL: 01422 373101 FAX: 01422 374947

Email: info@archway-engineering.com

REPORT OF A THOROUGH EXAMINATION OF LIFTING EQUIPMENT

Name and Address for whom the examination was made: Tor Drilling LTD Ashview Farm, Southwood Baltonsborough, Somerset BA6 8PG			Address of the premises at which the examination was made: Archway Engineering (UK) Ltd Ainleys Industrial Estate, Elland, West Yorkshire HX5 9JP		
Report Number: AR3259 Sales order Ref: 76500 Date of Report: 21.07.2021			Latest date by which the next thorough examination should be carried out: 20.01.2022		
Quantity	ID number	Description	Test weight	SWL	Date of test
1	AR3259	AUTO TRIP HAMMER OUTER SLEEVE (CUT I	630kg	300KG	21.07.2021
Was this equipment:			Was the examination carried out:		
Supplied new:	Yes ☐ No ☒	Before being issued for the first time	Yes ☐ No ☒		
Supplied reconditioned:	Yes ☐ No ☒	Within an interval of 6 months	Yes ☒ No ☐		
Examined only:	Yes ☐ No ☒	Within an interval of 12 months	Yes ☐ No ☒		
Examined and tested:	Yes ☒ No ☐	As part of an examination scheme	Yes ☐ No ☒		
Examined, repaired and tested	Yes ☐ No ☒	After an exceptional circumstance	Yes ☐ No ☒		
Identification of any part found to have a defect which is or could become a danger to persons and a description of the defect. (If no defects found state "NONE")					
NONE					
Is the above defect a defect which is of immediate danger to persons				Yes ☐ No ☒	
If the defect is not an immediate danger to persons state required rectification date:					
IS THE EQUIPMENT SAFE TO OPERATE				Yes ☒ No ☐	
Name of person making this report: J.LOCK			Name of person authenticating this report: Signature: 		

This report complies with the requirements of the Lifting Operations and Lifting Equipment Regulations 1998
The EC Declaration of conformity is available if the equipment is new and manufactured and supplied by
Archway Engineering (UK) Limited

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: AR3259
Test Date: 20/07/2021
Report Date: 20/07/2021
File Name: AR3259.spt
Test Operator: JL

Instrumented Rod Data

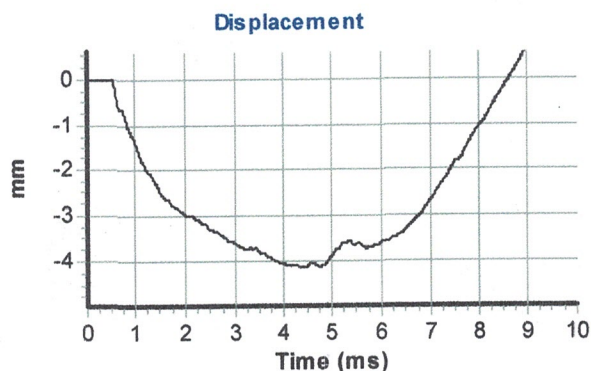
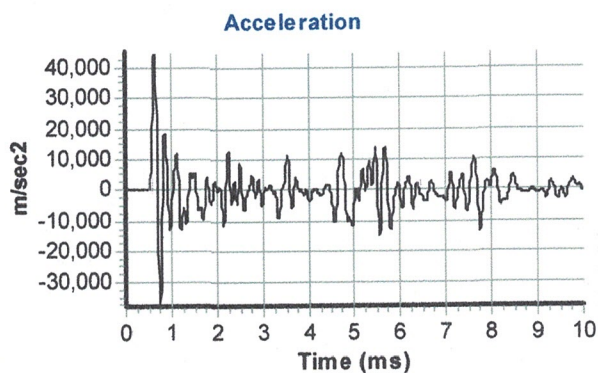
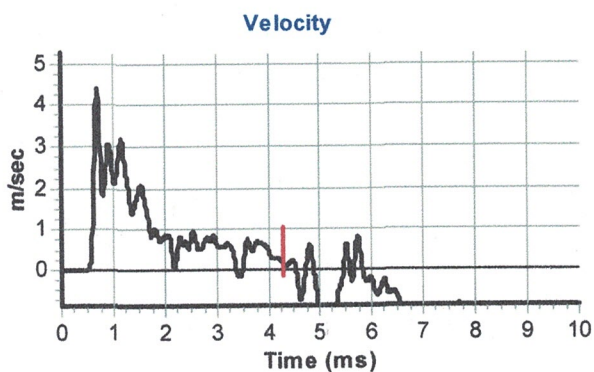
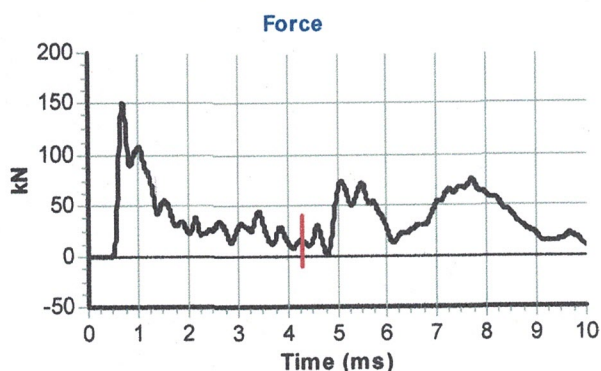
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.0
Assumed Modulus E_a (GPa): 200
Accelerometer No.1: 7080
Accelerometer No.2: 11609

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

TOR DRILLING LTD - 76500



Calculations

Area of Rod A (mm^2): 905
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 320

Energy Ratio E_r (%):

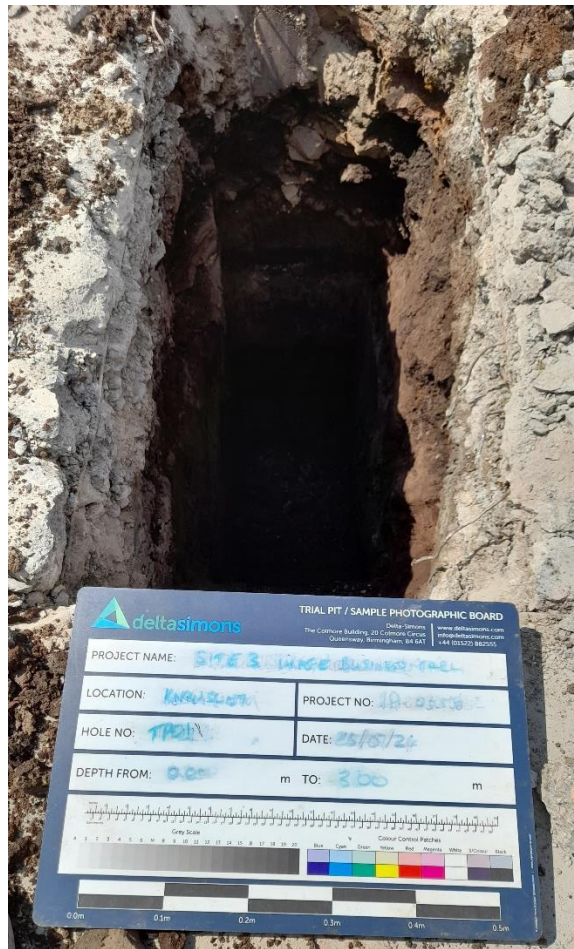
68

Signed: J.LOCK

Title: FITTER

The recommended calibration interval is 12 months

19-0654.06 – Site 3, Knowsley - Site Photographs



Photograph 1 – TP01 (0.00 – 3.00 m bgl)



Photograph 2 – TP01 Arisings



Photograph 3 – TP02 (0.00 – 3.00 m bgl)



Photograph 4 – TP02 – Arisings



Photograph 5 – TP03 (0.00 – 2.50 m bgl)



Photograph 6 – TP03 – Arisings



Photograph 7 – TP04 (0.00 – 2.50 m bgl)



Photograph 8 – TP04 – Arisings



Photograph 9 – TP05 (0.00 – 2.30 m bgl)



Photograph 10 – TP05 – Arisings



Photograph 11 – TP05 – Arisings



Photograph 12 – TP06 (0.00 – 3.00 m bgl)



Photograph 13 – TP06 – Arisings



Photograph 14 –TP07 (0.00 – 3.00 m bgl)



Photograph 15 – TP07 – Arisings



Photograph 16 – TP08 (0.00 – 3.00 m bgl)



Photograph 17 – TP08 - Arisings



Photograph 18 – TP09 (0.00 – 2.60 m bgl)



Photograph 19 – TP09 – Arisings



Photograph 20 – TP10 (0.00 – 1.50 m bgl)



Photograph 21 – TP10 – Arisings



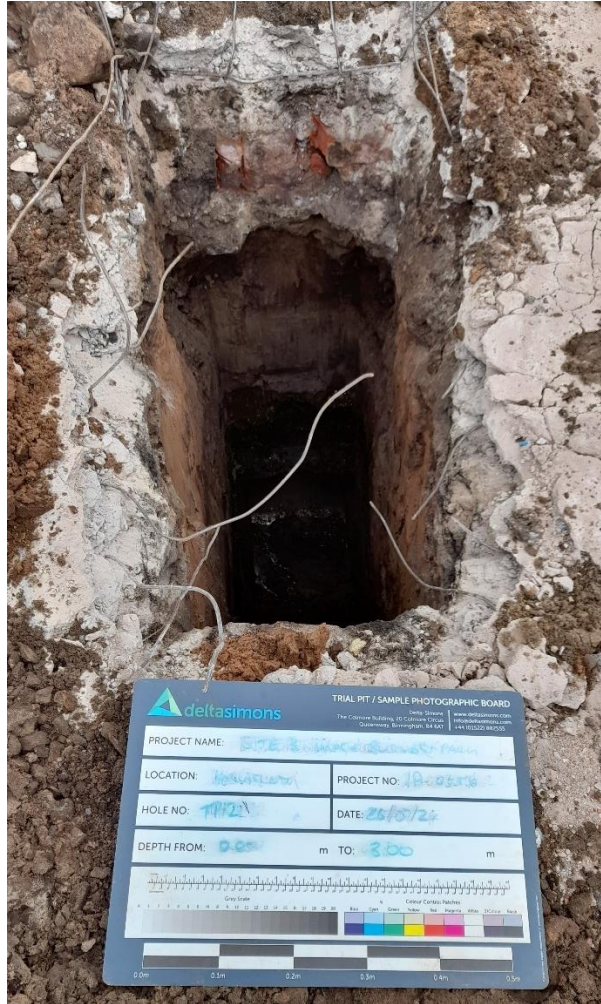
Photograph 22 (0.00 – 0.30 m bgl)



Photograph 23 – TP11 – Arisings



Photograph 24 – TP11 – Brick wall



Photograph 25 – TP12 (0.00 – 3.00 m bgl)



Photograph 26 – TP12 – Arisings



Photograph 27 – TP12 – Arisings



Photograph 28 (0.00 – 1.20 m bgl)



Photograph 29 – DS01 (1.20 – 5.00 m bgl)



Photograph 30 – DS02 (0.00 – 1.20 m bgl)



Photograph 31 – DS02 (1.20 – 5.00 m bgl)



Photograph 32 – DS03 (0.00 – 0.90 m bgl)



Photograph 33 – DS03A (0.00 – 1.20 m bgl)



Photograph 34 – DS03A (1.20 – 5.00 m bgl)



Photograph 35 – DS04 (0.00 – 1.20 m bgl)



Photograph 36 – DS04 (1.20 – 5.00 m bgl)



Photograph 37 – DS05 (0.00 – 1.20 m bgl)



Photograph 38 – DS06 (0.00 – 1.20 m bgl)



Photograph 39 – DS06 (1.20 – 5.00 m bgl)



Photograph 40 – DS07 (0.00 – 1.20 m bgl)



Photograph 41 – DS07 (1.20 – 5.00 m bgl)



Photograph 42 – (0.00 – 1.20 m bgl)



Photograph 43 – DS08 (1.20 – 3.00 m bgl)



Photograph 44 – DS08A (0.00 – 1.20 m bgl)



Photograph 45 – (0.00 – 1.20 m bgl)



Photograph 46 – DS09 (1.20 – 1.70 m bgl)



Photograph 47 – DS10 (1.20 – 2.00 m bgl)



Photograph 48 – DS10 (2.00 – 5.00 m bgl)



Photograph 49 – BH01 (1.20 – 6.70 m bgl)



Photograph 50 – BH04 (1.20 – 6.20 m bgl)



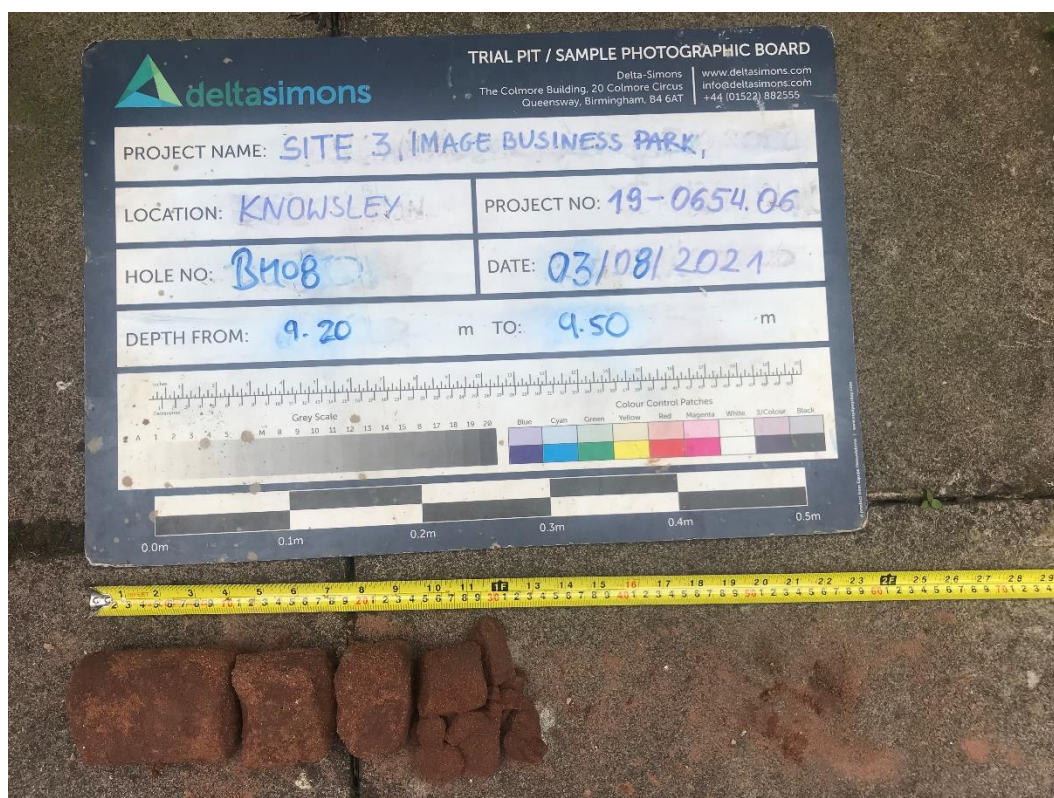
Photograph 51 – BH05 (9.20 – 10.70 m bgl)



Photograph 52 – BH05 (10.70 – 12.20 m bgl)



Photograph 53 – BH08 (0.00 – 1.20 m bgl)



Photograph 54 – BH08 (9.20 – 9.50 m bgl)



Photograph 55 – BH08 (9.50 – 9.80 m bgl)



Photograph 56 – BH08 (9.80 – 10.40 m bgl)



Photograph 56 – Western part of the Site looking north



Photograph 57 – Western part of the Site looking north-east



Photograph 58 – Area of dense vegetation in the central western part of the Site



Photograph 59 – Areas of dense vegetation in the central southern part of the Site



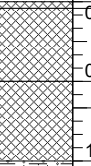
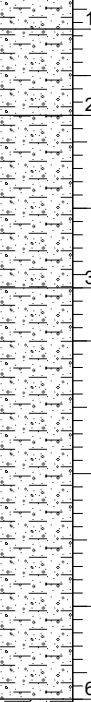
Photograph 60 – Area of dense vegetation in the central eastern part of the Site



Photograph 61 – Treatment tanks in the south-western corner (beyond fencing)



Photograph 62 – Eastern part of the Site looking east

 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com							Project No: 19-0654.06		Hole ID: BH01		Page: 1 of 2											
							Project: Site 3, Knowsley															
Rotary Core Borehole Log							Date: 22/07/2021 - 26/07/2021			Client: Seybourne Estates												
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill						
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results							
MADE GROUND: Concrete (reinforced).		-0.20	(0.20)	42.63							0.40	ES1	0.40	PID=2.3ppmv								
MADE GROUND: Light grey slightly sandy gravel with occasional cobbles. Gravel and cobbles are fine to coarse angular limestone.		-0.25	(0.55)	42.58																		
MADE GROUND: Dark brown slightly clayey sandy gravel. Gravel is fine to coarse angular to subrounded brick, concrete, asphalt, quartzite, limestone and sandstone. Rare glass and rope.		-0.80	(0.60)	42.03																		
MADE GROUND: Loose light brown slightly silty gravelly fine to medium sand. Gravel is fine to coarse angular brick, quartzite, sandstone and wood.		-1.40	(0.25)	41.43							1.80 - 2.00	C1	1.20	SPT(C) N=4 (1,0/1,1,1,1)								
MADE GROUND: Firm dark brown slightly gravelly very sandy CLAY. Gravel is fine to coarse subangular to subrounded quartzite. (GLACIAL TILL)		-1.65	(0.65)	41.18																		
MADE GROUND: Firm locally stiff light greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subrounded quartzite. (GLACIAL TILL)		-2.30	(1.30)	40.53							2.50	D1	2.20	SPT(C) N=12 (1,2/3,3,3,3) PID=0.3ppmv								
MADE GROUND: Firm becoming stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded quartzite. (GLACIAL TILL)		-3.60		39.23									3.20	SPT(C) N=28 (2,3/8,6,7,7)								
MADE GROUND: Very stiff reddish brown sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded quartzite and mudstone. (GLACIAL TILL)		-6.70		36.13							5.00 5.20 - 5.40	D2 C2	5.00	PID=3.0ppmv SPT(C) N=22 (3,2/4,5,6,7)								
MADE GROUND: Pockets of light grey medium to coarse clayey sand.		-6.80		36.03									6.50	PID=0.8ppmv SPT(C) N=34 (3,7/7,7,8,12)								
MADE GROUND: Reddish brown slightly gravelly clayey fine to medium SAND with occasional pockets of firm reddish brown slightly sandy clay. Gravel is fine to coarse subangular to rounded sandstone and quartzite. (WEATHERED CHESTER FORMATION)							1.5		33	25			0			8.20	SPT(C) N=47 (4,9/9,11,12,15)					
MADE GROUND: Poor sample recovery between 6.70 and 14.20 m bgl. (WEATHERED CHESTER FORMATION)																9.70	SPT(C) N=50 (5,9/50 for 280mm)					
Remarks: 1. Borehole progressed by dynamic sampling between 1.20 and 6.70 m bgl with rotary coring attempted between 6.70 m and 14.20 m. Poor sample recovery, Strata descriptions are inferred. 2. Borehole terminated at 14.20 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater not encountered during drilling. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations						Flush									
							Date	Depth	Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %									

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com							Project No: 19-0654.06			Hole ID: BH01		Page: 2 of 2				
							Project: Site 3, Knowsley									
Rotary Core Borehole Log							Date: 22/07/2021 - 26/07/2021			Client: Seybourne Estates						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
(WEATHERED CHESTER FORMATION)								0	0	0				11.20	SPT(C) N=39 (4,7/6,9,10,14)	
							1.5									
								0	0	0				12.70	SPT(C) N=50 (25 for 45mm/50 for 20mm)	
							1.5									
Borehole complete at 14.20 m bgl.		14.20		28.63										14.20	SPT(C) N=50 (25 for 80mm/50 for 80mm)	
Remarks: 1. Borehole progressed by dynamic sampling between 1.20 and 6.70 m bgl with rotary coring attempted between 6.70 m and 14.20 m. Poor sample recovery, Strata descriptions are inferred. 2. Borehole terminated at 14.20 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater not encountered during drilling. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations					Flush				
							Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %				
Coordinates: E343779.03 N398756.64		Elevation (mAOD): 42.83		Drilled By: TOR Drilling		Plant Used: Comacchio 205		Logged: AK		Checked: BHO		Approved: MY		Scale (m): 1:57		

Rotary Core Borehole Log

Date: **26/07/2021 - 27/07/2021**

Client: **Seybourne Estates**

Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Concrete (reinforced).		0.15		42.66												
MADE GROUND: Blackish dark brown, locally dark greyish brown, slightly clayey ashy sandy gravel. Gravel is fine to coarse angular to subrounded brick, concrete, limestone, quartzite and clinker. Rare metal.			(0.65)									0.50	ES1	0.50	PID=0.0ppmv	
		0.80		42.01												
		0.90		41.91												
		1.10	(0.20)	41.71										1.20	SPT(C) N=4 (1,0/1,1,1,1)	
Black slightly sandy amorphous PEAT. (SHIRDLEY HILL SAND FORMATION)			(1.60)									2.30	D1	2.30	PID=0.0ppmv	
Dark brown slightly silty slightly gravelly SAND. Gravel is fine to medium subrounded quartzite. (SHIRDLEY HILL SAND FORMATION)		2.70		40.11										2.60	SPT(C) N=16 (1,2/3,4,4,5)	
Firm locally soft light grey very sandy CLAY with rare gravel of quartzite. (GLACIAL TILL)			(3.30)									4.00 - 4.30	C1	4.00	PID=0.0ppmv	
Firm becoming stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded quartzite and sandstone. (GLACIAL TILL)												4.50	D2	4.50	PID=0.0ppmv	
														4.60	SPT(C) N=23 (2,3/4,6,6,7)	
												5.70 - 5.90	C2			
		6.00		36.81										6.10	SPT(C) N=17 (2,3/3,4,5,5)	
Possible rockhead (Drillers Description) (WEATHERED CHESTER FORMATION)														7.60	SPT(C) N=50 (3,5/7,11,12,20)	
			(8.30)									9.00	D3	9.00	PID=0.4ppmv	
														9.40	SPT(C) N=50 (25 for 135mm/50 for 175mm)	
														10.90	SPT(C) N=50	

Remarks:

- Borehole progressed by dynamic sampling between 1.20 and 5.60 m with rotary openhole drilling between 5.60 and 14.30 m bgl. Strata descriptions are inferred.
- Borehole terminated at 14.30 m bgl.
- Hand dug service avoidance pit excavated to 1.2 m bgl.
- Groundwater not encountered during drilling.
- Borehole installed with gas and groundwater monitoring standpipe as detailed above.
- Borehole logged in general accordance with BS5930:2015+A1:2020.

Water Level Observations

Flush

Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %

Coordinates:
E343735.67 N398729.60

Elevation (mAOD):
42.81

Drilled By:
TOR Drilling

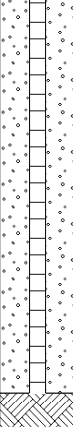
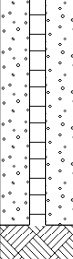
Plant Used:
Comacchio 205

Logged:
AK

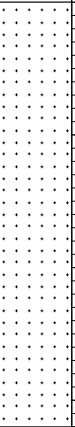
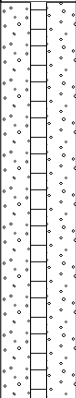
Checked:
BHO

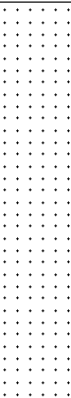
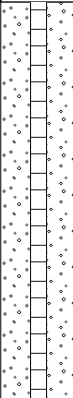
Approved:
MY

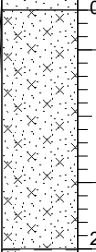
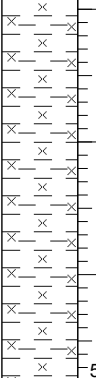
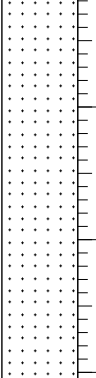
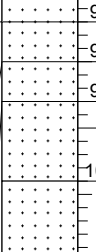
Scale (m):
1:57

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com							Project No: 19-0654.06			Hole ID: BH04		Page: 2 of 2				
							Project: Site 3, Knowsley									
Rotary Core Borehole Log							Date: 26/07/2021 - 27/07/2021			Client: Seybourne Estates						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
Possible rockhead (Drillers Description) (WEATHERED CHESTER FORMATION)												11.50	D4	11.50	(25 for 140mm/50 for 105mm) PID=0.4ppmv	
												13.00	D5	13.00	SPT(C) N=50 (25 for 85mm/50 for 30mm) PID=0.3ppmv	
Borehole complete at 14.30 m bgl.		14.30		28.51										14.30	SPT(C) N=50 (25 for 105mm/50 for 50mm)	
Remarks: 1. Borehole progressed by dynamic sampling between 1.20 and 5.60 m with rotary openhole drilling between 5.60 and 14.30 m bgl. Strata descriptions are inferred. 2. Borehole terminated at 14.30 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater not encountered during drilling. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations					Flush				
							Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %				
Coordinates: E343735.67 N398729.60		Elevation (mAOD): 42.81		Drilled By: TOR Drilling		Plant Used: Comacchio 205		Logged: AK	Checked: BHO	Approved: MY	Scale (m): 1:57					

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com							Project No: 19-0654.06			Hole ID: BH05		Page: 2 of 2				
							Project: Site 3, Knowsley									
Rotary Core Borehole Log							Date: 02/08/2021 - 03/08/2021			Client: Seybourne Estates						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
Medium strong dark reddish brown slightly silty fine to coarse grained SANDSTONE with occasional micaceous horizons and occasional mudstone partings. (CHESTER FORMATION)			(1.50)				1.5					11.20 11.60 - 12.00	D10 C4			
Medium strong to strong dark reddish brown thinly laminated fine to coarse grained SANDSTONE with clay lenses and rare conglomeratic gravel inclusions of medium to coarse size. (CHESTER FORMATION) Borehole complete at 12.20 m bgl.		12.20		30.47										12.20	SPT(C) N=50 (25 for 110mm/50 for 15mm)	
Remarks: 1. Borehole progressed by rotary openhole drilling between 1.20 and 9.20 m bgl. with rotary coring attempted between 9.20 and 12.20. 2. Borehole terminated at 12.20 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater not encountered during drilling. 5. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations					Flush				
							Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %				
Coordinates: E343774.76 N398717.29		Elevation (mAOD): 42.67		Drilled By: TOR Drilling		Plant Used: Comacchio 205		Logged: AK	Checked: BHO	Approved: MY	Scale (m): 1:57					

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							Project: Site 3, Knowsley									
Rotary Core Borehole Log							Date: 27/07/2021 - 28/07/2021			Client: Seybourne Estates						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
Grey rockhead SAND. (Drillers Description) (CHESTER FORMATION)												12.00	D4	12.00 12.20	PID=0.3ppmv SPT(C) N=50 (25 for 20mm/50 for 15mm)	
Borehole complete at 14.20 m bgl.		14.20	(5.00)	28.17								14.20	D5	14.00 14.20	SPT(C) N=50 (25 for 25mm/50 for 25mm) PID=0.4ppmv	
Remarks: 1. Borehole progressed by rotary openhole drilling between 1.20 and 14.20 m bgl. Strata description are inferred. 2. Borehole terminated at 14.20 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater not encountered during drilling. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations					Flush				
							Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %				
Coordinates: E343714.90 N398668.91							Elevation (mAOD): 42.37		Drilled By: TOR Drilling		Plant Used: Comacchio 205		Logged: AK	Checked: BHO	Approved: MY	Scale (m): 1:57

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							Project: Site 3, Knowsley									
Rotary Core Borehole Log							Date: 28/07/2021 - 30/07/2021			Client: Seybourne Estates						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
Very hard cemented SAND with rounded pebbles - rockhead. (Drillers Description) (CHESTER FORMATION)			(5.00)									12.00	D6	12.00 12.00	SPT(C) N=50 (25 for 10mm/50 for 0mm) PID=0.0ppmv	
Borehole complete at 14.00 m bgl.		14.00		27.64										14.00	SPT(C) N=50 (25 for 15mm/50 for 5mm)	
Remarks: 1. Borehole progressed by rotary openhole drilling between 1.20 and 14.00 m bgl. Strata descriptions are inferred. 2. Borehole terminated at 14.00 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater encountered at 7.00 m bgl during drilling. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations						Flush			
							Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %				
							30/07/2021	7.00	0	0.00						
Coordinates: E343752.99 N398643.88							Elevation (mAOD): 41.64		Drilled By: TOR Drilling		Plant Used: Comacchio 205		Logged: AK	Checked: BHO	Approved: MY	Scale (m): 1:57

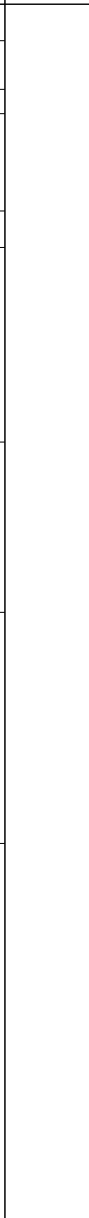
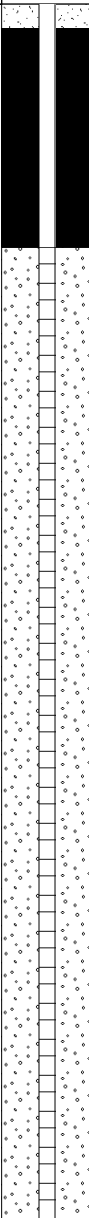
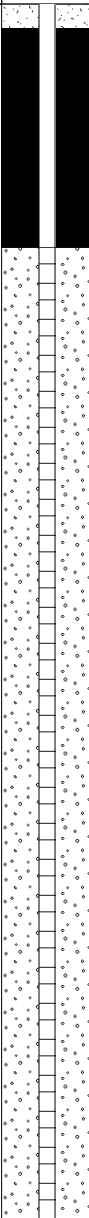
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com							Project No: 19-0654.06				Hole ID: BH08		Page: 1 of 2			
							Project: Site 3, Knowsley									
Rotary Core Borehole Log							Date: 28/07/2021 - 03/08/2021			Client: Seybourne Estates						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Asphalt.		0.10		41.10												
MADE GROUND: Light brown, blackish brown and green gravel of quartzite, limestone and clinker (subbase).		0.30	(0.20)	40.90												
		0.60	(0.30)	40.60								0.40	ES1	0.40	PID=0.0ppmv	
		0.70		40.50								0.65	D1	0.65	PID=0.0ppmv	
MADE GROUND: Light brown silty sandy angular to subangular fine to coarse gravel of limestone and quartzite. Low cobble content of similar.														1.20	SPT(C) N=16 (1,2/3,3,4,6)	
Dark brown SAND with frequent weakly cemented sand and with occasional decaying organic matter. Organic odour.		2.50		38.70												
Medium dense light orangish brown silty SAND with frequent pockets of blackish brown clayey sand and occasional decaying wood. Slight organic odour. (SHIRDLEY HILL SAND FORMATION)																
Soft silty red CLAY. (Drillers Description) (GLACIAL TILL)		5.80		35.40		5.50 ▼						4.00	D2	4.00	SPT(S) N=27 (5,5/6,6,7,8) PID=0.2ppmv	
		6.00	(0.20)	35.20								6.00	D3	6.00	SPT(S) N=50 (25 for 100mm/50 for 120mm) PID=0.0ppmv	
Red SAND - rockhead. (Drillers Descriptions) (WEATHERED CHESTER FORMATION)																
Red SANDSTONE. (Drillers Description) (CHESTER FORMATION)																
			(3.20)											9.00	SPT(C) N=50 (25 for 25mm/50 for 25mm)	
		9.20		32.00				100	60	33						
Medium strong to strong dark reddish brown coarse-grained thickly laminated SANDSTONE. (CHESTER FORMATION)		9.50	(0.30)	31.70				0.3	100	43	0	9.20 - 9.30	C1			
		9.80	(0.30)	31.40				0.3	100	37	17	9.40 - 9.50	C2			
Medium strong to strong dark reddish brown slightly silty fine to coarse grained thinly bedded SANDSTONE with undulating fracture surface, (CHESTER FORMATION)			(0.60)					0.6				9.90	D4			
		10.40		30.80								10.00	D5			
												10.40	D6			
Remarks: 1. Borehole progressed by rotary openhole drilling between 1.20 and 9.20 m bgl with rotary coring attempted between 9.20 and 11.90 m bgl. 2. Borehole terminated at 11.90 m bgl. 3. Hand dug service avoidance pit excavated to 1.2 m bgl. 4. Groundwater encountered at 5.9 m bgl during drilling. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.							Water Level Observations					Flush				
							Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %				
							02/08/2021	5.50	0	0.00						
Coordinates: E343709.85 N398645.77		Elevation (mAOD): 41.20		Drilled By: TOR Drilling		Plant Used: Comacchio 205		Logged: AK	Checked: BHO	Approved: MY	Scale (m): 1:57					

Rotary Core Borehole Log

Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery					Sample Details		Test Details		Backfill
							Run (m)	TCR %	SCR %	RQD %	Min. Fl Av. Fl Max. Fl	Depth (m)	Type & Ref	Depth (m)	Results	
Medium strong reddish brown slightly silty locally micaceous fine to coarse grained SANDSTONE with occasional pale green thin laminations. (CHESTER FORMATION)		11.90	(1.50)	29.30												
Blowing SAND. (Drillers Description) (No recovery) (CHESTER FORMATION) Borehole complete at 11.90 m bgl.																

Remarks:
1. Borehole progressed by rotary openhole drilling between 1.20 and 9.20 m bgl with rotary coring attempted between 9.20 and 11.90 m bgl.
2. Borehole terminated at 11.90 m bgl.
3. Hand dug service avoidance pit excavated to 1.2 m bgl.
4. Groundwater encountered at 5.9 m bgl during drilling.
5. Borehole installed with gas and groundwater monitoring standpipe as detailed above.
6. Borehole logged in general accordance with BS5930:2015+A1:2020.

Water Level Observations				Flush	
Date	Depth Strike (m)	Duration (min)	Standing (m)	Depth (m)	Return %
02/08/2021	5.50	0	0.00		

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					Project: Site 3, Knowsley							
Dynamic Sampler Log					Date: 22/07/2021		Client: Seybourne Estates					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill	
							Depth (m)	Type & Ref	Depth (m)	Results		
MADE GROUND: Concrete (reinforced).		0.15	(0.15)	42.52			0.90	ES1	0.90	PID=0.0ppmv		
MADE GROUND: Blackish grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded limestone.		0.35	(0.20)	42.32								
MADE GROUND: Whole and broken bricks.		0.45	(0.10)	42.22								
MADE GROUND: Blackish brown slightly cobbly gravelly fine to coarse sand. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, limestone and quartzite.		0.85	(0.40)	41.82								
MADE GROUND: Firm black slightly gravelly clayey fine to medium sand. Gravel is fine angular to subrounded brick and mixed lithologies.		1.00	(0.15)	41.67								
Loose light brown slightly silty medium to coarse SAND. (SHIRDLEY HILL SAND FORMATION)		1.80	(0.80)	40.87								
Firm, locally soft, greenish grey slightly gravelly sandy CLAY with occasional pockets of light brown fine to medium sand. (GLACIAL TILL)		2.50	(0.70)	40.17								
Firm light pinkish brown slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded quartzite. (GLACIAL TILL)		3.45	(0.95)	39.22								
Firm light brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine subangular to subrounded quartzite. (GLACIAL TILL)		5.00	(1.55)	37.67								
Borehole complete at 5.00 m bgl.												
Remarks: 1. Borehole terminated at 5.00 m bgl. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater not encountered during drilling. 4. Hand shear vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike			Water Level		Borehole Diameter		
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter	
Coordinates: E343781.80 N398827.06		Elevation (mAOD): 42.67		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:32	



Head Office

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Project No:
19-0654.06

Hole ID:
DS02

Page:
1 of 1

Project:
Site 3, Knowsley

Dynamic Sampler Log

Date:
22/07/2021

Client:
Seybourne Estates

Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Concrete (reinforced).			(0.50)								
		0.50		42.11							
MADE GROUND: Loose dark brown gravelly sand with occasional cobbles. Sand is fine to coarse. Gravel and cobbles are angular to subrounded limestone, brick and quartzite.			(0.90)				0.75	ES1	0.75	PID=0.0ppmv	
		1.40		41.21					1.20	SPT(C) N=4 (2,2/1,1,1,1)	
MADE GROUND: Dark grey gravelly sand. Sand is fine to medium. Gravel is fine to medium angular to subangular limestone and brick.			(0.25)	40.96							
MADE GROUND: Dark brown to black fine to medium sand with occasional pockets of soft clay. Occasional rootlets.		1.65	(0.15)	40.81							
MADE GROUND: Dense black clayey sand with occasional rootlets.		1.80	(0.10)	40.71			1.70	ES2	1.70	PID=0.0ppmv	
MADE GROUND: Pinkish grey sandy gravel. Sand is fine to medium. Gravel is fine to coarse angular to subangular limestone.		1.90	(0.20)	40.51					2.00	SPT(C) N=4 (2,1/1,1,1,1)	
Blackish brown slightly gravelly slightly clayey fine to medium SAND. Gravel is fine subrounded quartzite. (SHIRDLEY HILL SAND FORMATION)		2.10									
Firm, locally soft, greenish grey slightly gravelly sandy CLAY with pockets of light brown fine to medium sand. Gravel is fine subangular to subrounded quartzite. (GLACIAL TILL)		2.40	(0.30)	40.21							
Stiff locally firm purplish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium subangular to subrounded quartzite. (GLACIAL TILL)			(0.50)				2.60	D1	2.60	PID=0.0ppmv HV= 38 kPa	
Becoming stiff below 3.30 m bgl.		2.90		39.71					2.60		
Becoming firm below 4.00 m bgl.			(2.10)						3.00	SPT(C) N=10 (2,2/2,2,3,3) HV= 69 kPa	
									3.50	HV= 100 kPa	
									4.00	SPT(C) N=8 (1,1/2,2,2,2)	
									4.70	HV= 86 kPa	
Borehole complete at 5.00 m bgl.		5.00		37.61					5.00	SPT(C) N=10 (2,2/3,2,2,3)	

Remarks:
1. Borehole terminated at 5.00 m bgl.
2. Hand dug service avoidance pit excavated to 1.20 m bgl.
3. Groundwater not encountered during drilling.
4. Hand shear vane obtained using 19 mm blade. Results have been corrected and averaged.
5. Borehole installed with gas and groundwater monitoring standpipe as detailed above.
6. Borehole logged in general accordance with BS5930:2015+A1:2020.

Water Strike			Water Level		Borehole Diameter	
Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter

Coordinates:
E343739.12 N398831.55

Elevation (mAOD):
42.61

Drilled By:
Geospek Ltd

Plant Used:
Archway Dart

Logged:
AK

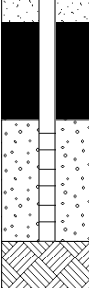
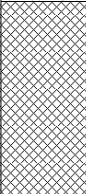
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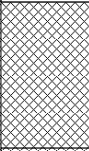
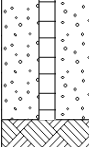
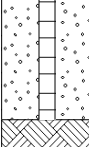
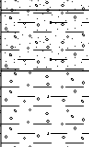
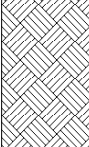
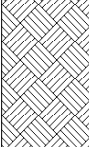
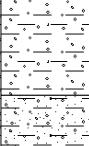
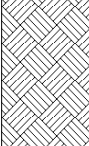
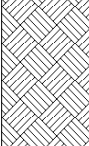
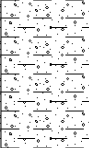
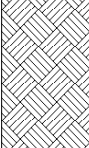
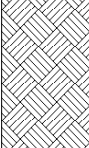
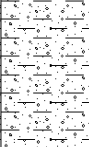
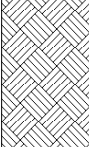
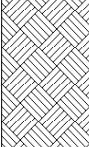
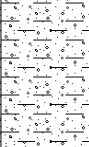
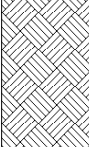
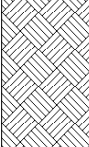
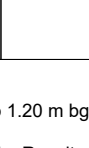
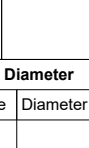
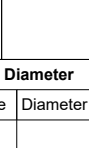
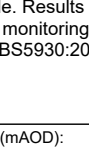
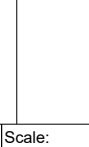
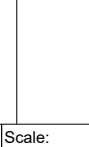
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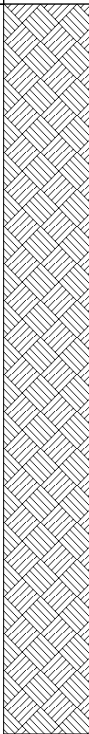
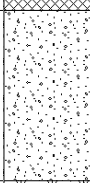


 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS04		Page: 1 of 1			
					Project: Site 3, Knowsley							
Dynamic Sampler Log					Date: 22/07/2021		Client: Seybourne Estates					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill	
							Depth (m)	Type & Ref	Depth (m)	Results		
MADE GROUND: Concrete.		0.40	(0.40)	42.18								
MADE GROUND: Medium dense dark brown gravelly fine to coarse sand with frequent cobbles. Gravel and cobbles are fine to coarse angular to subangular brick, slag, concrete, quartzite and limestone.		1.50	(1.10)	41.08			0.60	ES1				
							1.00	ES2	1.00	PID=0.0ppmv		
									1.20	SPT(C) N=13 (9,9/6,3,2,2)		
Dark brown slightly silty fine to medium SAND. (SHIRDLEY HILL SAND FORMATION)		1.90	(0.40)	40.68			1.60	D1	1.60	PID=0.0ppmv		
Firm greenish grey slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to medium subrounded quartzite. (GLACIAL TILL)		2.40	(0.50)	40.18					2.00	SPT(C) N=5 (1,0/1,1,2,1)		
Firm, becoming stiff, pinkish brown slightly sandy gravelly CLAY with occasional pockets of fine to medium orange sand. Gravel is fine to medium subrounded quartzite. (GLACIAL TILL)							2.50 - 2.70	C1	2.50	PID=0.0ppmv		
									2.50	HV= 60 kPa		
									2.70	HV= 109 kPa		
Becoming stiff below 2.70 m bgl.									3.00	SPT(C) N=12 (1,2/2,2,4,4)		
			(2.60)				3.50	D2	3.50	PID=0.0ppmv		
									3.80	HV= 147 kPa		
									4.00	SPT(C) N=18 (2,3/3,5,5,5)		
Becoming very stiff below 4.50 m bgl.												
									4.85	HV= 194 kPa		
		5.00		37.58					5.00	SPT(C) N=15 (2,2/3,4,4,4)		
Borehole complete at 5.00 m bgl.												
Remarks: 1. Borehole terminated at 5.00 m bgl. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater not encountered during drilling. 4. Hand shear vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike		Water Level		Borehole Diameter			
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter	
Coordinates: E343747.46 N398776.90		Elevation (mAOD): 42.58		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:32	

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS05		Page: 1 of 1		
					Project: Site 3, Knowsley						
Dynamic Sampler Log					Date: 23/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Concrete (reinforced).		0.40	(0.40)	42.44			0.50	ES1	0.50	PID=0.0ppmv	
MADE GROUND: Dark brown gravelly fine to coarse sand with occasional cobbles. Gravel and cobbles are fine to coarse angular to subangular limestone, brick, concrete and mixed lithologies.		1.20	(0.80)	41.64							
Borehole complete at 1.20 m bgl.											
Remarks: 1. Borehole terminated at 1.20 m bgl due to SPT refusal. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater not encountered during drilling. 4. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 5. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike			Water Level		Borehole Diameter	
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
Coordinates: E343745.46 N398761.86		Elevation (mAOD): 42.84		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:32

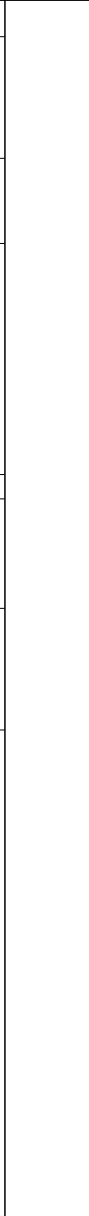
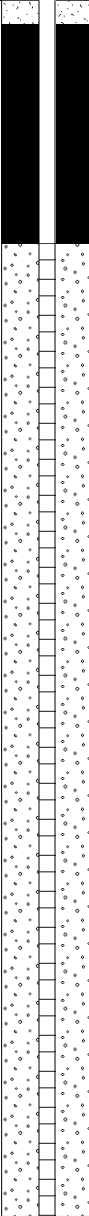
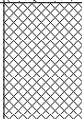
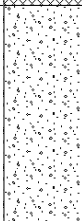
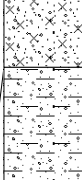
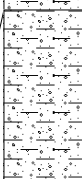
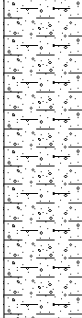
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS06		Page: 1 of 1									
					Project: Site 3, Knowsley													
Dynamic Sampler Log					Date: 23/07/2021		Client: Seybourne Estates											
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill							
							Depth (m)	Type & Ref	Depth (m)	Results								
MADE GROUND: Concrete (reinforced).			(0.40)															
MADE GROUND: Dark greyish brown slightly clayey gravelly sand with occasional cobbles of brick and concrete. Sand is coarse. Gravel is fine to coarse angular to subrounded brick and concrete.		0.40	(0.20)	42.41			0.50	ES1	0.50	PID=0.0ppmv								
MADE GROUND: Dark brown clayey slightly gravelly clayey sand with occasional cobbles of brick. Sand is coarse. Gravel is fine to coarse angular to subrounded brick, concrete and quartzite.		0.60	(0.70)	42.21														
Firm, locally soft, greenish grey slightly gravelly sandy CLAY with occasional pockets of dark brown clayey sand. Sand is medium to coarse. Gravel is fine to coarse angular to subrounded quartzite. Occasional rootlets.		1.30	(0.40)	41.51			1.50	D1	1.20	SPT(C) N=0 (0,0/0,0,0,0)								
(GLACIAL TILL)		1.70	(0.40)	41.11					1.50	PID=0.0ppmv								
Soft to firm purplish light brown, mottled greenish grey gravelly sandy CLAY with occasional pockets of orangish brown clayey sand. Sand is coarse. Gravel is fine to medium angular to subangular quartzite.		2.10	(0.40)	40.71					1.70	HV= 55 kPa								
(GLACIAL TILL)									2.00	SPT(C) N=7 (1,0/1,2,2,2)								
Becoming very sandy below 1.90 m bgl.			(1.50)						2.80	HV= 93 kPa								
Stiff pinkish brown slightly sandy slightly gravelly CLAY with occasional pockets of dark greyish sandy clay. Sand is coarse. Gravel is fine to medium angular to subangular quartzite.									3.00	SPT(C) N=5 (1,1/1,2,1,1)								
(GLACIAL TILL)		3.00							3.00	HV= 177 kPa								
Becoming very stiff below 3.00 m bgl.																		
Dark brown SAND with frequent pockets of clayey sand.		3.60		39.21														
(SHIRDLEY HILL SAND FORMATION)		3.80	(0.20)	39.01														
Firm dark brown slightly sandy CLAY with lenses of fine to coarse sand.			(0.40)															
(GLACIAL TILL)		4.20		38.61														
Dark brown SAND with frequent pockets of clayey sand.			(0.80)				4.50	D2	4.50	PID=0.0ppmv								
(GLACIAL TILL)		5.00		37.81														
Borehole complete at 5.00 m bgl.																		
Remarks: 1. Borehole terminated at 5.00 m bgl. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater encountered at 4.00 m bgl during drilling. 4. Borehole collapsed to 3.50 m bgl. 5. Hand shear vane obtained using 19 mm blade. Results have been corrected and averaged. 6. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 7. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike		Water Level		Borehole Diameter									
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter							
					23/07/2021	4.00		20	3.80									
Coordinates: E343741.53 N398716.89					Elevation (mAOD): 42.81		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: HJ		Checked: BHO		Approved: MY		Scale: 1:32	

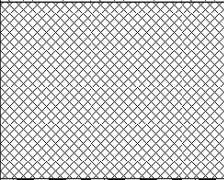
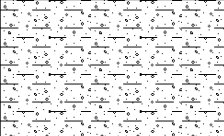
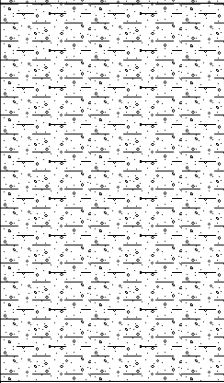
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS07		Page: 1 of 1			
					Project: Site 3, Knowsley							
Dynamic Sampler Log					Date: 23/07/2021		Client: Seybourne Estates					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill	
							Depth (m)	Type & Ref	Depth (m)	Results		
MADE GROUND: Light greyish brown slightly sandy gravel. Sand is coarse. Gravel is fine to coarse angular to subrounded concrete and brick.			(0.60)				0.70	ES1	0.70	PID=0.1ppmv		
		0.60	42.42									
MADE GROUND: Dark blackish brown slightly gravelly very clayey sand. Sand is coarse. Gravel is fine to coarse angular to subrounded brick, limestone and sandstone.			(0.20)	42.22			0.70	ES1	0.70	PID=0.1ppmv		
		0.80	42.22									
Light brown slightly gravelly SAND with frequent pockets of blackish dark brown sandy clay. Sand is medium to coarse. Gravel is fine to medium angular to subrounded limestone.			(0.40)	41.82			1.40	D1	1.20	SPT(C) N=5 (1,1/1,1,2,1) PID=0.1ppmv		
		1.20	41.82									
(SHIRDLEY HILL SAND FORMATION)			(0.50)	41.32			1.40	D1	1.40	SPT(C) N=5 (1,1/1,1,2,1) PID=0.1ppmv		
		1.70	41.32									
Black sandy amorphous PEAT with occasional pockets of orangish brown sand. Organic odour.			(0.15)	41.17			3.60 - 3.90	C1	3.60	PID=0.0ppmv		
		1.85	41.17									
(SHIRDLEY HILL SAND FORMATION)			(0.25)	40.92			3.60 - 3.90	C1	3.60	PID=0.0ppmv		
		2.10	40.92									
Firm light greyish brown slightly gravelly sandy CLAY. Sand is medium to coarse. Gravel is fine subrounded quartzite. (GLACIAL TILL)			(0.70)	40.22			4.00	D2	4.00	SPT(C) N=3 (0,0/0,1,1,1)		
		2.80	40.22									
Firm locally soft light greyish brown slightly gravelly very sandy CLAY with occasional pockets of orangish brown sand. Sand is medium to coarse. Gravel is fine to coarse angular to subrounded quartzite. (GLACIAL TILL)							4.00	D2	4.00	SPT(C) N=11 (1,2/3,2,3,3)		
Firm light brown mottled black and green slightly gravelly CLAY. Gravel is fine quartzite. Rare roots. (GLACIAL TILL)							4.00	D2	4.00	SPT(C) N=15 (2,3/4,4,3,4) PID=0.2ppmv		
Firm to stiff pinkish brown slightly sandy slightly gravelly CLAY with occasional pockets of greyish black sand. Sand is coarse. Gravel is fine to coarse quartzite and sandstone. Rare roots. (GLACIAL TILL)							4.00	D2	4.00	SPT(C) N=15 (2,3/4,4,3,4) PID=0.2ppmv		
Becoming very stiff below 3.60 m bgl.							4.00	D2	4.00	SPT(C) N=15 (2,3/4,4,3,4) PID=0.2ppmv		
Borehole complete at 5.00 m bgl.							4.00	D2	4.00	SPT(C) N=15 (2,3/4,4,3,4) PID=0.2ppmv		
Remarks: 1. Borehole terminated at 5.00 m bgl. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater not encountered during drilling. 4. Hand shear vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike		Water Level		Borehole Diameter			
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter	
Coordinates: E343737.70 N398691.77		Elevation (mAOD): 43.02		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: HJ	Checked: BHO	Approved: MY	Scale: 1:32	

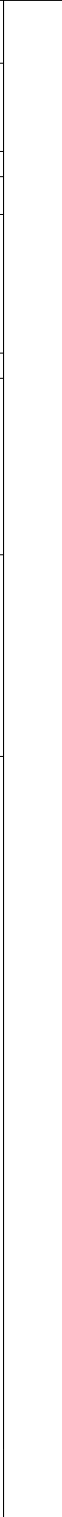
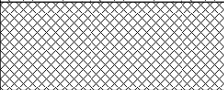
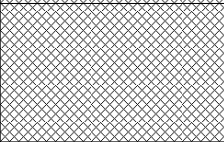
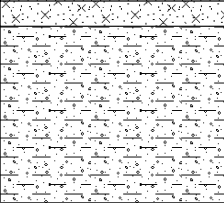
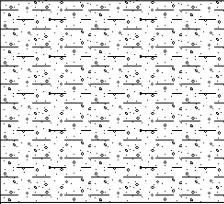
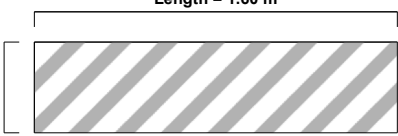
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS08		Page: 1 of 1						
					Project: Site 3, Knowsley										
Dynamic Sampler Log					Date: 23/07/2021 - 26/07/2021		Client: Seybourne Estates								
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill				
							Depth (m)	Type & Ref	Depth (m)	Results					
MADE GROUND: Asphalt.		0.15	(0.15)	41.10		1.00 1.10 	0.40	ES1	0.40	PID=1.9ppmv					
MADE GROUND: Dark brown slightly cobbly very gravelly fine to coarse sand. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, clinker, quartzite and limestone. Rare glass and organic material.		0.60	(0.45)	40.65											
MADE GROUND: Dark yellowish brown slightly gravelly medium to coarse sand. Gravel is fine to medium brick and quartzite.		1.00	(0.40)	40.25											
Medium dense light yellowish brown slightly gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRLDEY HILL SAND FORMATION)		1.70	(0.70)				1.60	D1	1.20	SPT(C) N=11 (1,2/3,3,3,2)					
Blackish brown slightly sandy amorphous PEAT. Sand is coarse. Organic odour. (SHIRLDEY HILL SAND FORMATION)		1.85	(0.15)	39.40					1.60	PID=0.3ppmv					
Firm greenish brown slightly sandy gravelly CLAY with occasional pockets of coarse orangish brown sand. Gravel is fine to medium quartzite. Occasional roots and organic material. Organic odour. (GLACIAL TILL)		3.00	(1.15)	38.25					2.00	SPT(C) N=4 (1,0/0,1,1,2)					
No recovery between 2.00 and 3.00 m bgl.															
Borehole complete at 3.00 m bgl.															

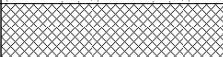
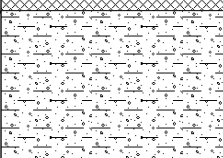
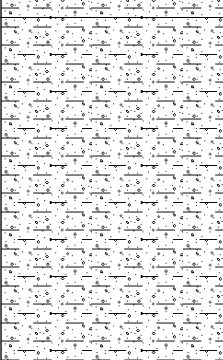
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS08A		Page: 1 of 1					
					Project: Site 3, Knowsley									
Dynamic Sampler Log					Date: 26/07/2021		Client: Seybourne Estates							
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill			
							Depth (m)	Type & Ref	Depth (m)	Results				
		MADE GROUND: Concrete (reinforced).		0.15			(0.15)	41.10						
		MADE GROUND: Dark brown slightly cobbly gravelly fine to coarse sand. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, clinker, limestone and quartzite.		0.45			(0.30)	40.80		0.30		ES1	0.30	PID=0.6ppmv
		Dark orangish brown slightly silty slightly gravelly fine to coarse SAND with occasional pockets of blackish brown clayey sand. Gravel is fine to medium subangular to subrounded quartzite. Slight organic odour.					(0.55)			0.60		D1	0.60	PID=0.8ppmv
(SHIRDLEY HILL SAND FORMATION)		1.00		40.25		1.00	D2	1.00	PID=0.5ppmv					
Light grey fine to coarse SAND with pockets of dark brown fine to medium sand.		1.20	(0.20)	40.05										
(SHIRDLEY HILL SAND FORMATION)														
Borehole complete at 1.20 m bgl.														
Remarks: 1. Hand pit terminated at 1.20 m bgl due to issues with advancing casing. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater encountered at 1.00 m bgl during drilling. 4. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 5. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike			Water Level		Borehole Diameter				
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter			
					26/07/2021	1.00		20	0.70					
Coordinates: E343733.34 N398635.91		Elevation (mAOD): 41.25		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:32			

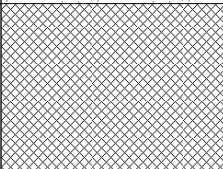
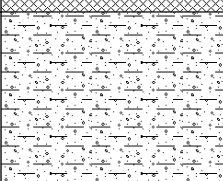
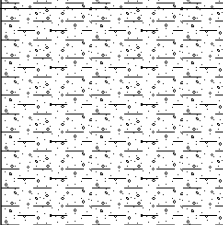
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS09		Page: 1 of 1		
					Project: Site 3, Knowsley						
Dynamic Sampler Log					Date: 23/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Dark greyish brown slightly cobbly very gravelly fine to coarse sand. Gravel and cobbles are fine to coarse angular to subrounded quartzite, brick, concrete, quartzite and sandstone.		0.50	(0.50)	41.44			0.70	ES1	0.70	PID=72.7ppmv	
MADE GROUND: Medium dense dark brown slightly gravelly fine to medium sand with pockets of clayey sand. Gravel is angular to subrounded brick, sandstone and quartzite. Occasional cobbles of quartzite. Occasional pockets of red weathered sandstone.		1.20	(1.20)	40.24					1.20	SPT(C) N=22 (3,3/5,5,6,6)	
Borehole complete at 1.70 m bgl.		1.70							1.70	SPT(C) 50 (10,10/50 for 225mm)	
Remarks: 1. Borehole terminated at 1.70 m bgl due to SPT refusal. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater not encountered during drilling. 4. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 5. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike			Water Level		Borehole Diameter	
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
Coordinates: E343752.09 N398596.32		Elevation (mAOD): 41.94		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:32

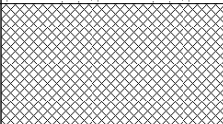
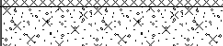
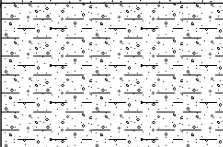
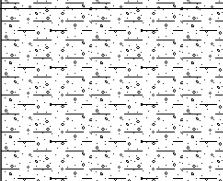
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.06		Hole ID: DS10		Page: 1 of 1		
					Project: Site 3, Knowsley						
Dynamic Sampler Log					Date: 23/07/2021 - 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Concrete (reinforced).		0.15	(0.15)	41.11			0.80	ES1	0.80	PID=0.9ppmv	
MADE GROUND: Dark greyish brown slightly cobbly very gravelly fine to coarse sand. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, quartzite and sandstone.		0.65	(0.50)	40.61							
MADE GROUND: Dark orangish brown gravelly fine to coarse sand. Gravel is fine to coarse of brick, concrete, quartzite.		1.00	(0.35)	40.26							
Medium dense yellowish brown slightly gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRDLEY HILL SAND FORMATION)			(0.95)								
		1.95		39.31							
Dark brown sandy amorphous PEAT with occasional roots and decaying matter. Strong organic odour. (SHIRDLEY HILL SAND FORMATION)		2.05	(0.10)	39.21							
Brown locally dark brown slightly silty slightly gravelly SAND with occasional pockets of dark brown clayey sand. Gravel is fine to medium angular to subrounded quartzite. Slight organic odour. (SHIRDLEY HILL SAND FORMATION)		2.50	(0.45)	38.76							
Firm locally soft grey slightly gravelly sandy CLAY. Gravel is fine to medium angular to subrounded quartzite. (GLACIAL TILL)		3.00	(0.50)	38.26							
Firm light brown slightly sandy slightly gravelly CLAY with occasional pockets of orangish brown fine sand. Gravel is fine to medium subangular to subrounded quartzite. (GLACIAL TILL)			(2.00)								
Becoming stiff below 3.0 m bgl.											
Borehole complete at 5.00 m bgl.		5.00		36.26							
Remarks: 1. Borehole terminated at 5.00 m bgl. 2. Hand dug service avoidance pit excavated to 1.20 m bgl. 3. Groundwater not encountered during drilling. 4. Hand shear vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike		Water Level		Borehole Diameter		
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
Coordinates: E343699.58 N398621.95		Elevation (mAOD): 41.26		Drilled By: Geospek Ltd		Plant Used: Archway Dart		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:32

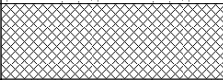
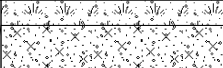
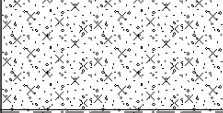
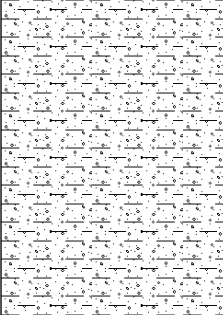
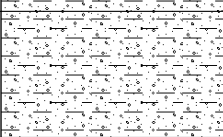
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP01		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.25	42.59		0.50 0.60 - 0.80	ES1 B1	0.50 0.60	PID=0.80ppmv PID=0.00ppmv
MADE GROUND: Dark greyish brown slightly cobbly very sandy ashy gravel. Gravel and cobbles are fine to coarse angular to subrounded concrete, brick, slate, slag, sandstone and limestone. Rare plastic, metal and timber.		0.95	41.89					
Firm light blueish grey mottled orangish brown slightly gravelly sandy CLAY with lenses of dark brown coarse sand. Gravel is fine to coarse angular to subrounded quartzite and sandstone. (GLACIAL TILL)		1.50	41.34					
Firm dark reddish brown mottled light greyish brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse angular to subrounded quartzite. (GLACIAL TILL)		3.00	39.84					
Trial pit complete at 3.00 m bgl.								
Dimensions and Orientation: Length = 1.50 m Width = 0.70 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.00 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343763.70 N398764.93	Elevation (mAOD): 42.84	Excavated By: Boundary Plant		Plant Used: JCB- 3CX	Logged: AK	Checked: BHO	Approved: MY	Scale: 1:30

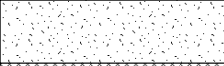
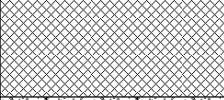
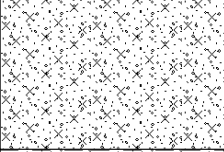
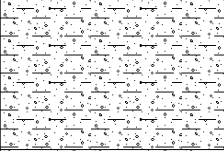
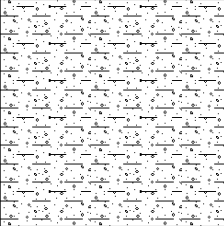
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP02		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.25	42.55		0.55	ES1	0.55	PID=1.10ppmv
MADE GROUND: Dark brown slightly cobbly very sandy gravel. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, quartzite, sandstone and slate. Rare rubber and ceramic fragments.		0.60	42.20					
MADE GROUND: Concrete.		0.70	42.10					
MADE GROUND: Firm locally soft dark blackish brown slightly gravelly very sandy clay with pockets of dark brown coarse sand. Gravel is fine to coarse angular concrete, quartzite and sandstone. Rare boulder of concrete.		0.85	41.95		1.10 - 1.30	B1	1.10	PID=0.00ppmv
MADE GROUND: Dark orangish brown locally light brown slightly silty gravelly medium to coarse sand. Gravel is fine to coarse angular to subrounded brick, siltstone and quartzite.								
Yellowish brown slightly silty medium to coarse SAND. (SHIRDLEY HILL SAND FORMATION)								
Firm orangish brown mottled light greyish brown slightly gravelly sandy CLAY with lenses of light grey coarse sand. Gravel is fine to medium subangular to subrounded siltstone and quartzite. (GLACIAL TILL)		1.40	41.40		1.60	D1	1.60 1.70	PID=0.50ppmv HV=64 kPa
		1.50	41.30					
Firm dark reddish brown mottled greyish brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse subangular to rounded siltstone and quartzite. (GLACIAL TILL)		2.20	40.60					
Trial pit complete at 3.00 m bgl.		3.00	39.80					
Dimensions and Orientation: Length = 1.60 m Width = 0.80 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.00 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit unstable between 0.70 and 1.00 m bgl during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343724.63 N398759.89		Elevation (mAOD): 42.80		Excavated By: Boundary Plant		Plant Used: JCB- 3CX		Logged: AK Checked: BHO Approved: MY Scale: 1:30

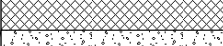
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP03		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.20	42.50		0.30	ES1	0.30	PID=0.80ppmv
MADE GROUND: Greyish brown slightly cobbly very sandy gravel. Gravel and cobbles are fine to coarse angular to subrounded concrete, brick, limestone and quartzite. Rare metal and timber.		0.45	42.25					
Firm light grey mottled orangish brown slightly gravelly sandy CLAY with lenses of reddish brown and light grey coarse sand. Gravel is fine to coarse angular to subrounded quartzite and sandstone. (GLACIAL TILL)		1.10	41.60					
Firm locally stiff reddish brown slightly gravelly slightly sandy CLAY with occasional pockets of organic matter. Gravel is fine to coarse subangular to subrounded quartzite, mudstone and sandstone. (GLACIAL TILL)		2.50	40.20					
Trial pit complete at 2.50 m bgl.								
Dimensions and Orientation: Length = 1.50 m Width = 0.80 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 2.50 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343778.11 N398731.11	Elevation (mAOD): 42.70	Excavated By: Boundary Plant		Plant Used: JCB- 3CX	Logged: AK	Checked: BHO	Approved: MY	Scale: 1:30

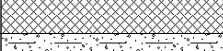
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP04		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.20	42.19	 0.60 0.60	0.60	ES1	0.60	PID=0.80ppmv
MADE GROUND: Dark brown slightly cobbly very sandy gravel with pockets of stiff light brown sandy clay. Gravel is fine to coarse angular to subrounded brick, quartzite, concrete, sandstone and slate.		0.90	41.49					
Firm light grey mottled light brown slightly gravelly sandy CLAY with lenses of light grey medium to coarse sand. Gravel is fine to medium subangular to subrounded quartzite, sandstone and mudstone. Occasional pockets of organic matter. (GLACIAL TILL)		1.60	40.79					
Firm locally stiff reddish brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded quartzite and sandstone. Occasional pockets of organic matter. (GLACIAL TILL)		2.50	39.89					
Trial pit complete at 2.50 m bgl.								
Dimensions and Orientation: Length = 1.40 m Width = 0.80 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 2.50 m bgl. 2. Groundwater encountered at 0.60 m bgl during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343717.98 N398703.06	Elevation (mAOD): 42.39	Excavated By: Boundary Plant		Plant Used: JCB- 3CX	Logged: AK	Checked: BHO	Approved: MY	Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP05		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.20	41.94		0.40	ES1	0.40	PID=0.90ppmv
MADE GROUND: Dark brown slightly cobbly very gravelly sand with occasional pockets of blackish clayey sand. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, limestone, quartzite and slate. Rare roots.		0.70	41.44					
Dark brown slightly silty gravelly SAND. Gravel is fine to coarse angular to subrounded quartzite.		0.90	41.24					
(SHIRDLEY HILL SAND FORMATION)		1.00	41.14					
Very dark brown weakly cemented fine to medium SAND. (SHIRDLEY HILL SAND FORMATION)		1.60	40.54					
Firm dark grey slightly gravelly sandy CLAY with occasional pockets of orangish brown fine to medium sand. Gravel is fine to medium subangular to subrounded quartzite. (GLACIAL TILL)		2.30	39.84					
Firm purplish brown slightly sandy slightly gravelly CLAY with occasional pockets of grey soft clay. Gravel is fine to coarse angular to subrounded of quartzite. Rare boulder of granite. (GLACIAL TILL)								
Trial pit complete at 2.30 m bgl.								
Dimensions and Orientation: Length = 1.70 m Width = 0.70 m 				Orientation: Inclination:		Remarks: 1. Trial pit terminated at 2.30 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.		
Coordinates: E343742.00 N398660.94		Elevation (mAOD): 42.14		Excavated By: Boundary Plant		Plant Used: JCB- 3CX		Logged: AK Checked: BHO Approved: MY Scale: 1:30

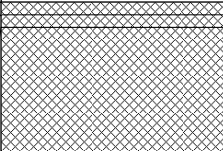
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP06		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 23/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.20	42.67		0.20 - 0.40 0.30	B1 ES1	0.20 0.30	PID=0.00ppmv PID=0.50ppmv
MADE GROUND: Dark brown very sandy gravel with frequent cobbles. Gravel and cobbles are fine to coarse angular to subangular brick and concrete and rare plastic and metal.		0.50	42.37					
Black slightly sandy slightly gravelly amorphous PEAT. Sand is coarse. Gravel is fine to medium angular to subrounded quartzite.		0.60	42.27					
(SHIRDLEY HILL SAND FORMATION)								
Light brown slightly silty slightly gravelly SAND with occasional pockets of blackish grey sand. Sand is coarse. Gravel is fine to medium angular to subrounded quartzite.		1.20	41.67					
(SHIRDLEY HILL SAND FORMATION)								
Firm, locally soft, greenish grey slightly gravelly sandy CLAY with occasional pockets of orangish brown sand and organic matter. Sand is coarse. Gravel is fine to coarse angular to subrounded quartzite.		2.50	40.37		2.70	D2	1.50 2.70	HV=46 kPa PID=0.40ppmv HV=30 kPa
(GLACIAL TILL)								
Soft reddish brown gravelly sandy CLAY. Sand is coarse. Gravel is fine to coarse angular to subrounded quartzite and sandstone.		3.00	39.87					
Trial pit complete at 3.00 m bgl.								
Dimensions and Orientation: Length = 1.40 m Width = 0.80 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.00 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343803.21 N398822.83	Elevation (mAOD): 42.87	Excavated By: Boundary Plant	Plant Used: JCB- 3CX	Logged: HJ	Checked: BHO	Approved: MY	Scale: 1:30	

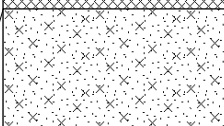
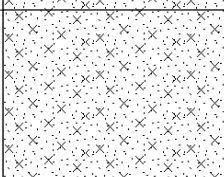
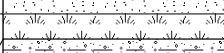
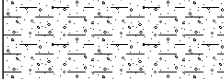
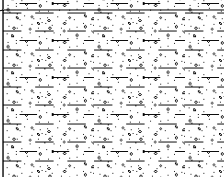
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP07		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.25	42.72		0.40	ES1	0.40	PID=0.40ppmv
MADE GROUND: Greyish brown slightly cobbly very gravelly fine to coarse sand. Gravel and cobbles are fine to coarse angular to subrounded concrete, brick and limestone.		0.35	42.62					
MADE GROUND: Dark blackish brown locally orangish brown cobbly gravelly fine to coarse sand with occasional pockets of soft dark brown gravelly clay. Gravel and cobbles are fine to coarse angular to subrounded brick, concrete, sandstone, quartzite and limestone. Rare fragment of ceramic and timber.		0.90	42.07					
Light greyish brown slightly silty medium to coarse SAND with rare fine rounded gravel of quartzite. (SHIRDLEY HILL SAND FORMATION)		1.50	41.47					
Firm light greyish brown slightly gravelly sandy CLAY with frequent lenses of light grey orange coarse sand. Gravel is fine to medium angular to subrounded siltstone and quartzite. (GLACIAL TILL)		2.10	40.87					
Firm dark reddish brown mottled light greyish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded quartzite and siltstone. (GLACIAL TILL)		3.00	39.97					
Trial pit complete at 3.00 m bgl.								
Dimensions and Orientation: Length = 1.70 m Width = 0.90 m 				Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.00 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.		
Coordinates: E343770.80 N398777.40		Elevation (mAOD): 42.97		Excavated By: Boundary Plant		Plant Used: JCB- 3CX		Logged: AK Checked: BHO Approved: MY Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP08		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 23/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.15	42.28		1.40	D1	1.40	PID=0.80ppmv
MADE GROUND: Light greyish brown very gravelly cobbly sand. Gravel and cobbles of fine to coarse angular to subangular concrete, brick, quartzite, limestone and rare textile and metal.		0.30	42.13					
MADE GROUND: Orangish brown sandy gravel with occasional cobbles of brick. Sand is medium to coarse. Gravel is fine to coarse angular to subangular brick, slate, sandstone, quartzite, limestone and rare glass.		0.70	41.73					
MADE GROUND: Dark brown slightly silty gravelly sand with occasional cobbles of brick. Sand is coarse. Gravel and cobbles are fine to coarse angular to subangular of brick, limestone, quartzite and rare timber, glass and ceramic.		1.00	41.43					
Light yellowish brown slightly gravelly SAND with occasional pockets of dark brown sand. Sand is fine to coarse. Gravel is medium to coarse of mixed lithologies. (SHIRLDEY HILL SAND FORMATION)		1.50	40.93					
Firm to stiff greenish grey slightly gravelly very sandy CLAY. Sand is coarse. Gravel is medium to coarse subrounded quartzite. (GLACIAL TILL)		2.20	40.23					
Firm, locally soft, reddish brown sandy gravelly CLAY with occasional pockets of greenish clay and orangish brown organic material. Sand is coarse. Gravel is fine to coarse subrounded quartzite. (GLACIAL TILL)		3.00	39.43					
					2.30 - 2.50	B2	2.30 2.50	PID=0.00ppmv HV=57 kPa
Trial pit complete at 3.00 m bgl.								
Dimensions and Orientation: Length = 1.60 m Width = 0.80 m 				Orientation: Inclination: Remarks: 1. Trial pit terminated at 3.00 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343762.61 N398819.59		Elevation (mAOD): 42.43		Excavated By: Boundary Plant		Plant Used: JCB- 3CX		Logged: HJ Checked: BHO Approved: MY Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP09		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 23/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Concrete (reinforced).		0.20	42.54		0.60	ES1	0.60	PID=0.00ppmv
MADE GROUND: Light greyish brown slightly cobbly very gravelly sand with frequent broken bricks. Sand is coarse. Gravel and cobbles are fine to coarse angular to subangular brick, concrete and limestone.		0.40	42.34					
MADE GROUND: Dark orangish brown sandy gravel with occasional pockets of yellowish sand. Sand is coarse. Gravel is fine to coarse brick, slate and limestone.		0.70	42.04					
MADE GROUND: Blackish brown sandy ashy gravel with occasional pockets of organic matter. Sand is coarse. Gravel is fine to coarse brick, concrete, slate, sandstone and slag.		1.10	41.64					
Light brown, mottled blackish brown, slightly gravelly clayey SAND with occasional pockets of light brown sandy clay. Sand is fine to coarse. Gravel is fine to coarse angular to subangular quartzite. (SHIRDLEY HILL SAND FORMATION)		1.70	41.04					
Firm, locally soft, light greyish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to medium angular to subangular quartzite. (GLACIAL TILL)		2.20	40.54					
Firm, locally soft, greyish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded quartzite and sandstone. Rare pockets of organic matter. (GLACIAL TILL)		2.60	40.14					
Trial pit complete at 2.60 m bgl.								
Dimensions and Orientation: Length = 1.40 m Width = 0.80 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 2.60 m bgl. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343732.16 N398794.32		Elevation (mAOD): 42.74		Excavated By: Boundary Plant		Plant Used: JCB- 3CX		Logged: HJ Checked: BHO Approved: MY Scale: 1:30

- | | | | | | | | |
|--|-----------------------------------|--|--------------------------------|----------------------|------------------------|------------------------|-----------------------|
| Coordinates:
E343752.61 N398614.74 | Elevation (mAOD):
41.50 | Excavated By:
Boundary Plant | Plant Used:
JCB- 3CX | Logged:
AK | Checked:
BHO | Approved:
MY | Scale:
1:30 |
|--|-----------------------------------|--|--------------------------------|----------------------|------------------------|------------------------|-----------------------|

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP11		Page: 1 of 1		
		Project: Site 3, Knowsley						
Trial Pit Log		Date: 26/07/2021		Client: Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Asphalt.		0.05	41.21		0.20 - 0.40 0.30	B1 ES1	0.20 0.30	PID=0.00ppmv PID=0.40ppmv
MADE GROUND: Light yellowish brown very sandy gravel. Gravel is medium to coarse angular to subrounded limestone. (SUBBASE)		0.10	41.16					
MADE GROUND: Light grey slightly gravelly ashy fine sand. Gravel is fine to coarse angular to subrounded brick, concrete, quartzite and limestone. Rare metal and mortar fragments.		0.60	40.66					
Trial pit complete at 0.60 m bgl.								
Dimensions and Orientation: Length = 1.60 m Width = 0.60 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 0.60 m bgl due to presence of brick obstruction at base of the trial pit. 2. Groundwater was not encountered during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343723.32 N398621.17	Elevation (mAOD): 41.26	Excavated By: Boundary Plant		Plant Used: JCB- 3CX	Logged: AK	Checked: BHO	Approved: MY	Scale: 1:30

deltasimons Environment - Health & Safety - Sustainability		Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.06		Hole ID: TP12		Page: 1 of 1	
				Project: Site 3, Knowsley					
Trial Pit Log				Date: 26/07/2021		Client: Seybourne Estates			
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details		
					Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Concrete (reinforced).		0.20	41.07	 1.50 1.50	0.25	ES1	0.25	PID=0.50ppmv	
MADE GROUND: Reddish brown locally dark greyish brown very sandy ashy gravel. Gravel is fine to coarse angular to subrounded concrete, brick, slate, clinker, limestone and quartzite. Rare metal and ceramic fragments.		0.40	40.87						
Light brown slightly silty medium to coarse SAND with lenses of dark brown weakly cemented silty sand. (SHIRDLEY HILL SAND FORMATION)		0.90	40.37		0.70	D1	0.70	PID=0.90ppmv	
Dark brown locally orangish brown slightly silty coarse SAND with frequent pockets of decayed wood fragments. (SHIRDLEY HILL SAND FORMATION)		1.60	39.67						
Light greyish brown coarse SAND. (SHIRDLEY HILL SAND FORMATION)		1.80	39.47		1.85	D2	1.85	PID=1.40ppmv	
Blackish brown plastic pseudo-fibrous PEAT. (SHIRDLEY HILL SAND FORMATION)		1.90	39.37						
Firm light blueish grey slightly gravelly sandy CLAY with lenses of dark brown slightly silty coarse sand. Gravel is fine to coarse subangular siltstone and quartzite. (GLACIAL TILL)		2.30	38.97		2.10 - 2.20	B2	2.10 2.20	PID=0.10ppmv HV=64 kPa	
Firm reddish brown mottled light grey slightly gravelly slightly sandy CLAY with lenses of orangish brown medium to coarse sand. Gravel is fine to coarse subangular to subrounded quartzite. (GLACIAL TILL)		3.00	38.27						2.50
Trial pit complete at 3.00 m bgl.									
Dimensions and Orientation:				Orientation:		Remarks: 1. Trial pit terminated at 3.00 m bgl. 2. Slight groundwater seepage at 1.50 m bgl during excavation. 3. Trial pit stable during excavation. 4. Trial pit backfilled with arisings upon completion. 5. Trial pit logged in general accordance with BS5930:2015+A1:2020.			
Length = 1.80 m Width = 0.70 m 				Inclination:					
Coordinates: E343702.65 N398633.87	Elevation (mAOD): 41.27	Excavated By: Boundary Plant	Plant Used: JCB- 3CX		Logged: AK	Checked: BHO	Approved: MY	Scale: 1:30	



Laboratory Report



Contract Number: 54652

Client Ref: **19-0654.06**

Report Date: **26-07-2021**

Client PO:

Client **Delta Simons**
20 Little Britain,
London,
EC1A 7DH

Contract Title: **Site 3, Image Business Park, Knowsley**
For the attention of: **Ben Osborne**

Date Received: **24-06-2021**

Date Completed: **26-07-2021**

Test Description	Qty
Determination of the in-situ California Bearing Ratio Rate includes mobilisation of technician and 4 x 4 and provision of equipment. BS 1377:1990 - Part 9 Cl 4.3 - * UKAS	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

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 except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)

Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Administrative Assistant / Health and Safety)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk



**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP06

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

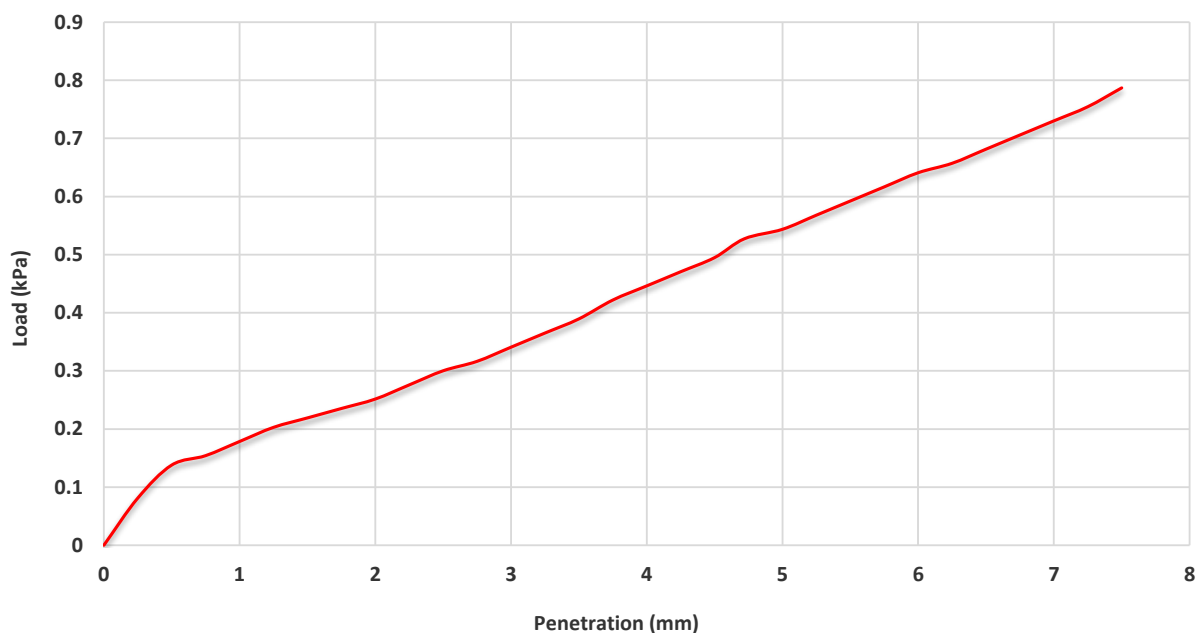
0.50

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

2.7

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

9.0

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021





**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP07

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

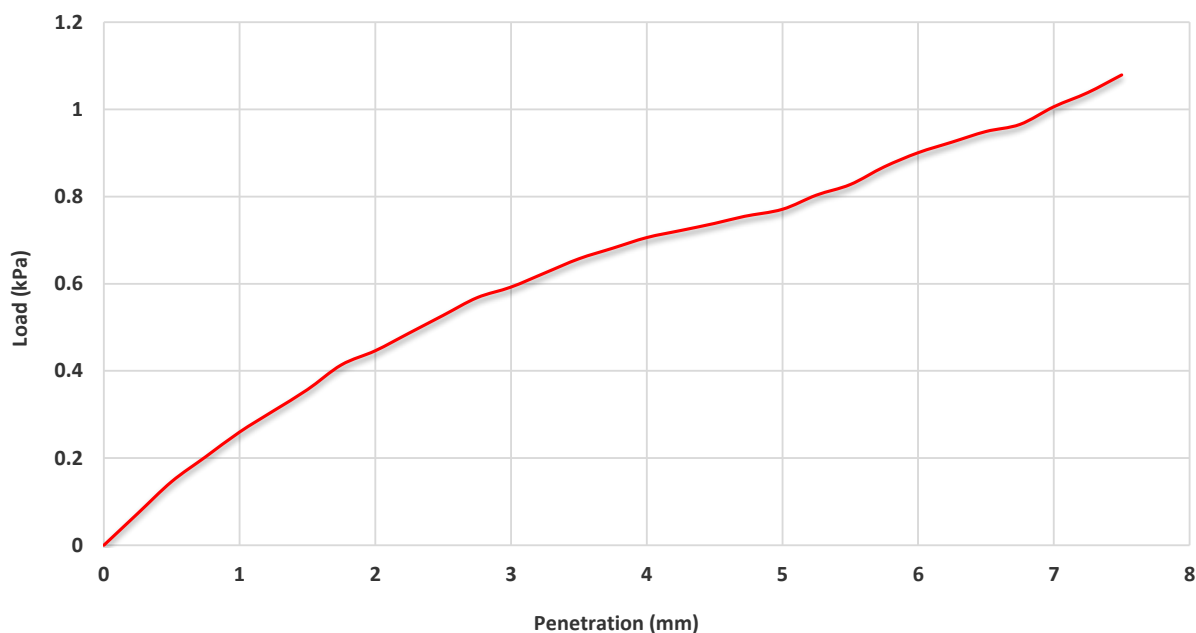
0.50

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

4.0

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

7.9

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021





**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP08

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

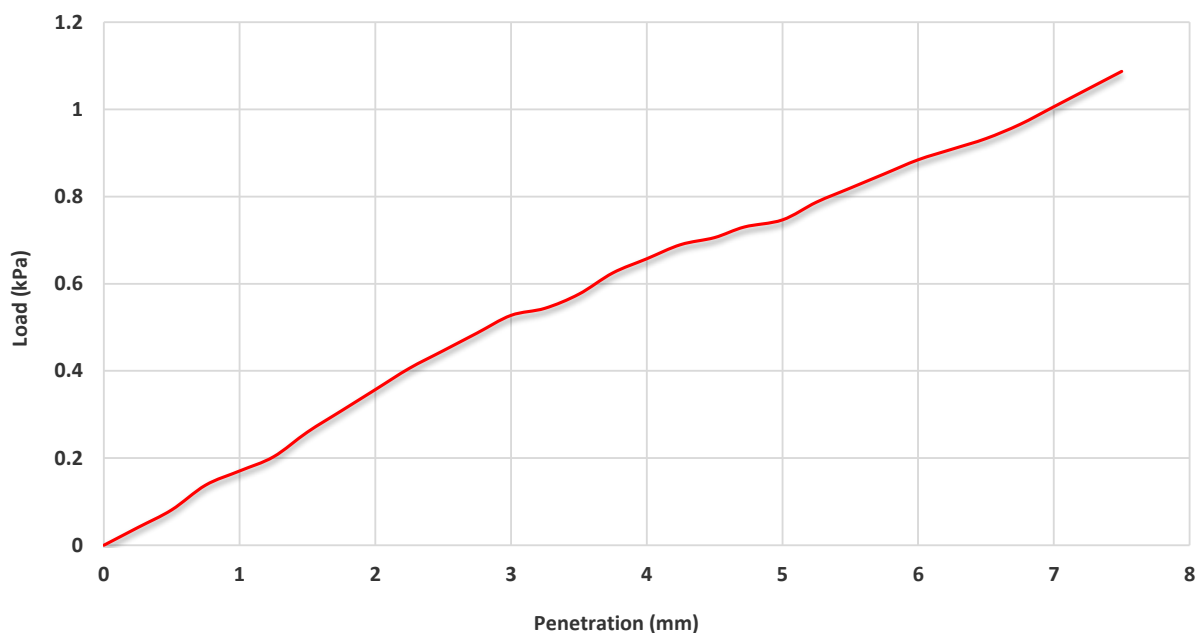
0.40

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

3.7

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

15

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021





**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP09

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

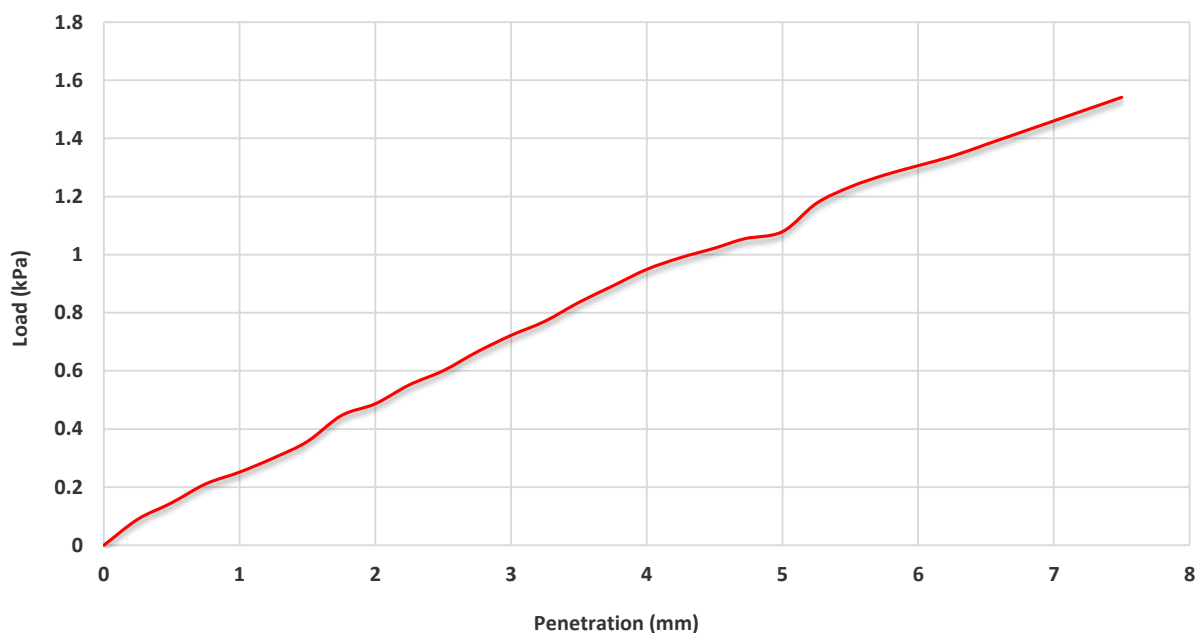
0.40

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

5.4

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

8.3

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021





**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP10

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

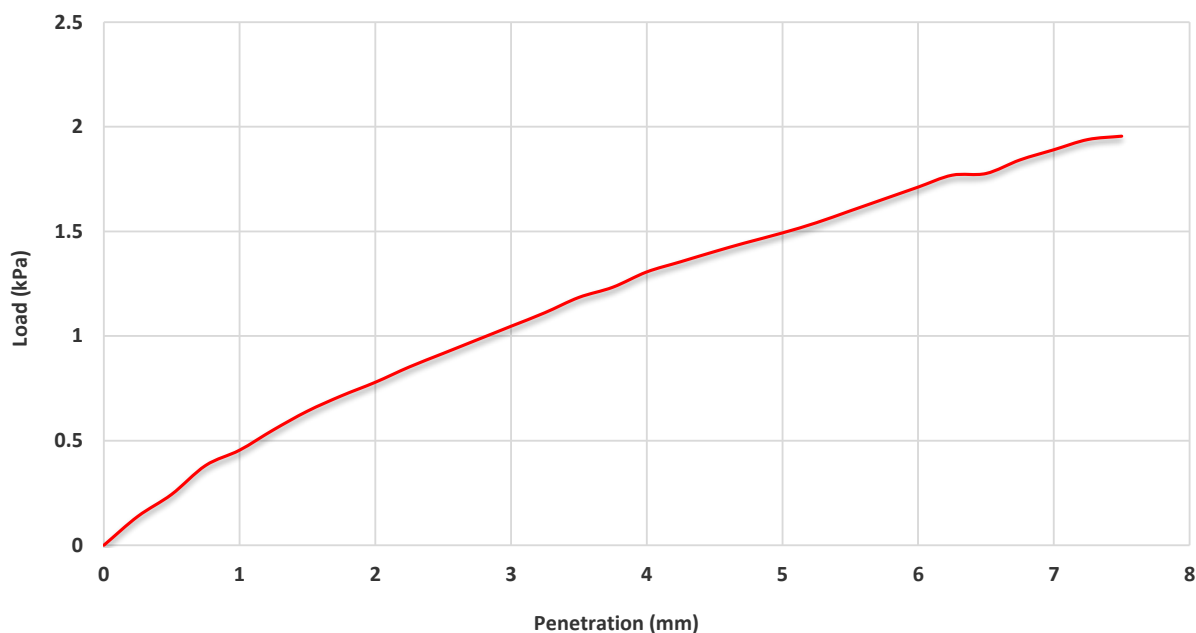
0.50

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

7.5

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

12

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021





**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP11

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

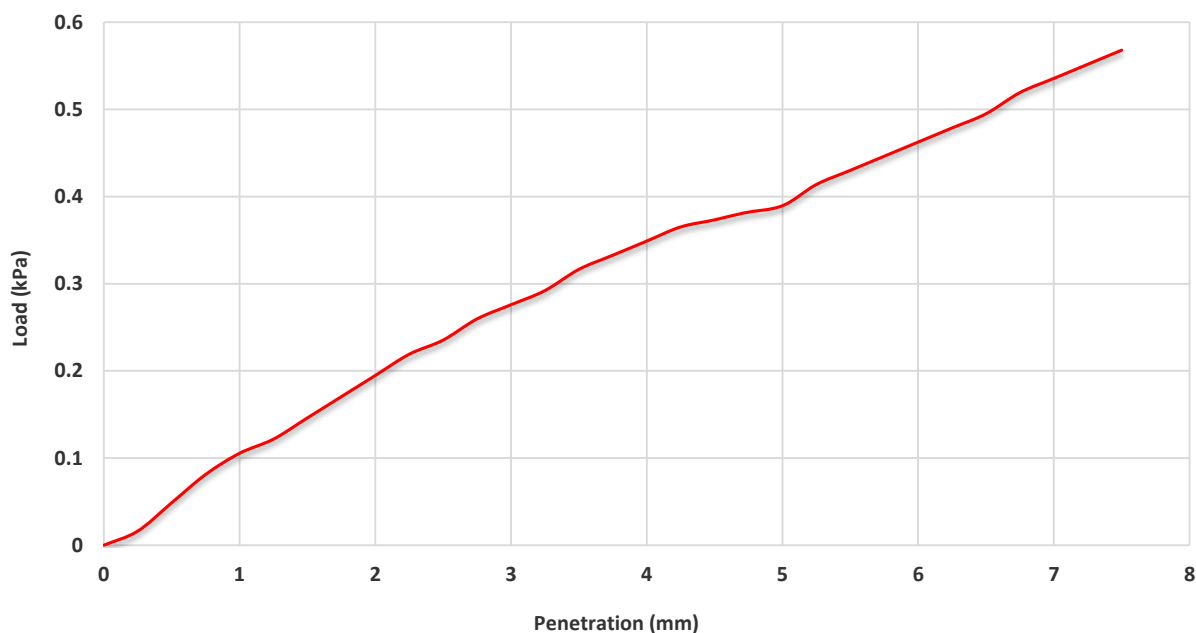
0.80

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

1.9

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

11

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021





**Determination of the Insitu California Bearing Ratio
BS 1377: Part 9: 1990 Clause 4.3**

Contract Number

54652

Client Reference

19-0654.06

Client

Delta Simons

Test Date

23/07/2021

Site Location

Site 3, Image Business Park, Knowsley

Test Location

TP12

Sampling Method

BS 1377-1:1990 General requirements and sample preparation

Test Depth (m)

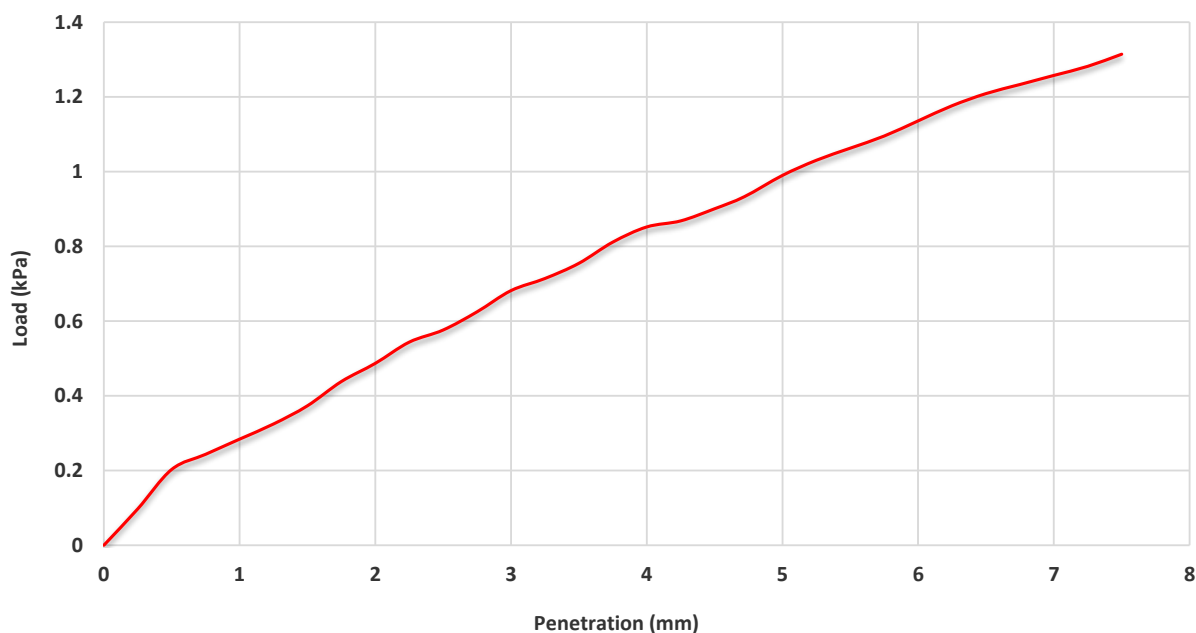
0.50

Soil Description

Brown clayey gravelly SILT.

Kentledge Type

JCB



**C.B.R Value
%**

4.9

Weather Conditions

Sunny

Surcharge (kg)

9

Material Above 20mm (est.)

N/A

Moisture Content (%)

11

Remarks:

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.

Test Operator

Checked and Authorised by

Shaun Thomas

Shaun Thomas

Date

30/07/2021



SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK LTD)
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP
UNITED KINGDOM

SPT Hammer Ref : GPK 005
Test Date : 09/11/20
Report Date : 12/11/20
File Name : 005:GPK
Test Operator : KS

Instrumented Rod Data

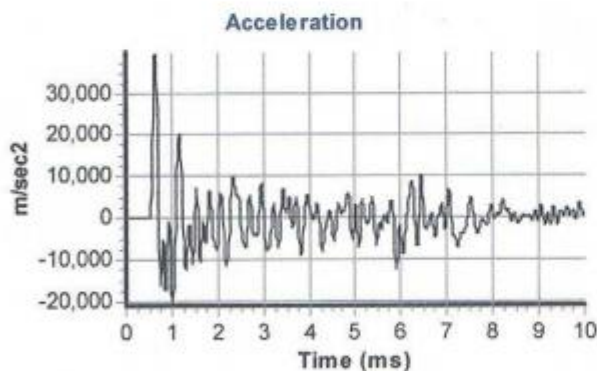
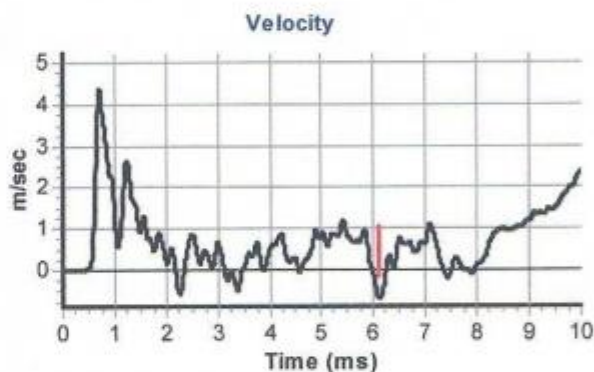
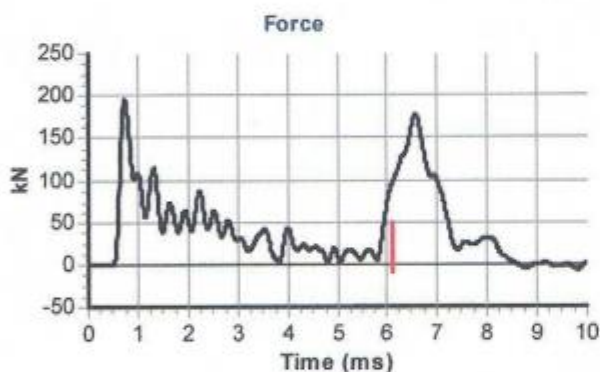
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.1
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 7080
Accelerometer No.2: 7079

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 13.0

Comments / Location

Geospek, New Archway front end



Calculations

Area of Rod A (mm²): 918
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 335

Energy Ratio E_r (%):

71

Signed: K.MCDONALD

Title: SALES ENGINEER

The recommended calibration interval is 12 months

Appendix D – Geotechnical Analysis Results



TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 22/07/2021
Date Received: 27/07/2021
Date Tested: 13/08/2021
Sampled By: Client - BHO

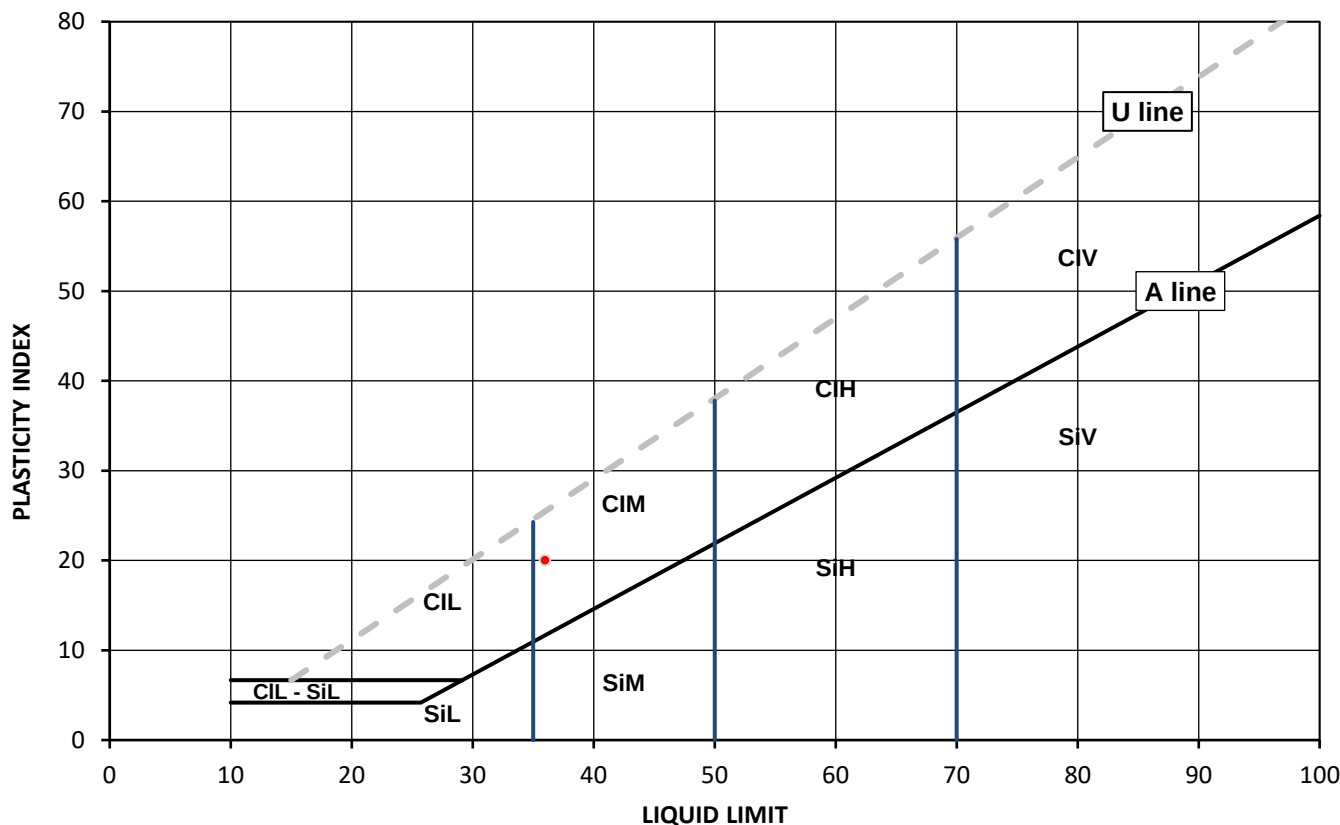
Test Results:

Laboratory Reference: 1966164
Hole No.: DS04
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 2.50
Depth Base [m]: 2.70
Sample Type: C

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	36	16	20	90



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

Date Reported: 20/08/2021

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TEST CERTIFICATE

Liquid and Plastic Limits

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Northampton NN4 7EB



Environmental Science

4041

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Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 23/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

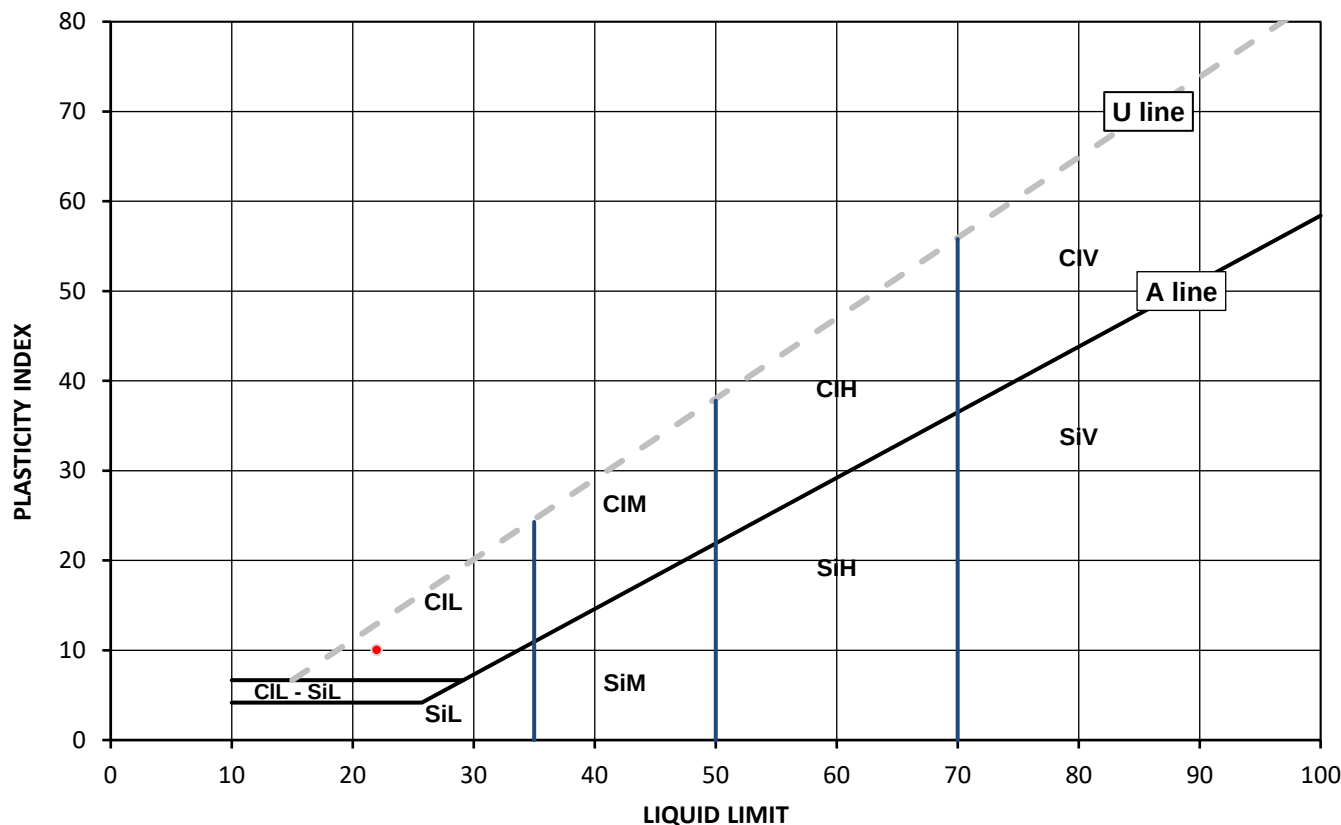
Test Results:

Laboratory Reference: 1966165
Hole No.: DS06
Sample Reference: Not Given
Soil Description: Brown slightly gravelly clayey SAND

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	22	12	10	93



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

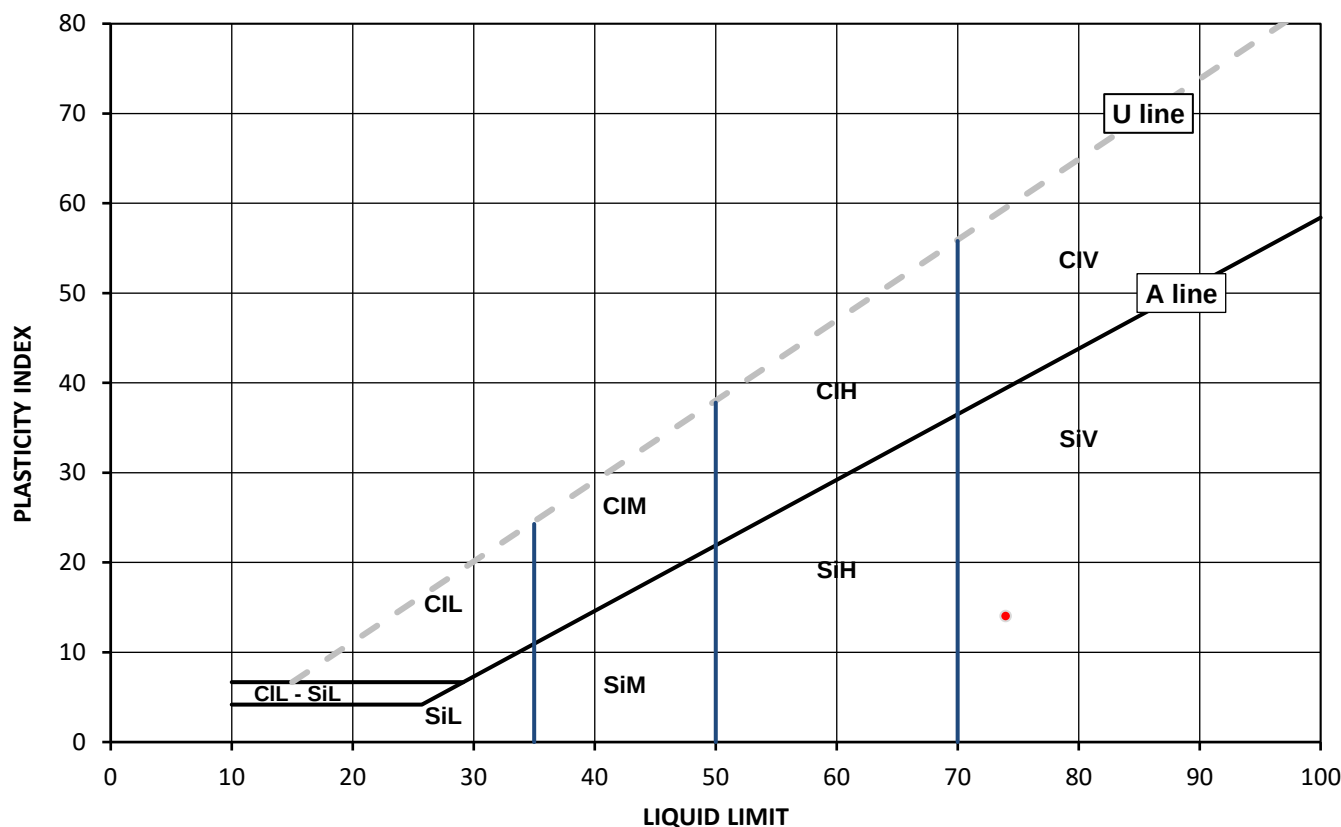
Test Results:

Laboratory Reference: 1966166
Hole No.: DS07
Sample Reference: Not Given
Soil Description: Black slightly gravelly silty CLAY

Depth Top [m]: 1.40
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
62	74	60	14	97



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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Environmental Science

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Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

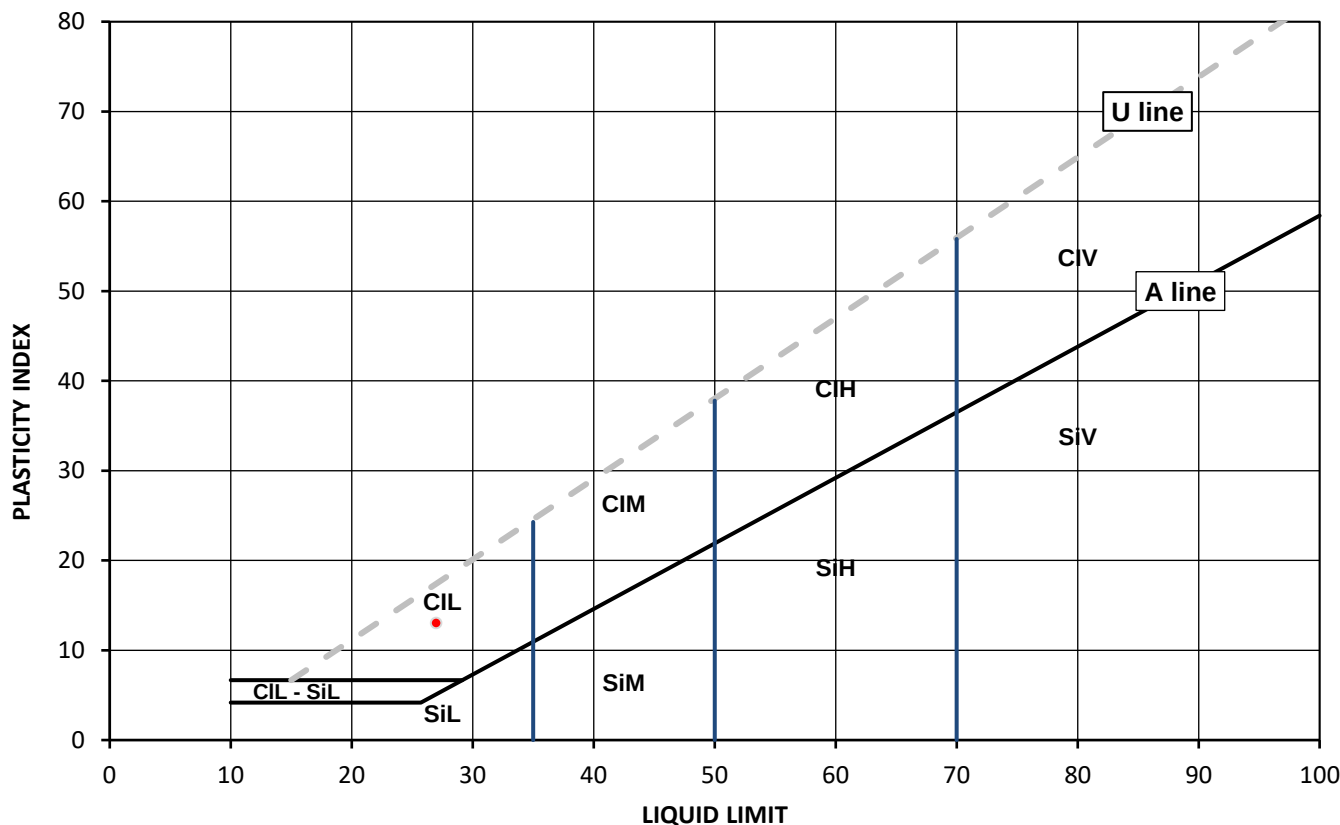
Test Results:

Laboratory Reference: 1966169
Hole No.: TP01
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: C

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	27	14	13	97



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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Environmental Science

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Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

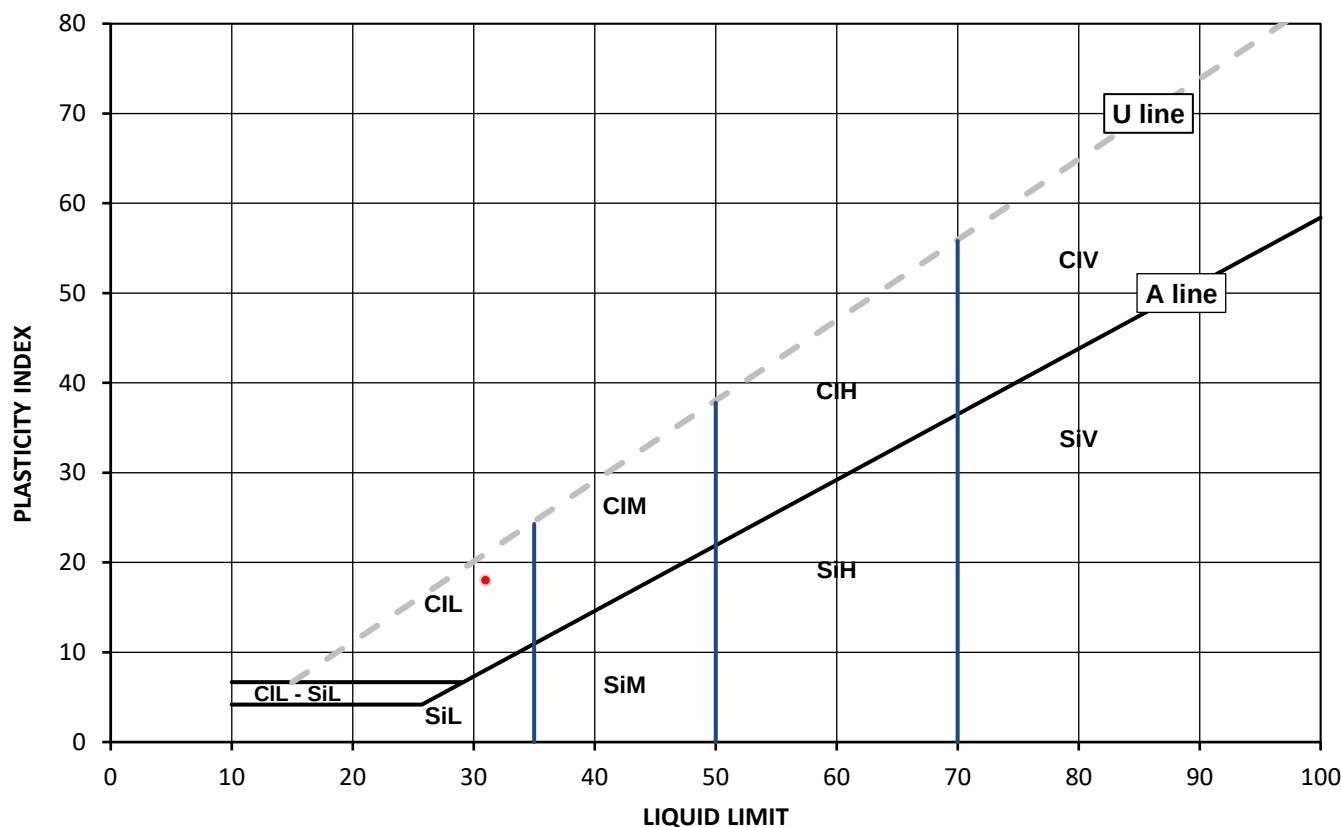
Test Results:

Laboratory Reference: 1966171
Hole No.: TP03
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
18	31	13	18	95



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

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Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
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Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 23/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

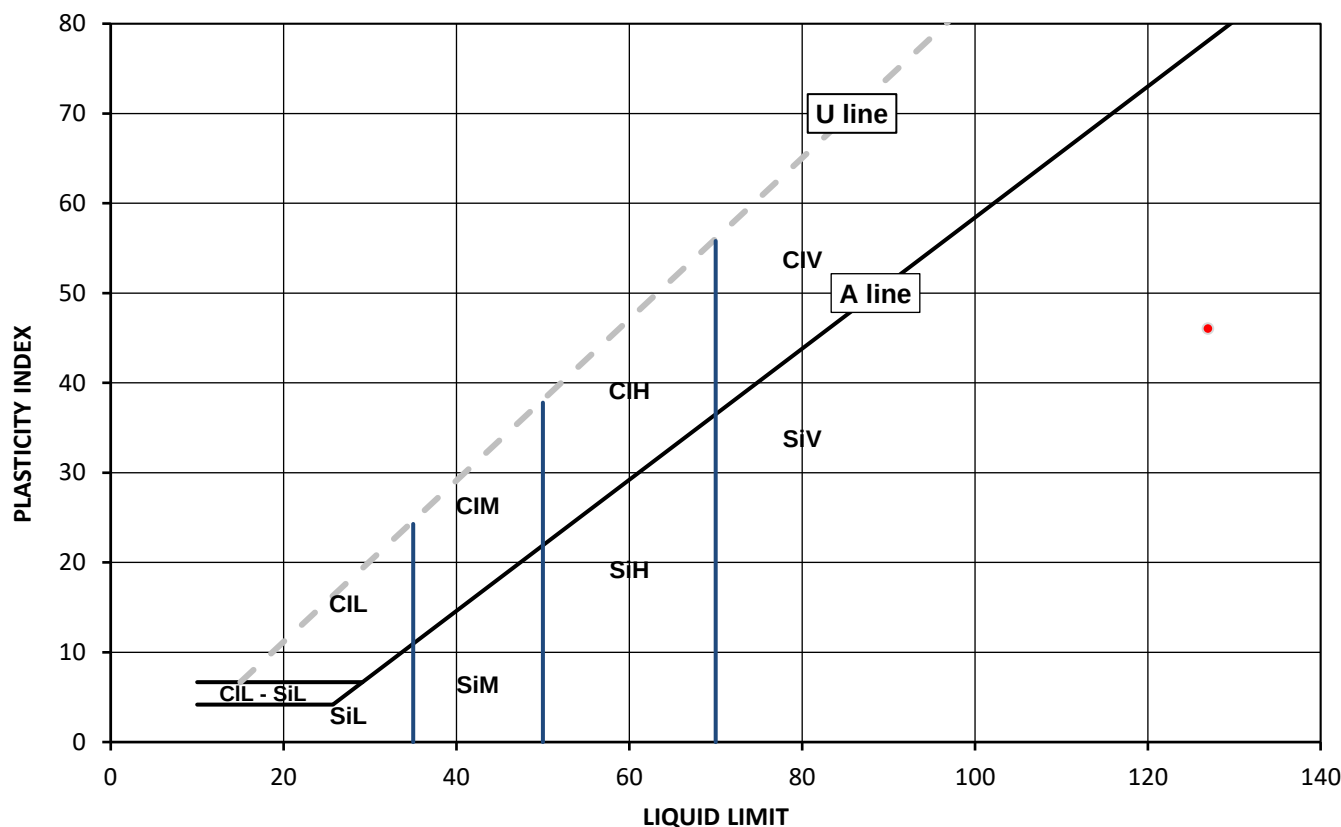
Test Results:

Laboratory Reference: 1966177
Hole No.: TP06
Sample Reference: Not Given
Soil Description: Black slightly gravelly organic CLAY

Depth Top [m]: 0.55
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
102	127	81	46	99



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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Environmental Science

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

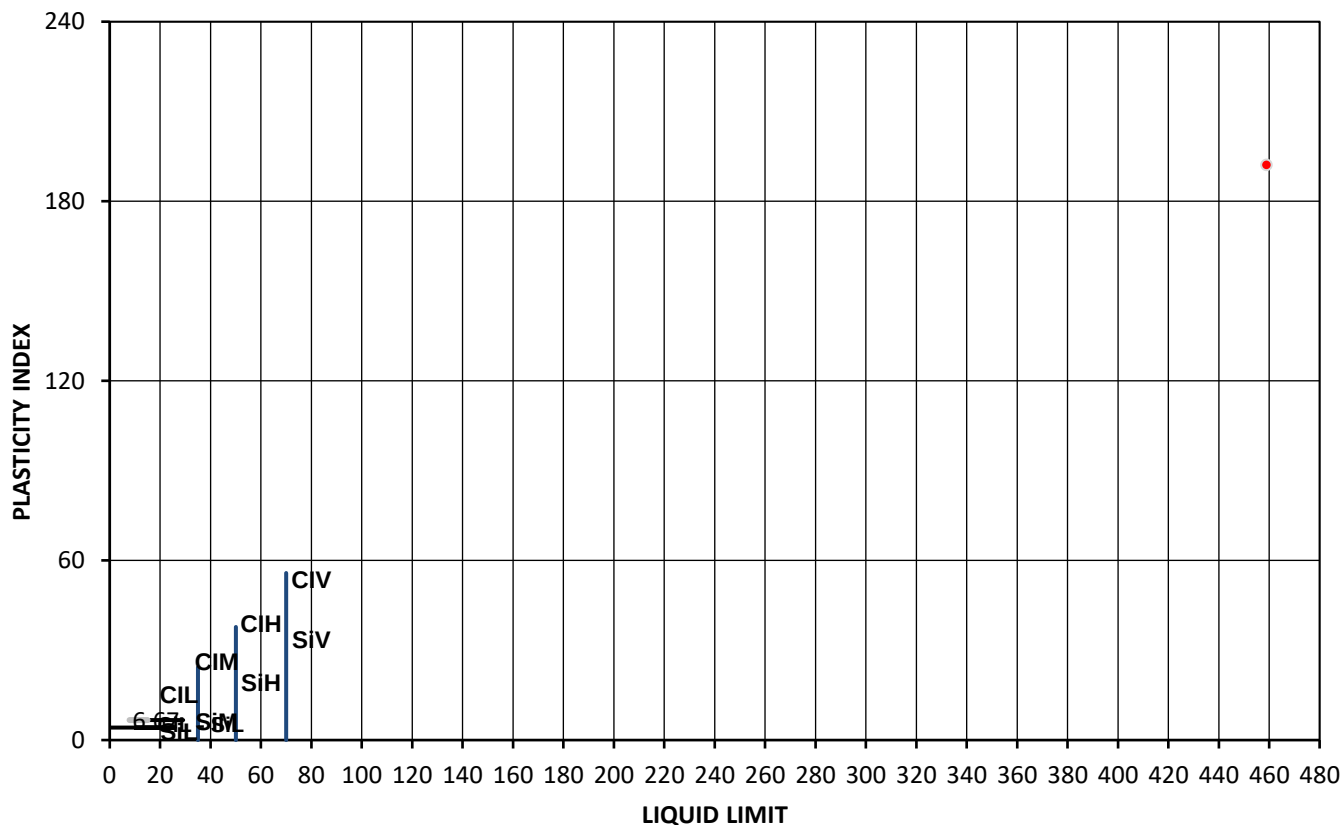
Test Results:

Laboratory Reference: 1966184
Hole No.: TP12
Sample Reference: Not Given
Soil Description: Black PEAT

Depth Top [m]: 1.85
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
407	459	267	192	100



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

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Environmental Science

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Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 23/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

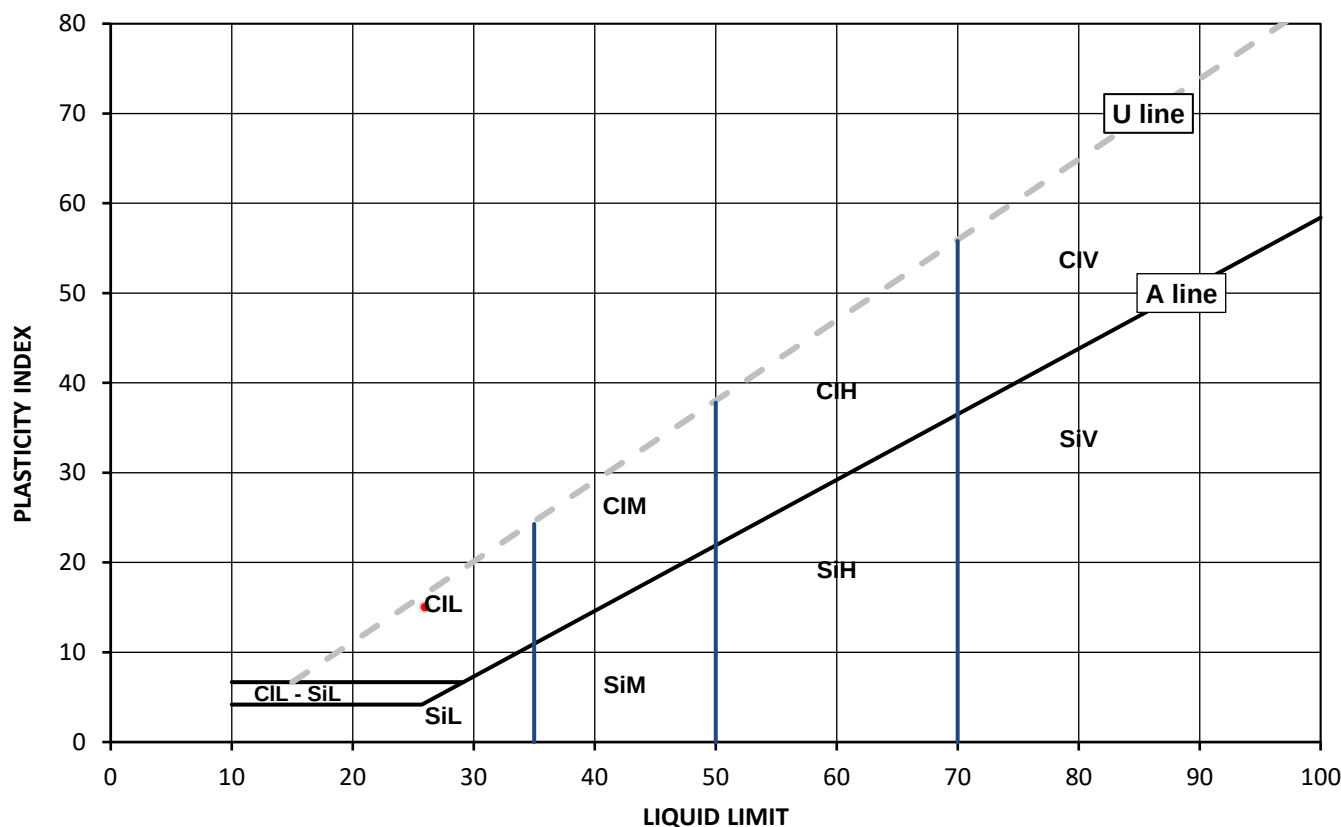
Test Results:

Laboratory Reference: 1966186
Hole No.: BH01
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 6.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
12	26	11	15	98



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

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Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 27/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

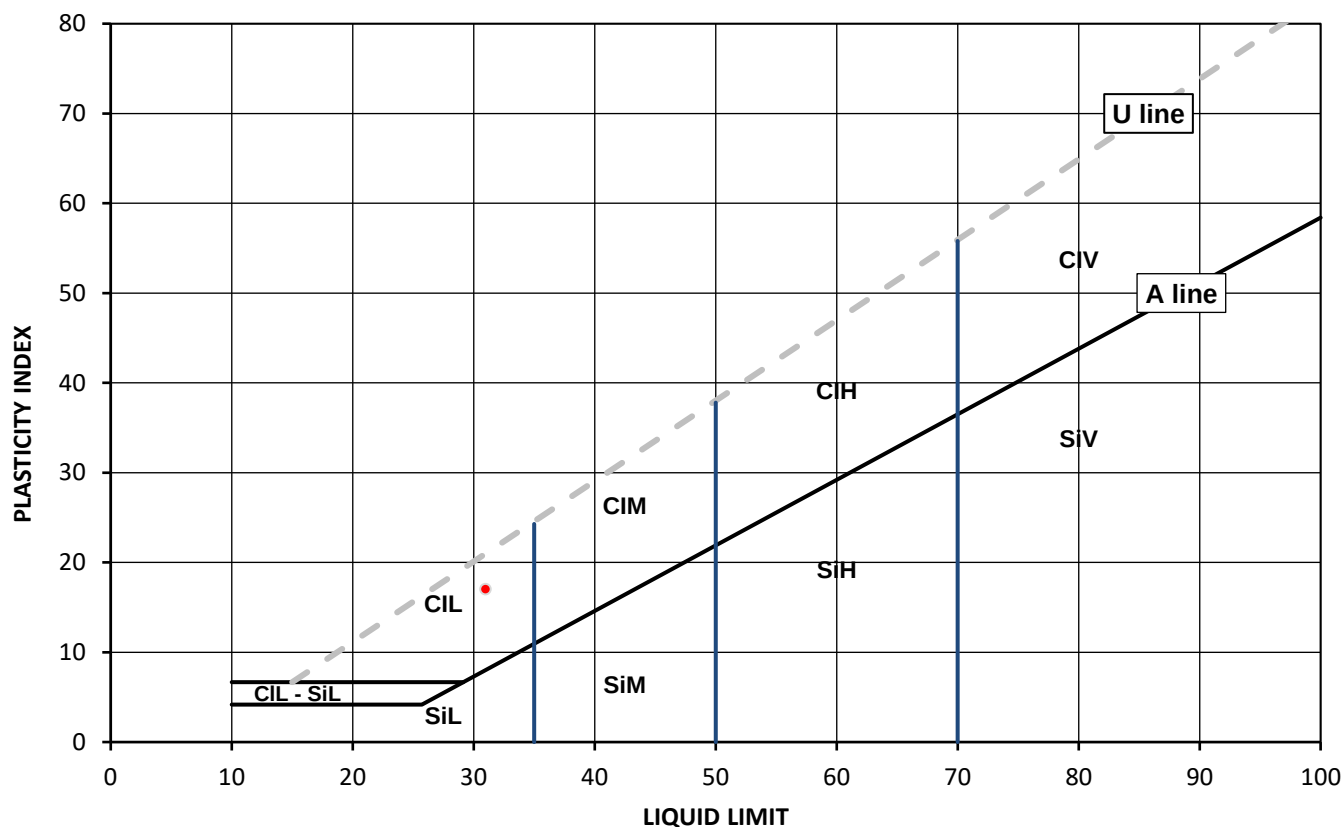
Test Results:

Laboratory Reference: 1966189
Hole No.: BH04
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 4.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
15	31	14	17	98



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 28/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

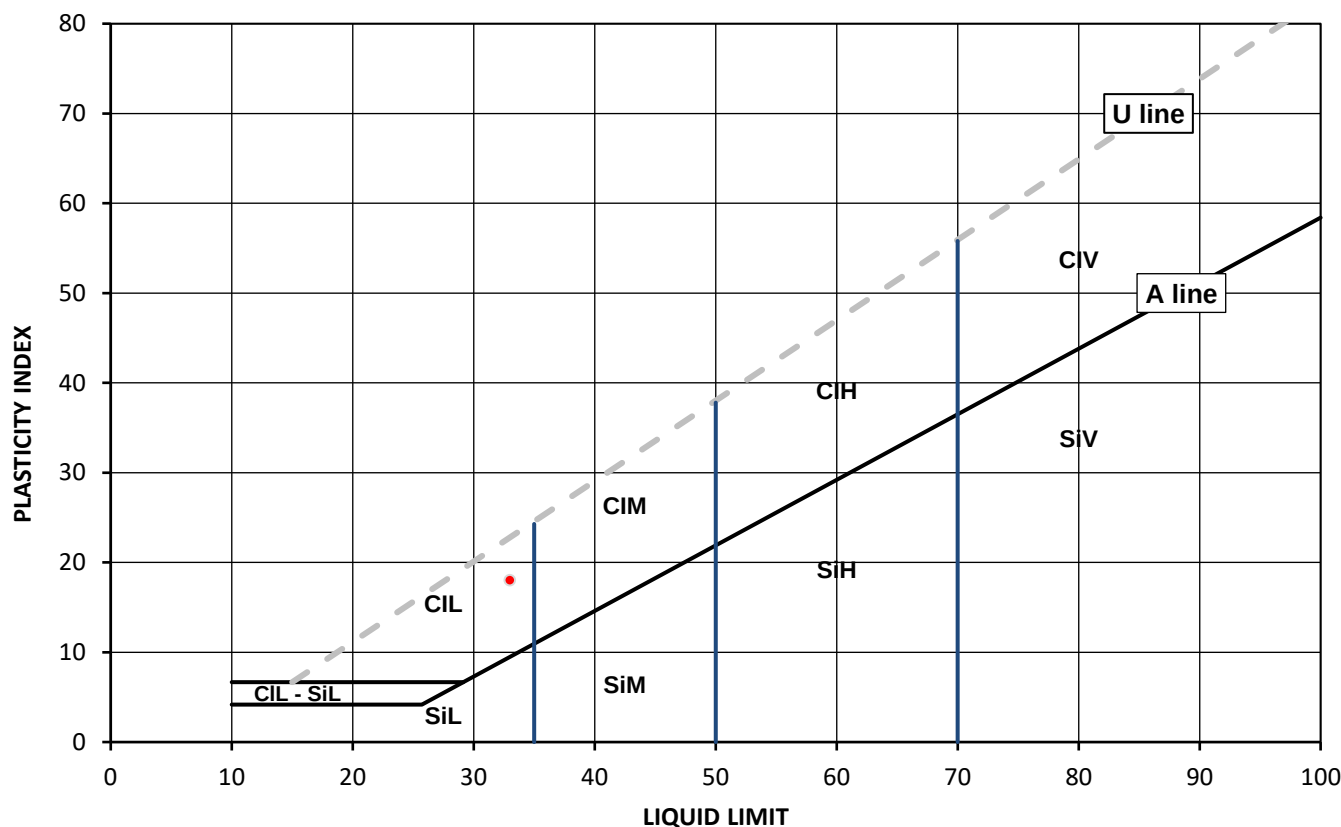
Test Results:

Laboratory Reference: 1966192
Hole No.: BH06
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 5.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	33	15	18	97



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 29/07/2021
Date Received: 27/07/2021
Date Tested: 14/08/2021
Sampled By: Client - BHO

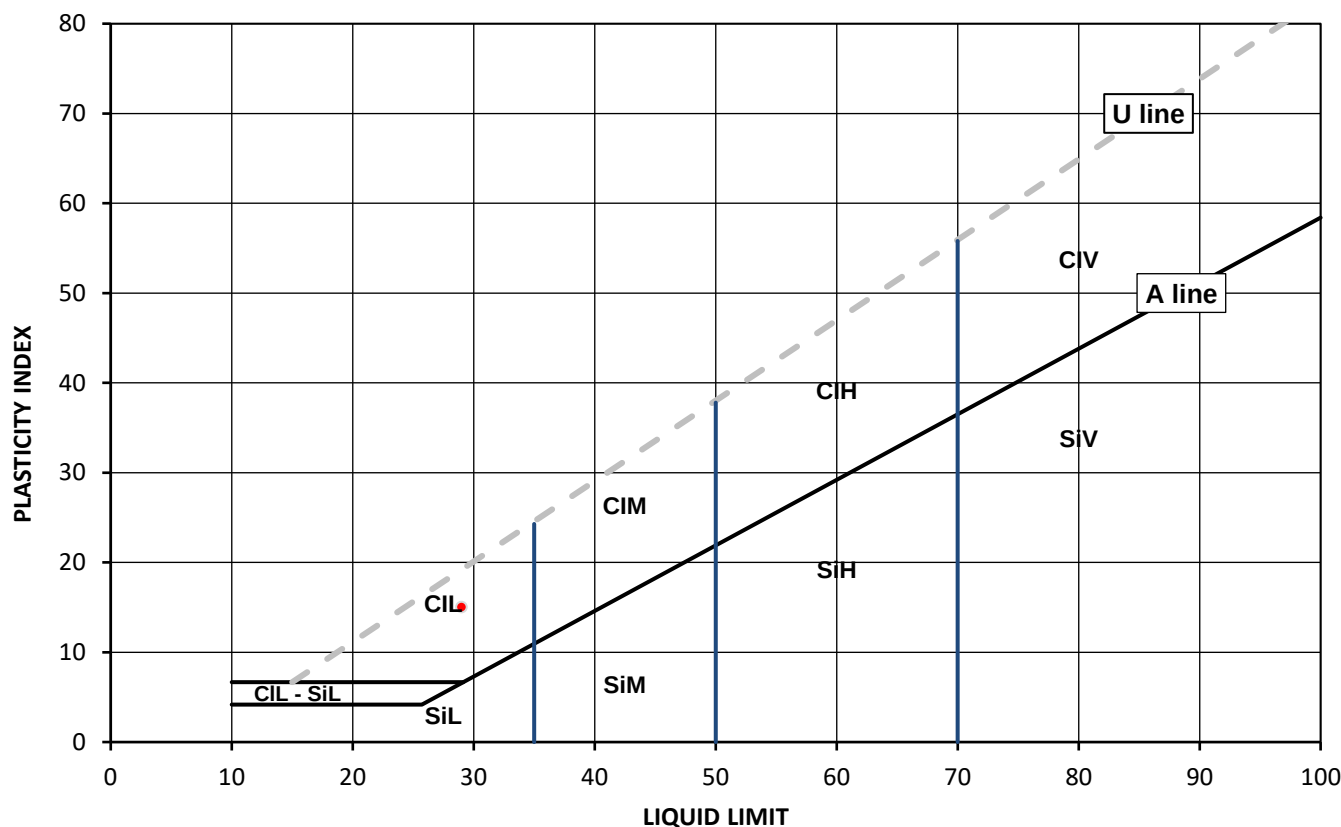
Test Results:

Laboratory Reference: 1966193
Hole No.: BH07
Sample Reference: Not Given
Soil Description: Reddish brown slightly gravelly very sandy CLAY

Depth Top [m]: 4.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	29	14	15	99



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

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

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

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

Client: Delta-Simons
 Client Address: The Colmore Building, 20 Colmore Circus
 Queensway,
 Birmingham, B4 6AT
 Contact: Ben Osborne
 Site Address: Site 3, Knowsley

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

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



Environmental Science

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 22/07 - 29/07/2021

Date Received: 27/07/2021

Date Tested: 13/08 - 14/08/2021

Sampled By: Client - BHO

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m															
1966186	BH01	Not Given	6.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	12		98	26	11	15						
1966189	BH04	Not Given	4.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	15		98	31	14	17						
1966192	BH06	Not Given	5.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	17		97	33	15	18						
1966193	BH07	Not Given	4.50	Not Given	D	Reddish brown slightly gravelly very sandy CLAY	Atterberg 1 Point	14		99	29	14	15						
1966164	DS04	Not Given	2.50	2.70	C	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	14		90	36	16	20						
1966165	DS06	Not Given	1.50	Not Given	D	Brown slightly gravelly clayey SAND	Atterberg 1 Point	16		93	22	12	10						
1966166	DS07	Not Given	1.40	Not Given	D	Black slightly gravelly silty CLAY	Atterberg 1 Point	62		97	74	60	14						
1966169	TP01	Not Given	3.00	Not Given	C	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	19		97	27	14	13						
1966171	TP03	Not Given	0.70	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	18		95	31	13	18						
1966177	TP06	Not Given	0.55	Not Given	D	Black slightly gravelly organic CLAY	Atterberg 1 Point	102		99	127	81	46						

Note: # Non accredited; NP - Non plastic

Comments: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
 PL Deputy Head of Geotechnical Section
 for and on behalf of i2 Analytical Ltd

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4041

Client: Delta-Simons
 Client Address: The Colmore Building, 20 Colmore Circus
 Queensway,
 Birmingham, B4 6AT
 Contact: Ben Osborne
 Site Address: Site 3, Knowsley

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN
 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test),
 Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

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



Environmental Science

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 26/07/2021

Date Received: 27/07/2021

Date Tested: 14/08/2021

Sampled By: Client - BHO

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1966184	TP12	Not Given	1.85	Not Given	D	Black PEAT	Atterberg 1 Point	407		100	459	267	192						

Note: # Non accredited; NP - Non plastic

Comments: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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 PL Deputy Head of Geotechnical Section
 for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

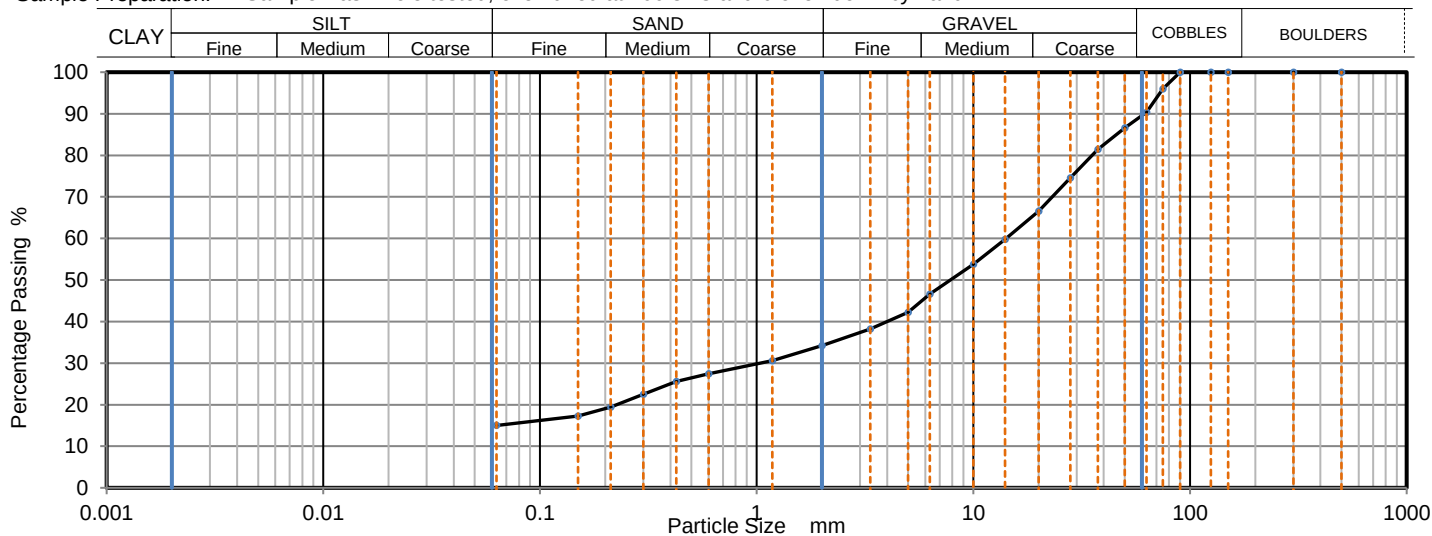
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 16/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966168
Hole No.: TP01
Sample Reference: Not Given
Sample Description: Greyish brown sandy GRAVEL with fragments of brick, concrete
Sample Preparation: Sample was whole tested, oven dried at 106.3 °C and broken down by hand.

Depth Top [m]: 0.60
Depth Base [m]: 0.80
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	96		
63	90		
50	87		
37.5	81		
28	75		
20	67		
14	60		
10	54		
6.3	47		
5	42		
3.35	38		
2	34		
1.18	31		
0.6	27		
0.425	26		
0.3	23		
0.212	19		
0.15	17		
0.063	16		

Sample Proportions	% dry mass
Very coarse	10
Gravel	56
Sand	18
Fines <0.063mm	16

Grading Analysis	
D100	mm 90
D60	mm 14.2
D30	mm 1.03
D10	mm
Uniformity Coefficient	> 220
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
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TEST CERTIFICATE

Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

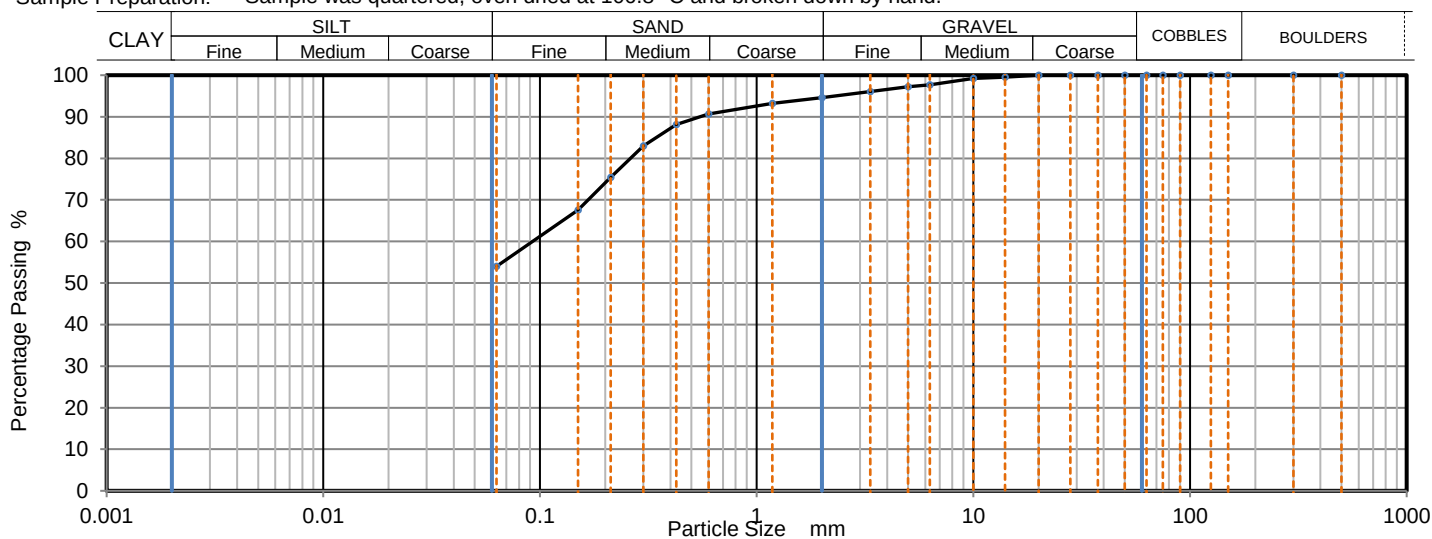
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 16/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966172
Hole No.: TP03
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 106.8 °C and broken down by hand.

Depth Top [m]: 1.50
Depth Base [m]: 1.70
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	98		
5	97		
3.35	96		
2	95		
1.18	93		
0.6	91		
0.425	88		
0.3	83		
0.212	75		
0.15	68		
0.063	55		

Sample Proportions	% dry mass
Very coarse	0
Gravel	5
Sand	40
Fines <0.063mm	55

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 1.4
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
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TEST CERTIFICATE

Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

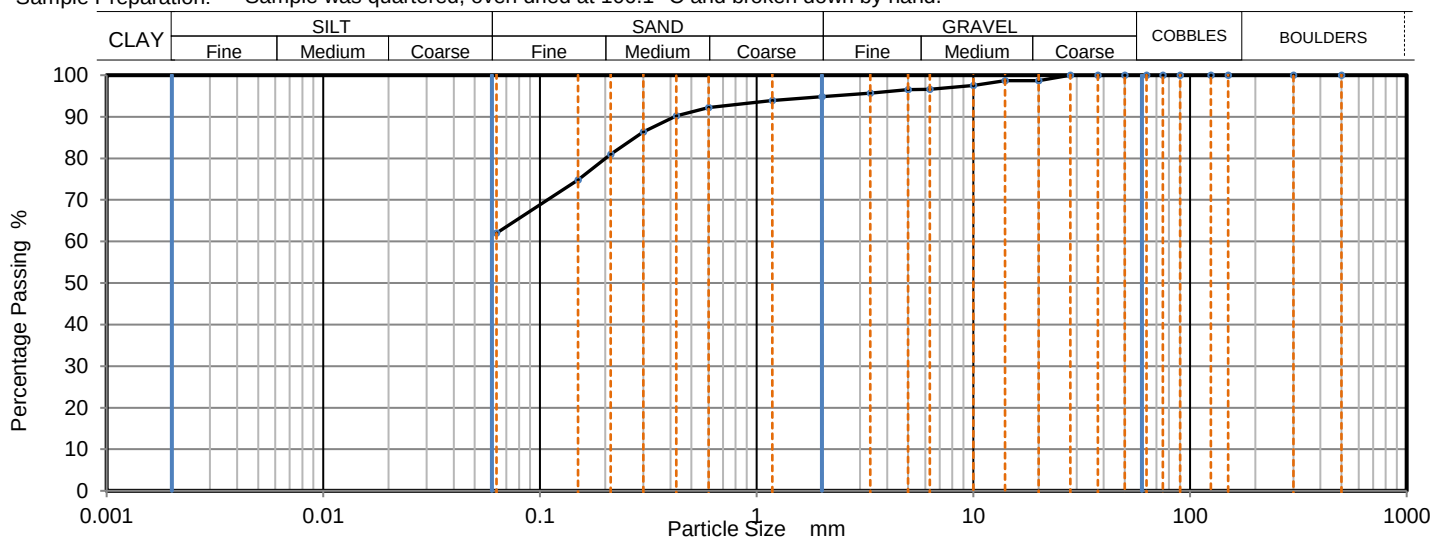
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 16/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966173
Hole No.: TP04
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 2.20
Depth Base [m]: 2.40
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	99		
10	98		
6.3	97		
5	97		
3.35	96		
2	95		
1.18	94		
0.6	92		
0.425	90		
0.3	86		
0.212	81		
0.15	75		
0.063	62		

Sample Proportions	% dry mass
Very coarse	0
Gravel	5
Sand	32
Fines <0.063mm	62

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	N/A
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

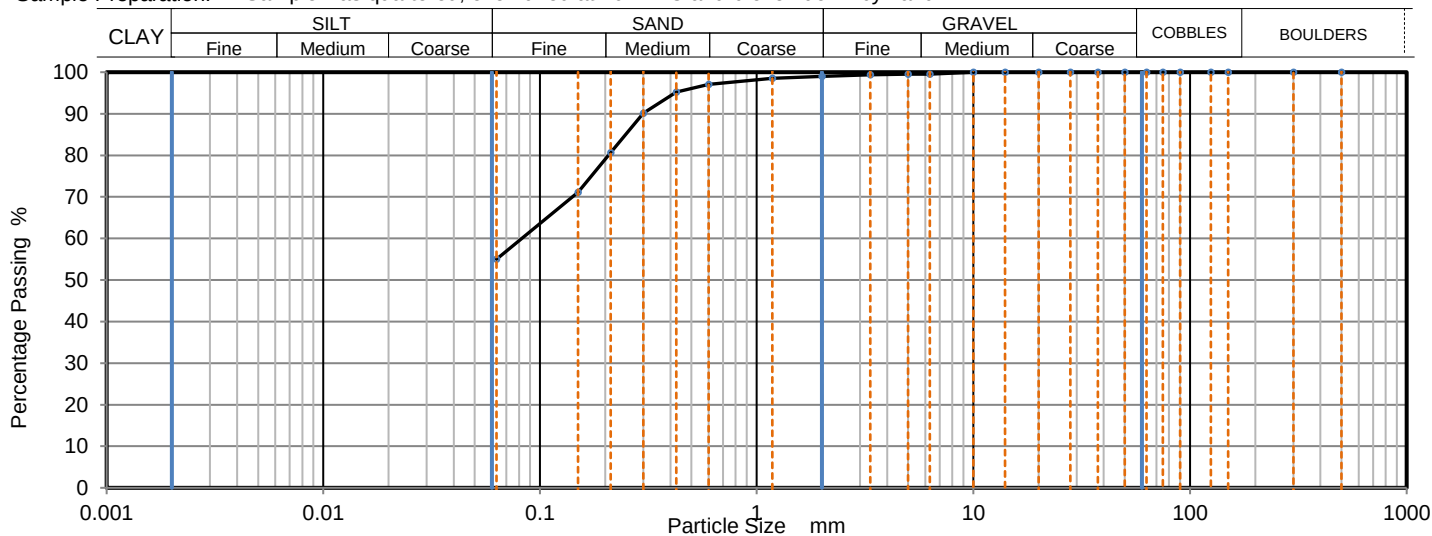
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 16/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966175
Hole No.: TP05
Sample Reference: Not Given
Sample Description: Grey slightly gravelly very sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 107.7 °C and broken down by hand.

Depth Top [m]: 1.20
Depth Base [m]: 1.40
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	99		
0.6	97		
0.425	95		
0.3	90		
0.212	81		
0.15	71		
0.063	55		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	44
Fines <0.063mm	55

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 1.3
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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TEST CERTIFICATE

Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

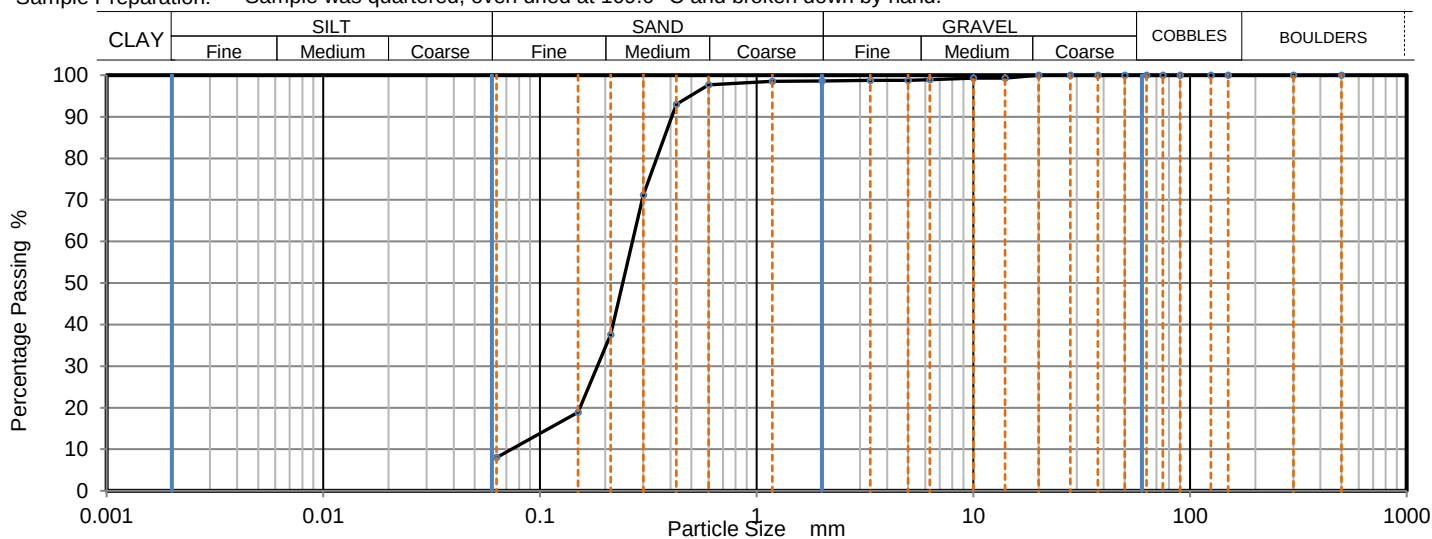
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 23/07/2021
Date Received: 27/07/2021
Date Tested: 12/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966178
Hole No.: TP06
Sample Reference: Not Given
Sample Description: Dark brown slightly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 0.70
Depth Base [m]: 0.90
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	99		
0.6	98		
0.425	93		
0.3	71		
0.212	38		
0.15	19		
0.063	9		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	90
Fines <0.063mm	9

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

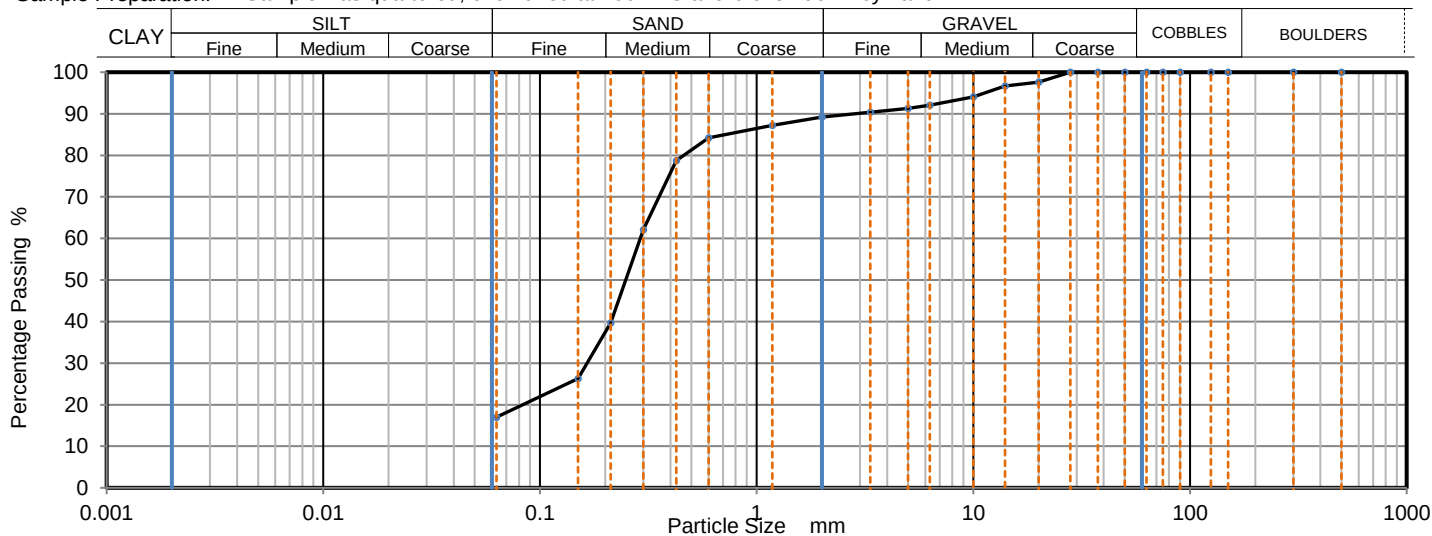
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 23/07/2021
Date Received: 27/07/2021
Date Tested: 12/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966181
Hole No.: TP09
Sample Reference: Not Given
Sample Description: Dark brown gravelly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.2 °C and broken down by hand.

Depth Top [m]: 0.80
Depth Base [m]: 1.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	97		
10	94		
6.3	92		
5	91		
3.35	90		
2	89		
1.18	87		
0.6	84		
0.425	79		
0.3	62		
0.212	40		
0.15	26		
0.063	18		

Sample Proportions	% dry mass
Very coarse	0
Gravel	11
Sand	72
Fines <0.063mm	18

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 4.6
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
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TEST CERTIFICATE

Particle Size Distribution

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

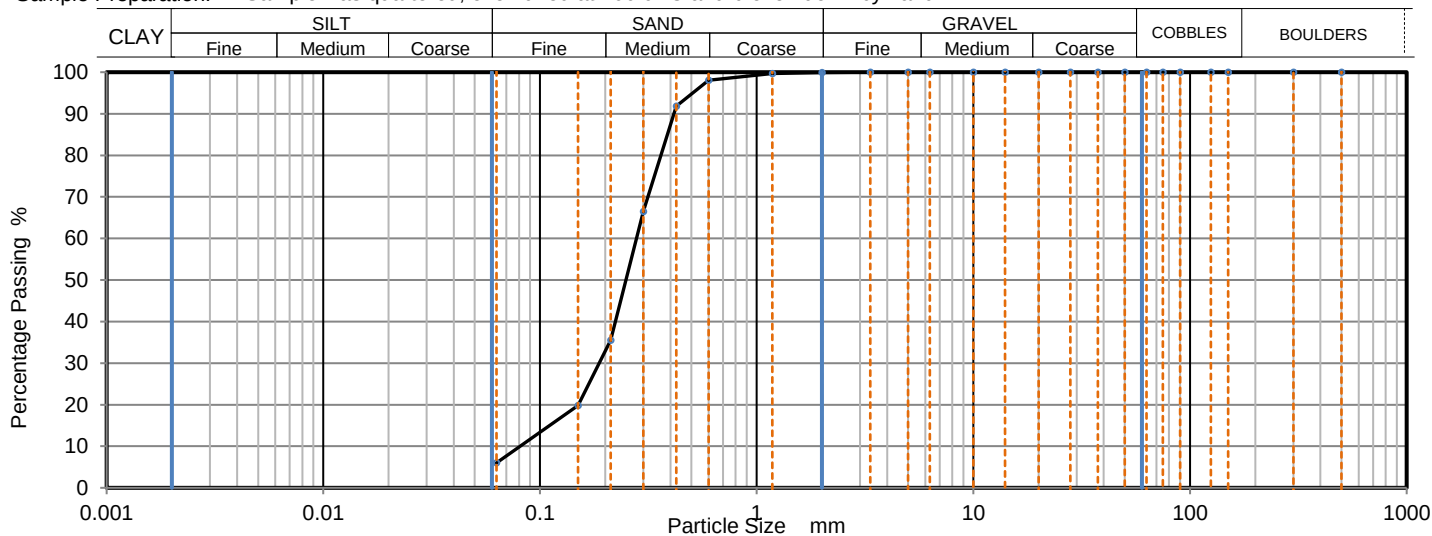
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 12/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966183
Hole No.: TP12
Sample Reference: Not Given
Sample Description: Dark brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 1.30
Depth Base [m]: 1.50
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	98		
0.425	92		
0.3	67		
0.212	36		
0.15	20		
0.063	7		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	93
Fines <0.063mm	7

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	3.6
Curvature Coefficient	1.6

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Dry Density / Moisture Content****Relationship Light Compaction**Tested in Accordance with:
BS 1377-4: 1990i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

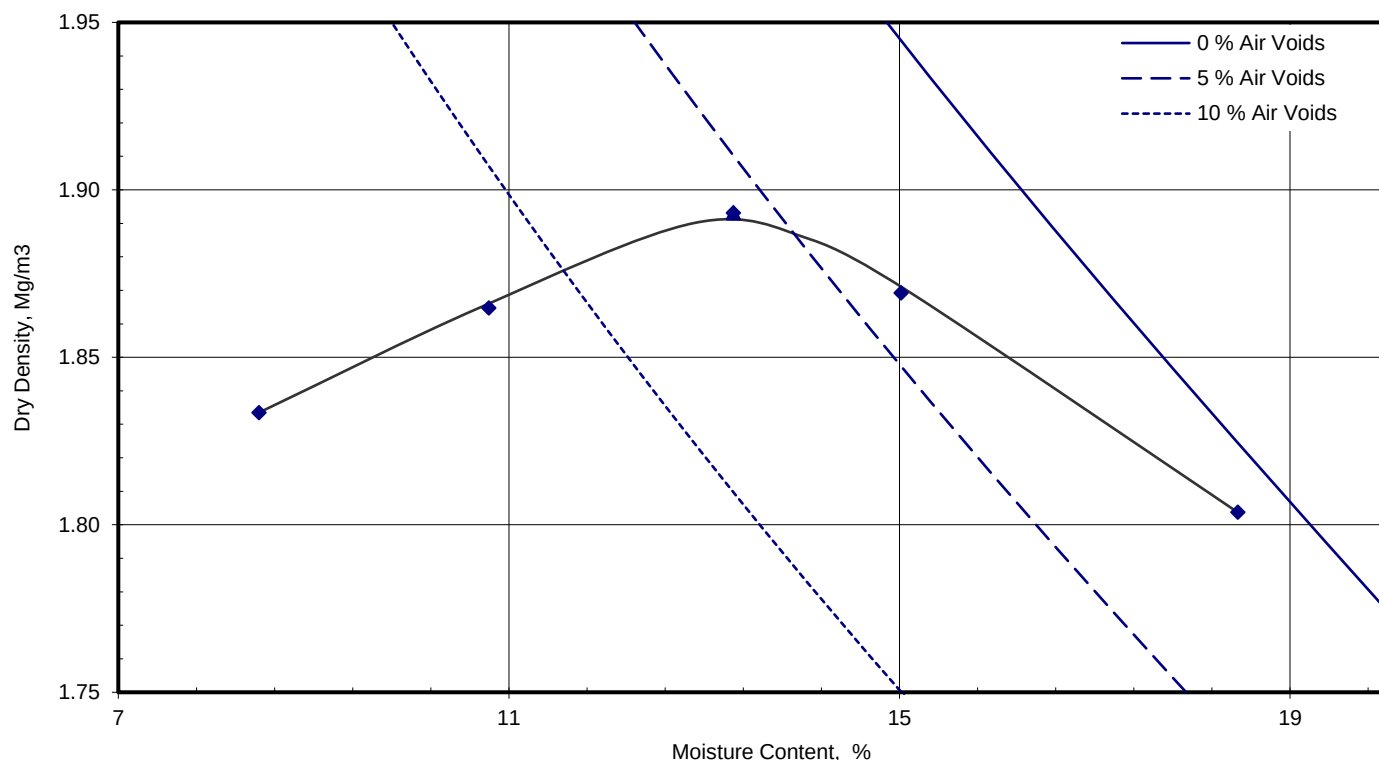
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 17/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966170
Hole No.: TP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 2.30
Depth Base [m]: 2.50
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	8.4	11	13	15	18
Dry Density	Mg/m³	1.83	1.86	1.89	1.87	1.80

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.75
As received Moisture Content	%	18
Maximum Dry Density	Mg/m³	1.89

Optimum Moisture Content	%	13
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Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Dry Density / Moisture Content****Relationship Light Compaction**Tested in Accordance with:
BS 1377-4: 1990i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 26/07/2021

Date Received: 27/07/2021

Date Tested: 17/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966174

Hole No.: TP05

Sample Reference: Not Given

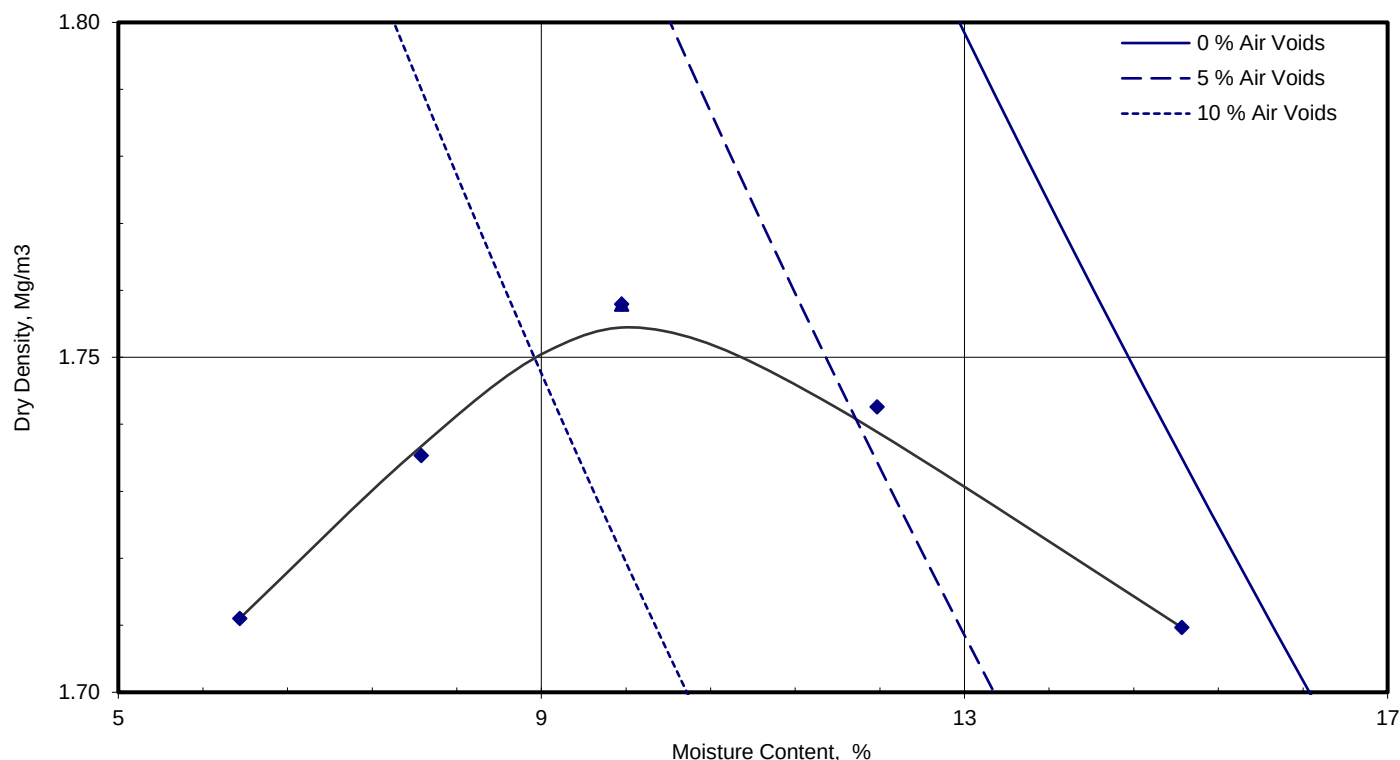
Sample Description: Greyish brown slightly gravelly CLAY

Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.75

Depth Base [m]: 0.85

Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	6.1	7.9	9.8	12	15
Dry Density	Mg/m³	1.71	1.74	1.76	1.74	1.71

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Assumed	Mg/m³	2.35
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.76

Optimum Moisture Content	%	9.8
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Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
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4041

TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

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



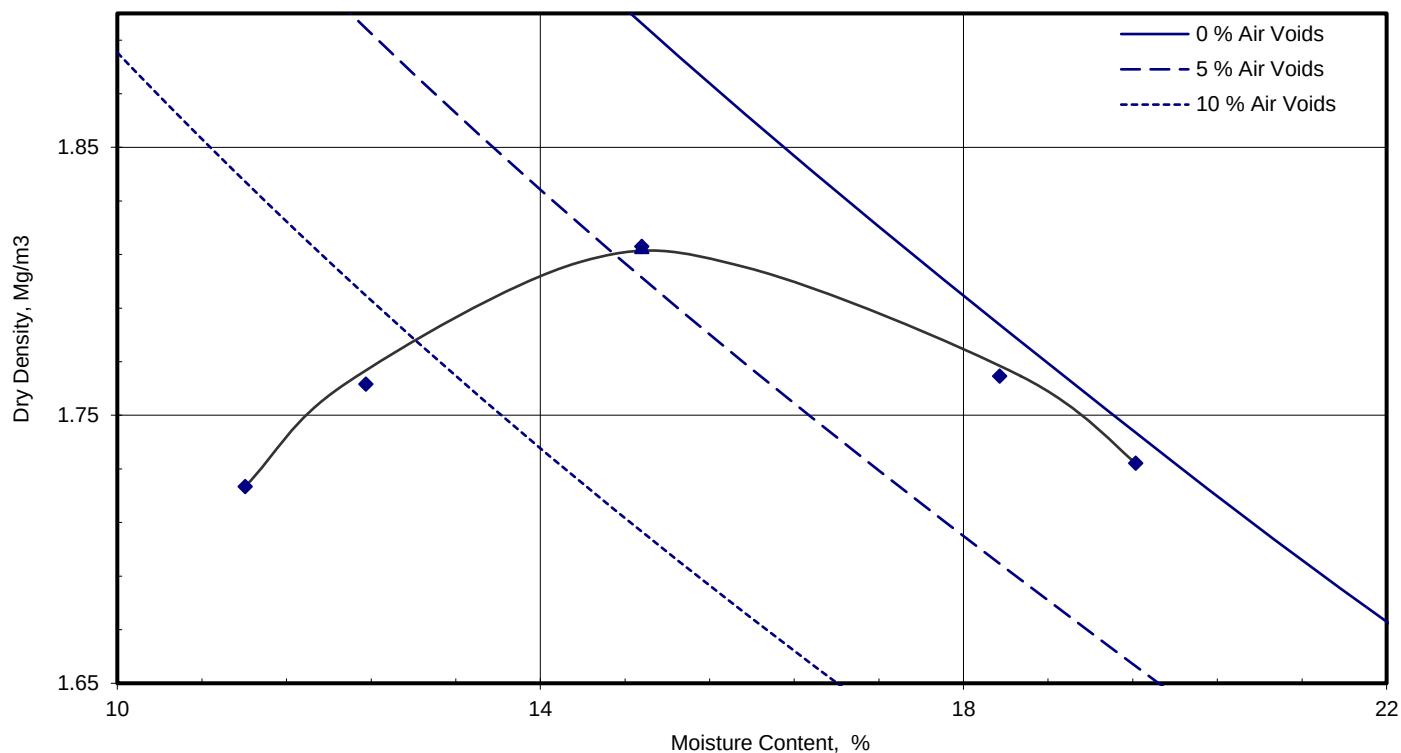
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 23/07/2021
Date Received: 27/07/2021
Date Tested: 17/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966176
Hole No.: TP06
Sample Reference: Not Given
Sample Description: Dark brown very gravelly SAND
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.20
Depth Base [m]: 0.40
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	11	12	15	18	20
Dry Density	Mg/m³	1.72	1.76	1.81	1.76	1.73

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	3
Material Retained on 20.0 mm Sieve	%	21
Particle Density - Assumed	Mg/m³	2.65
As received Moisture Content	%	11
Maximum Dry Density	Mg/m³	1.81
Optimum Moisture Content	%	15

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
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4041

TEST CERTIFICATE**Dry Density / Moisture Content****Relationship Light Compaction**Tested in Accordance with:
BS 1377-4: 1990i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 26/07/2021

Date Received: 27/07/2021

Date Tested: 17/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966179

Hole No.: TP07

Sample Reference: Not Given

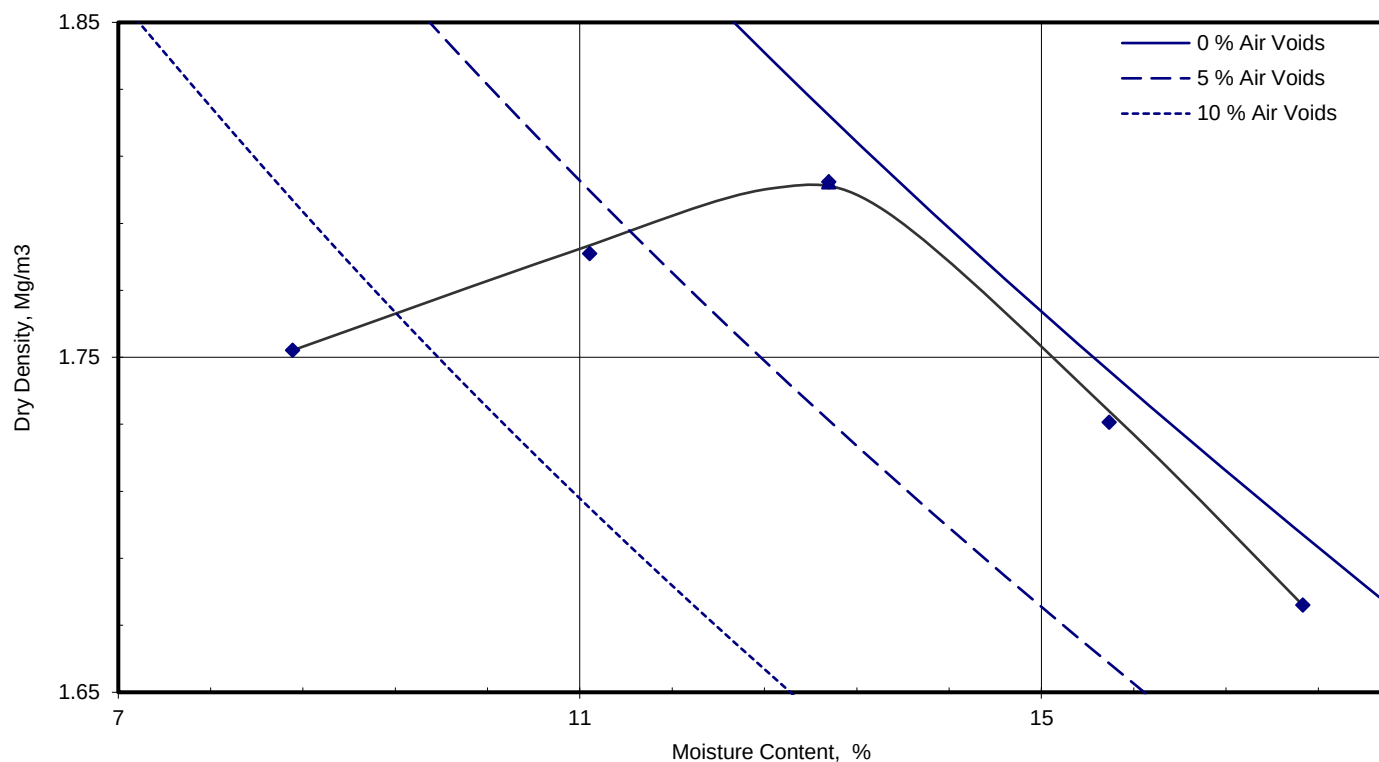
Sample Description: Greyish brown slightly gravelly slightly clayey SAND

Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 1.00

Depth Base [m]: 1.20

Sample Type: B



Compaction Point No.	1	2	3	4	5	
Moisture Content	%	8.5	11	13	16	17
Dry Density	Mg/m³	1.75	1.78	1.80	1.73	1.68

Mould Type	CBR
Samples Used	Single sample tested
Material Retained on 37.5 mm Sieve	0
Material Retained on 20.0 mm Sieve	6
Particle Density - Assumed	2.40
As received Moisture Content	16
Maximum Dry Density	1.80

Optimum Moisture Content	%	13
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Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Dry Density / Moisture Content****Relationship Light Compaction**Tested in Accordance with:
BS 1377-4: 1990i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 23/07/2021

Date Received: 27/07/2021

Date Tested: 17/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966180

Hole No.: TP08

Sample Reference: Not Given

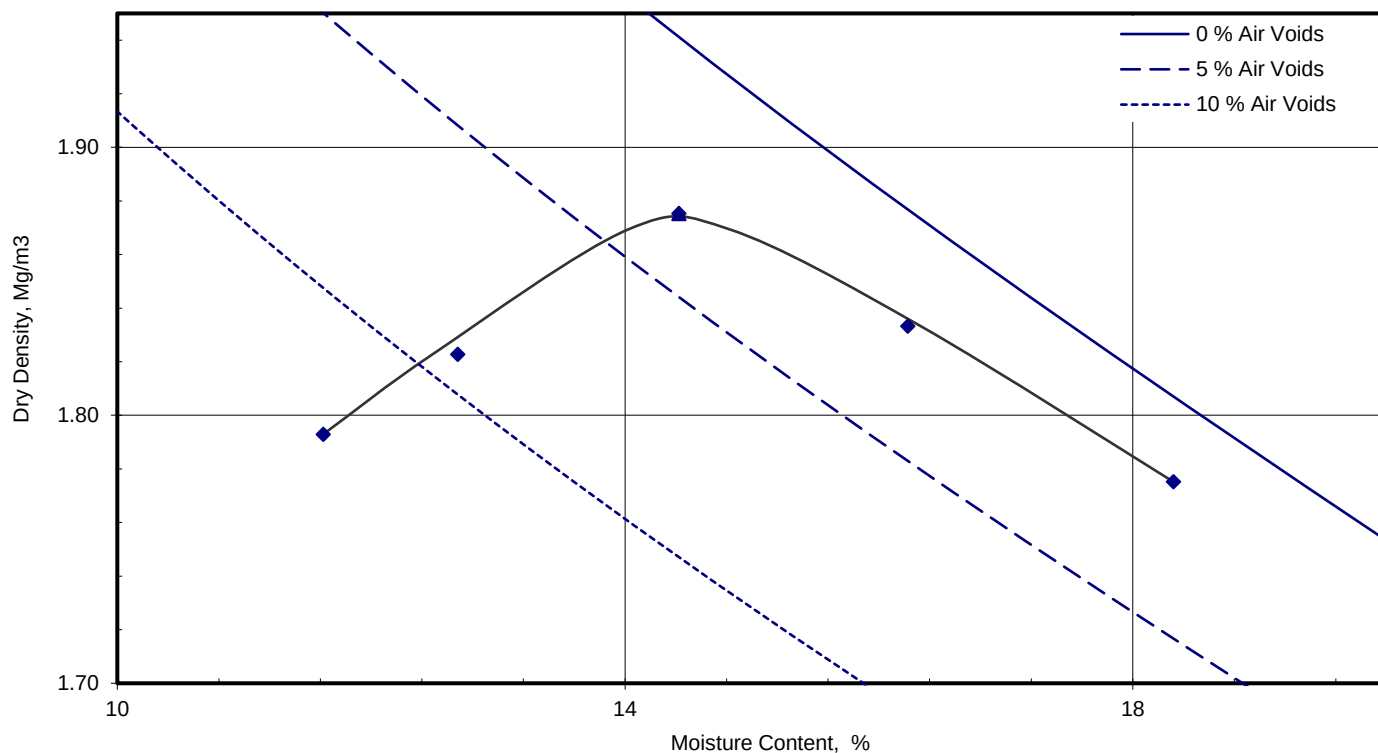
Sample Description: Brownish grey CLAY

Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 1.90

Depth Base [m]: 2.10

Sample Type: B



Compaction Point No.	1	2	3	4	5
Moisture Content %	12	13	14	16	18
Dry Density Mg/m³	1.79	1.82	1.88	1.83	1.78

Mould Type	1 Litre
Samples Used	Single sample tested
Material Retained on 37.5 mm Sieve %	0
Material Retained on 20.0 mm Sieve %	0
Particle Density - Assumed Mg/m³	2.70
As received Moisture Content %	16
Maximum Dry Density Mg/m³	1.88

Optimum Moisture Content %	14
----------------------------	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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4041

TEST CERTIFICATE**Dry Density / Moisture Content****Relationship Light Compaction**Tested in Accordance with:
BS 1377-4: 1990i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

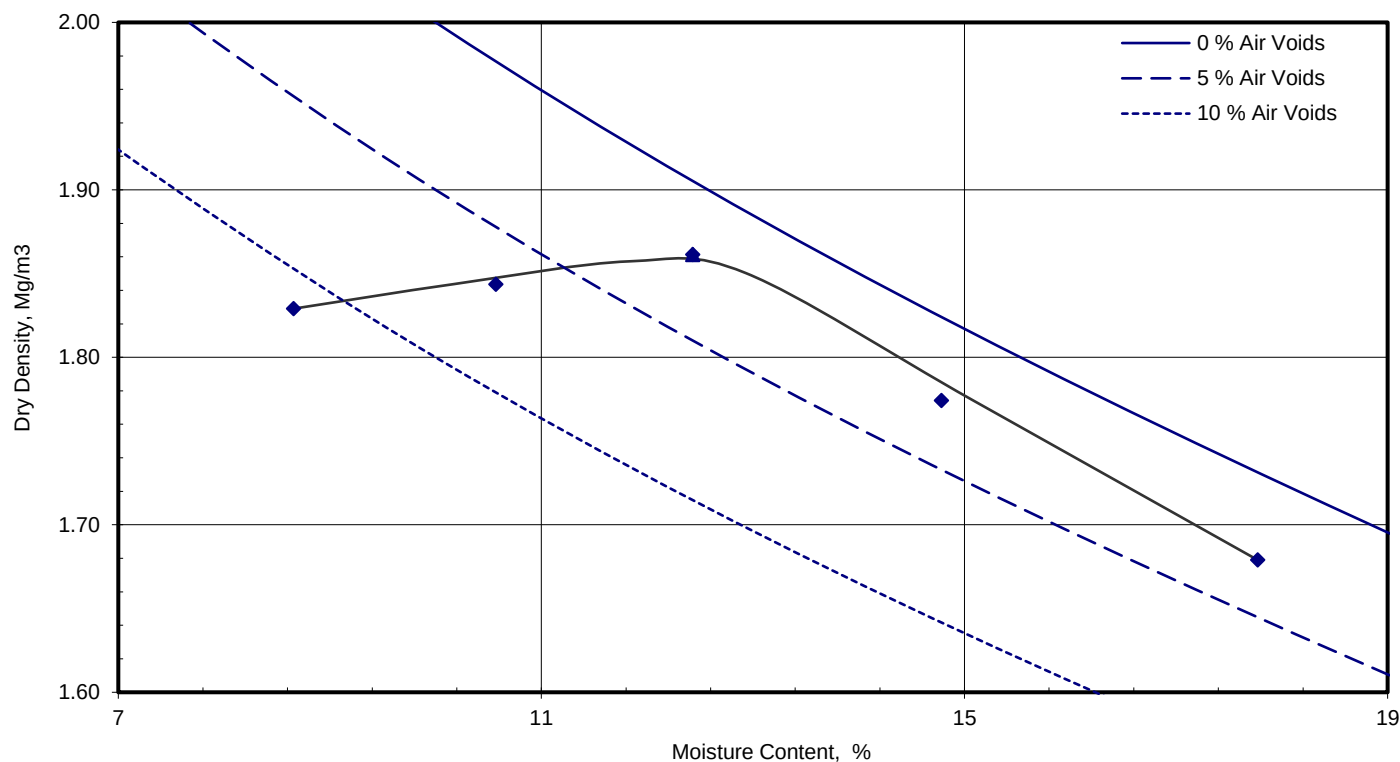
Client: Delta-Simons
 Client Address: The Colmore Building, 20 Colmore Circus Queensway,
 Birmingham, B4 6AT
 Contact: Ben Osborne
 Site Address: Site 3, Knowsley
 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
 Job Number: 21-91786
 Date Sampled: 26/07/2021
 Date Received: 27/07/2021
 Date Tested: 17/08/2021
 Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966182
 Hole No.: TP10
 Sample Reference: Not Given
 Sample Description: Brownish grey slightly gravelly slightly clayey SAND
 Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.50
 Depth Base [m]: 0.80
 Sample Type: B



Compaction Point No.	1	2	3	4	5
Moisture Content %	8.7	11	12	15	18
Dry Density Mg/m³	1.83	1.84	1.86	1.77	1.68

Mould Type	CBR
Samples Used	Single sample tested
Material Retained on 37.5 mm Sieve %	0
Material Retained on 20.0 mm Sieve %	14
Particle Density - Assumed Mg/m³	2.50
As received Moisture Content %	11
Maximum Dry Density Mg/m³	1.86
Optimum Moisture Content %	12

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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 PL Deputy Head of Geotechnical Section
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4041

TEST CERTIFICATE**Dry Density / Moisture Content****Relationship Light Compaction**Tested in Accordance with:
BS 1377-4: 1990i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

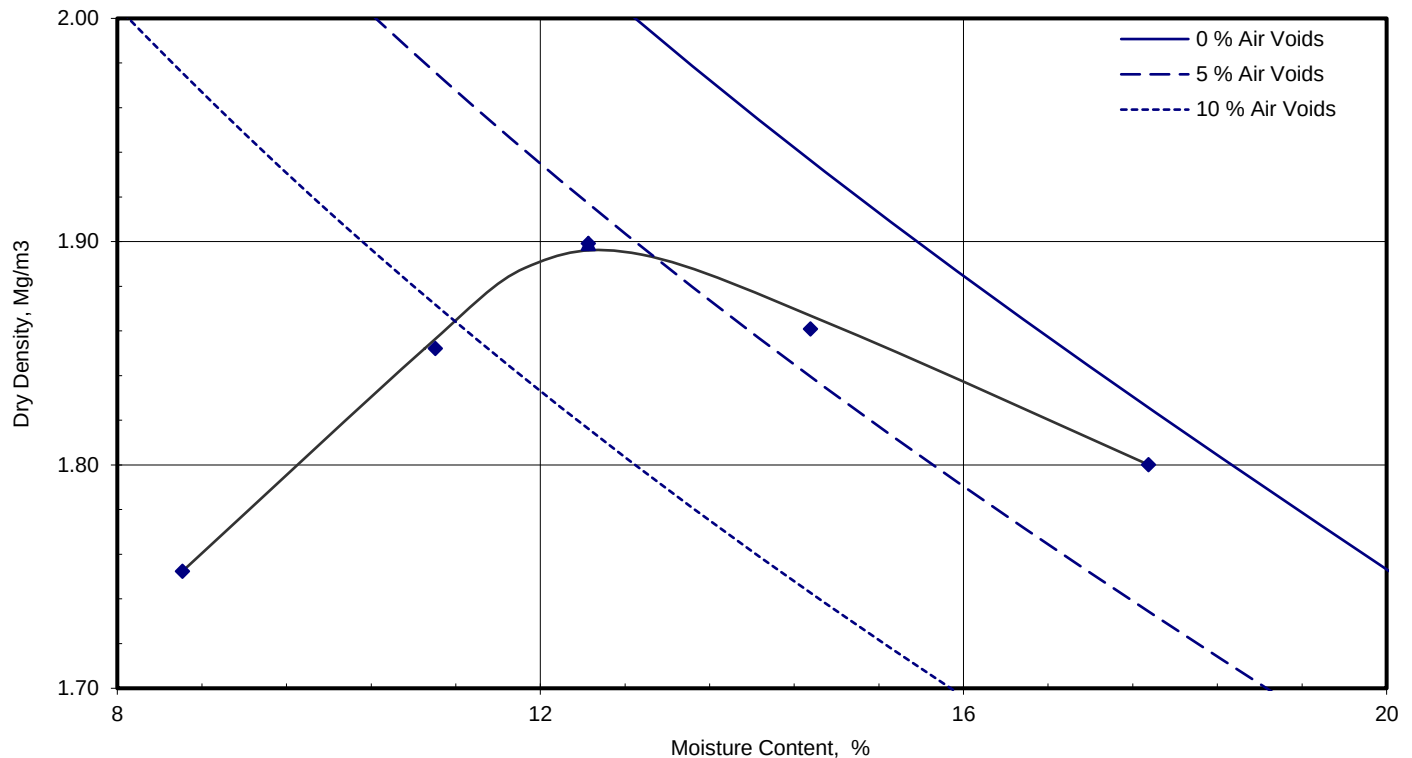
Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Ben Osborne
Site Address: Site 3, Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
Job Number: 21-91786
Date Sampled: 26/07/2021
Date Received: 27/07/2021
Date Tested: 17/08/2021
Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966185
Hole No.: TP12
Sample Reference: Not Given
Sample Description: Black CLAY
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 2.10
Depth Base [m]: 2.20
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	8.6	11	12	15	18
Dry Density	Mg/m³	1.75	1.85	1.90	1.86	1.80

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.70
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.90

Optimum Moisture Content	%	12
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Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 26/07/2021

Date Received: 27/07/2021

Date Tested: 13/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966162

Hole No.: DS03A

Sample Reference: Not Given

Sample Description: Brown slightly gravelly slightly sandy CLAY

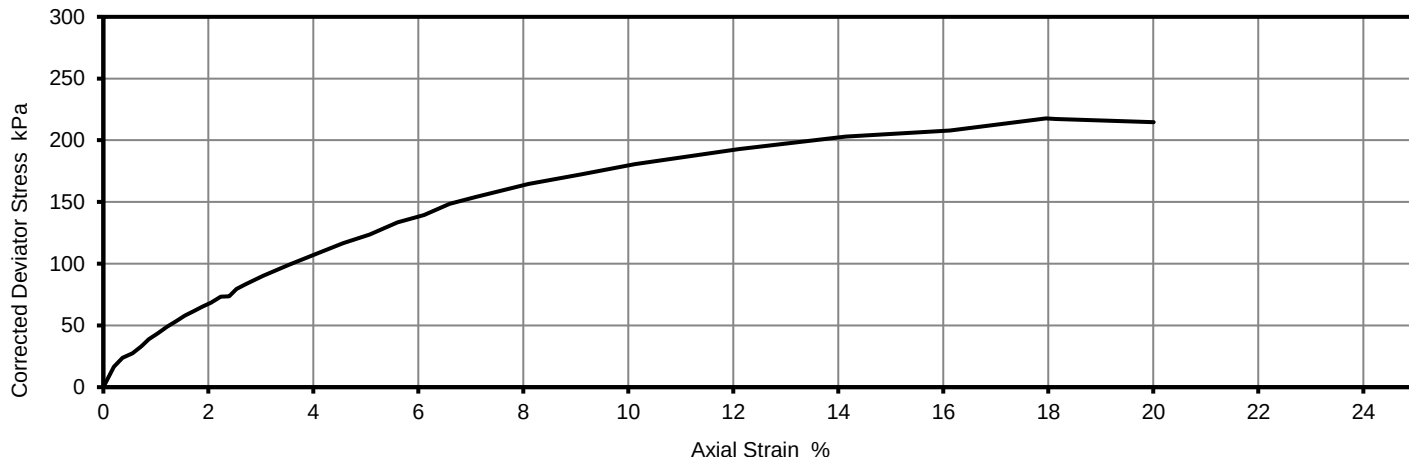
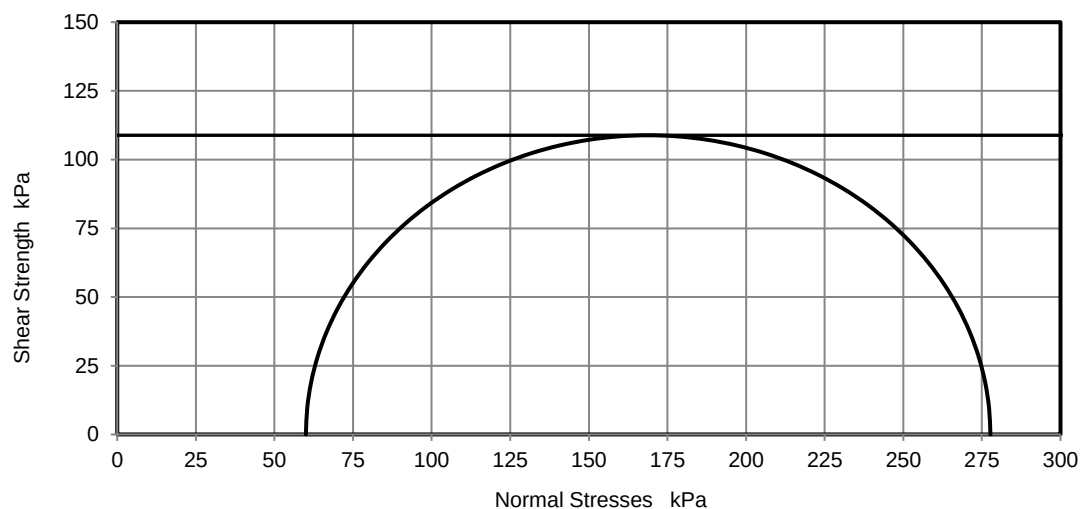
Depth Top [m]: 2.70

Depth Base [m]: 3.00

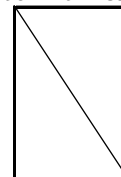
Sample Type: C

Test Number	1
Length	100.52 mm
Diameter	49.38 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	16 %
Dry Density	1.89 Mg/m ³
Membrane Correction	1.64 kPa

Rate of Strain	2.00 %/min
Cell Pressure	60 kPa
Axial Strain at failure	18.0 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	218 kPa
Undrained Shear Strength, c_u	109 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.23 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 26/07/2021

Date Received: 27/07/2021

Date Tested: 13/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966163

Hole No.: DS03A

Sample Reference: Not Given

Sample Description: Brown slightly gravelly slightly sandy CLAY

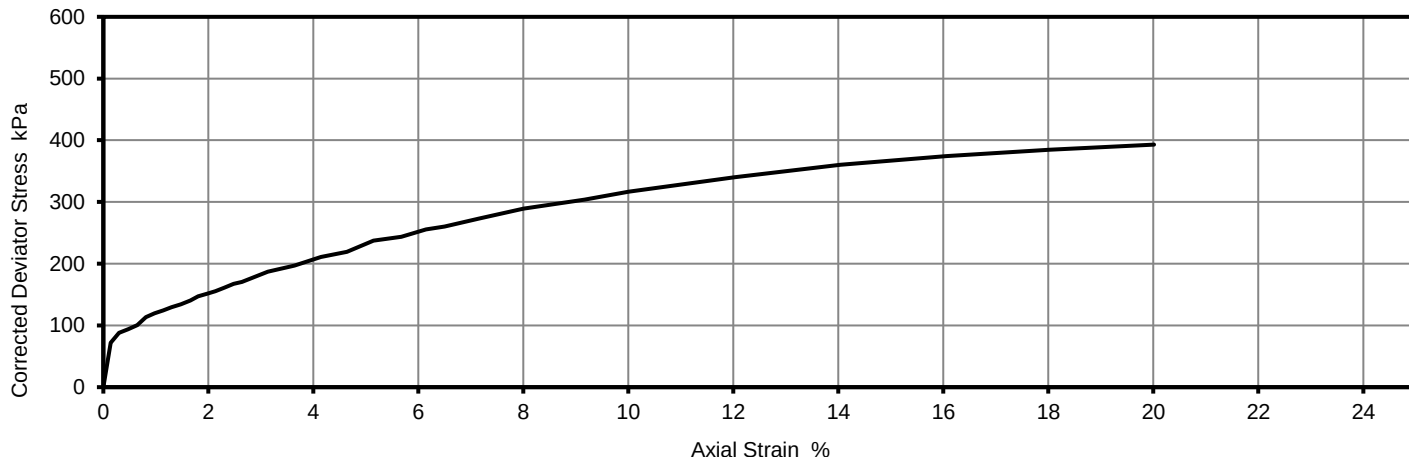
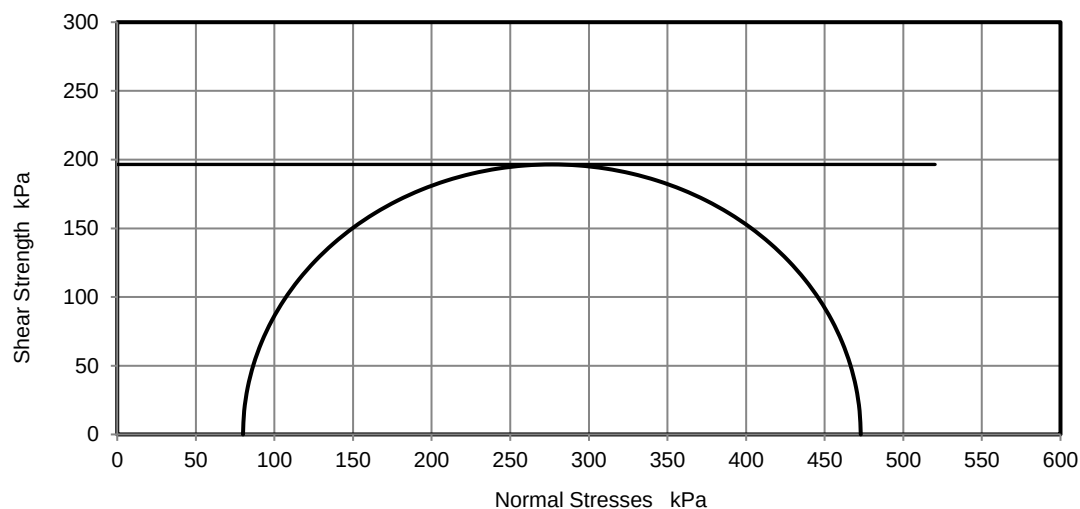
Depth Top [m]: 3.70

Depth Base [m]: 4.00

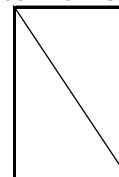
Sample Type: C

Test Number	1
Length	100.28 mm
Diameter	49.57 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	14 %
Dry Density	1.93 Mg/m ³
Membrane Correction	1.71 kPa

Rate of Strain	2.00 %/min
Cell Pressure	80 kPa
Axial Strain at failure	20.0 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	393 kPa
Undrained Shear Strength, c_u	196 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.22 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
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TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 22/07/2021

Date Received: 27/07/2021

Date Tested: 13/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966164

Hole No.: DS04

Sample Reference: Not Given

Sample Description: Brown slightly gravelly sandy CLAY

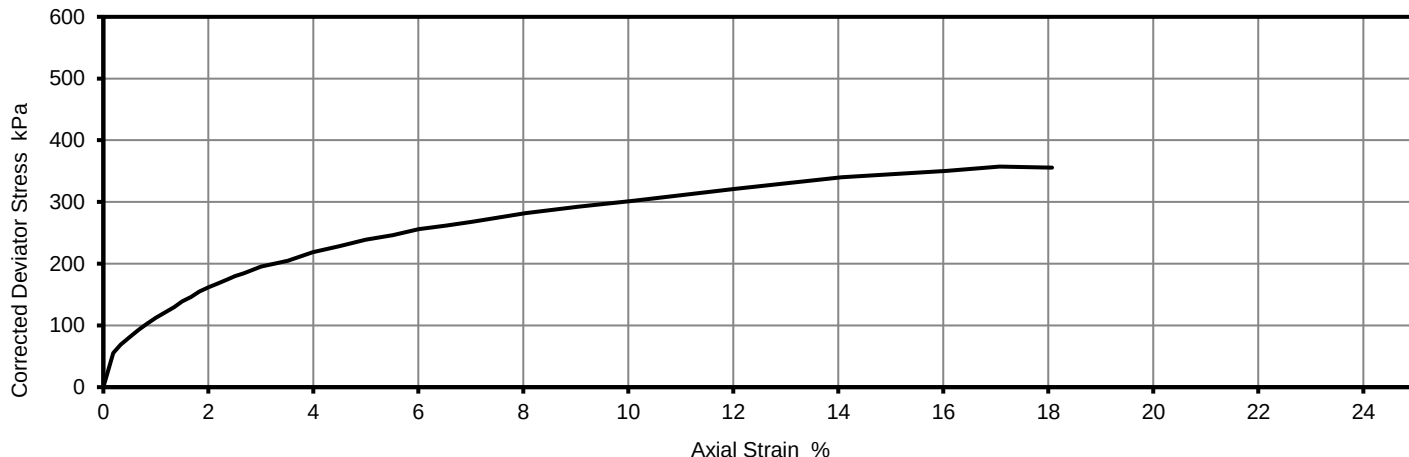
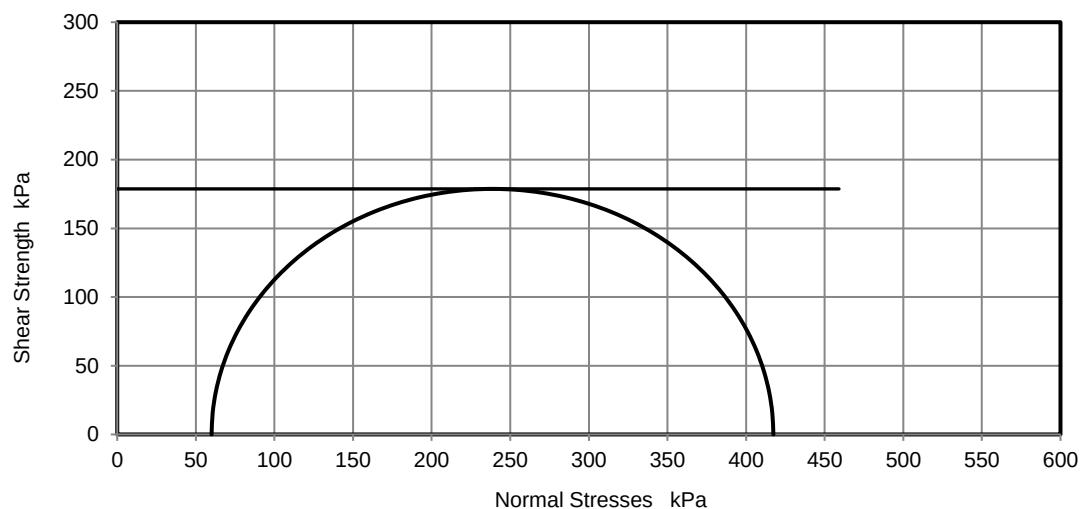
Depth Top [m]: 2.50

Depth Base [m]: 2.70

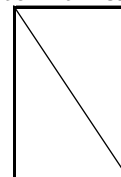
Sample Type: C

Test Number	1
Length	100.16 mm
Diameter	49.17 mm
Bulk Density	2.21 Mg/m ³
Moisture Content	14 %
Dry Density	1.94 Mg/m ³
Membrane Correction	1.58 kPa

Rate of Strain	2.00 %/min
Cell Pressure	60 kPa
Axial Strain at failure	17.1 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	357 kPa
Undrained Shear Strength, c_u	179 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.23 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Unconsolidated Undrained****Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 23/07/2021

Date Received: 27/07/2021

Date Tested: 13/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966167

Hole No.: DS07

Sample Reference: Not Given

Sample Description: Brown slightly gravelly slightly sandy CLAY

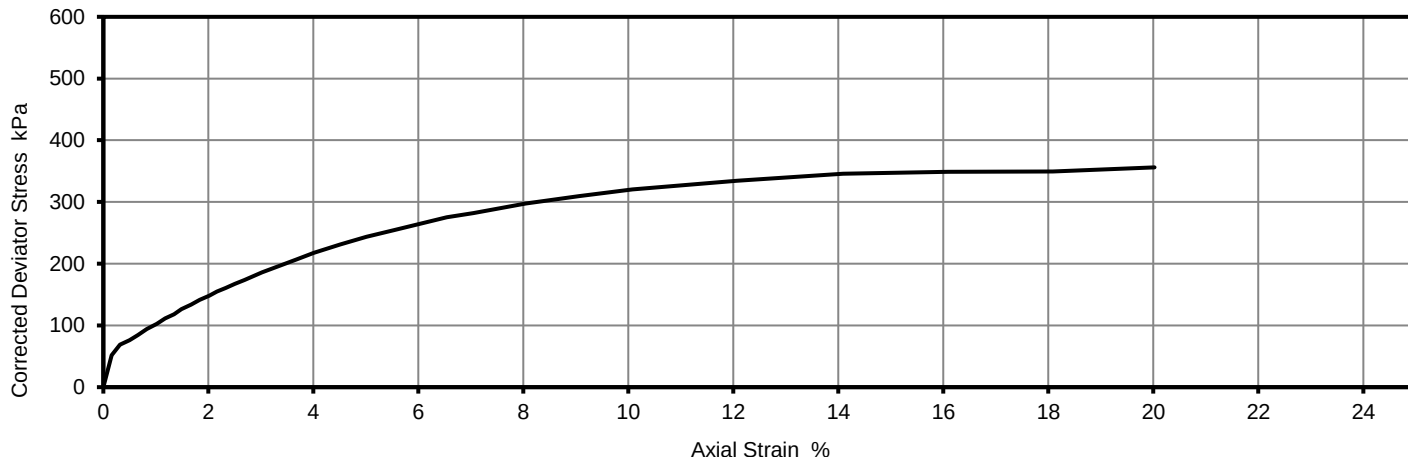
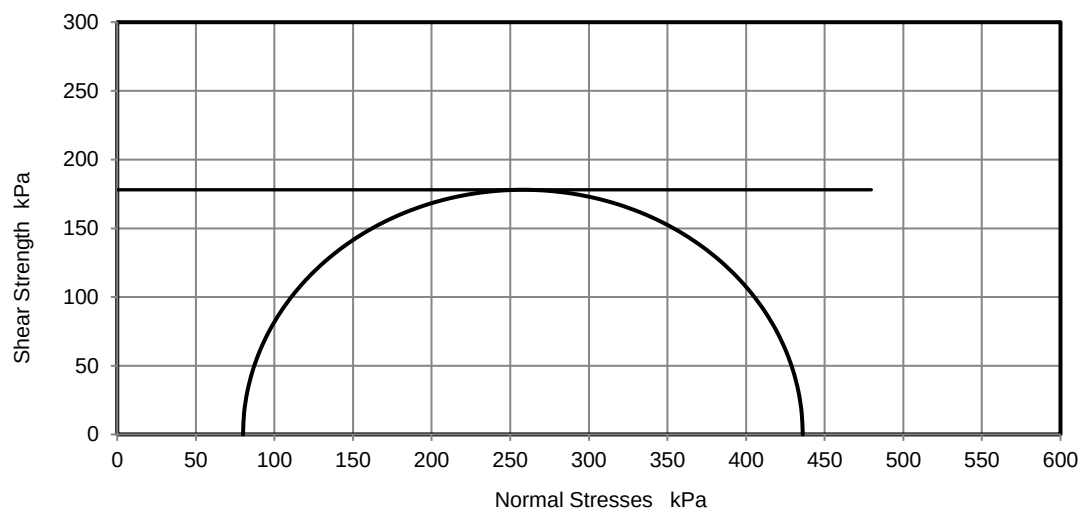
Depth Top [m]: 3.60

Depth Base [m]: 3.90

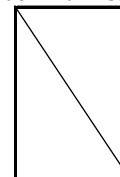
Sample Type: C

Test Number	1
Length	100.14 mm
Diameter	49.56 mm
Bulk Density	2.22 Mg/m ³
Moisture Content	14 %
Dry Density	1.95 Mg/m ³
Membrane Correction	1.71 kPa

Rate of Strain	2.00 %/min
Cell Pressure	80 kPa
Axial Strain at failure	20.0 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	356 kPa
Undrained Shear Strength, c_u	178 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.22 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

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PL Deputy Head of Geotechnical Section
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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: Delta-Simons
 Client Address: The Colmore Building, 20 Colmore Circus Queensway,
 Birmingham, B4 6AT
 Contact: Ben Osborne
 Site Address: Site 3, Knowsley
 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
 Job Number: 21-91786
 Date Sampled: 22/07/2021
 Date Received: 27/07/2021
 Date Tested: 13/08/2021
 Sampled By: Client - BHO

Test Results:

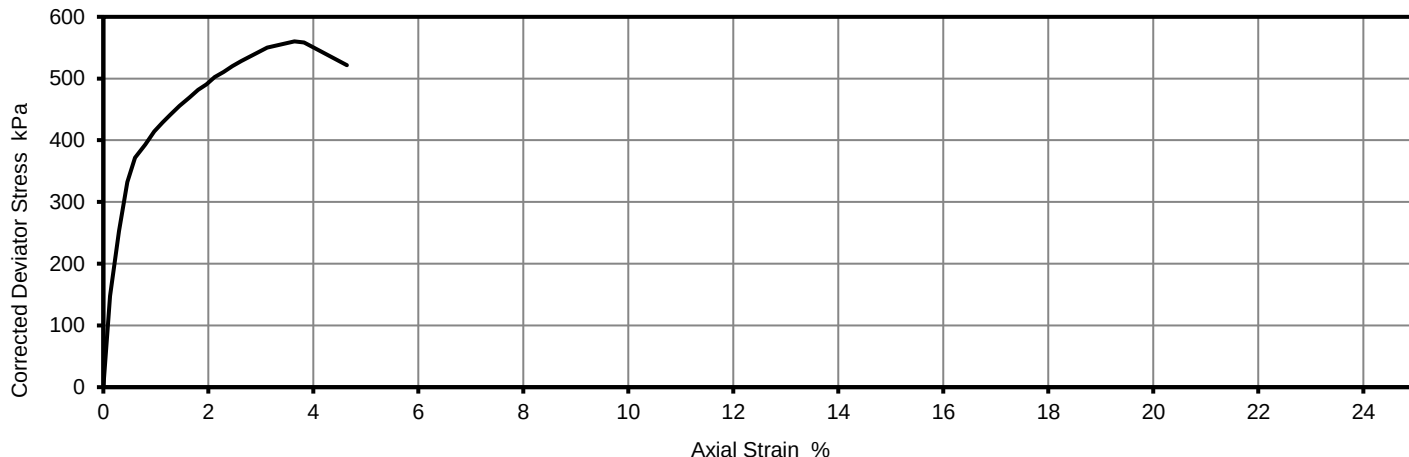
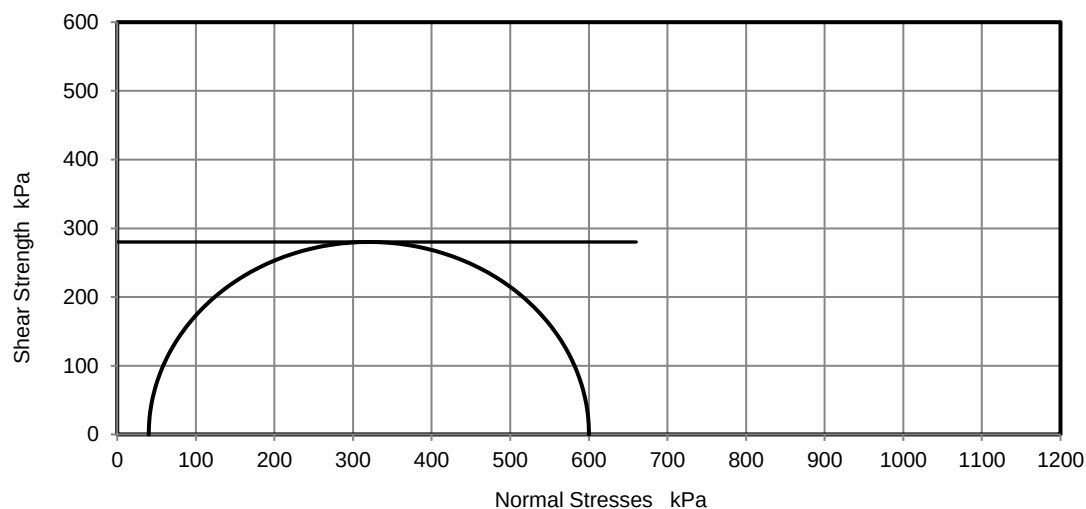
Laboratory Reference: 1966187
 Hole No.: BH01
 Sample Reference: Not Given
 Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 1.80
 Depth Base [m]: 2.00
 Sample Type: C

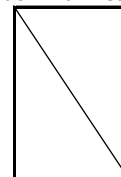
Test Number	1
Length	101.31 mm
Diameter	49.44 mm
Bulk Density	2.14 Mg/m ³
Moisture Content	12 %
Dry Density	1.91 Mg/m ³
Membrane Correction	0.44 kPa

Rate of Strain
 Cell Pressure
 Axial Strain at failure
 Deviator Stress, ($\sigma_1 - \sigma_3$)_f
 Undrained Shear Strength, c_u
 Mode of Failure
 Membrane thickness

2.00	%/min
40	kPa
3.6	%
560	kPa
280	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Compound	
0.22	mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
 Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
 PL Deputy Head of Geotechnical Section
 for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 22/07/2021

Date Received: 27/07/2021

Date Tested: 13/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966188

Hole No.: BH01

Sample Reference: Not Given

Sample Description: Brown slightly gravelly slightly sandy CLAY

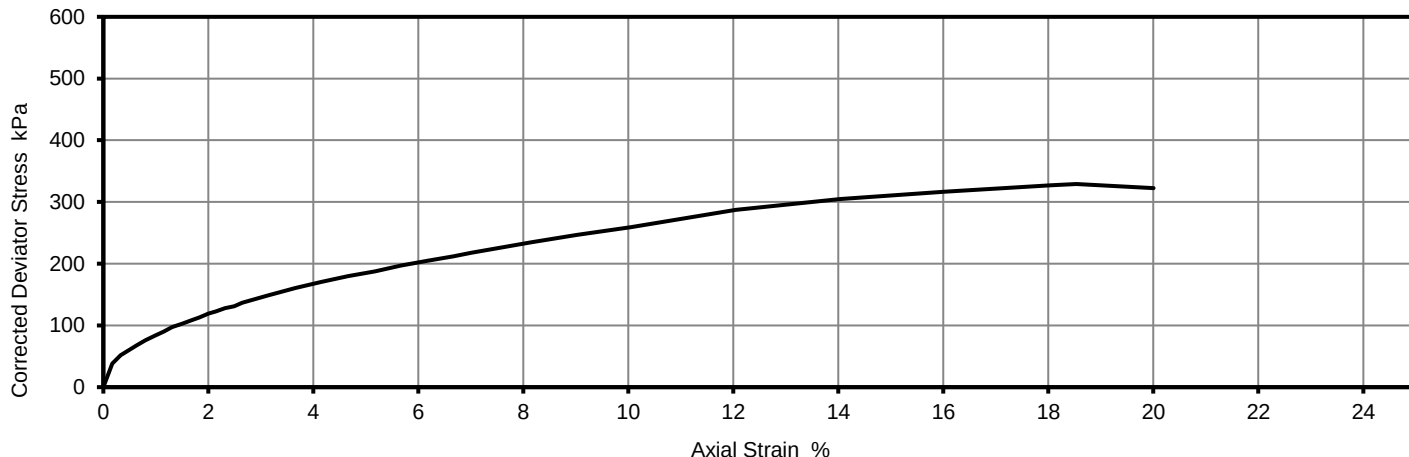
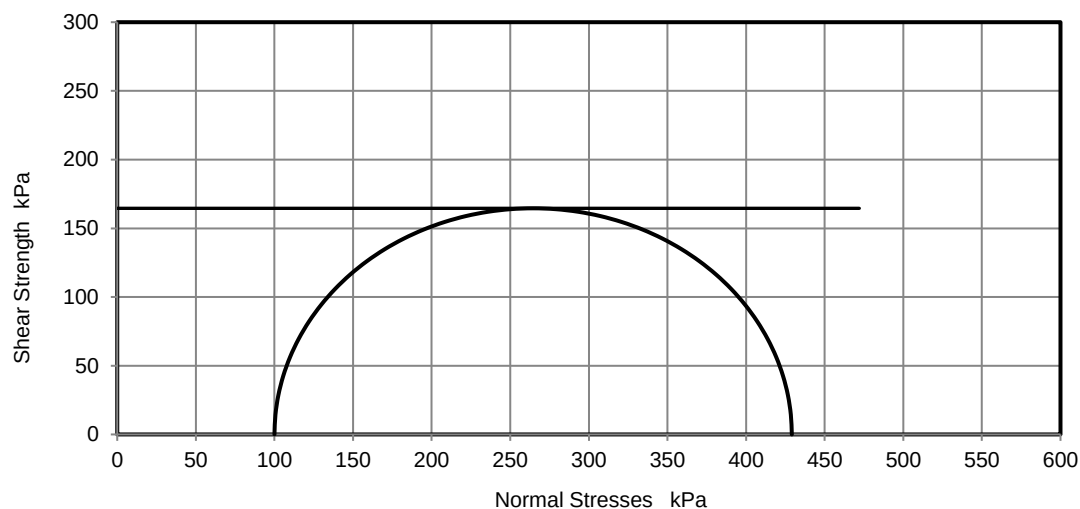
Depth Top [m]: 5.20

Depth Base [m]: 5.40

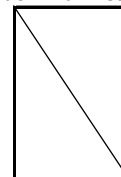
Sample Type: C

Test Number	1
Length	100.63 mm
Diameter	49.52 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	14 %
Dry Density	1.92 Mg/m ³
Membrane Correction	1.68 kPa

Rate of Strain	2.00 %/min
Cell Pressure	100 kPa
Axial Strain at failure	18.5 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	329 kPa
Undrained Shear Strength, c_u	165 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane thickness	0.23 mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: Delta-Simons
 Client Address: The Colmore Building, 20 Colmore Circus Queensway,
 Birmingham, B4 6AT
 Contact: Ben Osborne
 Site Address: Site 3, Knowsley
 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 19-0654.06
 Job Number: 21-91786
 Date Sampled: 27/07/2021
 Date Received: 27/07/2021
 Date Tested: 13/08/2021
 Sampled By: Client - BHO

Test Results:

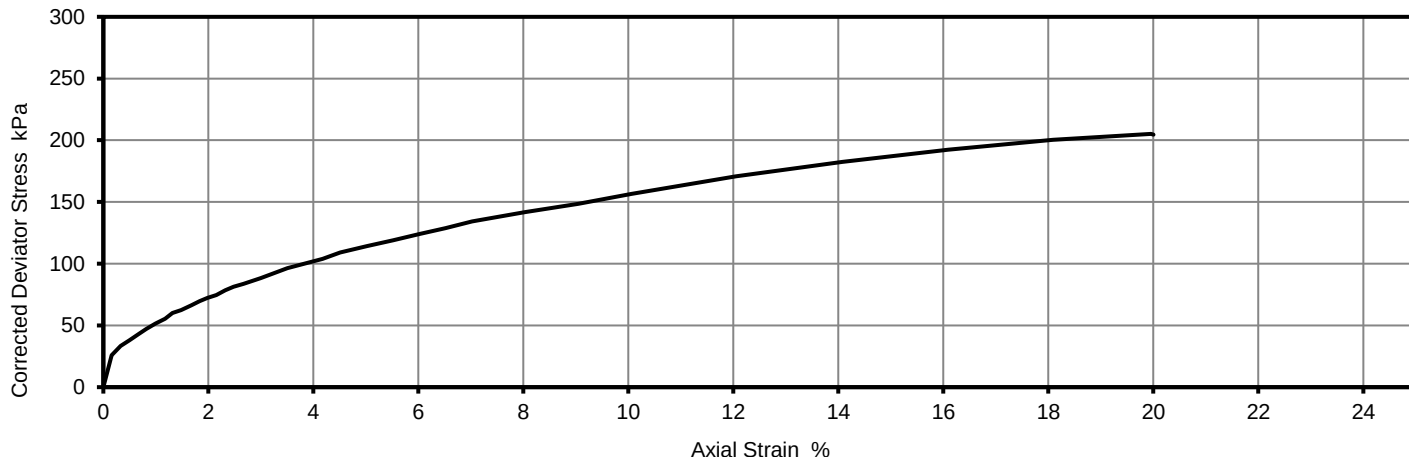
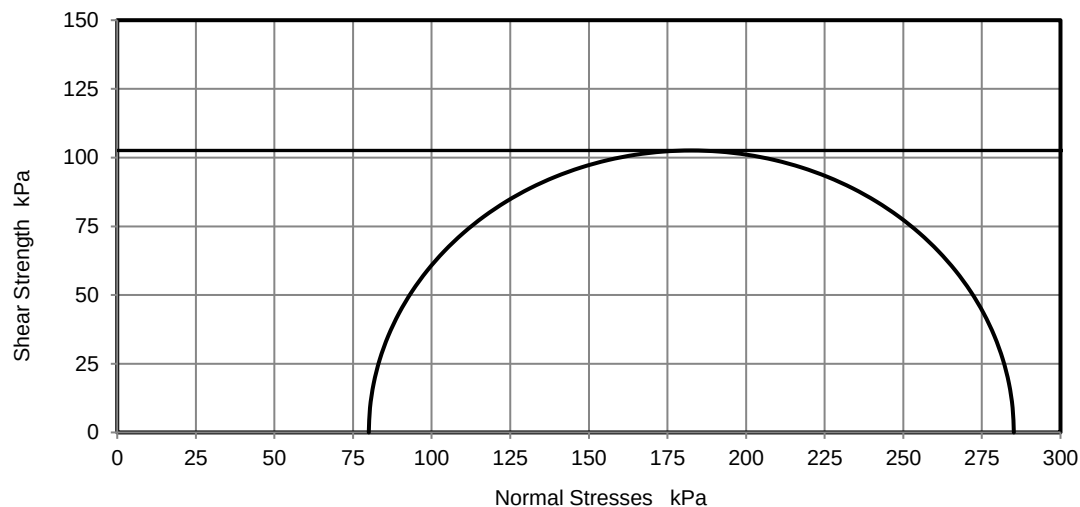
Laboratory Reference: 1966190
 Hole No.: BH04
 Sample Reference: Not Given
 Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 4.00
 Depth Base [m]: 4.30
 Sample Type: C

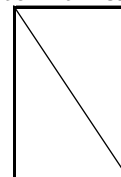
Test Number	1
Length	100.39 mm
Diameter	49.62 mm
Bulk Density	2.19 Mg/m ³
Moisture Content	16 %
Dry Density	1.89 Mg/m ³
Membrane Correction	1.78 kPa

Rate of Strain
 Cell Pressure
 Axial Strain at failure
 Deviator Stress, ($\sigma_1 - \sigma_3$)_f
 Undrained Shear Strength, c_u
 Mode of Failure
 Membrane thickness

2.00	%/min
80	kPa
20.0	%
205	kPa
103	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Compound	
0.23	mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
 This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
 Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
 PL Deputy Head of Geotechnical Section
 for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE
Unconsolidated Undrained**Triaxial Compression**Tested in Accordance with:
BS 1377-7: 1990: Clause 8i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Delta-Simons

Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT

Contact: Ben Osborne

Site Address: Site 3, Knowsley

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

Client Reference: 19-0654.06

Job Number: 21-91786

Date Sampled: 27/07/2021

Date Received: 27/07/2021

Date Tested: 13/08/2021

Sampled By: Client - BHO

Test Results:

Laboratory Reference: 1966191

Hole No.: BH04

Sample Reference: Not Given

Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 5.70

Depth Base [m]: 5.90

Sample Type: C

Test Number	1
Length	99.61 mm
Diameter	49.41 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	16 %
Dry Density	1.90 Mg/m ³
Membrane Correction	1.10 kPa

Rate of Strain

Cell Pressure

Axial Strain at failure

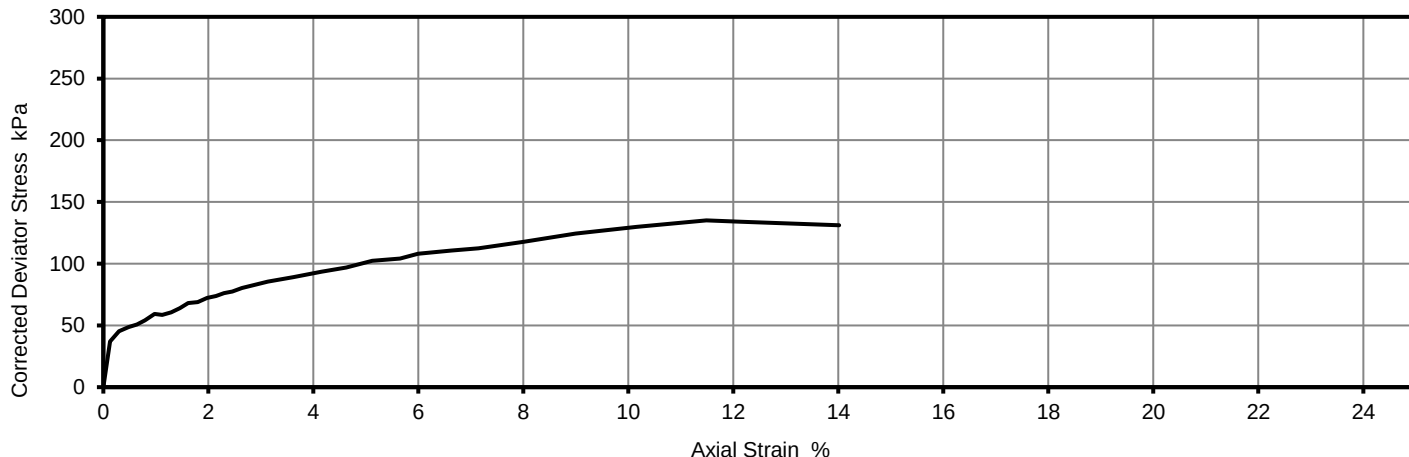
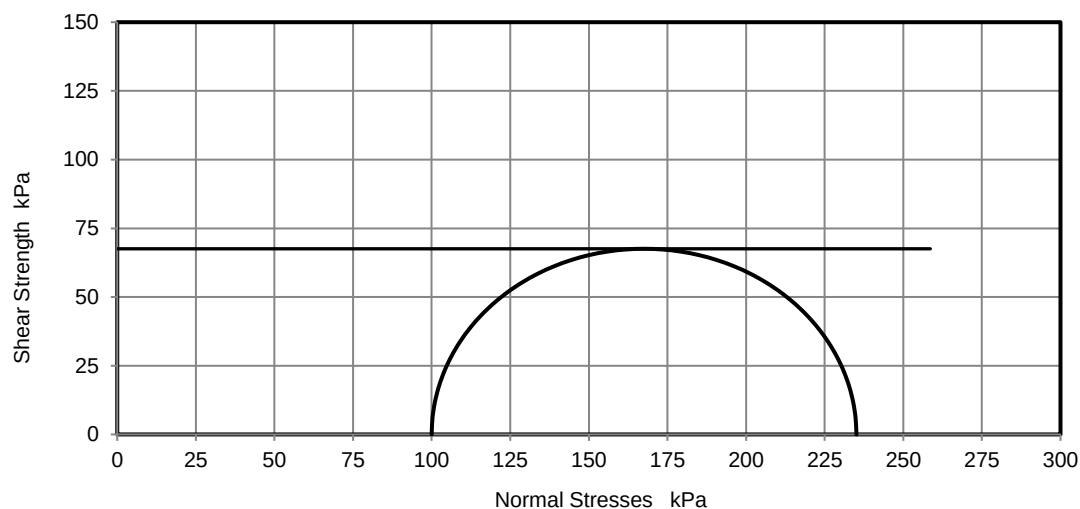
Deviator Stress, ($\sigma_1 - \sigma_3$)_f

Undrained Shear Strength, c_u

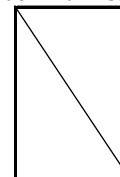
Mode of Failure

Membrane thickness

2.00	%/min
100	kPa
11.5	%
135	kPa
68	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Compound	
0.22	mm

Deviator Stress v Axial Strain**Mohr Circles**

Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of the core.
Re-issue 1: Additional results of PSD (sample no. 1966173)

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus Queensway,
Birmingham, B4 6AT
Contact: Martina Young
Site Address: Site 3 Knowsley
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 15-0654.06
Job Number: 21-91836
Date Sampled: 03/08/2021
Date Received: 05/08/2021
Date Tested: 14/08/2021
Sampled By: Client - MY/AK

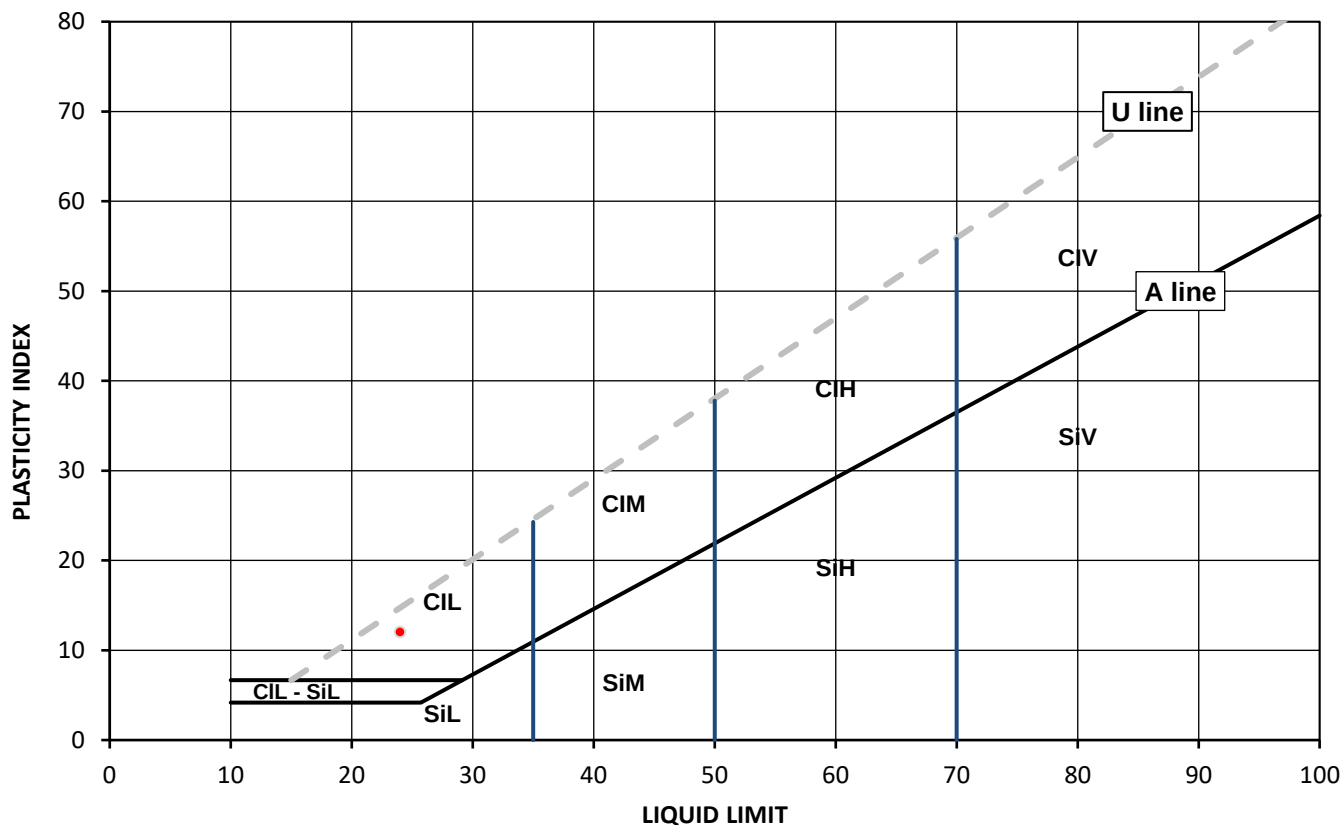
Test Results:

Laboratory Reference: 1966524
Hole No.: BH05
Sample Reference: D
Soil Description: Reddish brown slightly gravelly clayey SAND

Depth Top [m]: 9.60
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
9.1	24	12	12	94



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

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

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

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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Szczepan Bielatowicz

Page 1 of 1

Date Reported: 19/08/2021

GF 232.10



SUMMARY REPORT

Summary of Point Load Strength Index Tests Results

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

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



Environmental Science

Client: Delta-Simons
Client Address: The Colmore Building, 20 Colmore Circus
Queensway,
Birmingham, B4 6AT
Contact: Martina Young
Site Address: Site 3 Knowsley

Client Reference: 15-0654.06
Job Number: 21-91836
Date Sampled: 03/08/2021
Date Received: 05/08/2021
Date Tested: 18/08/2021
Sampled By: Client - MY/AK

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks # (including water content if measured)	Specimen Reference	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P kN	Equivalent diameter, De mm	Point Load Strength Index	
		Reference	Depth Top m	Depth Base m	Type				Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is MPa	Is(50) MPa
1966525	BH05	C	11.20	Not Given	C	Orangish brown SANDSTONE	WC = 9.6%	1	A	U	YES	-	78.9	61.0	49.0	3.4	70.2	0.69	0.80
1966528	BH08	C	9.90	Not Given	C	Light brown SANDSTONE	WC = 7.8%	1	A	P	YES	-	78.8	40.0	25.0	2.0	50.1	0.78	0.78
1966529	BH08	C	10.00	Not Given	C	Orangish brown SANDSTONE	WC = 7.5%	1	A	P	YES	-	78.6	61.0	43.0	3.2	65.6	0.74	0.84

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

Comments:

Signed:

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

Client: Delta-Simons
 Client Address: The Colmore Building, 20 Colmore Circus
 Queensway,
 Birmingham, B4 6AT
 Contact: Martina Young
 Site Address: Site 3 Knowsley

SUMMARY REPORT

Summary of Uniaxial Compression Test on Rock Test Results

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

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



Environmental Science

Client Reference: 15-0654.06
 Job Number: 21-91836
 Date Sampled: 03/08/2021
 Date Received: 05/08/2021
 Date Tested: 18/08/2021
 Sampled By: Client - MY/AK

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Specimen Dimensions (2)				Bulk density (2) Mg/m3	Water Content (1) %	Uniaxial Compression (3)			
		Reference	Depth Top	Depth Base	Type			Diameter	Length	H/D	Orientation of sample			Condition	Stress Rate Mpa/s	Mode of failure	UCS Mpa
			m	m													
1966523	BH05	C	10.30	10.40	C	Orangish brown SANDSTONE	Sample is below recommended length to diameter ratio.	78.6	134.1	1.7	Vertical	2.18	9.5	as received	0.0412	S + AC	16.5
1966522	BH05	C	10.40	10.50	C	Orangish brown SANDSTONE	Sample is below recommended length to diameter ratio.	78.5	126.4	1.6	Vertical	2.20	8.0	as received	0.0413	S + AC	16.2
1966521	BH05	C	10.60	10.70	C	Orangish brown SANDSTONE	Sample is below recommended length to diameter ratio.	78.7	130.2	1.7	Vertical	2.14	4.5	as received	0.0411	MS + AC	15.0
1966526	BH05	C	11.60	12.00	C	Orangish brown SANDSTONE	Duration of test exceeded time specified in ISRM method, 2007, p153, part1.	79.4	206.3	2.6	Vertical	2.24	6.9	as received	0.0404	S + AC	30.0
1966527	BH08	C	9.20	9.30	C	Orangish brown SANDSTONE	Sample is below recommended length to diameter ratio.	78.9	77.2	1.0	Vertical	2.17	8.3	as received	0.0409	S + AC	16.5
1966530	BH08	C	9.40	9.50	C	Orangish brown SANDSTONE	Sample is below recommended length to diameter ratio.	78.8	126.2	1.6	Vertical	1.93	8.4	as received	0.0411	S + AC	16.5

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

Comments:

Signed:

Szczepan Bielatowicz
 PL Deputy Head of Geotechnical Section
 for and on behalf of i2 Analytical Ltd

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Appendix E – Soil Chemical Analysis Results and Screening

19-0654.06 - Site 3, Knowsley																																		
Key	Below GAC	Above GAC	Below LoD	Exploratory Hole ID										TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10	TP11	TP12	BH01	BH04	BH05	BH06	BH07					
				Depth																														
				Consultant																														
				Date Sampled																														
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	No. tests	Minimum (mg/kg)	Maximum (mg/kg)	Commercial screening criteria (mg/kg)	GAC Source	D501	D502	D503	D504	D506	D507	D508	D509	D510	TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10	TP11	TP12	BH01	BH04	BH05	BH06	BH07	
									D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5	D5
									22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	26/07/2021	26/07/2021	26/07/2021	26/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	26/07/2021	26/07/2021	26/07/2021	22/07/2021	27/07/2021	26/07/2021	26/07/2021	26/07/2021	26/07/2021
Stone Content	%	0.1	NONE	26	0	0	N/A	N/A	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	26	3.5	20	N/A	N/A	20	3.5	5.7	3.8	12	N/A	4.4	9.5	5.6	5.5	3.8	5.9	13	6.6	10	6.8	10	9.7	8.7	5.8	7	11	4	9.1	8	
Total mass of sample received	kg	0.001	NONE	26	0.7	1.5	N/A	N/A	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.5	1	0.7	1	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	7	0	0	Detected	N/A	-	-	Chrysotile, Crocidolite - Loose Fibres	-	-	-	-	-	Amosite - Loose Fibres	-	-	-	Amosite - Loose Fibres	-	-	Chrysotile - Loose Fibres	Chrysotile - Loose Fibres	-	-	-	Chrysotile - Loose Fibres	Not-detected	Not-detected	Not-detected	Amosite - Loose Fibrous Debris	
Asbestos in Soil	Type	N/A	ISO 17025	26	0	0	N/A	N/A	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Detected	Detected	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Detected	
General Inorganics																																		
pH - Automated	pH Units	N/A	MCERTS	26	7.2	11.8	N/A	N/A	7.2	11.3	11.5	11.2	11.2	8.7	11.6	9	11.4	11.6	11.8	11.7	10.3	11.5	9.9	10.8	8.4	10.1	8.8	11.4	11.4	9.4	11.7	10.9	10.4	
Water Soluble Sulphate as SO ₄ , 16hr extraction (2:1)	mg/kg	2.5	MCERTS	26	21	4800	N/A	N/A	460	380	180	380	410	120	68	200	260	100	47	21	2000	370	4300	3600	4800	470	120	220	210	1100	70	500	440	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	26	0.011	2.4	N/A	N/A	0.23	0.19	0.092	0.19	0.21	0.058	0.034	0.1	0.13	0.051	0.024	0.011	1	0.19	2.2	1.8	2.4	0.23	0.059	0.11	0.1	0.57	0.035	0.25	0.22	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	26	10.5	2410	N/A	N/A	228	192	91.5	190	207	57.5	33.9	102	129	51.3	23.7	10.5	996	187	2150	1800	2410	235	59.1	108	103	569	34.8	249	219	
Organic Matter	%	0.2	MCERTS	10	1	11	N/A	N/A	11	2.4	-	2.5	6.7	-	2.5	-	1.7	-	1.2	-	-	1.2	-	-	-	-	-	4.7	-	-	-	-	1	
Speciated PAHs																																		
Naphthalene	mg/kg	0.05	MCERTS	26	0.64	0.64	190	LQM	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.64	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	26	<0.05	<0.05	83,000	LQM	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	26	0.21	0.42	84,000	LQM	< 0.05	< 0.05	0.21	< 0.05	< 0.05	0.42	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	26	0.34	0.4	63,000	LQM	< 0.05	< 0.05	0.4	< 0.05	< 0.05	0.34	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	26	0.22	3.5	22,000	LQM	< 0.05	< 0.05	2.3	1.4	< 0.05	3.5	< 0.05	0.96	1.3	1.2	< 0.05	0.24	0.31	1.9	1.4	0.76	< 0.05	< 0.05	1.6	0.63	< 0.05	0.22	2	0.44	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	26	0.2	0.86	520,000	LQM	< 0.05	< 0.05	0.86	0.27	< 0.05	0.85	< 0.05	< 0.05	< 0.05	0.25	0.2	< 0.05	< 0.05	< 0.05	< 0.05	0.42	0.39	< 0.05	< 0.05	0.29	< 0.05	< 0.05	0.37	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	26	0.25	5	23,000	LQM	< 0.05	< 0.05	2.5	2.3	< 0.05	5	< 0.05	< 0.05	1.5	0.94	1.6	< 0.05	0.38	0.37	4.4	4	1.3	< 0.05	< 0.05	1.5	0.97	< 0.05	0.25	2	0.79	
Pyrene	mg/kg	0.05	MCERTS	26	0.23	4.5	54,000	LQM	< 0.05	< 0.05	2.2	2.1	< 0.05	4.5	< 0.05	< 0.05	1.4	1.1	1.5	< 0.05	0.41	0.39	3.6	3.9	1.3	< 0.05	< 0.05	1.3	0.93	< 0.05	0.23	0.72	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	26	0.25	3	170	LQM	< 0.05	< 0.05	1.7	1.3	< 0.05	3	< 0.05	< 0.05	0.79	0.81	0.93	< 0.05	0.32	0.25	2.4	2.6	0.92	< 0.05	< 0.05	0.76	0.67	< 0.05	1.2	0.4	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	26	0.21	2.1	350	LQM	< 0.05	< 0.05	1.4	1.1	< 0.05	1.7	< 0.05	< 0.05	0.67	0.79	0.93	< 0.05	0.22	0.21	1.9	2.1	0.81	< 0.05	< 0.05	0.62	0.58	< 0.05	1	0.36	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	26	0.2	3.5	44	LQM	< 0.05	< 0.05	1.6	1.6	< 0.05	3	< 0.05	< 0.05	1	0.86	1.1	< 0.05	0.33	0.2	2.9	3.5	1.2	< 0.05	< 0.05	0.72	0.88	< 0.05	0.87	0.39	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	26	0.15	1.1	1,200	LQM	< 0.05	< 0.05	0.54	0.47	< 0.05	1.1	< 0.05	< 0.05	0.42	0.32	0.39	< 0.05	0.17	0.15	0.74	0.84	0.34	< 0.05	< 0.05	0.28	0.19	< 0.05	0.27	0.12	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	26	0.21	2.7	35	LQM	< 0.05	< 0.05	1.2	1.1	< 0.05	2.7	< 0.05	< 0.05	0.87	0.79	0.89	< 0.05	0.27	0.21	1.7	2.4	0.84	< 0.05	< 0.05	0.58	0.65	< 0.05	0.88	0.37	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	26	0.26	1.3	500	LQM	< 0.05	< 0.05	0.45	0.63	< 0.05	1.3	< 0.05	< 0.05	0.53	0.28	0.4	< 0.05	< 0.05	< 0.05	0.99	1.2	0.43	< 0.05	< 0.05	0.26	0.31	< 0.05	< 0.05	0.32	< 0.05	
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	26	0.33	0.41	3.5	LQM	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.38	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.33	0.41	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	26	0.33	1.7	3,900	LQM	< 0.05	< 0.05	0.64	0.76	< 0.05	1.7	< 0.05	< 0.05	0.68	0.45	0.55	< 0.05	< 0.05	< 0.05	< 0.05	1.2	1.5	< 0.05	< 0.05	0.33	0.41	< 0.05	0.44	< 0.05	< 0.05	
Total PAH																																		
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	26	2.09	29.5	N/A	N/A	< 0.80	< 0.80	15.9	13	< 0.80	29.5	< 0.80	< 0.80	8.85	8.54	9.62	< 0.80	2.34	2.09	22.4	24.1	8.33	< 0.80	< 0.80	8.12	6.22	< 0.80	< 0.80	11.5	3.67	

Appendix D - Chemical Screening - Leachate																	
19-0654.06 - Site 3, Image Business Park, Knowsley																	
							Exploratory Hole ID		DS01	DS02	DS04	DS06	DS08	DS10	TP02	TP06	TP12
Key	Below GAC		Above GAC	Below LoD			Depth		0.9	0.75	1	0.5	0.4	0.8	0.55	0.3	0.25
							Consultant		DS	DS	DS	DS	DS	DS	DS	DS	DS
							Date Sampled		22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	26/07/2021	23/07/2021	26/07/2021
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditati on Status	No. tests	Minimum (ug/l)	Maximum (ug/l)	Screening criteria (ug/l)	GAC Source	MG	MG	MG	MG	MG	MG	MG	MG	MG
Arsenic (dissolved)	µg/l	1.1	ISO 17025	10	<1.0	32	10	DWQS	7.8	< 1.0	3.6	4.9	< 1.0	7.2	< 1.0	< 1.0	32
Cadmium (dissolved)	µg/l	0.08	ISO 17025	10	<0.08	<0.08	5	WFD	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	10	<0.5	16	3.4	WFD 2015b	< 5.0	6	< 5.0	U/S*	16	9.8	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	10	<0.4	19	50	WFD	< 0.4	6.5	5.1	3	19	14	4.6	3.2	3.7
Copper (dissolved)	µg/l	0.7	ISO 17025	10	14	79	2,000	WFD	34	38	79	77	46	19	20	55	14
Lead (dissolved)	µg/l	1	ISO 17025	10	<1.0	4.3	10	DWQS	2.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.3	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	10	<0.5	<0.5	1	WFD	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	10	2.4	14	20	WFD	3.7	3.7	3.7	11	5.2	2.5	3	14	2.4
Zinc (dissolved)	µg/l	0.4	ISO 17025	10	<0.4	24	3000	WFD	24	9.7	15	14	15	12	12	10	8.8

Reference Sources

DWQS 2016 - The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards]

WFD - Water Framework Directive (Standards and Classification) Durections (England and Wales) 2015

BH07
0.5
DS
28/07/2021
MG
9.1
< 0.08
U/S*
2.5
38
2.8
< 0.5
11
16

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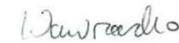
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Analytical Report Number : 21-90035

Replaces Analytical Report Number: 21-90035, issue no. 1
Additional analysis undertaken.

Project / Site name:	Site 3 Knowsley	Samples received on:	27/07/2021
Your job number:	19 0654 06	Samples instructed on/ Analysis started on:	29/07/2021
Your order number:	DS62562	Analysis completed by:	23/08/2021
Report Issue Number:	2	Report issued on:	23/08/2021
Samples Analysed:	9 leachate samples - 22 soil samples		

Signed:



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

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

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

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

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

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

Analytical Report Number: 21-90035

Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	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	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	20	3.5	5.7	3.8	12	13	4.4	9.5	5.6
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	1.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile & Crocidolite	-	-	-	-	-	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.002	-	-	-	-	-	0.003
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.002	-	-	-	-	-	0.003

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	11.3	11.5	11.2	11.2	8.7	11.6	9.0	11.4
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	460	380	180	380	410	120	68	200	260
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.23	0.19	0.092	0.19	0.21	0.058	0.034	0.10	0.13
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	228	192	91.5	190	207	57.5	33.9	102	129
Organic Matter (automated)	%	0.1	MCERTS	11	2.4	-	2.5	6.7	-	2.5	-	1.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.21	< 0.05	< 0.05	0.42	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.40	< 0.05	< 0.05	0.34	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.3	1.4	< 0.05	3.5	< 0.05	< 0.05	0.96
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.86	0.27	< 0.05	0.85	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.5	2.3	< 0.05	5.0	< 0.05	< 0.05	1.5
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.2	2.1	< 0.05	4.5	< 0.05	< 0.05	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	1.3	< 0.05	3.0	< 0.05	< 0.05	0.79
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	1.1	< 0.05	1.7	< 0.05	< 0.05	0.67
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	1.6	< 0.05	3.0	< 0.05	< 0.05	1.0
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.54	0.47	< 0.05	1.1	< 0.05	< 0.05	0.42
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	1.1	< 0.05	2.7	< 0.05	< 0.05	0.87
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.45	0.63	< 0.05	1.3	< 0.05	< 0.05	0.53
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.38	< 0.05	< 0.05	< 0.05

Analytical Report Number: 21-90035
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	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	< 0.05	0.64	0.76	< 0.05	1.7	< 0.05	< 0.05	0.68

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	15.9	13.0	< 0.80	29.5	< 0.80	< 0.80	8.85
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	6.7	34	29	10	8.0	13	2.9	14
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.5	1.7	< 0.2	0.4	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	11	72	67	18	18	16	11	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39	37	2000	13000	27	44	30	9.7	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	40	14	250	2000	19	42	8.0	5.1	32
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	9.1	97	850	13	18	12	9.0	15
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	44	42	1400	23000	56	100	55	64	54

Monoaromatics & Oxygenates

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
o-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	3.9	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	47	< 2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	67	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	42	< 8.0	< 8.0	< 8.0	59	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10	< 10	56	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	160	< 10	< 10	< 10	70	< 10	< 10

Analytical Report Number: 21-90035
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	3.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	12	< 2.0	< 2.0	< 2.0	2.4	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	28	< 10	< 10	15	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	21	20	< 10	27	90	< 10	< 10
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10	< 10	75	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	64	27	< 10	42	98	< 10	15

TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10	130	< 10	< 10
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VOCs

Chloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Chloroethane	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Bromomethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Vinyl Chloride	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Trichlorofluoromethane	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1-Dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Trichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Benzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Tetrachloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Trichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-

Analytical Report Number: 21-90035

Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Dibromomethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Bromodichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Toluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Tetrachloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Chlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Ethylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
p & m-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Styrene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Tribromomethane	mg/kg	0.001	NONE	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
o-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Isopropylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Bromobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-

Analytical Report Number: 21-90035

Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-

Analytical Report Number: 21-90035

Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	< 0.05	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	1.4	< 0.05	-	< 0.05	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	0.27	< 0.05	-	< 0.05	< 0.05	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	2.3	< 0.05	-	< 0.05	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	2.1	< 0.05	-	< 0.05	< 0.05	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	1.3	< 0.05	-	< 0.05	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	1.1	< 0.05	-	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	1.6	< 0.05	-	< 0.05	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	0.47	< 0.05	-	< 0.05	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	1.1	< 0.05	-	< 0.05	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	0.63	< 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	-	0.76	< 0.05	-	< 0.05	< 0.05	-

PCBs

PCB Congener 077	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-
PCB Congener 081	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-
PCB Congener 105	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-
PCB Congener 114	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-
PCB Congener 118	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-
PCB Congener 123	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-
PCB Congener 126	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-	-	< 0.001	-

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Lab Sample Number				1956568	1956569	1956570	1956571	1956572	1956573	1956574	1956575	1956576
Sample Reference				DS01	DS02	DS03	DS04	DS06	DS07	DS08	DS09	DS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	0.70	1.00	0.50	0.70	0.40	0.70	0.80
Date Sampled				22/07/2021	22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status						
PCB Congener 156				mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-
PCB Congener 157				mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-
PCB Congener 167				mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-
PCB Congener 169				mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-
PCB Congener 189				mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001	-
Total PCBs – WHO12												
Total PCBs				mg/kg	0.012	NONE	-	< 0.012	-	-	< 0.012	-

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

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Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956577	1956578	1956579	1956580	1956581	1956582	1956583	1956584	1956585
Sample Reference				TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.55	0.30	0.60	0.30	0.40	0.25	0.60	0.60
Date Sampled				26/07/2021	26/07/2021	26/07/2021	26/07/2021	23/07/2021	26/07/2021	23/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	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	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.5	3.8	5.9	13	6.6	10	6.8	10	9.7
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	1.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Amosite	-	-	Chrysotile	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	< 0.001	-	-	< 0.001	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	< 0.001	-	-	< 0.001	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.6	11.8	11.7	10.3	11.5	9.9	10.8	8.4	10.1
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100	47	21	2000	370	4300	3600	4800	470
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.051	0.024	0.011	1.0	0.19	2.2	1.8	2.4	0.23
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	51.3	23.7	10.5	996	187	2150	1800	2410	235
Organic Matter (automated)	%	0.1	MCERTS	-	1.2	-	-	1.2	-	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.64	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	1.2	< 0.05	0.24	0.31	1.9	1.4	0.76	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.25	0.20	< 0.05	< 0.05	< 0.05	0.42	0.39	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.94	1.6	< 0.05	0.38	0.37	4.4	4.0	1.3	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.1	1.5	< 0.05	0.41	0.39	3.6	3.9	1.3	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.81	0.93	< 0.05	0.32	0.25	2.4	2.6	0.92	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.79	0.93	< 0.05	0.22	0.21	1.9	2.1	0.81	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.86	1.1	< 0.05	0.33	0.20	2.9	3.5	1.2	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.32	0.39	< 0.05	0.17	0.15	0.74	0.84	0.34	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.79	0.89	< 0.05	0.27	0.21	1.7	2.4	0.84	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.28	0.40	< 0.05	< 0.05	< 0.05	0.99	1.2	0.43	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.33	0.41	< 0.05	< 0.05

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[illegible]

Analytical Report Number: 21-90035
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1956577	1956578	1956579	1956580	1956581	1956582	1956583	1956584	1956585
Sample Reference				TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.55	0.30	0.60	0.30	0.40	0.25	0.60	0.60
Date Sampled				26/07/2021	26/07/2021	26/07/2021	26/07/2021	23/07/2021	26/07/2021	23/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	24	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	88	< 10	< 10	< 10	< 10	11	< 10	55
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	130	< 10	< 10	< 10	14	22	< 10	130
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	< 10	28	< 10	< 10	< 10	< 10	< 10	< 10	11
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	240	< 10	< 10	< 10	24	33	< 10	180
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	28	< 10	< 10	< 10	< 10	< 10	< 10	26

VOCs

Chloromethane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Chloroethane	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Bromomethane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Vinyl Chloride	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Trichlorofluoromethane	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1-Dichloroethene	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Trichloromethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Benzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Tetrachloromethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Trichloroethene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010

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Lab Sample Number				1956577	1956578	1956579	1956580	1956581	1956582	1956583	1956584	1956585
Sample Reference				TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.55	0.30	0.60	0.30	0.40	0.25	0.60	0.60
Date Sampled				26/07/2021	26/07/2021	26/07/2021	26/07/2021	23/07/2021	26/07/2021	23/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Dibromomethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Bromodichloromethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Toluene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Tetrachloroethene	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Chlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Ethylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
p & m-Xylene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Styrene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Tribromomethane	mg/kg	0.001	NONE	-	-	-	-	< 0.0010	-	-	-	< 0.0010
o-Xylene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Isopropylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Bromobenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010

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Project / Site name: Site 3 Knowsley

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Lab Sample Number				1956577	1956578	1956579	1956580	1956581	1956582	1956583	1956584	1956585
Sample Reference				TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.55	0.30	0.60	0.30	0.40	0.25	0.60	0.60
Date Sampled				26/07/2021	26/07/2021	26/07/2021	26/07/2021	23/07/2021	26/07/2021	23/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	-	-	-	< 0.0010	-	-	-	< 0.0010
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	-	-	-	< 0.0010	-	-	-	< 0.0010

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	-	< 0.1	-	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	< 0.2	-	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2	-	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2	-	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2	-	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05	-	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	< 0.2	-	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2	-	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05	-	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3	-	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	< 0.1	-	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	< 0.1	-	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2	-	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	< 0.1	-	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1	-	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05	-	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05	-	-	-	< 0.05

Your Order No: DS62562

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Analytical Report Number: 21-90035

Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956577	1956578	1956579	1956580	1956581	1956582	1956583	1956584	1956585
Sample Reference				TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.55	0.30	0.60	0.30	0.40	0.25	0.60	0.60
Date Sampled				26/07/2021	26/07/2021	26/07/2021	26/07/2021	23/07/2021	26/07/2021	23/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status						
PCB Congener 156				mg/kg	0.001	NONE	-	-	-	-	-	-
PCB Congener 157				mg/kg	0.001	NONE	-	-	-	-	-	-
PCB Congener 167				mg/kg	0.001	NONE	-	-	-	-	-	-
PCB Congener 169				mg/kg	0.001	NONE	-	-	-	-	-	-
PCB Congener 189				mg/kg	0.001	NONE	-	-	-	-	-	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	-	-	-	-	-	-	-	-	-
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-90035
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.7	5.8	7.0	11
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	1.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	11.4	11.4	9.4
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	120	220	210	1100
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.059	0.11	0.10	0.57
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	59.1	108	103	569
Organic Matter (automated)	%	0.1	MCERTS	-	4.7	-	-

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	1.6	0.63	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.29	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.5	0.97	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.3	0.93	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.76	0.67	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.62	0.58	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.72	0.88	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.28	0.19	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.58	0.65	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.26	0.31	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

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Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				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	0.33	0.41	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	8.12	6.22	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.2	47	19	22
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.3	21	20	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39	80	71	36
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	43	150	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.5	36	18	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	100	220	120

Monoaromatics & Oxygenates

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
o-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	62
TPH-CWG - Aliphatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	67

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Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10

VOCs

Chloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Chloroethane	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
Bromomethane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Vinyl Chloride	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
Trichlorofluoromethane	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
1,1-Dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Trichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
Benzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Tetrachloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Trichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010

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Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Dibromomethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Bromodichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Toluene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Tetrachloroethene	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
Chlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Ethylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
p & m-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Styrene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Tribromomethane	mg/kg	0.001	NONE	-	< 0.0010	< 0.0010	< 0.0010
o-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Isopropylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Bromobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010

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Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	< 0.0010	< 0.0010	< 0.0010
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	< 0.0010	< 0.0010

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05

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Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	1.6	0.63	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	0.29	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	1.5	0.97	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	1.3	0.93	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.76	0.67	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	0.62	0.58	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	0.72	0.88	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.28	0.19	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.58	0.65	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.26	0.31	< 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	-	0.33	0.41	< 0.05

PCBs

PCB Congener 077	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 081	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 105	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 114	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 118	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 123	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 126	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001

Analytical Report Number: 21-90035
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1956586	1956587	1956588	1956589
Sample Reference				TP11	TP12	BH01	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.25	0.40	0.50
Date Sampled				26/07/2021	26/07/2021	22/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
PCB Congener 156	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 157	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 167	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 169	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001
PCB Congener 189	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	-	< 0.012	-	< 0.012
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: **21-90035**
Project / Site name: **Site 3 Knowsley**
Your Order No: **DS62562**

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1956570	DS03	0.70	163	Loose Fibres	Chrysotile & Crocidolite	0.002	0.002
1956576	DS10	0.80	139	Loose Fibres	Amosite	0.003	0.003
1956580	TP04	0.60	130	Loose Fibres	Amosite	< 0.001	< 0.001
1956583	TP08	0.25	138	Loose Fibres	Chrysotile	< 0.001	< 0.001
1956584	TP09	0.60	134	Loose Fibres	Chrysotile	< 0.001	< 0.001
1956588	BH01	0.40	138	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number: 21-90035

Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1956590	1956591	1956592	1956593	1956594	1956595	1956596	1956597	1956598
Sample Reference				DS01	DS02	DS04	DS06	DS08	DS10	TP02	TP06	TP12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.75	1.00	0.50	0.40	0.80	0.55	0.30	0.25
Date Sampled				22/07/2021	22/07/2021	22/07/2021	23/07/2021	23/07/2021	23/07/2021	26/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status									

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	7.8	< 1.0	3.6	4.9	< 1.0	7.2	< 1.0	< 1.0	32
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	6.0	< 5.0	U/S*	16	9.8	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	5.1	U/S*	3.1	4.3	4.6	3.2	3.7
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	6.5	5.1	3.0	19	14	4.6	3.2	3.7
Copper (dissolved)	µg/l	0.7	ISO 17025	34	38	79	77	46	19	20	55	14
Lead (dissolved)	µg/l	1	ISO 17025	2.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.3	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.7	3.7	3.7	11	5.2	2.5	3.0	14	2.4
Zinc (dissolved)	µg/l	0.4	ISO 17025	24	9.7	15	14	15	12	12	10	8.8

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

*U/S due to high variances between chromium (hexavalent) and chromium (dissolved) caused by method differences.

Analytical Report Number : 21-90035**Project / Site name: Site 3 Knowsley**

* 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 *
1956568	DS01	None Supplied	0.9	Brown loam and sand with gravel and vegetation.
1956569	DS02	None Supplied	0.75	Brown sand with gravel.
1956570	DS03	None Supplied	0.7	Brown sand with rubble.
1956571	DS04	None Supplied	1	Brown sandy loam with gravel and vegetation.
1956572	DS06	None Supplied	0.5	Brown sand with gravel.
1956573	DS07	None Supplied	0.7	Brown sandy clay with gravel and vegetation.
1956574	DS08	None Supplied	0.4	Brown sand with rubble.
1956575	DS09	None Supplied	0.7	Brown sand with gravel.
1956576	DS10	None Supplied	0.8	Brown sand with gravel.
1956577	TP01	None Supplied	0.5	Brown sand with rubble.
1956578	TP02	None Supplied	0.55	Brown sand with rubble.
1956579	TP03	None Supplied	0.3	Brown sand with rubble.
1956580	TP04	None Supplied	0.6	Brown sand with gravel.
1956581	TP06	None Supplied	0.3	Brown sand with rubble.
1956582	TP07	None Supplied	0.4	Brown sand with rubble.
1956583	TP08	None Supplied	0.25	Brown sand with rubble.
1956584	TP09	None Supplied	0.6	Brown sand with rubble and brick.
1956585	TP10	None Supplied	0.6	Brown sand with gravel.
1956586	TP11	None Supplied	0.3	Brown sand with gravel.
1956587	TP12	None Supplied	0.25	Grey sand with rubble.
1956588	BH01	None Supplied	0.4	Grey sand with rubble.
1956589	BH04	None Supplied	0.5	Brown sand with rubble.

Analytical Report Number : 21-90035

Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in 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
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-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
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
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
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

Analytical Report Number : 21-90035
Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
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	NONE
Cr (III) in leachate	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
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
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 21-90035
Project / Site name: Site 3 Knowsley

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

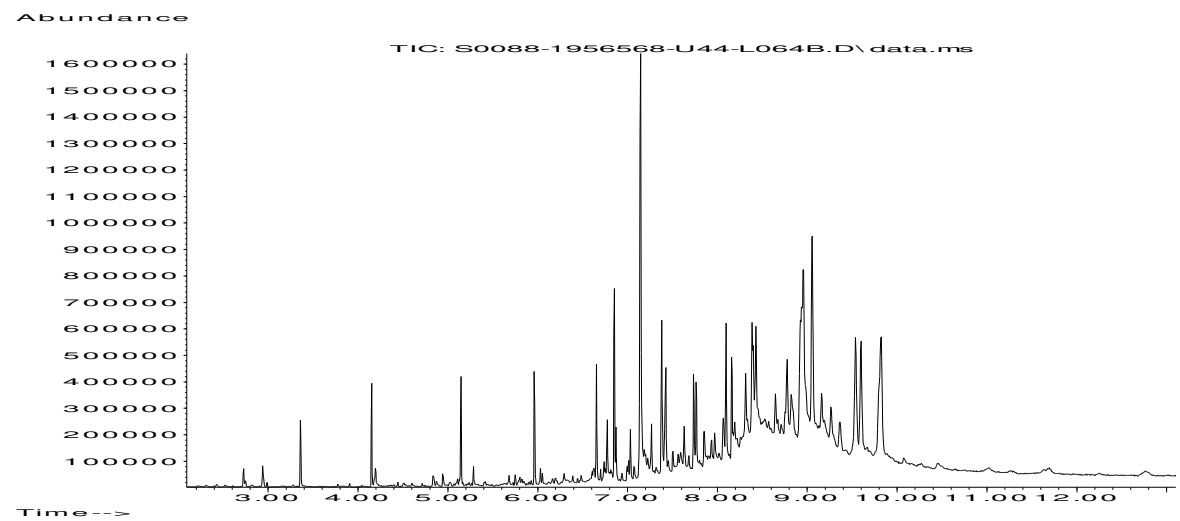
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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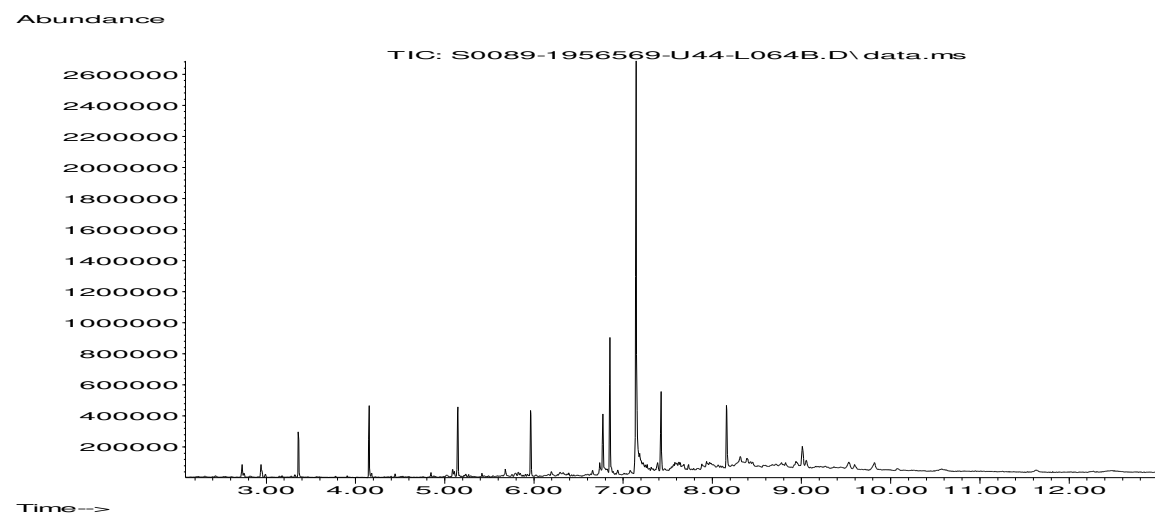
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

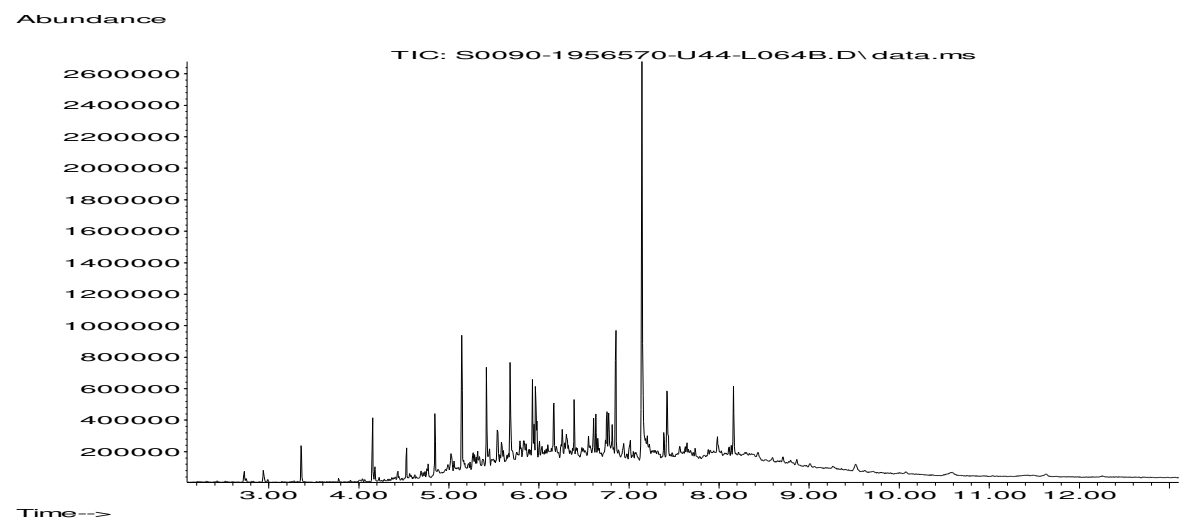
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

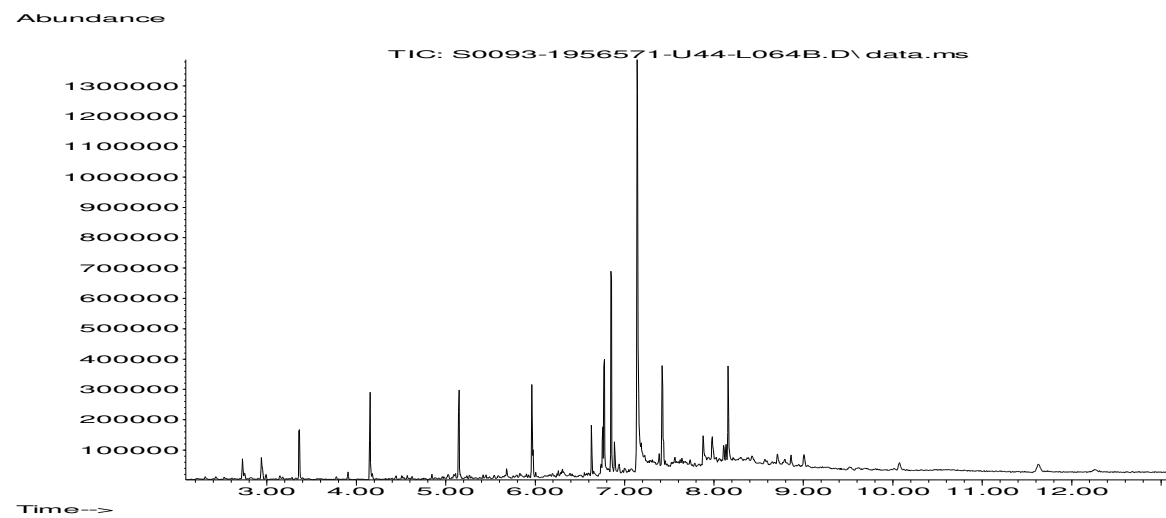
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

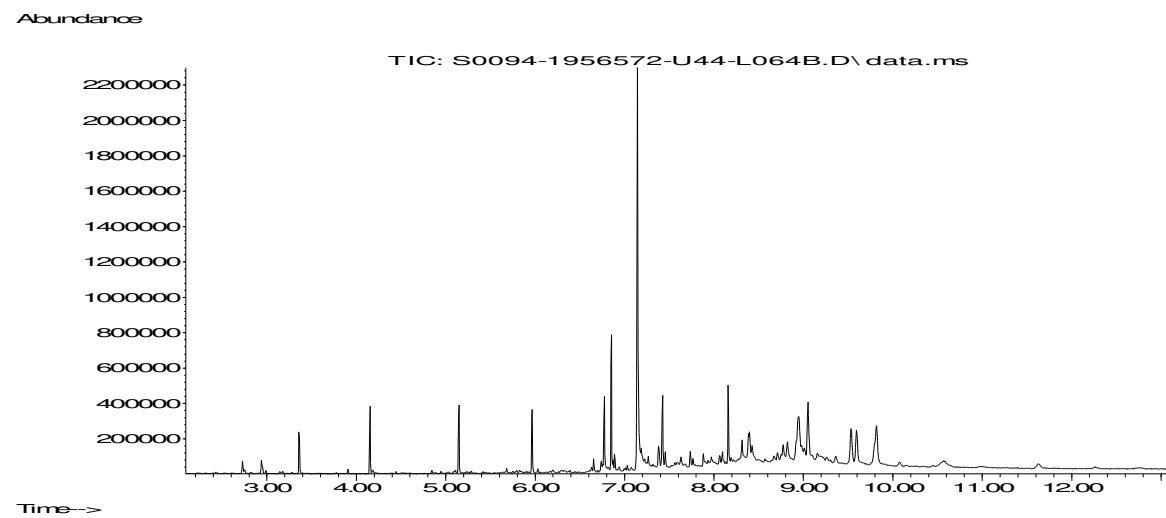
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

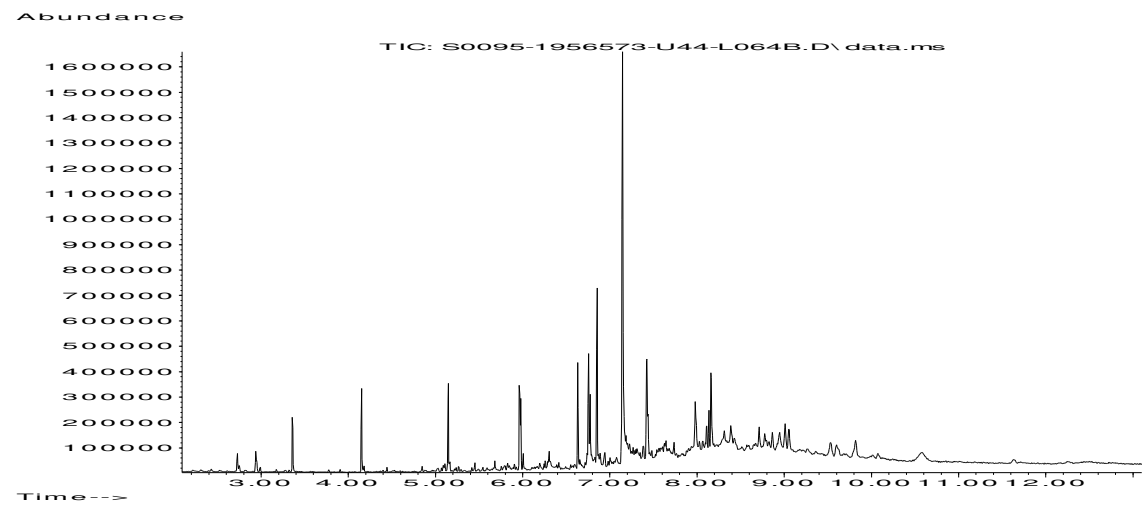


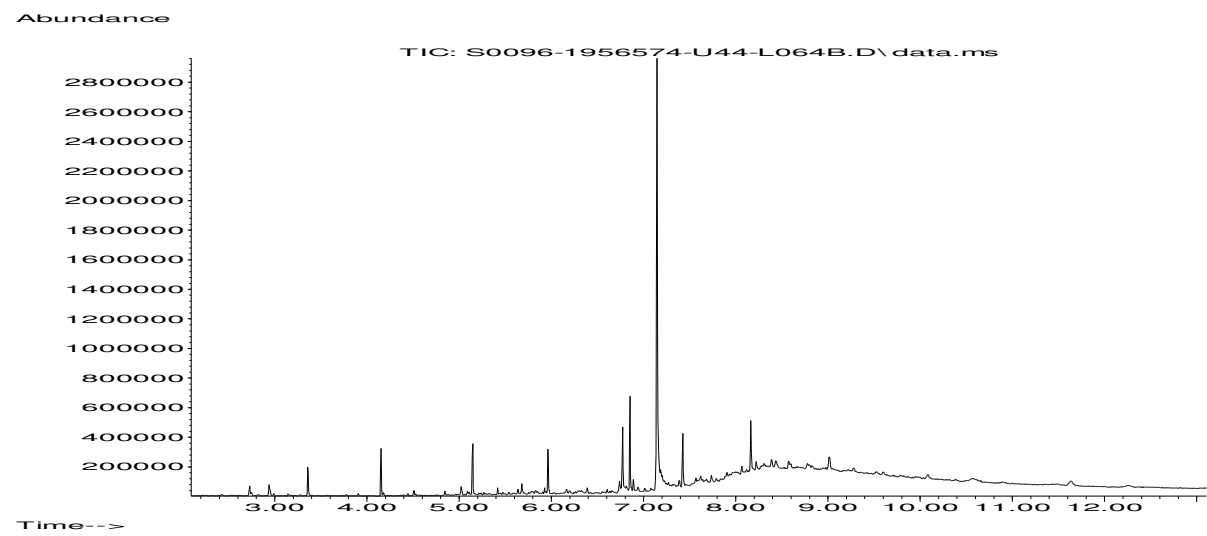


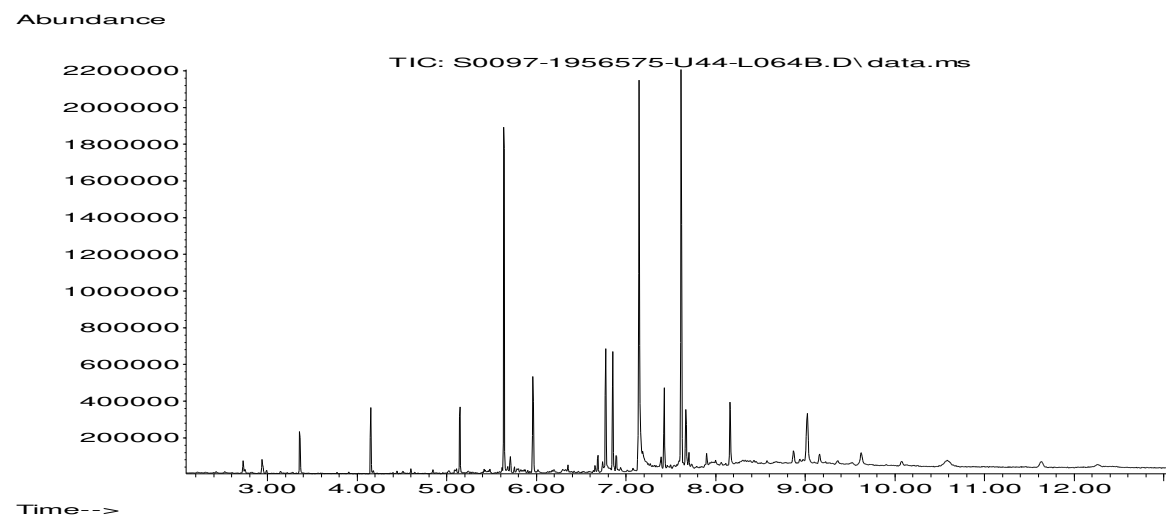


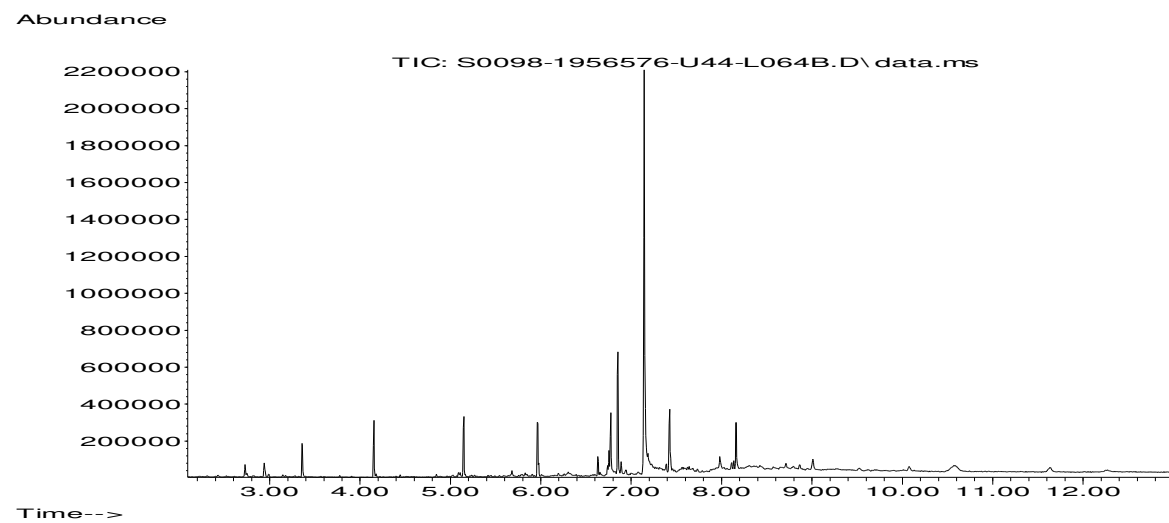


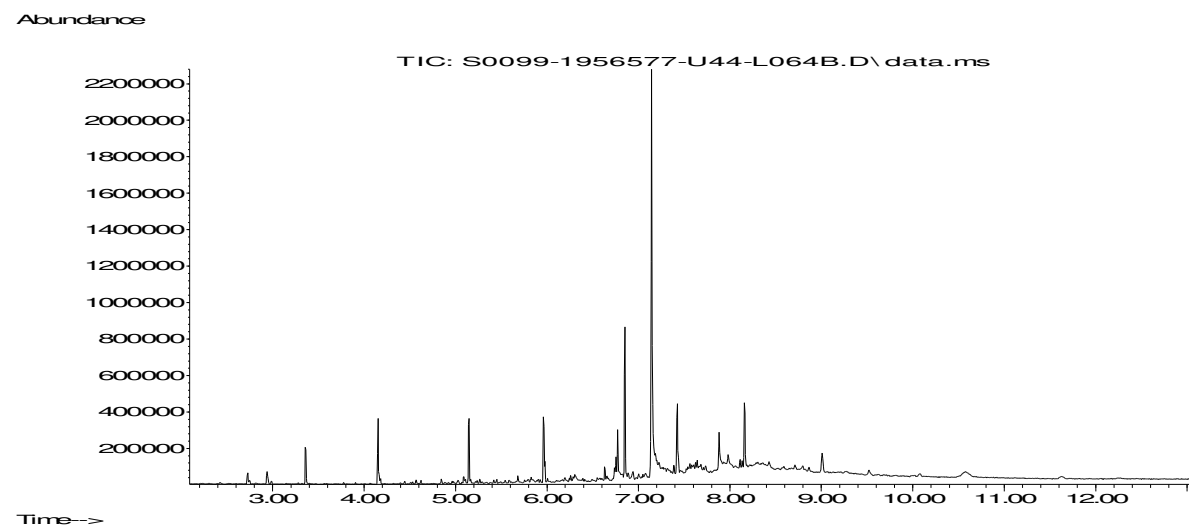


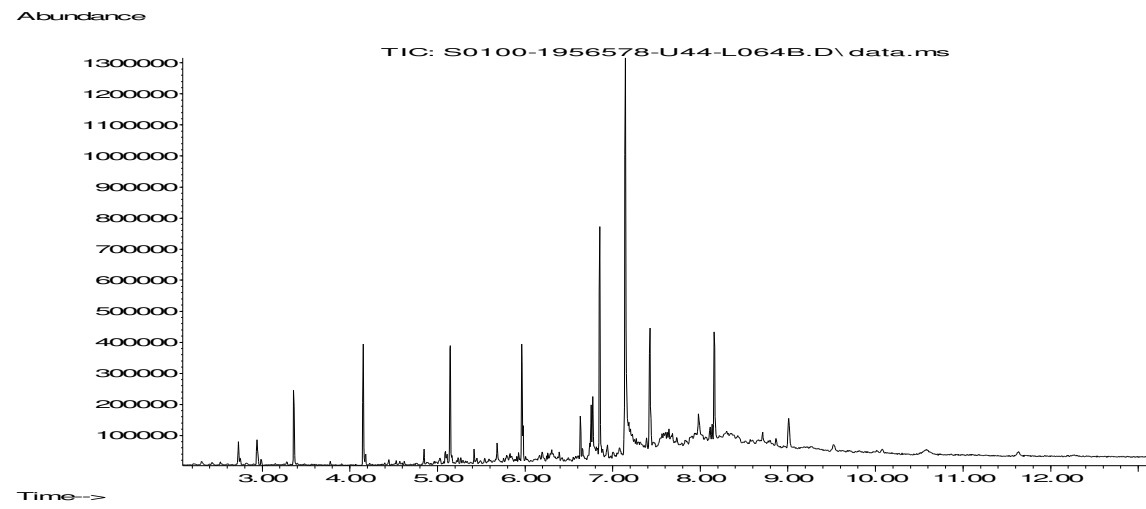


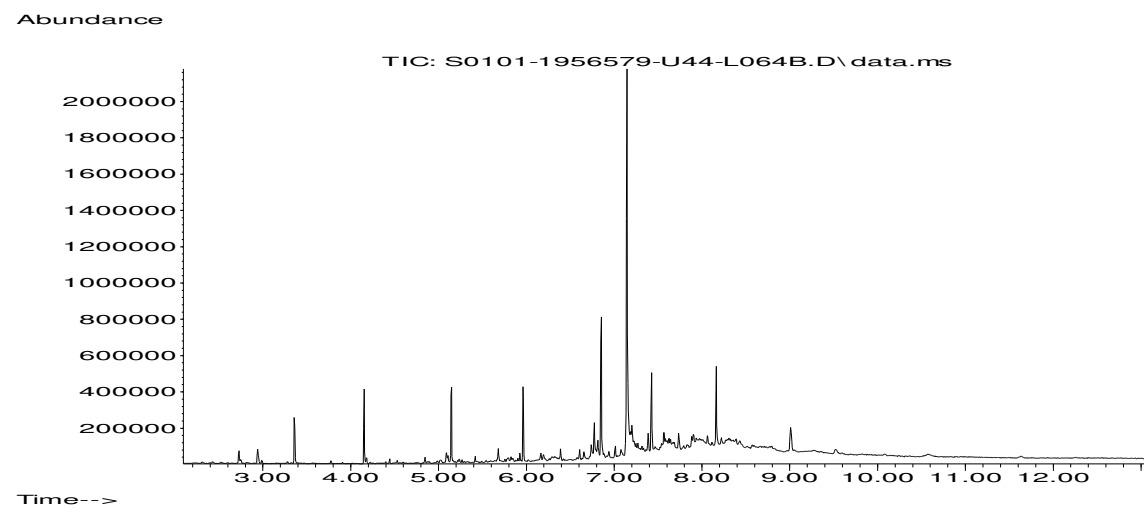


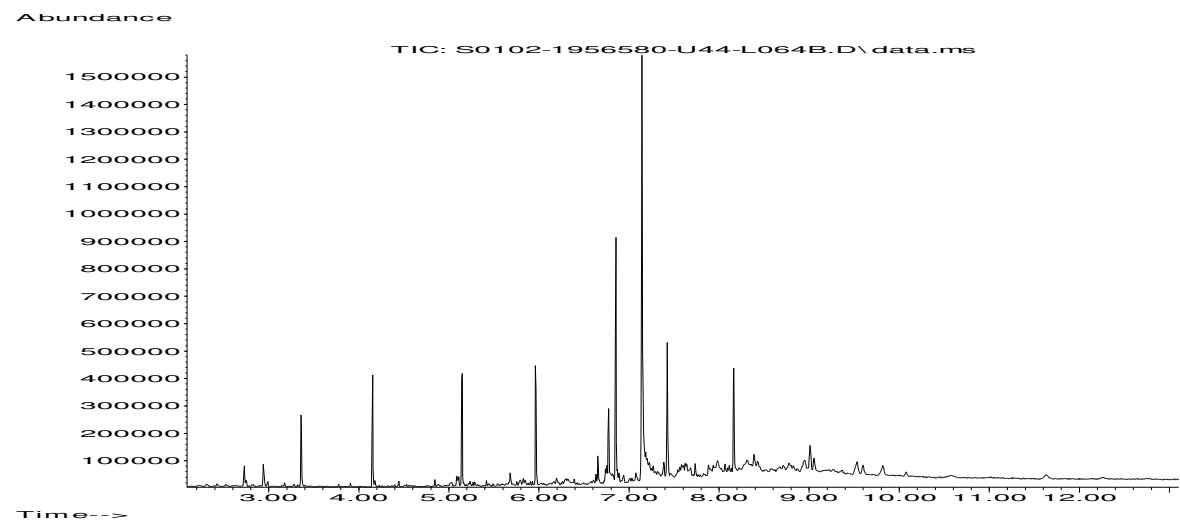


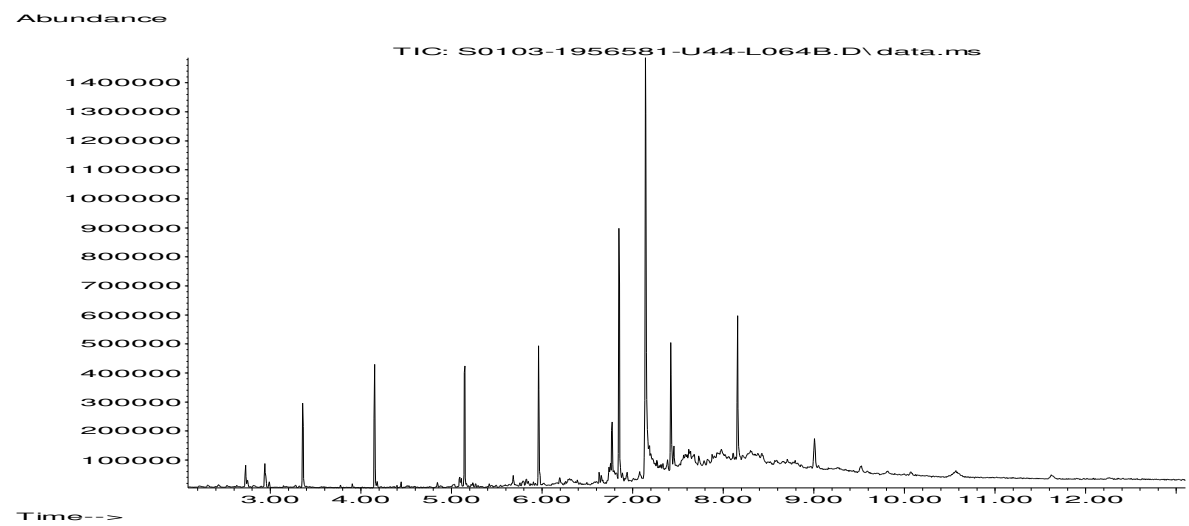


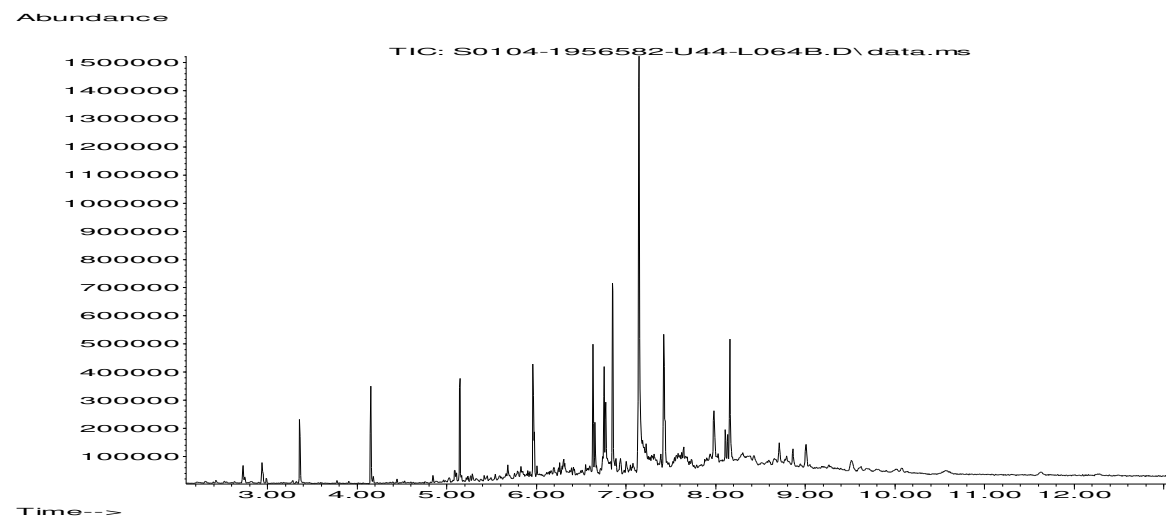


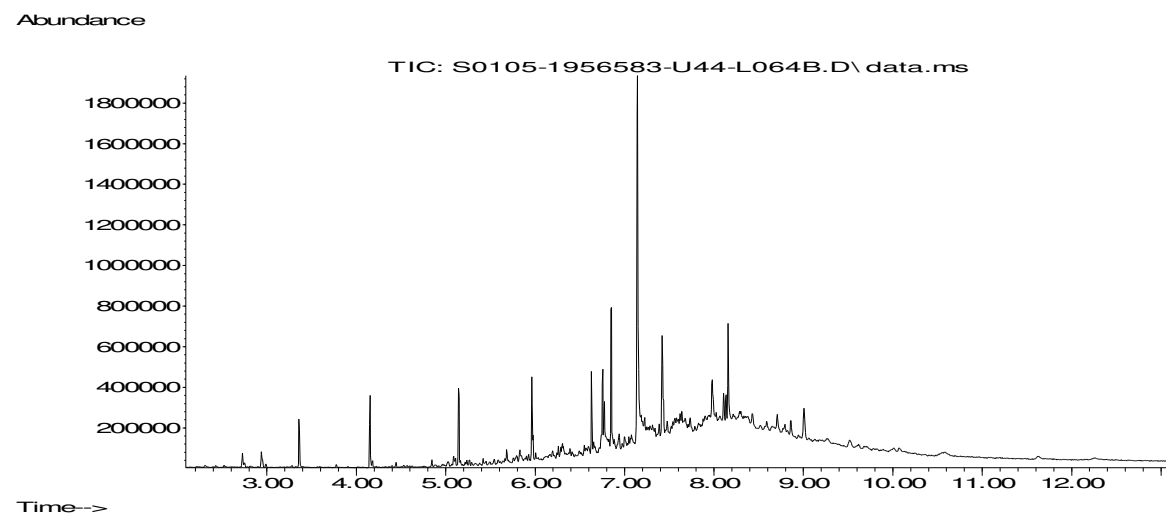






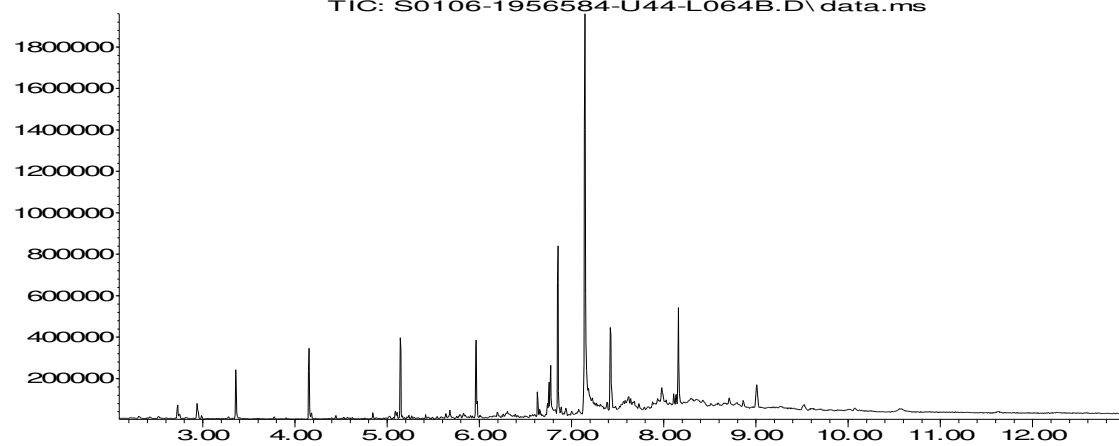




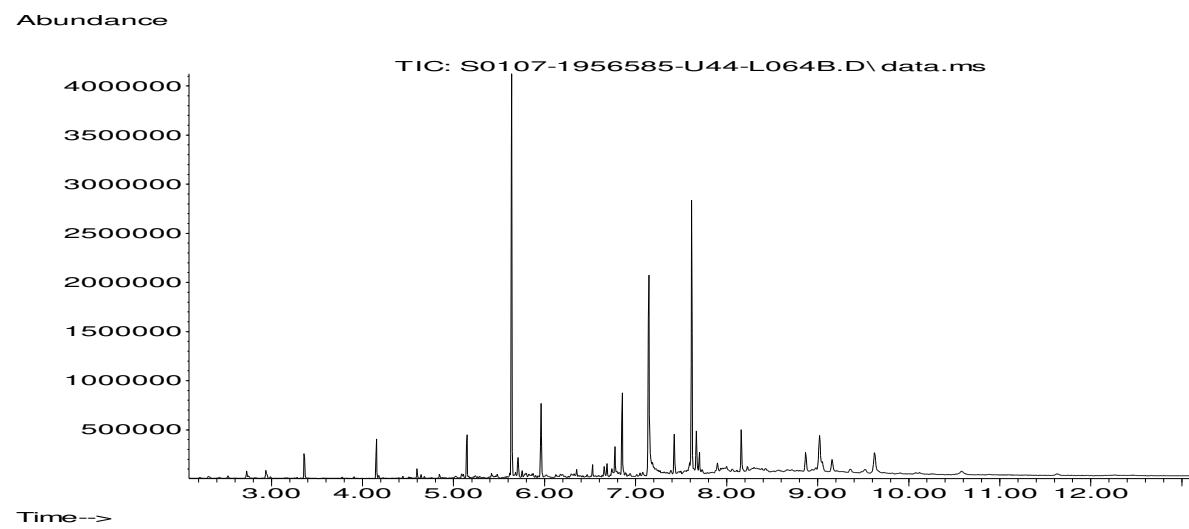


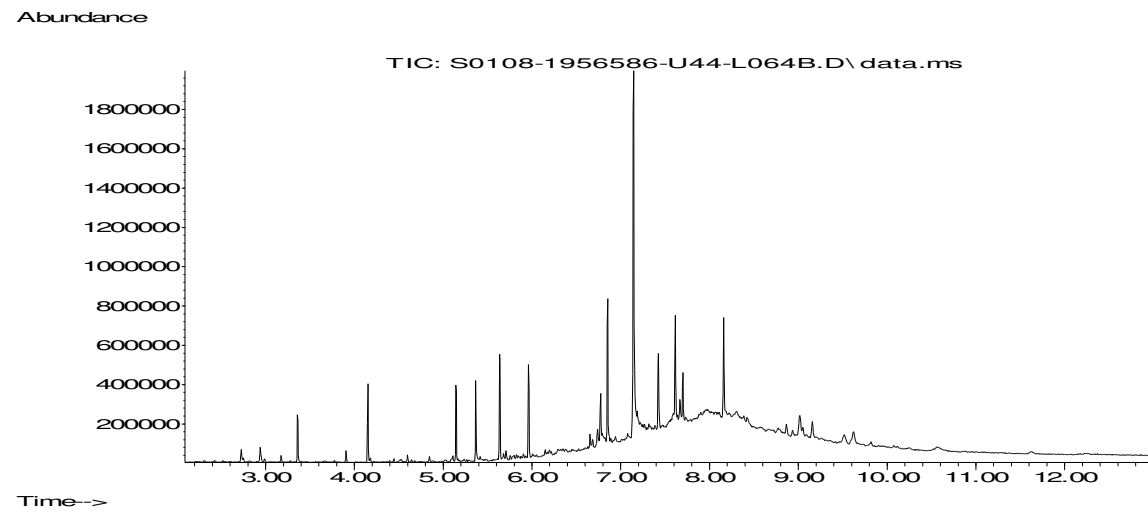
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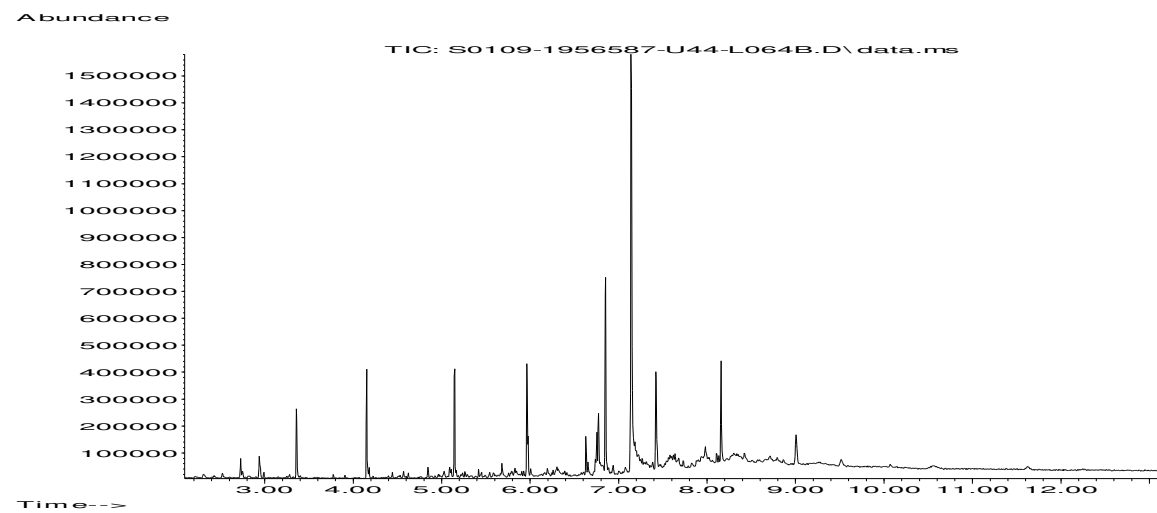
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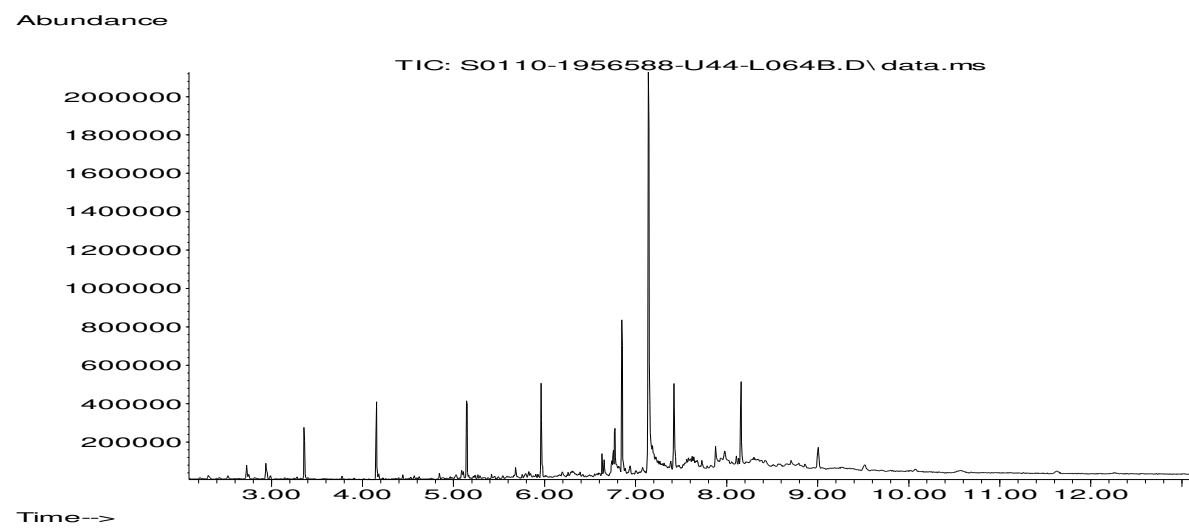


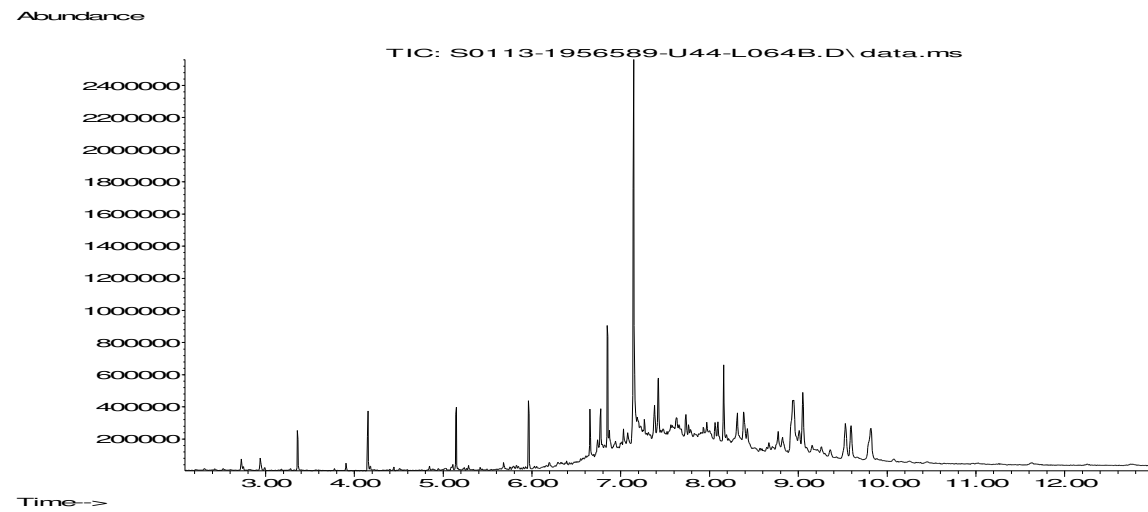
Time-->













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e: ben.osborne@deltasimons.com

Analytical Report Number : 21-90039

Project / Site name:	Site 3 Knowsley	Samples received on:	27/07/2021
Your job number:	19 0654 06	Samples instructed on/ Analysis started on:	29/07/2021
Your order number:	DS62562	Analysis completed by:	05/08/2021
Report Issue Number:	1	Report issued on:	05/08/2021
Samples Analysed:	5 10:1 WAC Samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

i2 Analytical

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Waste Acceptance Criteria Analytical Results							
Report No:		21-90039					
					Client: DELTASIM		
Location		Site 3 Knowsley					
Lab Reference (Sample Number)		1956636 / 1956637			Landfill Waste Acceptance Criteria		
Sampling Date		22/07/2021			Limits		
Sample ID		DS04			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)		1.00					
Solid Waste Analysis							
TOC (%)**	1.5				3%	5%	6%
Loss on Ignition (%) **	3.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	10.5				100	--	--
pH (units)**	11.7				--	>6	--
Acid Neutralisation Capacity (mol / kg)	80				--	To be evaluated	To be evaluated
Eluate Analysis							
	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0035			0.0319	0.5	2	25
Barium *	0.0422			0.385	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0033			0.030	0.5	10	70
Copper *	0.038			0.34	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0039			0.0355	0.5	10	30
Nickel *	0.0032			0.029	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0036			0.033	4	50	200
Chloride *	5.1			47	800	15000	25000
Fluoride	0.22			2.0	10	150	500
Sulphate *	39			360	1000	20000	50000
TDS*	470			4200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.32			48.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.3						
Dry Matter (%)	96						
Moisture (%)	3.8						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.							

i2 Analytical

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Waste Acceptance Criteria Analytical Results							
Report No:	21-90039						
				Client: DELTASIM			
Location	Site 3 Knowsley						
Lab Reference (Sample Number)	1956638 / 1956639			Landfill Waste Acceptance Criteria			
Sampling Date	23/07/2021			Limits			
Sample ID	DS06			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	3.9			3%	5%	6%	
Loss on Ignition (%) **	8.1			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--	
pH (units)**	11.3			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	140			--	To be evaluated	To be evaluated	
Eluate Analysis				10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0101			0.0805	0.5	2	25
Barium *	0.0221			0.177	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0033			0.027	0.5	10	70
Copper *	0.045			0.36	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0188			0.150	0.5	10	30
Nickel *	0.0086			0.069	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.026			0.20	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0063			0.050	4	50	200
Chloride *	15			120	800	15000	25000
Fluoride	0.48			3.8	10	150	500
Sulphate *	62			490	1000	20000	50000
TDS*	230			1800	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	69.9			558	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.3						
Dry Matter (%)	88						
Moisture (%)	12						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				** = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.							
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.							

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Waste Acceptance Criteria Analytical Results						
Report No:	21-90039					
				Client: DELTASIM		
Location	Site 3 Knowsley					
Lab Reference (Sample Number)	1956640 / 1956641			Landfill Waste Acceptance Criteria		
Sampling Date	23/07/2021			Limits		
Sample ID	DS08			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	0.40					
Solid Waste Analysis						
TOC (%)**	1.5			3%	5%	6%
Loss on Ignition (%) **	2.9			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg)	200			500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--
pH (units)**	11.9			--	>6	--
Acid Neutralisation Capacity (mol / kg)	110			--	To be evaluated	To be evaluated
Eluate Analysis						
	10:1		10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0043		0.0393	0.5	2	25
Barium *	0.0886		0.818	20	100	300
Cadmium *	< 0.0001		< 0.0008	0.04	1	5
Chromium *	0.021		0.19	0.5	10	70
Copper *	0.030		0.27	2	50	100
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2
Molybdenum *	0.0018		0.0162	0.5	10	30
Nickel *	0.0047		0.044	0.4	10	40
Lead *	< 0.0010		< 0.010	0.5	10	50
Antimony *	< 0.0017		< 0.017	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
Zinc *	0.0018		0.017	4	50	200
Chloride *	5.2		48	800	15000	25000
Fluoride	0.095		0.87	10	150	500
Sulphate *	7.7		72	1000	20000	50000
TDS*	1100		10000	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
DOC	11.9		109	500	800	1000
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	1.3					
Dry Matter (%)	96					
Moisture (%)	4.4					
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)						
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited						
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Waste Acceptance Criteria Analytical Results							
Report No:	21-90039						
				Client: DELTASIM			
Location	Site 3 Knowsley						
Lab Reference (Sample Number)	1956642 / 1956643			Landfill Waste Acceptance Criteria			
Sampling Date	23/07/2021			Limits			
Sample ID	DS09			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.70						
Solid Waste Analysis							
TOC (%)**	1.0			3%	5%	6%	
Loss on Ignition (%) **	2.5			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--	
pH (units)**	9.0			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	4.1			--	To be evaluated	To be evaluated	
Eluate Analysis				10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0133			0.121	0.5	2	25
Barium *	0.0158			0.143	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0028			0.025	0.5	10	70
Copper *	0.012			0.11	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0105			0.0953	0.5	10	30
Nickel *	0.0087			0.079	0.4	10	40
Lead *	0.0027			0.024	0.5	10	50
Antimony *	0.0042			0.039	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.018			0.16	4	50	200
Chloride *	3.9			36	800	15000	25000
Fluoride	0.18			1.7	10	150	500
Sulphate *	18			170	1000	20000	50000
TDS*	83			760	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	33.9			308	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.3						
Dry Matter (%)	91						
Moisture (%)	9.5						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				**= UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			
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Waste Acceptance Criteria Analytical Results						
Report No:	21-90039					
				Client: DELTASIM		
Location	Site 3 Knowsley					
Lab Reference (Sample Number)	1956644 / 1956645			Landfill Waste Acceptance Criteria		
Sampling Date	23/07/2021			Limits		
Sample ID	DS10			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	0.80					
Solid Waste Analysis						
TOC (%)**	0.9			3%	5%	6%
Loss on Ignition (%) **	2.1			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg)	< 10			500	--	--
Total PAH (WAC-17) (mg/kg)	14.2			100	--	--
pH (units)**	10.8			--	>6	--
Acid Neutralisation Capacity (mol / kg)	37			--	To be evaluated	To be evaluated
Eluate Analysis						
	10:1		10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0141		0.128	0.5	2	25
Barium *	0.0165		0.150	20	100	300
Cadmium *	< 0.0001		< 0.0008	0.04	1	5
Chromium *	0.015		0.14	0.5	10	70
Copper *	0.011		0.099	2	50	100
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2
Molybdenum *	0.0020		0.0180	0.5	10	30
Nickel *	0.0034		0.031	0.4	10	40
Lead *	0.0044		0.040	0.5	10	50
Antimony *	< 0.0017		< 0.017	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
Zinc *	0.0082		0.074	4	50	200
Chloride *	7.5		69	800	15000	25000
Fluoride	0.28		2.5	10	150	500
Sulphate *	29		260	1000	20000	50000
TDS*	210		1900	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
DOC	9.46		86.1	500	800	1000
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	1.3					
Dry Matter (%)	94					
Moisture (%)	5.6					
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)						
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited						
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Analytical Report Number : 21-90039

Project / Site name: Site 3 Knowsley

* 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 *
1956636	DS04	None Supplied	1	Brown sandy loam with gravel and vegetation.
1956638	DS06	None Supplied	0.5	Brown sand with gravel.
1956640	DS08	None Supplied	0.4	Brown sand with rubble.
1956642	DS09	None Supplied	0.7	Brown sand with gravel.
1956644	DS10	None Supplied	0.8	Brown sand with gravel.

Analytical Report Number : 21-90039
Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 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. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	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 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 in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	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
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-90039
Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	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	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

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

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

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

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

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Analytical Report Number : 21-90807

Replaces Analytical Report Number: 21-90807, issue no. 1
Additional analysis undertaken.

Project / Site name:	Site 3 Knowsley	Samples received on:	02/08/2021
Your job number:	19 0654 06	Samples instructed on/ Analysis started on:	03/08/2021
Your order number:	DS62562	Analysis completed by:	23/08/2021
Report Issue Number:	2	Report issued on:	23/08/2021
Samples Analysed:	1 leachate sample - 3 soil samples		


Signed:

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

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

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

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

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

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

Analytical Report Number: 21-90807
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1961445	1961446	1961447
Sample Reference				BH05	BH06	BH07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.60	0.50
Date Sampled				28/07/2021	28/07/2021	28/07/2021
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	4.0	9.1	8.0
Total mass of sample received	kg	0.001	NONE	1.0	0.70	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.005
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.005

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.7	10.9	10.4
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	70	500	440
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.035	0.25	0.22
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	34.8	249	219
Organic Matter (automated)	%	0.1	MCERTS	-	-	1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.22	2.0	0.44
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.37	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.25	2.0	0.79
Pyrene	mg/kg	0.05	MCERTS	0.23	2.2	0.70
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.2	0.40
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.0	0.36
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.87	0.39
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.27	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.88	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.32	< 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	0.44	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	11.5	3.67
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.6	13	4.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	15	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6.8	34	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	26	270	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	15	9.1
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	33	110	64

Analytical Report Number: 21-90807
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1961445	1961446	1961447
Sample Reference				BH05	BH06	BH07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.60	0.50
Date Sampled				28/07/2021	28/07/2021	28/07/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Monoaromatics & Oxygenates

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	0.004
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	0.007
o-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	0.006
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	0.017
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.6	3.5
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	11	24
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	24	75
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	18
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	40	100

TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	18
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VOCs

Chloromethane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Chloroethane	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
Bromomethane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Vinyl Chloride	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
Trichlorofluoromethane	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
1,1-Dichloroethene	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,1-Dichloroethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
2,2-Dichloropropane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Trichloromethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,2-Dichloroethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,1-Dichloropropene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
Benzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Tetrachloromethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,2-Dichloropropane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Trichloroethene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Dibromomethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Bromodichloromethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010

Analytical Report Number: 21-90807
 Project / Site name: Site 3 Knowsley
 Your Order No: DS62562

Lab Sample Number				1961445	1961446	1961447
Sample Reference				BH05	BH06	BH07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.60	0.50
Date Sampled				28/07/2021	28/07/2021	28/07/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Toluene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Dibromochloromethane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Tetrachloroethene	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
Chlorobenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.0010	-	0.0038
p & m-Xylene	mg/kg	0.001	MCERTS	< 0.0010	-	0.0070
Styrene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Tribromomethane	mg/kg	0.001	NONE	< 0.0010	-	< 0.0010
o-Xylene	mg/kg	0.001	MCERTS	< 0.0010	-	0.0062
1,1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Isopropylbenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Bromobenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
n-Propylbenzene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
2-Chlorotoluene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
4-Chlorotoluene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
tert-Butylbenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
sec-Butylbenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Butylbenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
Hexachlorobutadiene	mg/kg	0.001	MCERTS	< 0.0010	-	< 0.0010
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	< 0.0010	-	< 0.0010

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1

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 Project / Site name: Site 3 Knowsley
 Your Order No: DS62562

Lab Sample Number				1961445	1961446	1961447
Sample Reference				BH05	BH06	BH07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.60	0.50
Date Sampled				28/07/2021	28/07/2021	28/07/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.22	-	0.44
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.25	-	0.79
Pyrene	mg/kg	0.05	MCERTS	0.23	-	0.70
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	0.40
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	0.36
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	0.39
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	0.37
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

Analytical Report Number: 21-90807
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Lab Sample Number				1961445	1961446	1961447
Sample Reference				BH05	BH06	BH07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.60	0.50
Date Sampled				28/07/2021	28/07/2021	28/07/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

PCBs

PCB Congener 077	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	-	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	< 0.012	-	-
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-90807
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1961447	BH07	0.50	132	Loose Fibrous Debris	Amosite	0.005	0.005

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



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Project / Site name: Site 3 Knowsley

Your Order No: DS62562

Lab Sample Number				1961448
Sample Reference				BH07
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				28/07/2021
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	9.1
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	U/S*
Chromium (III)	µg/l	1	NONE	U/S*
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.5
Copper (dissolved)	µg/l	0.7	ISO 17025	38
Lead (dissolved)	µg/l	1	ISO 17025	2.8
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	11
Zinc (dissolved)	µg/l	0.4	ISO 17025	16

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

*U/S due to high variances between chromium (hexavalent) and chromium (dissolved) caused by method differences.

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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 *
1961445	BH05	None Supplied	0.25	Brown sand with gravel.
1961446	BH06	None Supplied	0.6	Brown sand with brick and rubble.
1961447	BH07	None Supplied	0.5	Brown loam and sand with gravel.

Analytical Report Number : 21-90807

Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in 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
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-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
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
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
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
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
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	NONE
Cr (III) in leachate	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE

Analytical Report Number : 21-90807
Project / Site name: Site 3 Knowsley

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

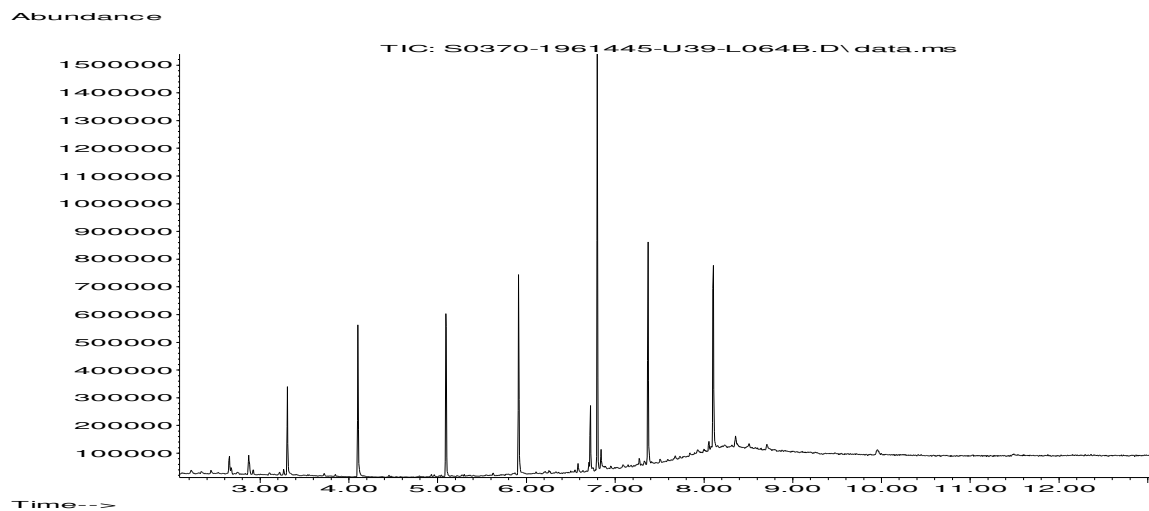
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

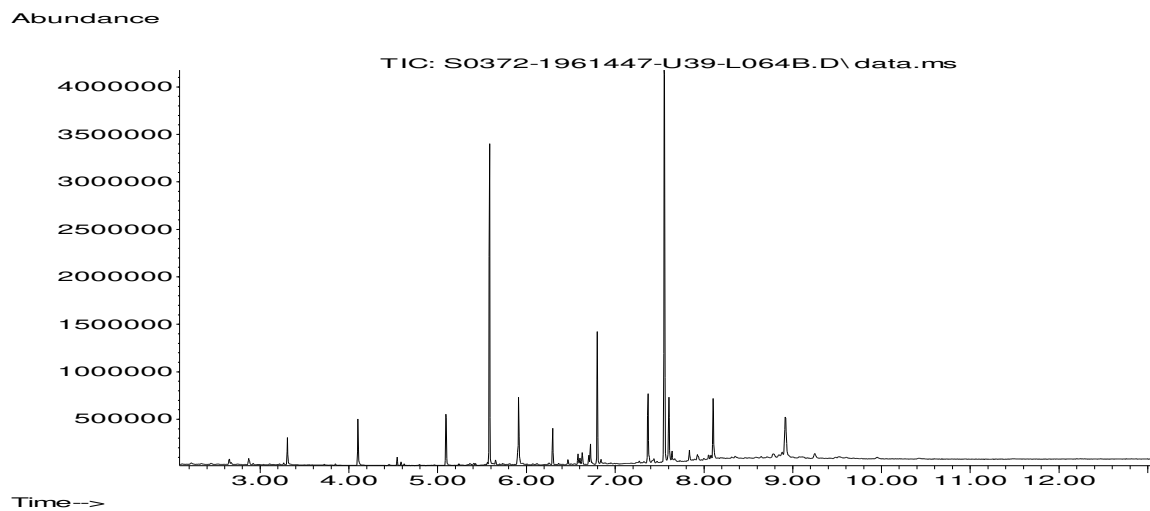
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

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







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Analytical Report Number : 21-90809

Project / Site name:	Site 3 Knowsley	Samples received on:	02/08/2021
Your job number:	19 0654 06	Samples instructed on/ Analysis started on:	03/08/2021
Your order number:	DS62562	Analysis completed by:	10/08/2021
Report Issue Number:	1	Report issued on:	10/08/2021
Samples Analysed:	1 10:1 WAC sample		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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



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Waste Acceptance Criteria Analytical Results							
Report No:	21-90809						
				Client: DELTASIM			
Location	Site 3 Knowsley						
Lab Reference (Sample Number)	1961450 / 1961451			Landfill Waste Acceptance Criteria			
Sampling Date	28/07/2021			Limits			
Sample ID	BH06			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.60						
Solid Waste Analysis							
TOC (%)**	0.7			3%	5%	6%	
Loss on Ignition (%) **	2.8			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	62			500	--	--	
Total PAH (WAC-17) (mg/kg)	17.3			100	--	--	
pH (units)**	11.0			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	60			--	To be evaluated	To be evaluated	
Eluate Analysis							
	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	< 0.0010		< 0.0100	0.5	2	25	
Barium *	0.0372		0.336	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	0.0090		0.081	0.5	10	70	
Copper *	0.016		0.14	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	0.0083		0.0754	0.5	10	30	
Nickel *	0.0040		0.036	0.4	10	40	
Lead *	0.0058		0.053	0.5	10	50	
Antimony *	0.017		0.15	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.012		0.10	4	50	200	
Chloride *	5.8		53	800	15000	25000	
Fluoride	0.32		2.9	10	150	500	
Sulphate *	60		540	1000	20000	50000	
TDS*	380		3400	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	7.51		67.9	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.70						
Dry Matter (%)	91						
Moisture (%)	9.1						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited							
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.							



Analytical Report Number : 21-90809

Project / Site name: Site 3 Knowsley

* 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 *
1961450	BH06	None Supplied	0.6	Brown sand with brick and rubble.

Analytical Report Number : 21-90809
Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 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. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	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 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 in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	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
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-90809
Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	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	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

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

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

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

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

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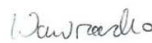
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e: ben.osborne@deltasimons.com

Analytical Report Number : 21-91066

Project / Site name:	Site 3 Knowsley	Samples received on:	02/08/2021
Your job number:	19 0654 06	Samples instructed on/ Analysis started on:	03/08/2021
Your order number:	DS62562	Analysis completed by:	11/08/2021
Report Issue Number:	1	Report issued on:	11/08/2021
Samples Analysed:	1 soil sample		

Signed:



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

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

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

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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

Analytical Report Number: 21-91066
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1962668
Sample Reference				BH08
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				30/07/2021
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	4.2
Total mass of sample received	kg	0.001	NONE	1.2

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

pH - Automated	pH Units	N/A	MCERTS	9.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	38
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	19.1

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	4.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.8
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.2
Lead (aqua regia extractable)	mg/kg	1	MCERTS	4.1
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.5
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	16

Monoaromatics & Oxygenates

Benzene	mg/kg	0.001	MCERTS	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001
o-xylene	mg/kg	0.001	MCERTS	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001

Analytical Report Number: 21-91066
Project / Site name: Site 3 Knowsley
Your Order No: DS62562

Lab Sample Number				1962668
Sample Reference				BH08
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				30/07/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	12
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	57
TPH-CWG - Aliphatic >EC35 - EC40	mg/kg	10	NONE	79
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	71

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	42
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	96
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	42

TPH (C35 - C40)	mg/kg	10	MCERTS	170
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-91066

Project / Site name: Site 3 Knowsley

* 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 *
1962668	BH08	None Supplied	0.4	Light brown sand with gravel and tar.

Analytical Report Number : 21-91066
Project / Site name: Site 3 Knowsley

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

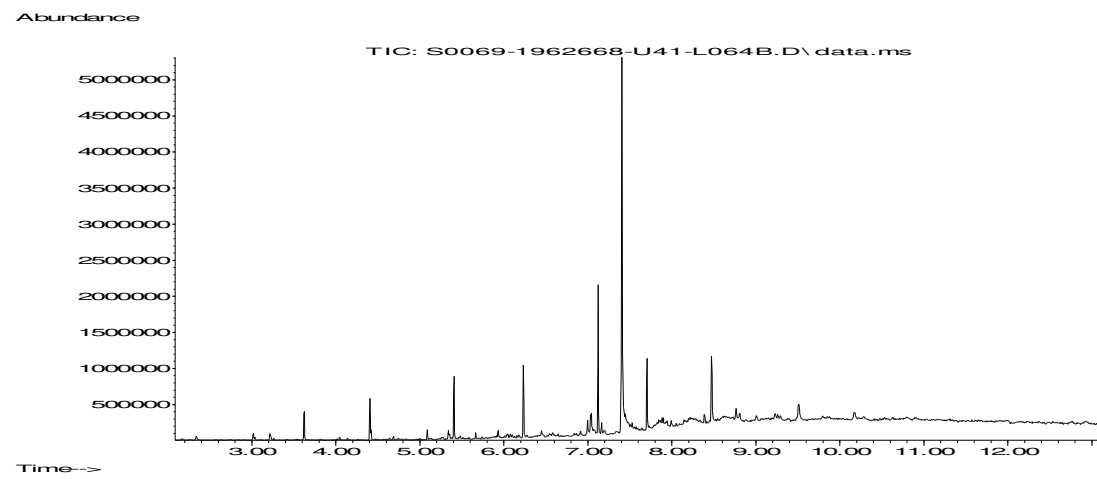
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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
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
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
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	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

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

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



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Analytical Report Number : 21-91793

Project / Site name:	Site 3, Knowsley	Samples received on:	27/07/2021
Your job number:	19-0654.06	Samples instructed on/ Analysis started on:	05/08/2021
Your order number:	DS62686	Analysis completed by:	18/08/2021
Report Issue Number:	1	Report issued on:	18/08/2021
Samples Analysed:	12 soil samples		

Signed: *A. Czerwińska*

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 21-91793
Project / Site name: Site 3, Knowsley
Your Order No: DS62686

Lab Sample Number				1966222	1966223	1966224	1966225	1966226
Sample Reference				DS01	DS04	DS06	DS07	DS08A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	1.50	1.40	1.00
Date Sampled				22/07/2021	22/07/2021	23/07/2021	23/07/2021	26/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.2	12	10	26	11
Total mass of sample received	kg	0.001	NONE	0.70	0.70	0.70	0.70	0.70

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.1	7.1	6.6	7.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.022	0.073	0.016	0.072	0.018
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	910	47	240	77
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.064	0.45	0.023	0.12	0.039
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	64.3	454	23.3	120	38.5
Total Sulphur	%	0.005	MCERTS	0.013	0.038	0.010	0.088	0.011

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

Analytical Report Number: 21-91793
Project / Site name: Site 3, Knowsley
Your Order No: DS62686

Lab Sample Number				1966227	1966228	1966229	1966230	1966231
Sample Reference				DS10	TP06	BH01	BH04	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	0.55	5.00	9.00	13.00
Date Sampled				23/07/2021	23/07/2021	22/07/2021	27/07/2021	27/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	31	7.9	8.7	9.9
Total mass of sample received	kg	0.001	NONE	0.70	0.70	0.70	0.70	0.70

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.9	6.5	8.4	9.0	8.9
Total Sulphate as SO ₄	%	0.005	MCERTS	0.018	0.384	0.054	0.019	0.021
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	2800	310	46	59
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.063	1.4	0.15	0.023	0.029
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	63.3	1380	153	22.9	29.4
Total Sulphur	%	0.005	MCERTS	0.019	0.392	0.048	0.044	0.068

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

Analytical Report Number: 21-91793
 Project / Site name: Site 3, Knowsley
 Your Order No: DS62686

Lab Sample Number				1966232	1966233
Sample Reference				BH06	BH07
Sample Number				None Supplied	None Supplied
Depth (m)				12.00	7.00
Date Sampled				29/07/2021	29/07/2021
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	9.4	6.8
Total mass of sample received	kg	0.001	NONE	0.70	0.70

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7	9.2
Total Sulphate as SO ₄	%	0.005	MCERTS	0.020	0.030
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	97	160
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.049	0.082
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	48.7	81.6
Total Sulphur	%	0.005	MCERTS	0.039	0.016

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

Analytical Report Number : 21-91793

Project / Site name: Site 3, Knowsley

* 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 *
1966222	DS01	None Supplied	1.2	Brown sandy loam with gravel.
1966223	DS04	None Supplied	3.5	Brown clay.
1966224	DS06	None Supplied	1.5	Brown clay.
1966225	DS07	None Supplied	1.4	Brown sandy loam with gravel.
1966226	DS08A	None Supplied	1	Brown sand with gravel.
1966227	DS10	None Supplied	1.5	Brown sand with gravel.
1966228	TP06	None Supplied	0.55	Brown loam and clay with gravel and vegetation.
1966229	BH01	None Supplied	5	Brown clay.
1966230	BH04	None Supplied	9	Brown clay and sand with gravel.
1966231	BH04	None Supplied	13	Brown clay and sand with gravel.
1966232	BH06	None Supplied	12	Brown clay and sand with gravel.
1966233	BH07	None Supplied	7	Brown sandy clay with gravel.

Analytical Report Number : 21-91793

Project / Site name: Site 3, Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

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

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

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Analytical Report Number : 21-91837

Project / Site name:	Site 3 Knowsley	Samples received on:	05/08/2021
Your job number:	19.0654.06	Samples instructed on/ Analysis started on:	05/08/2021
Your order number:	DS62686	Analysis completed by:	16/08/2021
Report Issue Number:	1	Report issued on:	16/08/2021
Samples Analysed:	4 soil samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 21-91837

Project / Site name: Site 3 Knowsley

Lab Sample Number				1966531	1966532	1966533	1966534
Sample Reference				BH05	BH05	BH05	BH08
Sample Number				D	D	D	D
Depth (m)				11.00	9.60	10.00	10.40
Date Sampled				03/08/2021	03/08/2021	03/08/2021	03/08/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.3	8.2	7.8	4.3
Total mass of sample received	kg	0.001	NONE	0.60	0.80	0.80	0.80

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	8.7	8.8	7.9
Total Sulphate as SO ₄	%	0.005	MCERTS	0.011	0.036	0.018	0.015
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0048	0.034	0.013	0.0077
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	4.8	33.5	12.5	7.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.5	4.1	2.9	6.6
Total Sulphur	%	0.005	MCERTS	< 0.005	0.057	< 0.005	< 0.005
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	15	6.2	< 5.0
Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	7.3	3.1	< 2.5

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

Analytical Report Number : 21-91837

Project / Site name: Site 3 Knowsley

* 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 *
1966531	BH05	D	11	Non Soil**
1966532	BH05	D	9.6	Brown sandy clay.
1966533	BH05	D	10	Brown sandy gravel.**
1966534	BH08	D	10.4	Brown sandy gravel.**

** Non MCERTS matrix

Analytical Report Number : 21-91837

Project / Site name: Site 3 Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
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
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

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

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

Appendix F – Groundwater Chemical Analysis Results and Screening

Appendix F Chemical Screening - Groundwater														
19-0654.06, Site 3 Image Business Park, Knowsley														
							Exploratory Hole ID		DS01	DS03A	DS04	DS05	DS06	
Key	Below GAC		Above GAC	Below LoD			Response Zone Material		Shirdley Hill Sand Fm / Glacial Till	Shirdley Hill Sand Fm / Glacial Till	Glacial Till	Made Ground	Glacial Till	
							Consultant		DS	DS	DS	DS	DS	
							Date Sampled		29/07/2021	02/08/2021	29/07/2021	30/07/2021	30/07/2021	
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	No. tests	Minimum (ug/l)	Maximum (ug/l)	Screening criteria (ug/l)	GAC Source						
Heavy Metals / Metalloids														
Arsenic (dissolved)	µg/l	1.1	ISO 17025	12	0.93	50.2	10	DWQS	2.14	22.3	1.63	10.3	12	
Cadmium (dissolved)	µg/l	0.08	ISO 17025	12	0.02	< 0.02	5	WFD	0.11	0.07	0.75	0.1	0.07	
Chromium (hexavalent)	µg/l	5	ISO 17025	12	25	< 5.0	3.4	WFD 2015b	< 5.0	< 5.0	U/S*	25	< 5.0	
Chromium (dissolved)	µg/l	0.4	ISO 17025	12	2.6	30	50	WFD	5.4	7.4	6.4	30	2.6	
Copper (dissolved)	µg/l	0.7	ISO 17025	12	1.4	190	2,000	WFD	6	18	170	190	16	
Lead (dissolved)	µg/l	1	ISO 17025	12	0.3	< 0.2	10	DWQS	0.7	3.9	20	0.7	0.8	
Mercury (dissolved)	µg/l	0.5	ISO 17025	12	0.06	< 0.05	1	WFD	< 0.05	< 0.05	< 0.05	0.06	0.1	
Nickel (dissolved)	µg/l	0.3	ISO 17025	12	7.6	770	20	WFD	11	58	370	17	18	
Zinc (dissolved)	µg/l	0.4	ISO 17025	12	1.9	310	3000	WFD	11	16	310	4.2	1.9	
Speciated PAH														
Naphthalene	µg/l	0.01	ISO 17025	12	< 0.01	5.05	4.24	WFD 2015	< 0.01	< 0.01	5.05	< 0.01	< 0.01	
Acenaphthylene	µg/l	0.01	ISO 17025	12	< 0.01	<0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	µg/l	0.01	ISO 17025	12	< 0.01	1.17	N/A	N/A	< 0.01	< 0.01	1.17	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	12	< 0.01	<0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	12	< 0.01	<0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	0.1	DWQS 2016	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	0.1	DWQS 2016	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	0.01	DWQS 2016	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	0.1	DWQS 2016	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.01	0.1	DWQS 2016	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Monoaromatics & Oxygenates														
Benzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0	1	DWQS 2016	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	12	< 1.0	13	700	WHO 2017	< 1.0	4	< 1.0	< 1.0	13	
Ethylbenzene	µg/l	1	ISO 17025	12	< 1.0	1.7	300	WHO 2017	< 1.0	< 1.0	< 1.0	< 1.0	1.7	
p & m-xylene	µg/l	1	ISO 17025	12	< 1.0	6.4	500	WHO 2017	< 1.0	2.2	< 1.0	< 1.0	6.4	
o-xylene	µg/l	1	ISO 17025	12	< 1.0	6.8	500	WHO 2017	< 1.0	1.5	6.8	< 1.0	3.4	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	12	< 1.0	< 1.0	15	DS1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons														
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	12	< 1.0	< 1.0	300	DS2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	12	< 1.0	< 1.0	300	DS2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	12	< 1.0	< 1.0	300	WHO 2008	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	12	< 1.0	< 1.0	1	DWQS 2016	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	12	< 1.0	13	700	WHO 2008	< 1.0	4	< 1.0	< 1.0	13	
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	12	< 1.0	25	300	WHO 2008	< 1.0	3.7	25	< 1.0	13	
Aliphatic >C10 - C12	µg/l	10	ISO 17025	12	< 10	70	300	WHO 2008	< 10	< 10	70	< 10	< 10	
Aliphatic >C12 - C16	µg/l	10	ISO 17025	12	< 10	360	300	WHO 2008	< 10	< 10	360	< 10	< 10	
Aliphatic >C16 - C21	µg/l	10	ISO 17025	12	< 10	410	N/A	N/A	< 10	< 10	410	< 10	< 10	
Aliphatic >C21 - C35	µg/l	10	ISO 17025	12	< 10	580	N/A	N/A	< 10	< 10	580	< 10	< 10	
Aliphatic >C10 - C35	µg/l	10	ISO 17025	12	< 10	1400	N/A	N/A	< 10	< 10	1400	< 10	< 10	
Aromatic >C10 - C12	µg/l	10	ISO 17025	12	< 10	170	90	WHO 2008	< 10	< 10	170	< 10	< 10	
Aromatic >C12 - C16	µg/l	10	ISO 17025	12	< 10	800	90	WHO 2008	< 10	< 10	800	< 10	< 10	
Aromatic >C16 - C21	µg/l	10	ISO 17025	12	< 10	640	90	WHO 2008	< 10	< 10	640	< 10	< 10	
Aromatic >C21 - C35	µg/l	10	ISO 17025	12	< 10	910	90	WHO 2008	< 10	< 10	910	< 10	< 10	
Aromatic >C10 - C35	µg/l	10	ISO 17025	12	< 10	2500	N/A	N/A	< 10	< 10	2500	< 10	< 10	
VOC's														
Chloromethane	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroethane	µg/l	1	ISO 17025	12	< 1.0	< 1.0	0.5	DWQS 2016	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/l	1	NONE	12	< 1.0	< 1.0	0.5	DWQS 2016	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorofluoromethane	µg/l	1	NONE	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	12	< 1.0	< 1.0	50	WHO 2017	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethane	µg/l	1	ISO 17025	12	< 1.0	17.5			< 1.0	< 1.0	< 1.0	< 1.0		

Appendix F Chemical Screening - Groundwater														
19-0654.06, Site 3 Image Business Park, Knowsley														
							Exploratory Hole ID		DS01	DS03A	DS04	DS05	DS06	
Key	Below GAC	Above GAC	Below LoD				Response Zone Material	Shirdley Hill Sand Fm / Glacial Till	Shirdley Hill Sand Fm / Glacial Till	Glacial Till	Made Ground	Glacial Till		
								Consultant	DS	DS	DS	DS	DS	
							Date Sampled	29/07/2021	02/08/2021	29/07/2021	30/07/2021	30/07/2021		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	No. tests	Minimum (ug/l)	Maximum (ug/l)	Screening criteria (ug/l)	GAC Source						
sec-Butylbenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichlorobenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
p-Isopropyltoluene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichlorobenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0	1000	WHO 2017	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,4-Dichlorobenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0	300	WHO 2017	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Hexachlorobutadiene	µg/l	1	ISO 17025	12	< 1.0	< 1.0	0.6	WHO 2017	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	12	< 1.0	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
SVOC's														
Aniline	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Phenol	µg/l	0.05	NONE	12	< 0.05	5	7.7	WFD 2015	< 0.05	5	< 0.05	< 0.05	< 0.05	
2-Chlorophenol	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,3-Dichlorobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,2-Dichlorobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,4-Dichlorobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Methylphenol	µg/l	0.05	NONE	12	< 0.05	2.8			< 0.05	2.8	< 0.05	< 0.05	< 0.05	
Hexachloroethane	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Methylphenol	µg/l	0.05	NONE	12	< 0.05	9.8			< 0.05	9.8	< 0.05	< 0.05	< 0.05	
Isophorone	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Nitrophenol	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4-Dimethylphenol	µg/l	0.05	NONE	12	< 0.05	2.8			< 0.05	2.8	< 0.05	< 0.05	< 0.05	
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Naphthalene	µg/l	0.01	ISO 17025	12	< 0.01	5.1			< 0.01	< 0.01	5.1	< 0.01	< 0.01	
2,4-Dichlorophenol	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chloroaniline	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachlorobutadiene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chloro-3-methylphenol	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4,6-Trichlorophenol	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4,5-Trichlorophenol	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Methylnaphthalene	µg/l	0.05	NONE	12	< 0.05	8.8			< 0.05	< 0.05	8.8	< 0.05	< 0.05	
2-Chloronaphthalene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dimethylphthalate	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,6-Dinitrotoluene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dinitrotoluene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenzofuran	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Diethyl phthalate	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Nitroaniline	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Azobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bromophenyl phenyl ether	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachlorobenzene	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	µg/l	0.01	ISO 17025	12	< 0.01	1.2			< 0.01	< 0.01	1.2	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Carbazole	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibutyl phthalate	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Anthraquinone	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Butyl benzyl phthalate	µg/l	0.05	NONE	12	< 0.05	< 0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	12	< 0.01	< 0.05			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
3&4-Methylphenol	µg/l	0.1	NONE	12	< 0.10	9.8			< 0.10	9.8	< 0.10	< 0.10	< 0.10	

Reference Sources

DWQS 2016 - The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards]

WFD - Water Framework Directive (Standards and Classification) Durections (England and Wales) 2015

Appendix F Chemical Screening - Groundwater

19-0654.06, Site 3 Image Business Park, Knowsley

				DS10	BH01	BH04	BH05	BH06	BH07	BH08
Key	Below GAC		Above	Shirdley Hill Sand Fm / Glacial Till	Chester Formation	Chester Formation	Glacial Till/ Chester Fm	Chester Formation	Chester Formation	Shirdley Hill Sand Fm/ Glacial Till/ Chester Fm
				DS10	DS	DS	DS	DS	DS	DS
				02/08/2021	02/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status							
Heavy Metals / Metalloids										
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.47	11.3	50.2	36.4	8.45	10.8	0.93
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.02	0.14	0.02	0.02	0.04	< 0.02	0.12
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	U/S*	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	3.3	23	3.7	4.2	2.8	3.6	3
Copper (dissolved)	µg/l	0.7	ISO 17025	4.1	2.6	2.6	1.6	3.6	1.4	8.8
Lead (dissolved)	µg/l	1	ISO 17025	0.6	7.4	0.3	< 0.2	0.3	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.05	0.06	< 0.05	0.73	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.3	ISO 17025	7.6	770	30	160	43	100	11
Zinc (dissolved)	µg/l	0.4	ISO 17025	16	44	13	11	13	7.7	4.3
Speciated PAH										
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 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	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 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	< 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	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 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	< 0.01	< 0.01	< 0.01
Monoaromatics & Oxygenates										
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons										
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10	< 10	< 10
VOC's										
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17.5	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	11.5	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	29	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0

Appendix F Chemical Screening - Groundwater

19-0654.06, Site 3 Image Business Park, Knowsley

				DS10	BH01	BH04	BH05	BH06	BH07	BH08
Key	Below GAC		Above	Shirdley Hill Sand Fm / Glacial Till	Chester Formation	Chester Formation	Glacial Till/ Chester Fm	Chester Formation	Chester Formation	Shirdley Hill Sand Fm/ Glacial Till/ Chester Fm
				DS10	DS	DS	DS	DS	DS	DS
				02/08/2021	02/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status							
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 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	< 1.0	< 1.0	< 1.0
SVOC's										
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 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	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 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	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 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	< 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	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 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	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Reference Sources

DWQS 2016 - The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Regulations]
WFD - Water Framework Directive (Standards and Classification) Durections



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Analytical Report Number : 21-90178

Project / Site name:	Site 3, Knowsley	Samples received on:	02/08/2021
Your job number:	19-0654.06	Samples instructed on/ Analysis started on:	02/08/2021
Your order number:	DS62786	Analysis completed by:	06/08/2021
Report Issue Number:	1	Report issued on:	06/08/2021
Samples Analysed:	4 water samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 21-90178
Project / Site name: Site 3, Knowsley

Lab Sample Number	1957248	1957249	1957250	1957251
Sample Reference	DS01	DS04	DS05	DS06
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	29/07/2021	29/07/2021	30/07/2021	30/07/2021
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	6.7	8.2	12.4	8.8
Sulphate as SO4	µg/l	45	ISO 17025	213000	2310000	101000	263000

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	5.05	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	1.17	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
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
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

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	6.22	< 0.16	< 0.16
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Heavy Metals / Metalloids

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	U/S*	25	< 5.0
Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.14	1.63	10.3	12.0
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.11	0.75	0.10	0.07
Chromium (dissolved)	µg/l	0.2	ISO 17025	5.4	6.4	30	2.6
Copper (dissolved)	µg/l	0.5	ISO 17025	6.0	170	190	16
Lead (dissolved)	µg/l	0.2	ISO 17025	0.7	20	0.7	0.8
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	0.06	0.10
Nickel (dissolved)	µg/l	0.5	ISO 17025	11	370	17	18
Zinc (dissolved)	µg/l	0.5	ISO 17025	11	310	4.2	1.9

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	13.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	1.7
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	6.4
o-xylene	µg/l	1	ISO 17025	< 1.0	6.8	< 1.0	3.4
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-90178
Project / Site name: Site 3, Knowsley

Lab Sample Number				1957248	1957249	1957250	1957251
Sample Reference				DS01	DS04	DS05	DS06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/07/2021	29/07/2021	30/07/2021	30/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

Aliphatic >C10 - C12	µg/l	10	ISO 17025	< 10	70	< 10	< 10
Aliphatic >C12 - C16	µg/l	10	ISO 17025	< 10	360	< 10	< 10
Aliphatic >C16 - C21	µg/l	10	ISO 17025	< 10	410	< 10	< 10
Aliphatic >C21 - C35	µg/l	10	ISO 17025	< 10	580	< 10	< 10
Aliphatic >C10 - C35	µg/l	10	ISO 17025	< 10	1400	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	13
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	25	< 1.0	13

Aromatic >C10 - C12	µg/l	10	ISO 17025	< 10	170	< 10	< 10
Aromatic >C12 - C16	µg/l	10	ISO 17025	< 10	800	< 10	< 10
Aromatic >C16 - C21	µg/l	10	ISO 17025	< 10	640	< 10	< 10
Aromatic >C21 - C35	µg/l	10	ISO 17025	< 10	910	< 10	< 10
Aromatic >C10 - C35	µg/l	10	ISO 17025	< 10	2500	< 10	< 10

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	13.0
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



Analytical Report Number: 21-90178
Project / Site name: Site 3, Knowsley

Lab Sample Number				1957248	1957249	1957250	1957251
Sample Reference				DS01	DS04	DS05	DS06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/07/2021	29/07/2021	30/07/2021	30/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				
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	1.7
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	6.4
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	6.8	< 1.0	3.4
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	8.5	< 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	9.2	< 1.0	1.7
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

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	5.1	< 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	8.8	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05

Analytical Report Number: 21-90178
Project / Site name: Site 3, Knowsley

Lab Sample Number				1957248	1957249	1957250	1957251
Sample Reference				DS01	DS04	DS05	DS06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/07/2021	29/07/2021	30/07/2021	30/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				
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	1.2	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10

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

*U/S due to high variances between chromium (hexavalent) and chromium (dissolved) caused by method differences.

Analytical Report Number : 21-90178
Project / Site name: Site 3, Knowsley

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

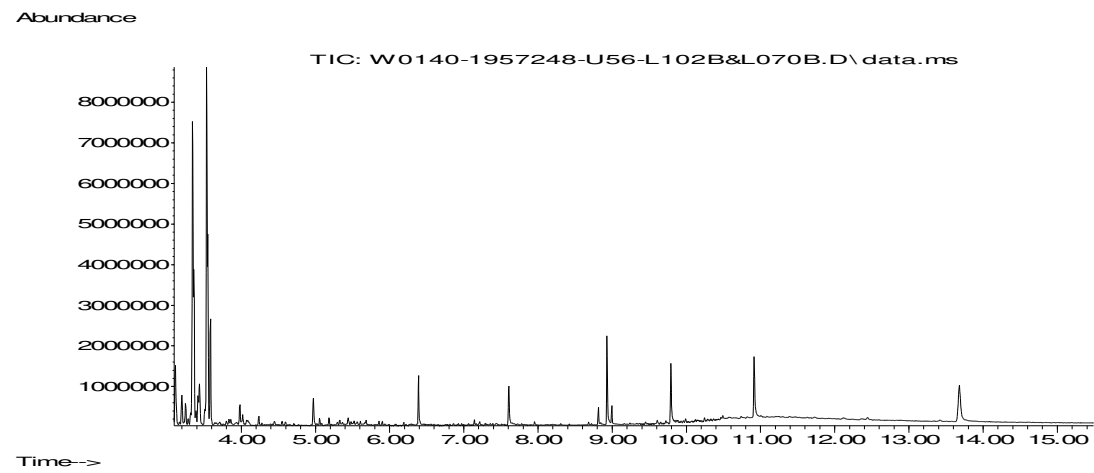
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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
TPH C10-C35 by GCxGC-FID	Determination of total petroleum hydrocarbons in water by GC x GC FID with carbon banding aliphatic and aromatic C10-C35. Accredited Matrices SW,GW,PW.	In-house method	L101B-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
TPH Chromatogram in Water	TPH Chromatogram in Water.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

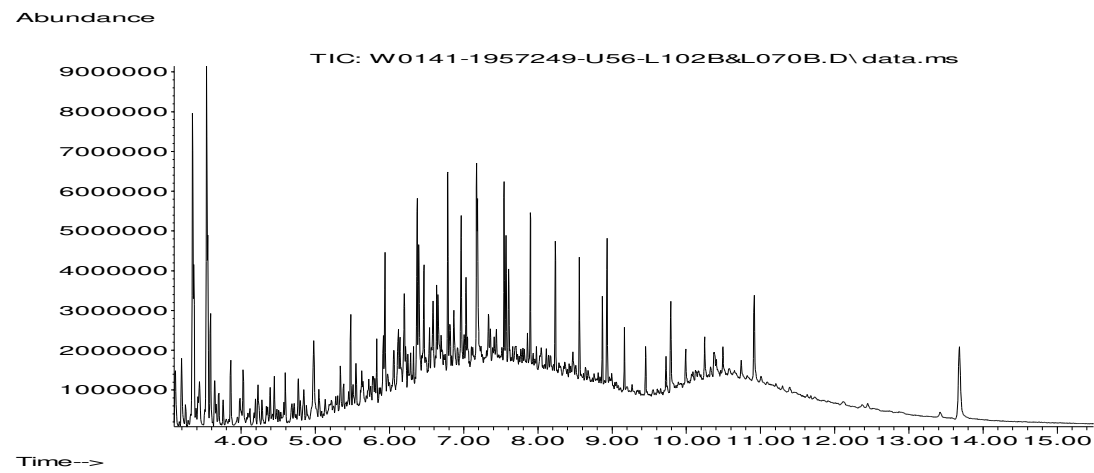
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

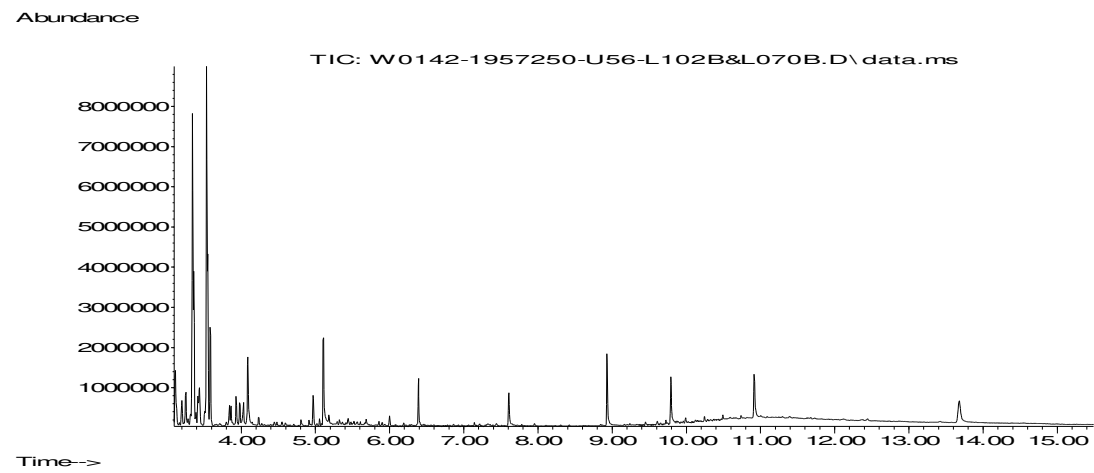
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

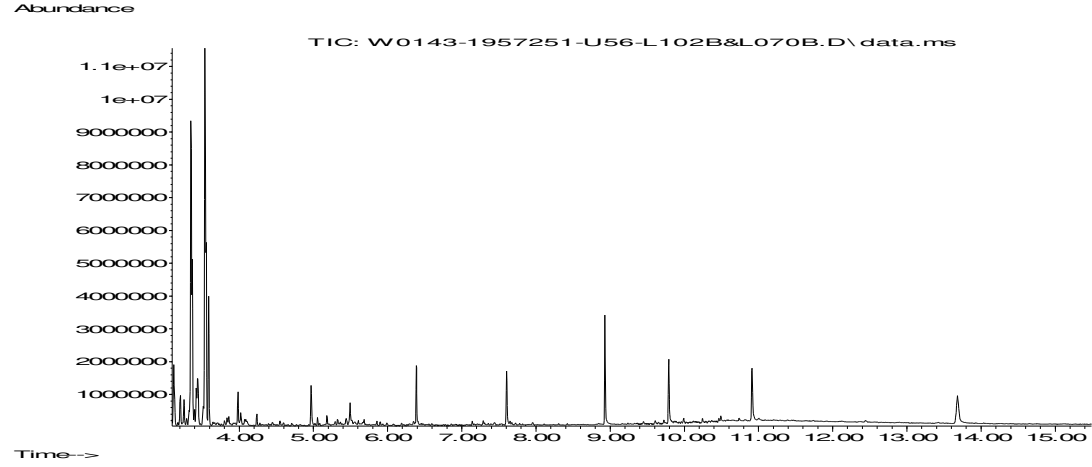
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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









Sample Deviation Report



Analytical Report Number : 21-90178
Project / Site name: Site 3, Knowsley

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
DS01	None Supplied	W	1957248	c	pH at 20oC in water (automated)	L099-PL	c
DS04	None Supplied	W	1957249	c	pH at 20oC in water (automated)	L099-PL	c



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Analytical Report Number : 21-91064

Project / Site name:	Site 3 Knowsley	Samples received on:	03/08/2021
Your job number:	19 0654 06	Samples instructed on/ Analysis started on:	05/08/2021
Your order number:		Analysis completed by:	11/08/2021
Report Issue Number:	1	Report issued on:	11/08/2021
Samples Analysed:	3 water samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 21-91064
Project / Site name: Site 3 Knowsley

Lab Sample Number				1962605	1962606	1962607
Sample Reference				DS03A	DS10	BH01
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				02/08/2021	02/08/2021	02/08/2021
Time Taken				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	10.1	7.4	6.9
Sulphate as SO ₄	µg/l	45	ISO 17025	742000	256000	878000

Speciated PAHs

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

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	U/S*
Arsenic (dissolved)	µg/l	0.15	ISO 17025	22.3	2.47	11.3
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.07	< 0.02	0.14
Chromium (dissolved)	µg/l	0.2	ISO 17025	7.4	3.3	23
Copper (dissolved)	µg/l	0.5	ISO 17025	18	4.1	2.6
Lead (dissolved)	µg/l	0.2	ISO 17025	3.9	0.6	7.4
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	0.06
Nickel (dissolved)	µg/l	0.5	ISO 17025	58	7.6	770
Zinc (dissolved)	µg/l	0.5	ISO 17025	16	16	44

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	4.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	2.2	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	1.5	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-91064
Project / Site name: Site 3 Knowsley

Lab Sample Number				1962605	1962606	1962607
Sample Reference				DS03A	DS10	BH01
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				02/08/2021	02/08/2021	02/08/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

Aliphatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	4.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	3.7	< 1.0	< 1.0

Aromatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	4.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-91064
Project / Site name: Site 3 Knowsley

Lab Sample Number				1962605	1962606	1962607
Sample Reference				DS03A	DS10	BH01
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				02/08/2021	02/08/2021	02/08/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	2.2	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	1.5	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	5.0	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	2.8	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	9.8	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	2.8	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05



Analytical Report Number: 21-91064
Project / Site name: Site 3 Knowsley

Lab Sample Number				1962605	1962606	1962607
Sample Reference				DS03A	DS10	BH01
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				02/08/2021	02/08/2021	02/08/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	9.8	< 0.10	< 0.10

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

*U/S due to high variances between chromium (hexavalent) and chromium (dissolved) caused by method differences.



Analytical Report Number : 21-91064
Project / Site name: Site 3 Knowsley

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

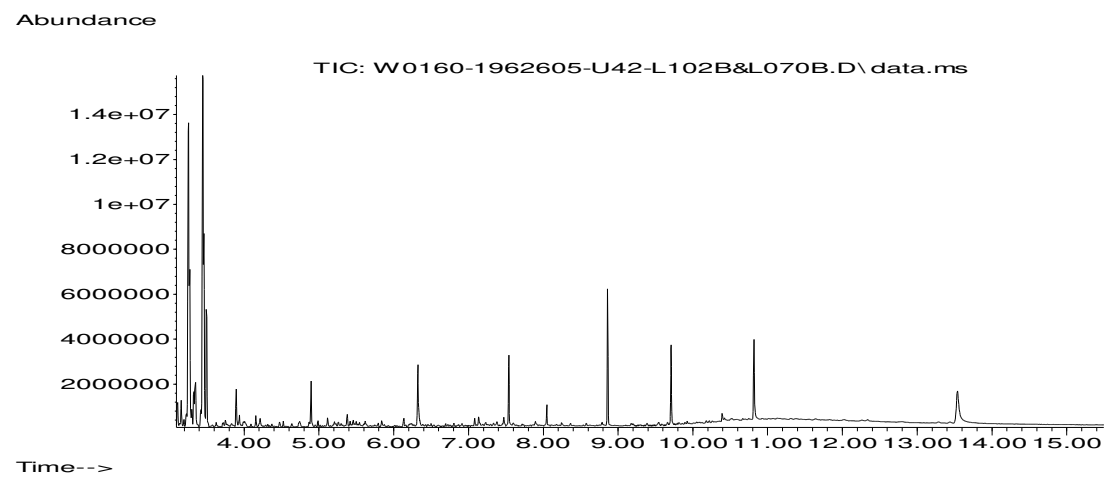
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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
TPH C10-C35 by GCxGC-FID	Determination of total petroleum hydrocarbons in water by GC x GC FID with carbon banding aliphatic and aromatic C10-C35. Accredited Matrices SW,GW,PW.	In-house method	L101B-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
TPH Chromatogram in Water	TPH Chromatogram in Water.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

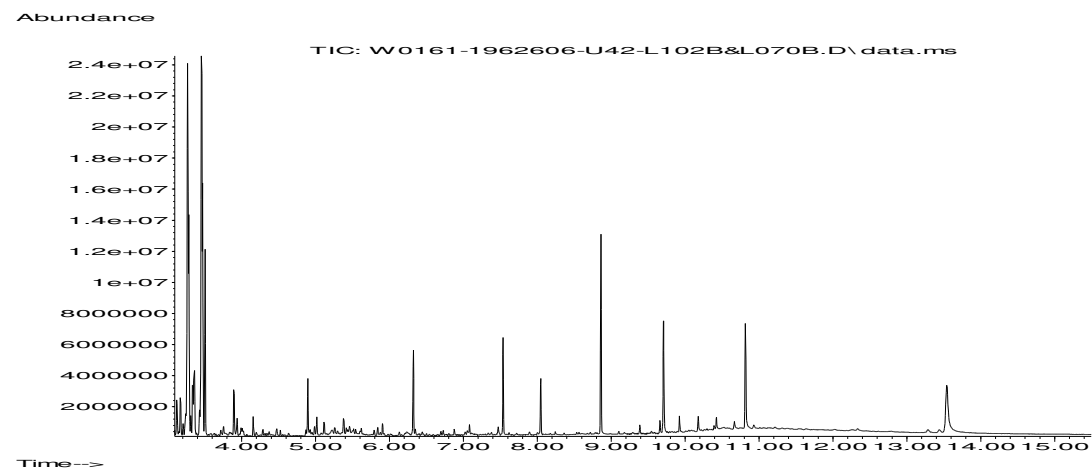
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

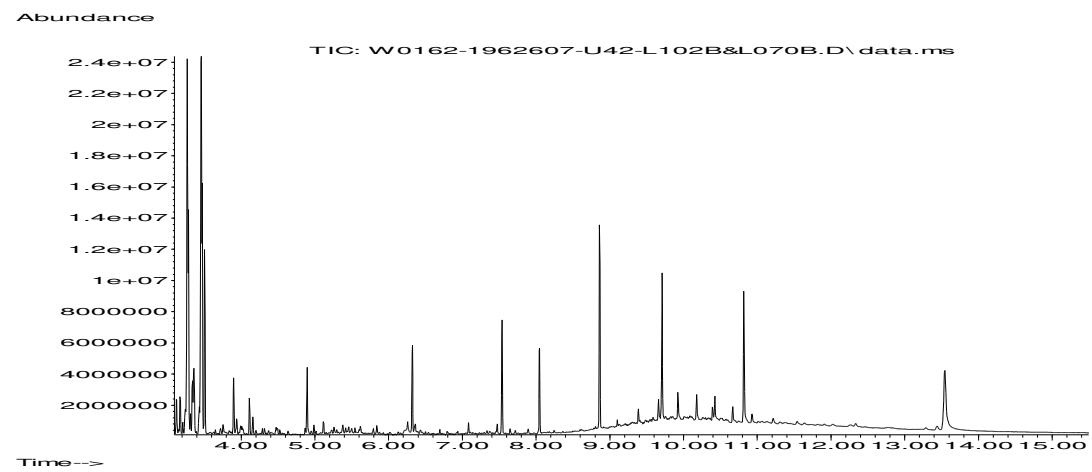
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

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

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







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Analytical Report Number : 21-92500

Project / Site name:	Site 3, Knowsley	Samples received on:	11/08/2021
Your job number:	19-0654.06	Samples instructed on/ Analysis started on:	11/08/2021
Your order number:	DS62786	Analysis completed by:	18/08/2021
Report Issue Number:	1	Report issued on:	18/08/2021
Samples Analysed:	5 water samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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



Analytical Report Number: 21-92500
Project / Site name: Site 3, Knowsley

Your Order No: DS62786

Lab Sample Number	1969909	1969910	1969911	1969912	1969913
Sample Reference	BH04	BH05	BH06	BH07	BH08
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Time Taken	None Supplied	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	7.0	6.9	7.1	6.6	7.1
Sulphate as SO4	µg/l	45	ISO 17025	33000	111000	85700	67400	91300

Speciated PAHs

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

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Arsenic (dissolved)	µg/l	0.15	ISO 17025	50.2	36.4	8.45	10.8	0.93
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02	0.02	0.04	< 0.02	0.12
Chromium (dissolved)	µg/l	0.2	ISO 17025	3.7	4.2	2.8	3.6	3.0
Copper (dissolved)	µg/l	0.5	ISO 17025	2.6	1.6	3.6	1.4	8.8
Lead (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2	0.3	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	0.73	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	30	160	43	100	11
Zinc (dissolved)	µg/l	0.5	ISO 17025	13	11	13	7.7	4.3

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0



Analytical Report Number: 21-92500
Project / Site name: Site 3, Knowsley

Your Order No: DS62786

Lab Sample Number				1969909	1969910	1969911	1969912	1969913
Sample Reference				BH04	BH05	BH06	BH07	BH08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Aliphatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aliphatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aliphatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Aromatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aromatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aromatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aromatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Aromatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	17.5	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	11.5	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-92500
Project / Site name: Site 3, Knowsley

Your Order No: DS62786

Lab Sample Number				1969909	1969910	1969911	1969912	1969913
Sample Reference				BH04	BH05	BH06	BH07	BH08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	29	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 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	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 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	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 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	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 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	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 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	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 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	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05



Analytical Report Number: 21-92500
Project / Site name: Site 3, Knowsley

Your Order No: DS62786

Lab Sample Number				1969909	1969910	1969911	1969912	1969913
Sample Reference				BH04	BH05	BH06	BH07	BH08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 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	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 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	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 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	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 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	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 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	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3,4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

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



Analytical Report Number : 21-92500
Project / Site name: Site 3, Knowsley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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
TPH C10-C35 by GCxGC-FID	Determination of total petroleum hydrocarbons in water by GC x GC FID with carbon banding aliphatic and aromatic C10-C35. Accredited Matrices SW,GW,PW.	In-house method	L101B-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
TPH Chromatogram in Water	TPH Chromatogram in Water.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

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

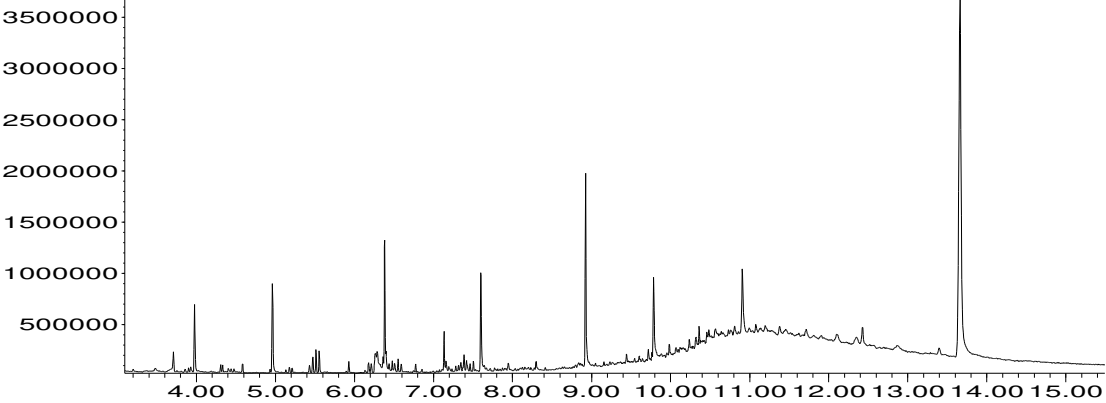
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

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.

Abundance

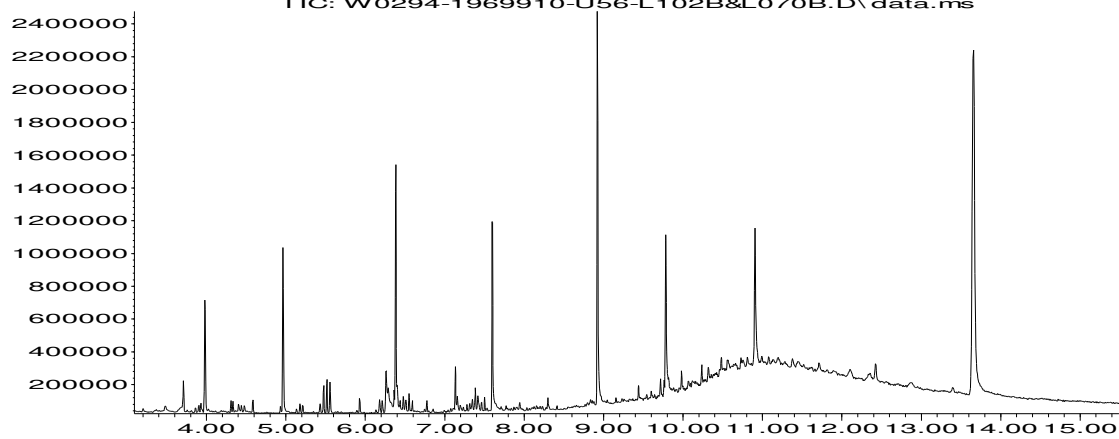
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Time-->

Abundance

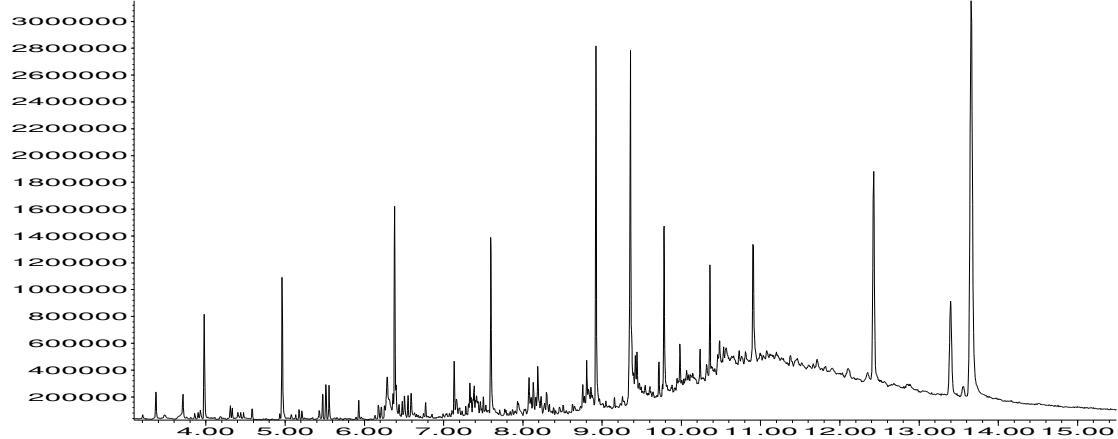
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Time-->

Abundance

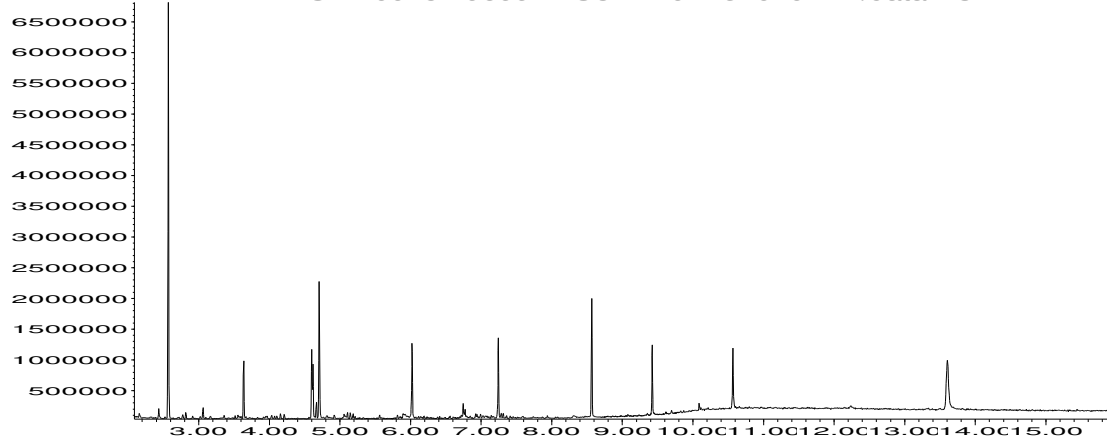
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Time-->

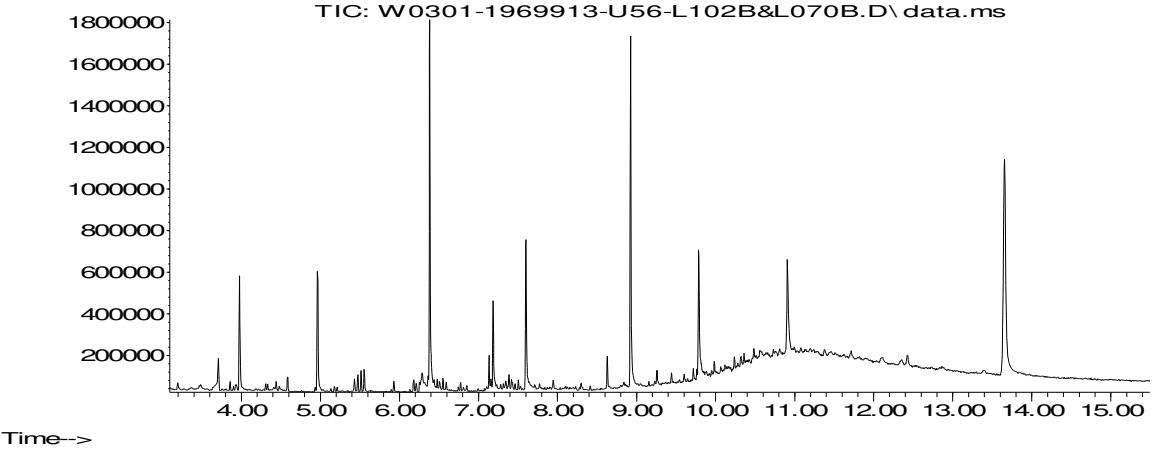
Abundance

TIC: W0025-1969912-U31-L102B&L070B.D\data.ms



Time-->

Abundance



Appendix G – Groundwater/Gas Monitoring Data

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Appendix H – Risk Definitions

Contaminated Land Risk Definitions

The following methodology is based on the methodology presented in CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice 2001. It requires the classification of the:

Magnitude of the potential consequence (severity) of the Risk occurring: and

Magnitude of the Probability (likelihood) of the Risk occurring.

The classifications are then compared to indicate the risk presented by each pollutant linkage.

Consequence to Receptor Definition Matrix

	Human Health	Controlled Waters	Buildings/Services
Severe Consequence	Acute or chronic permanent impact on human health.	Sensitive controlled water pollution ongoing, or just about to occur.	Catastrophic collapse
Medium Consequence	Chronic permanent impact on human health	Gradual pollution of sensitive controlled water	Degradation of materials
Mild Consequence	Chronic temporary impact on human health	Gradual pollution of non-sensitive controlled water	Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor Consequence	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc).	Slight discoloration of water	Easily repairable effects of damage to buildings, structures and services, i.e. discoloration of concrete

Probability Definitions

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

Standard Risk Matrix

		Consequence/Magnitude of impact			
		Severe	Medium	Mild	Minor
Probability	High	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/low	Low
	Low Likelihood	Moderate	Moderate/low	Low	Very Low
	Unlikely	Moderate/low	Low	Very Low	Very Low

Classified risks and likely action

Significance Level	Definition/Comments
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required. Demonstrable contaminated land situation, highest threat & liability level, urgent action recommended.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term. Likely contaminated land situation, risk assessment and action recommended.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, if it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. Plausible contaminated land situation, risk assessment and possible action recommended.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Unlikely contaminated land situation, possible risk assessment and possible action.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. Negligible risk, no action recommended except vigilance for changes in conditions.

Geotechnical Risk Classification

The geohazards listed in the report within Section 4 follow guidance presented in Clayton, C.R.I. (2001) *Managing Geotechnical Risk*, Thomas Telford and the Highways Agency document CD622 '*Managing Geotechnical Risk*' (2008) which aims to identify and manage the geotechnical risks associated with a scheme throughout its lifespan, from planning to construction to maintenance.

For each geohazard the probability of the hazard occurring (P) has been considered together with the impact it would have (I) if it were to happen to calculate the risk rating between 1 and 25.

Risks that fall within Moderate, Significant and Severe categories below are considered to be **substantial** and are therefore listed within the report.

Probability	(P)		Impact	(I)		(R)	Risk
Very Likely (VLk)	5	X	Very High (VH)	5	=	20 – 25	Severe
Likely (Lk)	4		High (H)	4		15 – 19	Substantial
Plausible (P)	3		Medium (M)	3		10 – 14	Moderate
Unlikely (U)	2		Low (L)	2		5 – 9	Minor
Very Unlikely (VU)	1		Very Low (VL)	1		1 – 4	Negligible

