Executive Summary

Brief	Delta-Simons Limited ('Delta-Simons') was instructed by Trinovant on behalf of Aequitas Estates (Raunds No3) Limited (the 'Client') to undertake a Geo-Environmental Assessment for land off Cotswold Dene, Lakeside Industrial Estate Standlake, Witney OX29 7PL (hereafter referred to as the 'Site'). It is understood that it is proposed that the Site will be developed to a commercial end use. The report has been produced to assess the risk for land contamination issues to be present at the Site in the context of the proposed development, to support the planning application and to provide a preliminary geotechnical assessment.
Site Setting	The Site is an irregular shaped area of land south of Cotswold Dene. The Site is currently unoccupied, consisting of a relatively flat, roughly vegetated area with a large stockpile located in the south, adjacent to the site boundary. Some areas of hardstanding remain from historic land use in the west of the Site. Historic records show that the Site has remained mostly undeveloped with later use of the Site for stockpiling/storage. A former gravel pit was located in the southern extent of the Site and the area is characterised by a number of disused gravel pits, industrial land uses and former landfills. The Site underwent remediation / earthworks in 2021 with the removal of Made Ground up to 1.7m and replacement with backfill.
Ground Conditions	The current ground investigation recorded a variable thickness of Made Ground, which in turn is underlain by the Summertown-Radley Sand and Gravel Formation and Oxford Clay Formation and West Walton Formation (to the maximum investigated depth of 5.0m bgl). The Summertown-Radley Sand and Gravel Formation is a Secondary A Aquifer. The closest surface water course is a drainage channel to the south-west and east.
Land Contamination Assessment	Significant soil contamination has not been identified that is considered to pose a risk to human health receptors in a commercial end use setting. Asbestos Containing Materials (ACM) have not been identified during this investigation. However, the presence of asbestos cannot be discounted within the Made Ground, particularly within historic Made Ground. Elevated metals and sulphates were recorded in the underlying groundwater, considered to be indicative of background groundwater quality. Risks to controlled waters are considered to be low. Preliminary ground gas monitoring indicates the Site can be provisionally classified as CS2. It is recommended that supplementary ground gas monitoring and a revised assessment is undertaken to fully understand the ground gas regime for the Site.
Geotechnical Assessment	Spread foundations extending to the underlying Summertown Radley Sand and Gravel Member may be considered to be a suitable foundation solution subject to further geotechnical testing. Care should be given to the presence of shallow groundwater when designing foundations. Where Made Ground is too deep or higher loads are required, then consideration of ground improvement of the Made Ground or piling into the bedrock deposits should be given. Resting groundwater was noted to lie between 1.18 and 2.22 m bgl. Therefore, shallow groundwater maybe encountered within excavations and removal of these waters maybe required. Shallow Made Ground and groundwater at the Site have recorded elevated sulphates and as such, the conditions have been provisionally classified as Design Sulphate Class DS-5 for buried concrete.
Data Gaps and Uncertainty	The following Site specific data gaps and uncertainty apply to this assessment: ▲ The presence of obstructions within the Made Ground resulted in some exploratory hole locations being terminated at shallow depths. ▲ The presence of a large stockpile in the south of the Site restricted additional boreholes along the southern boundary of the Site.

	▲ The investigation scoped and assessments provided are specific to a light industrial/commercial development anticipated and may not be relevant for other development schemes should these be considered in the future. ▲ Ground conditions on-Site meant that drilling of the boreholes was particularly slow and prevented one of the borehole locations being drilled. However, general Site coverage was still achieved.
Recommendations	Based on the findings of this report, it is recommended that supplementary ground gas monitoring is undertaken to fully understand the ground gas regime at the Site, and give confidence that no steady state flow rates are present that may increase the preliminary ground gas characteristic situation from CS2. Additional recommendations include confirmation of geotechnical design parameters upon development of a masterplan, implementation of ground gas protection measures, as required and provision of a hotspot/ACM protocol in the event that contamination is encountered during the 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.	

Table of Contents

1.0 Introduction

1.1 Appointment

Delta-Simons Limited ("Delta-Simons") was instructed by Trinovant on behalf of Aequitas Estates (Raunds No3) Limited (the "Client") to prepare a Geo-Environmental Assessment for Land off Cotswold Dene, Lakeside Industrial Estate, Standlake, Witney, OX29 7PL (the "Site").

The project was undertaken to an agreed brief as set out in Delta-Simons' proposal (reference 21-2605.01, dated 21st December 2021).

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 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 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 detailed scope of works is outlined in Section 3.

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 currently undeveloped. It is understood that the Site is to be developed for light industrial/commercial warehouses, likely with associated yard / car parking space.

No planning conditions have yet been granted for the proposed redevelopment to the knowledge of Delta-Simons.

1.5 Existing Information

The following information was made available to Delta-Simons for review:

- Phase I Geo-environmental Assessment, Land West of Cotswold Dene, Standlake Business Park, Witney, Oxfordshire, OX29 7PL by Green Earth Management Company Co Ltd. Dated February 2021.

A review of these third party Reports is provided for information purposes only. No reliance on these Reports is assumed or inferred.

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.

[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

1.7 Data Gaps and Uncertainty

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

- The presence of obstructions within the Made Ground resulted in DS106 being terminated at a shallow depth.
- The presence of a large stockpile in the south of the Site restricted where the boreholes could be located.
- The investigation scoped and assessments provided are specific to the commercial development anticipated, and may not be relevant for other development schemes should these be considered in the future.
- Slow drilling through sands and gravels on Site meant that time constraints prevented one location being completed. However, the aim to achieve general Site coverage had been fulfilled.
- 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.

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 438320, 204410	Elevation	76 - 82 m AOD
		Area	2.8 Ha
Site Address and Location	The Site is located south of Cotswold Dene, Lakeside Industrial Estate Standlake, Witney, OX29 7PL. Access to the Site is from the north via Cotswold Dene and the Site is surrounded by industrial units to the north, east and west with agricultural land beyond the south of the Site. A Site location map is provided as Figure 1. Google Maps Link		
Current Site Description	The Site currently comprises an irregular shaped relatively flat undeveloped area of land with a stockpile located along the southern boundary. It is roughly vegetated with one area in the southwest of the plot covered by concrete, with two small stockpiles located on top. No other pertinent features exist currently on the Site.		
Physical Setting	The British Geological Survey (BGS) online and published maps (1:50,000) indicates that the ground conditions comprise: **Worked Ground** An elongated circle of land in the south of the Site (covering approximately half of the site) is recorded on the mapping as worked ground. **Superficial deposits** Summertown-Radley Sand and Gravel Member (Secondary 'A' Aquifer) – Sands and Gravels described as coarse to fined grained sands/ gravels deposited in beds and lenses reflecting the depositional channel, floodplains and levees of a river or estuary. Mapped as covering much of the northern half of the Site and beyond the Site boundary to the south. Locally absent in the southern half of the Site where the worked ground is present. **Bedrock** Oxford Clay Formation and West Walton Formation (undifferentiated) – Clay and mudstone. It is also understood based on review of previous reports that the upper 1.7m of ground comprises engineered backfill following the removal of Made Ground. The nearest surface water feature is a small pond in the adjacent plot to the east, approximately 100 m from the Site boundary and local drainage ditches. The closest drainage channels are located approximately 290m south-west of the Site and 290m to the east of the Site. These channels link via wider drainage networks to the River Thames (located circa 2.65km to the south of the Site) and to a lesser degree to the River Windrush (located 1.1km to the north of the Site). Groundwater is likely to be regionally flowing to the south-west / south in line with the general topography and direction of the River Thames. Locally variations in the thickness of the superficial deposits may influence local shallow groundwater direction.		

	The Site is located within a Drinking Water Protected Area (Surface Waters).
Key Historical Features	Online and third party report sources include historical mapping of the Site. Historically, the northern part of the Site was a site of settlement (Bronze Age) and the site used for agricultural land. Mapping from the 1960's show a pond along the southern boundary of the Site and wooded/vegetation in the north, the former likely a former gravel/sand pit. Gravel pits and further 'works' surround the Site to the north. Mapping from 1975 shows the pond no longer present in the south, with the Site vacant. The Site appeared to be undeveloped further until 2004, where aerial photography indicatives that concrete has been laid in an area in the west of the Site and was being used to store stockpiles of aggregates. Industrial units, within what is now Standlake Business Park, are first mapped to the north of the Site in the 1960's, comprising a works with further units (including works and egg producing plant) from the 1970's. The current Business Park and Standlake Arena (motor circuit) located beyond to the north were present by the end of the 1990's. The majority of the gravel pits in the area were noted as disused and/or redeveloped to leisure uses by the late 1990's. By 2009, the whole of the Site was noted as being used for stockpiling of materials both located in the east as well as the west of the Site. Aerial photography indicates that the stockpiles were largely no longer present by 2017 and the Site noted to become roughly vegetated. Based on third party reports, ground clearance activities are considered to have occurred prior to 2021 to level the Site, with a stockpile remaining in the south of the Site. More recent remediation works, understood to removed and replace 1.7m of Made Ground is understood to have occurred in 2021.

Summary of Previous /Third Party Reports	<u>Phase I Geoenvironmental Assessment, Land West of Cotswold Dene, Standlake Business Park, Witney, Oxfordshire, OX29 7PL by Green Earth Management Company Co Ltd. Dated February 2021.</u> Green Earth Management Company Co Limited completed a phase I geo-environmental assessment in order to support planning at the Site for commercial end use. The report consisted of a desk based review of available information from an Envirocheck report, a Site walkover, Preliminary Risk Assessment of contamination risk to human health and the environment and provision of a preliminary CSM and a summer of any recommended additions works based on the findings of the assessment. The report findings are summarised below: ▲ The report found that no significant active environmental permits, pollution incidents or registry entries were listed at the Site; ▲ Potentially significant landfill / infilled ground entries were identified in relation to landfill sites in the immediate vicinity of the Site, the closest located adjacent to the south-east, which accepted wasted which included aircraft oils and putrescible wastes. Records are also held for a landfill, 110m to the north-east (currently Standlake Arena), including for putrescible waste; ▲ The Site was once a waste transfer station accepting 'special waste' amongst others such as scrap metal and car parts (It should be noted that on review of the report database, this is believed by Delta-Simons to refers to an operational waste transfer site immediately to the east of the Site and may not have extended onto the subject Site); ▲ Pollution incidents relating the Site were recorded in 1995, 2008 and 2012 relating to sewage, biodegradable pollutant (likely sewage) and commercial waste respectively, ▲ The Site and surrounding area are within both the Thames (Leach to Evenlode) and Windrush and Tributaries (Little Rissington to Thames) surface water Nitrate Vulnerable Zones (NVZ); ▲ The Site may potentially have natural elevated arsenic, chromium and nickel; and ▲ The Site is in a low Unexploded Ordnance (UXO) risk area. The report found the following on-Site potential sources of contamination based on the desk based review – ▲ Historic Site use (waste transfer station) and Site restoration (including surface soils and stockpile) – potential oil hydrocarbons, heavy metals, inorganic compounds, asbestos, organic wastes, ground gas ▲ Agricultural activities – Agrichemicals, fuel and oil hydrocarbons, heavy metals, asbestos, buried organic./inorganic wastes, ground gas ▲ Construction & Demolition activities (including groundworks, made/infilled ground) Additionally, the following off-site sources of contamination have been identified – ▲ Standlake Business Park (current/historical activities) – Heavy metals, fuel and oil hydrocarbons, asbestos, ground gas, organic and inorganic wastes; and

	▲ Off-site quarrying and landfill/landfilling activities (including putrescible waste) – Leachate, heavy metals, metalloids, fuel and oil hydrocarbons, ground/landfill gas, asbestos, phenols, VOCs/SVOCs, pH, organic wastes. The report concludes by recommending an intrusive investigation to appraise the ground and contamination conditions of the Site, to include combines gas & groundwater monitoring installation as well as assessing groundwater levels and any potential contamination it may contain, and to have in place a discovery strategy for all the development works. The report also recommends that a geotechnical investigation should be undertaken to characterise the ground conditions and inform the civil / structural design.
Summary of Preliminary Conceptual Site Model	Sources ▲ Made Ground – Made Ground deposits of unknown providence are expected across the Site (both historic and recent backfill material). ▲ Historic land use – including possible use as part of a waste transfer station and deposition of stockpiles observed on-Site; ▲ Surrounding land use – Contamination associated with the surrounding agricultural / commercial / industrial land use, such as the scrap yard/waste transfer station adjacent to the east and former landfills to the south-east and north of the Site (including putrescible waste); and ▲ Ground gas associated with the Made Ground deposits. Pathways ▲ Direct contact, ingestion or inhalation of soil bound contaminants / dust / fibres during or following development; ▲ Inhalation of organic vapours associated with contamination; ▲ Migration of ground gas into on-Site building causing asphyxiation or risk of explosion; and ▲ Direct contact between aggressive ground conditions and new infrastructure. Receptors ▲ Construction workers: ▲ Future site users/maintenance workers; ▲ Third parties during construction (workers/residents adjacent to the Site); ▲ The underlying groundwater (Secondary A Aquifer) beneath the Site; ▲ Drainage channels, the closest located 290m east and south-west of the Site, part of a wider drainage network; and ▲ The built environment.

3.0 Ground Investigation

3.1 Intrusive Investigation

Delta-Simons carried out intrusive investigation work from 8th to 10th February 2022 to assess the potential linkages identified in the outline conceptual model (see Section 2.2 above).

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 x,y,z co-ordinates;
- Monitoring 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 Ground Investigations;
- Excavation of seven trial pits (TP101 to TP107) to a maximum depth of 3.5 m bgl;
- Collection of two samples using a JCB3X from the southern stockpile on Site (SP1 + SP2); and
- Drilling of six dynamic sampler drilled boreholes (DS101 to DS103, DS105 to DS107) to a maximum depth of 5.0 m bgl.

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 B together with 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 are provided in Appendix B.

3.2.2 Rationale

Location	Rationale	Key Contaminants of Concern
DS101 – DS103, DS105 - DS107	General Site coverage, to obtain shallow and deep environmental soil samples, obtain in-situ geotechnical information, log excavated material and install ground gas and groundwater monitoring wells to allow for future monitoring / groundwater sample collection.	Heavy metals, pH, sulphates, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylene, soil organic matter (SOM), volatile and semi-volatile organic compounds (VOC and SVOCs) and asbestos.
TP101 – TP107	General Site coverage, to observe shallow ground conditions, log excavated materials, obtain shallow environmental samples and carry out hand shear vane (HSV) testing where appropriate.	Heavy metals, pH, sulphates, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylene, soil organic matter (SOM), volatile and semi-volatile organic compounds (VOC and SVOCs) and asbestos.
SP1 + SP2	To obtain environmental samples of the southern stockpile	Heavy metals, pH, sulphates, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylene and asbestos.

3.2.3 In-Situ Tests

SPT tests were undertaken in all boreholes at 1.00 m intervals until 5.00 m bgl (or base of borehole, whenever is the sooner). The results of these tests are presented on the borehole logs included as Appendix B. A plot of Corrected SPT N values versus Depth is included as Figure 3.

3.3 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 B.

Four groundwater samples were obtained from the installed boreholes on 16th February 2022. 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 C and D.

Analytes	No. of Samples Tested		Rationale
	Soil	Ground-water	
Asbestos	16	-	Common potential contaminant - Analysed in all samples of Made Ground.
pH, As, Cd, Cu, Cr, Hg, Pb, Ni, Zn, speciated Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons, Criteria Working Group Method (TPHCWG), Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	16	4	Potential contaminants of concern, common to many sites.
Volatile and Semi-Volatile Organic Compounds (VOC and SVOC)	2	-	Potential contaminants of concern associated with unknown providence of former stockpiles.
Soil Organic Matter (SOM)	7	-	To assess the % of organic material within the soil and allow comparison of potentially elevated contaminants against their relevant assessment criteria.
pH, sulphate	16	4	To assess potential for chemical attack on buried concrete.
Total Sulphur	7	-	
Total Hardness	-	1	Groundwater parameter.

3.4 Monitoring Programme

Two rounds of groundwater level and ground gas monitoring were undertaken on all the newly installed wells (DS101 – DS103, DS105 and DS107) between 16th and 22nd February 2022.

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 (CO_2), methane (CH_4) and oxygen (O_2) 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 E.

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 and should be read in conjunction with the borehole logs presented in appendix B.

Strata	Typical Strata Description	Depth Range of Strata Top (m)	Depth Range of Strata Base (m)	Thickness Range (m)	Comments
Stockpiled Material (Made Ground)	Soft brown or black sandy gravelly CLAY or clayey gravelly SAND. Gravel is of wood, wire, glass, brick, metal, polystyrene, concrete, pumice, geotextile, plastics and metals.	*Above Ground*	*Above Ground*	-	*Black, ashy in places.* *Descriptions based on two excavations into stockpile to obtain environmental samples*
Made Ground – Granular	Orangish brown clayey gravelly SAND. Gravels are of concrete, sandstone, clinker, wood, plastics, metal and brick.	*0.0*	*1.1 - 2.6*	*1.1 - 2.6*	*Made Ground recorded as typically sand overlying clay except for DS105, TP106 and TP107.* *Granular Made Ground beneath the clay recorded in DS105, TP103 and TP105.* *Stained black locally*
Made Ground – Cohesive	Brown sandy gravelly CLAY. Gravels are of plastics, concrete, flint, metals, pumice, chalk, sandstone and wood.				
Summertown-Radley Sand and Gravel Member	Yellow sands and gravels of flint.	*1.1 - 2.6*	*3.8 - 4.5*	*2.0 - 3.1*	*Varying between gravelly sands and sandy gravels. Occasionally very clayey.* *Local discontinuous bands of grey clay*
Oxford Clay Formation and West Walton Formation	Firm to stiff grey mottled orangish brown CLAY.	*3.8 - 4.5*	*Not Proven*	*>1.2 (not proven)*	*Depth of strata not observed beyond base of borehole (5.0m bgl)*

Ground conditions at the Site were observed to comprise Made Ground to a maximum depth of 2.6m bgl overlying the Summertown-Radley Sands and Gravels Formation to 3.1m bgl and finally the Oxford Clay Formation and West Walton Formation to the base of the excavations.

Made Ground was observed in significant thicknesses Site-wide (minimum of 1.0m bgl up to 2.6m bgl) consisting of both gravelly clays and sands. Typically sandy Made Ground was recorded from surface between 0.3 and 1.20 m (average thickness of 0.50m) underlain by sandy gravelly clay. Cohesive Made Ground was absent in TP106 and TP107 in the south / south-west of the Site. The mantle of sandy clay was also absent from DS105 and a mantle of gravel was recorded in DS103 only. A thickness of granular Made Ground underlying the cohesive Made Ground was noted in DS105, TP103 and TP105.

There was no significant observational difference between the Made Ground within the upper 1.7m (depth based on provided third party information). Though it is assumed, that where encountered, the mantle of sandy Made ground over the clay Made Ground forms the backfill strata. The degree of engineering compaction/specification is not known and the depth to the base of the clay Made Ground was variable between 0.4 and 2.20m bgl.

The deepest Made Ground was recorded in TP106 located in the south of the Site (2.60 m bgl) and TP105, in the approximate location of the former pond (infilled). It would be anticipated that deeper Made Ground would also extend beneath the stockpile.

Widespread obstructions within the ground were not observed however a concrete slab was noted within TP105 at 1.2m bgl and DS106 was obstructed at 1.3m bgl due to an unknown obstruction. Furthermore, a concrete slab in the south-west corner of the Site was present at surface.

4.3 Groundwater

4.3.1 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
DS101	1.90	72.83	Summertown-Radley Sand and Gravel Member	Groundwater within sands/gravels
DS102	2.90	72.10		
DS103	2.60	72.74		
DS105	3.60	71.84		
DS107	3.00	72.31		
TP101	2.70	72.61		Flowing into the excavation at a high rate causing instability in the sands and gravels.
TP102	2.40	72.57		
TP103	2.75	72.66		
TP104	3.20	72.02		
TP105	3.10	72.54		
TP106	2.90	72.87		
TP107	2.80	72.82		

4.3.2 Levels During Monitoring Programme

Groundwater levels were monitored on a total of two occasions on 16th February 2022 and 24th February 2022. Monitoring data and LNAPL measurements are provided in Appendix E and summarised in the table below.

Exploratory Hole	Water level during monitoring Max to Min Range		LNAPL Y/N	Stratum
	m bgl	m AOD.		
DS101	1.35 – 1.44	73.29 - 73.38	N	Made Ground/ Summertown-Radley Sand and Gravels
DS102	1.71 – 1.76	73.24 - 73.29	N	Made Ground/ Summertown-Radley Sand and Gravels
DS103	1.18 – 2.00	73.34 - 74.16	N	Made Ground/ Summertown-Radley Sand and Gravels
DS105	2.16 – 2.22	73.22 - 73.28	N	Made Ground/ Summertown-Radley Sand and Gravels

Exploratory Hole	Water level during monitoring Max to Min Range		LNAPL Y/N	Stratum
	m bgl	m AOD.		
DS107	1.97 – 2.02	73.29 - 73.34	N	Made Ground/ Summertown-Radley Sand and Gravels

Groundwater levels during monitoring varied between 73.24 – 74.16m AOD within the Made Ground and Summertown-Radley Sand and Gravels. No LNAPL was noted on any of the monitoring visits.

Resting groundwater was only recorded at a depth within the Made Ground strata on one occasion during the first monitoring visit within DS103, it was then observed to fall and be present within the Summertown-Radley Sand and Gravels, consistent with all other locations. This indicates that the two units are in hydraulic continuity.

Based on an assessment of groundwater levels recorded, groundwater flow direction is indicated to be to the north-east though it should be considered that groundwater elevation was relatively flat across the site with little hydraulic gradient.

4.4 Visual and Olfactory Evidence of Contamination

No visual or olfactory evidence of potential gross contamination was observed during the investigation.

4.5 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	Justification
Made Ground			
Uncorrected SPT 'N'	Blows	6 - 23	In Situ Testing
Corrected SPT 'N60'	-	5 - 22	SPT N values corrected for energy ration (Er) after BS EN ISO 22476-3:2005. Er = 80%
Summertown and Radley Member			
Uncorrected SPT 'N'	Blows	12 – 55	In Situ Testing
Corrected SPT 'N60'	-	11 - 52	SPT N values corrected for energy ration (Er) after BS EN ISO 22476-3:2005. Er = 80%
Oxford Clay Formation and West Walton Formation			
Uncorrected SPT 'N'	Blows	12 - 24	In Situ Testing
Corrected SPT 'N60'	-	11 - 23	SPT N values corrected for energy ration (Er) after BS EN ISO 22476-3:2005. Er = 80%
cu (Undrained Shear Strength)	kPa	47 – 98	Inferred from PI and N-Value after Stroud (1975). No lab testing undertaken - assumed conservative factor of 4.3.

A plot of corrected SPT N value versus depth per strata is presented as Figure 3. Furthermore, the uncorrected results of the SPT tests are included on the borehole logs within Appendix B.

4.6 Geochemical Testing

Geochemical analysis was undertaken on 7 soil samples of Made Ground, 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
Soil - pH	16	7.4	11.3
Soil - Total Sulphur	7	0.042%	4.35%
Soil – Acid Soluble Sulphate	7	0.075 %	11.7 %
Soil - Water Soluble Sulphate	16	150 mg/L	3,800 mg/L
Water – pH	4	7.0	7.5
Water - Sulphate	4	203 mg/L	1210 mg/L

5.0 Preliminary Geotechnical Assessment

5.1 Introduction

5.1.1 Summary of Development Proposals

At the time of writing, it is understood the Site is not subject to any active planning applications. However, it is understood that the Site is likely to be redeveloped for a commercial / light industrial end use.

At the time of writing, proposed structural and floor loadings and final levels of future development were unknown and the ground investigation was not designed to provide geotechnical design information and no geotechnical laboratory testing has been undertaken to date. Consequently, the information provided below should be treated as preliminary and will be subject to review once a scheme and levels have been finalised, and further detailed assessment may be required.

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' (2020) 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.

- Deep Made Ground: - Substantial Made Ground deposit, both cohesive and granular in nature were identified underlying the Site (up to 2.6 m bgl). Made Ground is typically variable in nature and strength with a potentially low bearing capacity and unacceptable levels of total/differential settlement may occur.
- Shallow groundwater – groundwater was present at relatively shallow depths within the superficial deposits and considerations for excavation and foundations (both in construction and allowable bearing capacity) will be required during construction.
- Cohesive soils – The Site is locally underlain by cohesive Made Ground which has the potential to shrink / swell in the presence of vegetation. The Site is partly vegetated with shrubs / grassland and the clays in the upper strata could become soft or very soft when subject to routine wetting.

5.2 Foundations

The Made Ground is considered to be too variable in depth and composition in its existing condition for conventional shallow foundations at the Site. Both granular and cohesive Made Ground was encountered at depths between 1.1 and 2.60mbgl.

Traditional spread foundations may be feasible for founding on medium dense superficial deposits (Summertown-Radley Sand and Gravel Member) subject to further geotechnical laboratory testing and assessment. Groundwater may be present at foundation depths and as such, provisional allowable bearing capacity would be lower for traditional spread foundations.

Consideration should be given to founding in uniform strata in order to limit the potential for differential settlement, however consideration may also be given to founding in earthworks fill placed to a suitable engineered specification.

Where the Made Ground extends to greater depths (e.g. TP102, TP105 and TP106 noted Made Ground thicknesses in excess of 2.0m) then consideration of trench fill to transfer loads to the underlying competent strata may be required.

All foundation excavations should be inspected by a suitably qualified engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved.

5.2.1 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*".

5.2.2 Ground Improvement Techniques

Due to the local thickness of Made Ground and depending on final design loads, consideration may be given to transferring load to competent Summertown-Radley Sand and Gravel Member through ground improvement of existing soils. It is recommended that a ground improvement specialist is consulted to determine suitable techniques which may be adopted and likely anticipated allowable bearing capacities.]

The precise ground improvement technique/proprietary methods, suitability of the ground, suitability of fill materials and allowable bearing capacity that can be achieved would need to be confirmed by discussions with a suitably experienced contractor; whose design should be warranted.

5.2.3 Piling

A piled (or mini-piled) foundation solution using driven/ traditional bored or continuous flight auger (CFA) piles transferring loads to deeper competent geology (Oxford Clay Formation) may be suitable for the proposed or anticipated design loads, utilising both skin friction and / or end bearing capacity.

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, whose design should be warranted.

Consideration of Made Ground with respect to negative skin friction should be given.

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.

5.2.4 Floor Slabs

Consideration should be given to the significant local thickness of Made Ground and variable cohesive and granular nature of the material. If ground bearing floor slabs are required, then all unsuitable soils should be removed, the formation should be heavily proof rolled and any soft spots excavated and replaced with well compacted granular material or alternatively it would be recommended that the Made Ground soils are subject to re-engineering or ground improvement to an appropriate depth below formation level in order to control settlement. This may incorporate the requirement for a piling mat. Further geotechnical testing of the Made Ground may be required. Alternatively, floor loads should be transferred to ground improved soils or to piles through concrete ground beams/concrete frame or otherwise suspended.

5.3 Earthworks

At the time of writing, proposed finished levels were unknown although the Site is relatively level (with the exception of the stockpile in the south). It is understood that to some degree, minor earthworks will be required as part of the proposed development, which could include the use of the existing soils and stockpiled soil mound in the south of the Site. No specific earthworks testing has been completed within the scope of this investigation.

Shallow earthworks on the Site will likely encounter Made Ground and the Summertown-Radley Sand and Gravel Member which may be suitable for general fill subject to appropriate classification and laboratory testing as part of an earthworks specification and removal of oversized and unacceptable inclusions.

Earthworks testing and preparation of an Earthworks Strategy/ Specification is recommended once the principles and scale of any earthworks requirements associated with the project are understood.

5.4 Roads and Pavements

No in-situ CBR testing has been completed as part of this ground investigation and it is recommended that plate CBR tests are undertaken at formation level prior to finalising pavement design.

5.5 Excavations & Obstructions

It is expected that conventional mechanical excavators will readily remove the Made Ground encountered in shallow excavations although a breaker may be required to remove any existing concrete hardstanding in the west of the Site, or any concrete slabs that may be buried in areas not investigated.

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

5.6 Groundwater

Resting groundwater was noted to lie between 1.35 – 2.22m bgl (73.22 and 74.16 mAOD). As such, significant groundwater could be encountered within excavations required as part of the proposed development. Due to the likely high rates of infiltration of groundwater into excavations below the groundwater table, dewatering via sump and dump may not be appropriate, and as such other forms of groundwater control will need to be considered.

The nature of the shallow water and Made Ground strata makes it unlikely that infiltration drainage would be suitable for the development.

5.7 Chemical Attack on Buried Concrete

The underlying Oxford Clay Formation is considered to be a potentially pyritic soil, though it wouldn't be anticipated that the superficial deposits are naturally high in sulphate. The Made Ground, possibly derived in part from the underlying geology, including the Oxford Clay Formation, has the potential to be high in sulphates.

Water soluble sulphate concentrations in Made Ground soils varied from 74 mg/l to 2,800 mg/l with soil pH values ranging from 7.4 to 11.3. Total sulphur concentrations ranged from 0.042 % to 2.06 %.

Sulphate concentrations in the groundwater ranged from 0.203 mg/l to 1.21 mg/l with groundwater pH values ranging from 7 to 7.5.

In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the conditions of the Made Ground soils at the Site would therefore be classified as Design Sulphate Class DS-5 and ACEC Class AC-4s for soils and groundwater, 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 in potentially pyritic soils).

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

6.2.1 Risks from Soil Sources

None of the contaminant concentrations reported in soil exceeded the relevant Generic Assessment Criteria (GAC). Therefore, the soil contaminant concentrations are not considered likely to represent a risk to human health.

No ACM were identified within the Made Ground soils or within the samples obtained from the stockpile in the south of the Site. However, Asbestos Containing Materials cannot be discounted within the soils on-Site (particularly the existing stockpile comprising of historical Made Ground) which has not been investigated, and future groundworkers should be informed about the possibility of encountering such material.

6.2.2 Risks from Groundwater Sources

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

No sources of potentially volatile contaminants were detected within the groundwater samples in excess of the SOBRA GAC.

6.2.3 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; and
- 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).

The Site is located on a Secondary 'A' aquifer (Summertown-Radley Sand and Gravel Formation) and does not lie within a source protection zone (SPZ). However, the Site does lie within a drinking water protection zone for surface waters. It is therefore considered that the underlying groundwater is the primary controlled receptor associated with the Site, it is not currently associated with a potable water supply. There is potential for groundwater to migrate to drainage channels in the locality of the Site and as such, groundwater analysis has been compared to both surface water and groundwaters (as a potable resource) receptor.

6.3.1 Groundwater Results

Concentrations of contaminants within the groundwater which exceed the GAC are summarised in the following table.

Contaminant	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC / No. of samples	Location of Exceedances
Sulphate as SO4	1,210,000	250,000	DWQS 2016	3 / 4	DS102 (north), DS103 (west) and DS107 (east)
Copper	12	1	WFD 2015b	4/4	DS101 – DS103 (north-east, north, west), DS107(east)
Nickel (dissolved)	73	20	DWQS 2016	2 / 4	DS102 (north) and DS107 (east)
		4	WFD 2015a	4/4	DS101 – DS103 (north-east, north, west), DS107(east)
Zinc	70	12.1	WFD 2015b	4/4	DS101 – DS103 (north-east, north, west), DS107(east)

Notes:
WFD 2015 = Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
DWQS 2016 = The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards]

6.3.2 Groundwater Results Summary

Exceedances in Nickel concentrations have been recorded in the north and the east of the Site for both the protection of groundwater and surface waters. In addition, copper and zinc have been recorded above the applied GAC for the protection of surface waters in all samples. It should be noted that the GACs for the protection of surface water for these metals (copper, zinc and nickel) are considered to be highly conservative. These are bioavailability metals for which the GAC can be site-specific based on the chemistry of the receiving surface waters. In the absence of a soil source of these metals, site-wide concentrations of a similar magnitude (and therefore likely background quality) and the absence of an immediate surface water receptor, it is considered that risks to controlled waters from slightly elevated metals are low.

Sulphate as SO_4 exceeds the GAC for drinking water (250,000 µg/l) in three of the samples with a maximum concentration of 1,210,000 µg/l recorded within DS103. It is considered likely that this is related to natural background groundwater conditions associated with natural geology (high-sulphate bearing strata). In the absence of a potable source, risks to controlled waters from elevated sulphates are considered to be low. Similarly, GAC exceedances in nickel (max concentration of 73 µg/l compared to a drinking water GAC of 20 µg/l) in two of the four locations are not considered to pose a considerable risk to controlled waters given the highly conservative GAC, absence of an identified soil source and other contaminants in conjunction with the nickel exceedance. As above, the elevated nickel levels are considered to be indicative of background water quality.

As such, groundwater contaminant concentrations at the Site are not considered to pose a significant risk to controlled waters.

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. The relevant water supply company needs be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

A preliminary review of the results indicates that a relevant linkage is unlikely to exist associated with organic contaminants and therefore contaminant polyethylene (PE) and/or polyvinyl chloride (PVC) water supply pipes may be suitable for use on the development subject to discussions with the relevant Local Water Authority.

6.4.2 Building Materials

Risks to building materials associated with aggressive ground conditions is addressed in Section 5.6.

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 analyses.

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 – Significant thicknesses (up to 2.6m thick) observed across the Site. However, low organic content was typically observed within the soils;
- Historic landfills to the south-east (adjacent) and to the north (110m), the latter containing putrescible waste; and
- Infilled land associated with former gravel pits in the vicinity of the Site.

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; and
- 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.

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, the gas generation potential is considered to be low, whilst the sensitivity of the proposed development is low.

Gas monitoring has been carried out upon the Site on an initial two 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 988 mBar to 1002 mBar, of which both 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	
DS101	<0.1	3.1	<0.1	0.0001	CS1	0.0031	CS1	N
DS102	<0.1	7.2	<0.1	0.0001	CS1	0.0072	CS2	N
DS103	<0.1	0.8	<0.1	0.0001	CS1	0.0008	CS1	N
DS105	1.2	6.6	<0.1	0.0012	CS1	0.0066	CS1	N
DS107	<0.1	8.0	<0.1	0.0001	CS1	0.008	CS2	N

The highest recorded concentration of methane is 1.2%v/v in DS105 though below detection in all other locations.. The highest carbon dioxide concentration is 8%v/v within DS102. However, steady flow rates are considered to be negligible as below the limits of detection on both monitoring events. Higher initial flow rates were recorded on the second monitoring round.

The preliminary data indicates that the Site can be provisionally classified as CS2 (low hazard potential) in accordance with BS 8485:2015 Table 2. The GSV for the site-wide worst-case flow rate and ground gas concentration (either CO_2 or CO_4) has also been assessed which indicates that the Site may be classified as CS2. The CS2 classification is consistent with the CSM for the Site, which indicates a low ground gas potential associated with the thickness of Made Ground and potential for off-Site ground gas sources.

The GSV values in the table above are low due to the absence of any steady state flows recorded within the boreholes during either of the monitoring visits. However, given that some peak flow readings have been recorded (up to a maximum of 5.5 l/hr within DS103) it would be recommended that further assessment be undertaken in order to provide a more robust dataset to adequately characterise the ground gas regime.

7.4 Ground Gas Risk Mitigation

The ground gas regime at the Site has been provisionally classified as CS2 in accordance with the CIRIA guidance and it is recommended that and CS2 situation is assumed for design purposes.

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 C or D buildings 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); and
- 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 is on a preliminary bases, and supplementary monitoring should be undertaken in order to provide a robust ground gas regime. Following the completion of supplementary monitoring, an updated ground gas regime shall be provided. Entry to excavations/confined spaces should be restricted to personnel with relevant Confined Spaces training and with prior conformation 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 with associated office space, car parking / yard space and limited soft landscaping.

Revised Conceptual Site Model				
Source	**Pathways**	**Receptors**	**Pollutant Linkage?**	**Discussion and Mitigation**
Elevated metals in soils and groundwater Potential ACM in historic Made Ground.	Direct contact, ingestion and/or inhalation of soil/dust/fibres	Human health - Future commercial Site users	No	Whilst locally elevated metals were recorded in the Made Ground, these are not at concentrations that are considered to pose a risk to commercial/industrial development and therefore risk to commercial site users are low. ACM has not been identified during the current ground investigation though the presence of ACM cannot be wholly discontinued, particularly in the stockpiled material or beneath historic hardstanding though unlikely to be significantly widespread. Removal of stockpiled material and exists hardstanding in proposed redevelopment would likely mitigate any risks associated with ACM.
		Human health – construction workers	Yes	Short term risk would be mitigated by use of PPE and provision of suitable welfare facilities. The potential for ACM cannot be wholly discounted and toolbox talks on asbestos awareness should be given during construction. Should gross ACM be encountered during intrusive works a hotspot protocol should be implemented. The hotspot protocol should include but not be confined to isolating and cordoning off areas of gross contamination, removing subject material onto a suitable plastic sheeting or similar, and material to be disposed of off Site and relevant documentations supplied to the environmental consultant.
	Migration of contaminants into groundwater	Secondary A Aquifer (Summertown-Radley Sand and Gravels)	Yes	No widespread or significant contamination of groundwater has been encountered during the Site investigation. Concentrations of nickel, copper and zinc above the GAC for the protection of surface waters but these are considered to be highly conservative and given the absence of an identified on-Site source and similar recorded magnitude of concentrations, it is considered that these results are indicative of background levels rather than specific contamination. Similarly, in the absence of a potable water source and likely indication of background
	Migration of contaminants into surface waters	Drainage channels (290m south and east of the Site)		

Revised Conceptual Site Model				
Source	**Pathways**	**Receptors**	**Pollutant Linkage?**	**Discussion and Mitigation**
				quality, concentrations of nickel and sulphate above the GAC for the protection of drinking water are not considered to be significant. Given the distance, surface water run-off to surface water drainage channels is not considered to be feasible. Development of the Site will likely improve groundwater conditions by reducing infiltration through the Made Ground. Therefore, risks to controlled waters from the Site are considered to be low.
	Direct infiltration into water supply pipes	Drinking water supply pipes	No	Assessment of the risk to water pipes for any new supply will have to be undertaken as a requirement of the statutory undertakers, who should be provided with a copy of this Assessment and provide recommendations for upgrading of potable water supply pipes. Given the absence of organics within the Made Ground, it is not anticipated that upgraded water pipes will be required however confirmation should be sought from the statutory undertaker.
Ground gas (elevated carbon dioxide)	Indoor exposure / explosive hazard via enclosed space accumulation of ground gas	Future site users / buildings	Yes	Ground gas monitoring completed at the Site has identified slightly elevated levels of carbon dioxide. However, steady flow readings within all the boreholes have been recorded as below the limits of detection and therefore the Site can be provisionally classified as Characteristic Situation 2 in accordance with CIRIA C665 guidance. Ground gas mitigation measures for CS2 should be implemented in accordance with BS8485:2015 (Tables 5-7) to ensure the points system is achieved. Full details of measures required are outlined in section 7.4. However, given that the GSV is characterised by the absence of steady state flow rates within all of the boreholes and variable carbon dioxide locally above 5%v/v, it is recommended that further ground gas monitoring is undertaken at the Site, to provide a more robust dataset in order to fully characterise the ground gas regime and give confidence to the provisional CS2 classification. Following supplementary monitoring, an updated ground gas Characteristic Situation will be recommended.

9.0 Conclusions & Recommendations

9.1 Ground Model Summary

Ground conditions underlying the Site were found to comprise site-wide cohesive and granular underlain by the yellow flint gravels and sands of the Summertown-Radley Sand and Gravel Member. The underlying bedrock is the Oxford Clay Formation and West Walton Formation, observed on Site as firm to stiff grey clay recorded from 3.80m bgl.

Groundwater was encountered between 1.18 m (Made Ground) and 2.28 m bgl (Summertown-Radley Sand and Gravel Member).

9.2 Geotechnical Summary

Structural and floor loadings and final levels are unknown and consequently, the information provided should be treated as preliminary and will be subject to review once a scheme and levels have been finalised, and further detailed assessment may be required.

The following geotechnical risks have been identified at the Site;

- Made Ground – significant Made Ground has been identified across the Site, which is variable in nature.
- Shallow groundwater – shallow groundwater within the superficial deposits has the potential to a risk to excavations and shallow foundations;
- Cohesive soils – limited cohesive soils (Made Ground) with the ability to swell/ shrink with routine wetting, affecting the strength of the soils.

Spread foundations, extending to the underlying Summertown and Radley Member may be considered suitable for the proposed development subject to further geotechnical testing. Where anticipated loads are too high or the depth of Made Ground is too great then consideration for the use of ground improvement or piling should be give not transfer loads to the underlying superficial or bedrock deposits respectively. Advice from a ground improvement specialist or piling contractor should be sought to assess likely techniques and bearing capacities.

Resting groundwater was noted to lie between 1.18 and 2.22 m bgl. Therefore, shallow groundwater maybe encountered within excavations and removal of these waters maybe required.

Sulphate concentrations within the Made Ground and groundwater were elevated and as such, it is recommended that the Site is classified as Design Sulphate Class DS-5.

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/light industrial end use. The assessment is being completed prior to the proposed redevelopment of the Site.

9.3.1 Human Health

None of the selected contaminants analysed were found to exceed their relevant Generic Assessment Criteria (GAC) for 1% SOM. Therefore, no risks to human health arising from soils are thought to be associated with the Site.

Although no asbestos containing materials (ACM) were identified in the samples analysed, ACM may still be present within the Made Ground soils not sampled as part of the Site investigation (in particular the remaining stockpile and residual / historic Made Ground) therefore, a suitable protocol should be implemented in the event that ACM is discovered during construction.

9.3.2 Controlled Waters

No widespread contamination of groundwater was encountered during this investigation. Elevated metal and sulphate concentrations were found and are considered indicative of background groundwater quality in the absence of a specific soil source. There is no potable water source in the vicinity of the Site and surface water drainage channels are not considered to be in close proximity. As such, risks to controlled waters are considered to be low.

9.3.3 Ground Gas

Preliminary ground gas monitoring indicates the Site can be provisionally classified as Characteristic Situation 2. It is recommended that supplementary monitoring is undertaken to fully understand the ground gas regime at the Site, and following completion of any supplementary monitoring, an updated ground gas assessment would be undertaken.

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.

The conditions of the shallow soils at the Site have been classified as Design Sulphate Class DS-5 for soils and groundwater, when considering the most appropriate type of concrete to be used at the Site for shallow foundations in order to resist chemical attack from elevated sulphate present in the soils (assuming mobile groundwater in non-pyritic soils).

9.4 Recommendations

It is considered that supplementary ground gas monitoring should be undertaken to provide a more robust data-set with respect to the ground gas regime and confirm the absence of any significant flows which may affect the Characteristic Situation for design purposes.

Further geotechnical assessment of the Site should be undertaken once the proposed development is known to investigate and assess the geotechnical properties of the underlying superficial and bedrock deposits in order to progress geotechnical design.

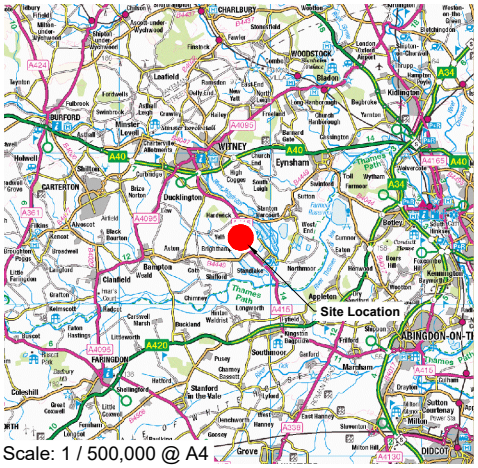
The following recommendations for the development of the Site are made:

- The ground gas regime at the Site has been provisionally categorised as a Characteristic Situation 2 based on the results of the preliminary ground gas monitoring undertaken as part of this investigation. As such, ground gas mitigation measures should be implemented and verified in accordance with BS8485:2015 to mitigate the risk to future/end site users;
- A hotspot protocol should be implemented should any areas of unexpected gross contamination be uncovered during intrusive works. This should include but not be limited to stopping all works and cordoning off the area in which the contamination has been uncovered. The environmental consultant should be alerted and decisions made over the immediate health and safety requirements. Any grossly contaminant material should be placed on plastic sheeting away from other uncontaminated material, fenced off before being disposed of off-Site. All documentation relating to the disposal of the material including the nature of the soils, quantities and receiving facility should be recorded and supplied to the Environmental Consultant for review;
- Waste classification has not been undertaken as part of the scope of works, should it be proposed to dispose of materials from the Site then specific additional investigations may be needed to classify the materials in accordance with current regulatory requirements. ;
- Groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks and in particular the potential presence of asbestos and an appropriate protocol and risk assessments to mitigate exposure of the workforce and general public should be in place. Good standards of personal hygiene should be observed, and appropriate levels of PPE / RPE utilised wherever necessary;
- Suitable dust suppression techniques and prevention of nuisance/environmental impacts will need to be implemented by the groundworkers during construction works;
- Confirmation should be sought from the Local Water Authority as to whether they will require upgraded pipework to be installed for new service installations, although this is considered to be likely; and

- 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 (MMP). Any imported material, including topsoil would also be chemically and geotechnical suitable for its proposed end-use.

Figures

Figure 1 – Site Location Map



Scale: 1 / 500,000 @ A4

LEGEND

Site Boundary

N

The Island

DOWNS ROAD

THE FURLONG

COTSWOLD DENE

Museum

A415

CALAIS LANE

A415 WITNEY ROAD

Brighthampton

THE PITCH

ABINGDON ROAD

LANCOTT LANE

B4449

MALTHOUSE LANE

ASTON ROAD

MARTINS LANE

Scale: 1 / 10,000 @ A4

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TITLE:
Site Location Map
Land at Cotswold Dene

DRAWN BY: KE	SCALE: To Scale@A4	PROJECT NO: 21-2605.01
CHECKED BY: CB	REVISION: 1	FIGURE NO: 1
DATE: 04 February 2022		

Figure 2 – Exploratory Hole Location Plan

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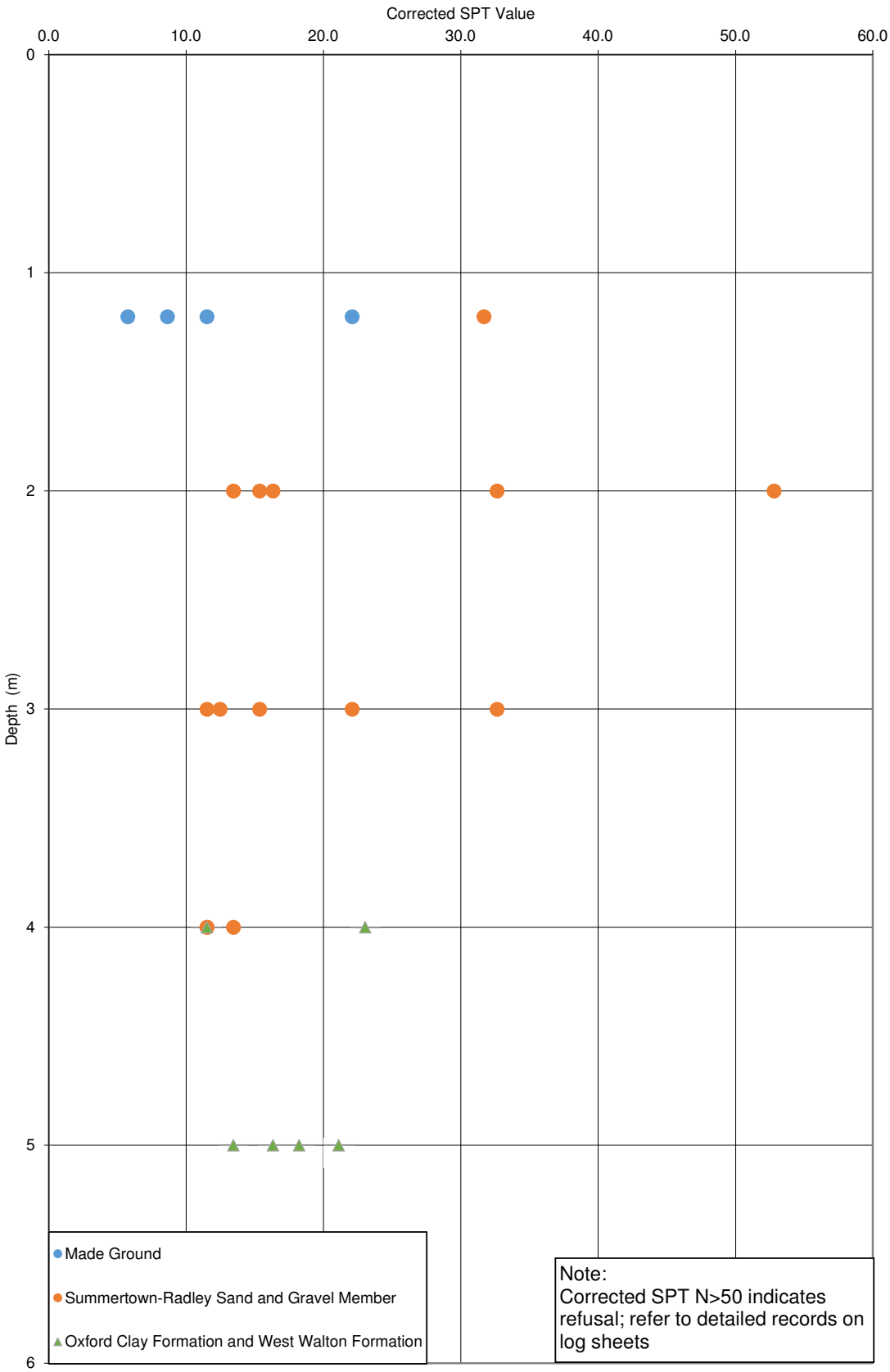
TITLE:
Exploratory Hole Location Plan
Land at Cotswold Dene

DRAWN BY: YA	SCALE: Not to Scale
CHECKED BY: BC	REVISION: 1
DATE: 03 March 2022	

PROJECT NO: 21-2605.01

FIGURE NO: 2

Figure 3 – Corrected ‘SPT’ Plot



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TITLE:

Corrected SPT vs depth in Made Ground
Land off Cotswold Dene, Witney

DWN:	PROJECT NO.:
BC	21-2605.01
DATE:	FIGURE NO.:
Feb-22	3

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.

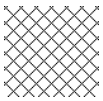
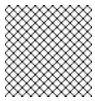
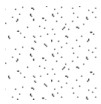
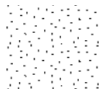
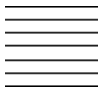
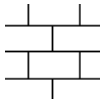
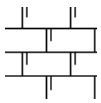
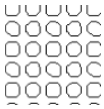
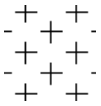
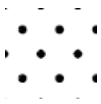
No aspect of this Report constitutes a design. Where this information is used in design, the designer should verify the information has been used appropriately.

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.

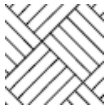
Appendix B – Borehole Logs, SPT Calibrations Certificate

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

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Project No: 21-2605.01 | Hole ID: DS101 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Dynamic Sampler Log

Date: 10/02/2022 | Client: Aequitis Estates

Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results	Backfill
MADE GROUND: Brown very gravelly slightly clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded limestone, pumice, brick, concrete, metals and plastics. Frequent cobbles of limestone and concrete.		0.30	(0.30)	74.43			0.10	ES1	0.10	PID=0.0ppmv	
MADE GROUND: Soft brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded limestone, concrete, brick and clinker.		1.10	(0.80)	73.63			0.50	ES2	0.50	PID=0.0ppmv	
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded to rounded flint. (RIVER TERRACE DEPOSITS)		2.80	(1.70)	71.93		1.90 ▼			1.20	SPT(C) N=33 (18,12/10,9,8,6)	
									2.00	SPT(C) N=16 (2,3/3,3,4,6)	
Firm grey slightly gravelly CLAY. Gravel is fine to medium subrounded flint. (RIVER TERRACE DEPOSITS)		3.30	(0.50)	71.43			3.00	ES3	3.00 3.00	SPT(C) N=12 (4,4/3,3,3,3) PID=1.2ppmv	
Yellow sandy GRAVEL of fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		4.00	(0.70)	70.73							
Borehole complete at 4.00 m bgl.									4.00	SPT(C) N=14 (3,3/3,3,4,4)	

Remarks:
1. Borehole logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Hand dug inspection pit complete to 1.2m bgl. 5. Elevation and location data obtained from GPS survey. 6. SPT/CPT undertaken at 1m intervals. 7. Borehole complete at 4.00m bgl and installed with standpipe, bung and flush cover.

Water Strike			Water Level		Borehole Diameter	
Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
10/02/2022	1.90					

Coordinates:	Elevation (mAOD):	Drilled By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438325.15 N204481.51	74.73	Sherwood Drilling	Premier 110	BC	CB		1:32

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Project No: 21-2605.01 | Hole ID: DS102 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Dynamic Sampler Log

Date: 09/02/2022 | Client: Aequitis Estates

Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results	Backfill
MADE GROUND: Grass overlying brown slightly clayey slighty gravelly fine to coarse SAND. Gravel is fine to coarse subangular flint, brick, wood, concrete, pumice and metals.		0.40	(0.40)	74.60							
MADE GROUND: Soft brown gravelly slightly sandy CLAY. Gravel is fine to coarse subangular to subrounded sandstone, flint, plastics and wood.		1.40	(1.00)	73.60					1.20	SPT(C) N=23 (1,2/3,3,5,12)	
							1.40	ES1	1.40	PID=0.2ppmv	
Yellow slightly gravelly fine to coarse SAND. Gravel is fine to medium subrounded to rounded flint. (RIVER TERRACE DEPOSITS)		2.70	(1.30)	72.30					2.00	SPT(C) N=14 (9,9/6,3,2,3)	
									2.00	PID=0.2ppmv	
Yellowish brown slightly clayey very gravelly fine to coarse SAND. Gravel is fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		3.80	(1.10)	71.20		2.90 ▼			3.00	SPT(C) N=16 (9,8/5,5,3,3)	
							3.60	ES2	3.60	PID=0.8ppmv	
Yellow sandy GRAVEL of fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		4.50	(0.70)	70.50					4.00	SPT(C) N=12 (3,3/3,3,3,3)	
Firm grey CLAY. (OXFORD CLAY FORMATION)		5.00	(0.50)	70.00							
									5.00	SPT(S) N=17 (3,4/4,4,4,5)	
Borehole complete at 5.00 m bgl.											

Remarks:
1. Borehole logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Hand dug inspection pit complete to 1.2m bgl. 5. Elevation and location data obtained from GPS survey. 6. SPT/CPT undertaken at 1m intervals. 7. Borehole complete at 5.00m bgl and installed with standpipe, bung and flush cover.

Water Strike			Water Level		Borehole Diameter	
Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
09/02/2022	2.90					

Coordinates:	Elevation (mAOD):	Drilled By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438406.88 N204462.82	75.00	Sherwood Drilling	Premier 110	BC	CB		1:32

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Project No: **21-2605.01**

Hole ID: **DS103**

Page: **1 of 1**

Project: **Land off Cotswold Dene, Whitney**

Dynamic Sampler Log

Date: **10/02/2022**

Client: **Aequitis Estates**

Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results	Backfill
MADE GROUND: Greyish brown sandy fine to coarse GRAVEL of subangular to subrounded concrete, clinker, paving slab, ceramics, plastics, metal, brick, sandstone and plastic pipe.		0.80	(0.80)	74.54			0.70	ES1	0.60	PID=0.6ppmv	
MADE GROUND: Greyish brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded concrete, clinker, paving slab, MDPE Pipe, ceramics, plastics, metal and brick.		1.10	(0.30)	74.24							
MADE GROUND: Orangish brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded concrete, sandstone and wood.		1.60	(0.50)	73.74			1.40	ES2	1.20	SPT(C) N=12 (3,4/3,3,3,3)	
Black staining.									1.40	PID=2.0ppmv	
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded to rounded flint. (RIVER TERRACE DEPOSITS)		3.30	(1.70)	72.04		2.60 ▼			2.00	SPT(C) N=17 (4,4/5,3,5,4)	
									2.80	PID=0.1ppmv	
									3.00	SPT(C) N=23 (3,3/6,6,6,5)	
Soft grey mottled orangish brown very sandy CLAY. (RIVER TERRACE DEPOSITS)		3.50	(0.20)	71.84							
Yellow very sandy fine to coarse GRAVEL of subrounded flint. (RIVER TERRACE DEPOSITS)		4.00	(0.50)	71.34					4.00	SPT(C) N=12 (1,2/3,3,3,3)	
Firm to stiff grey CLAY. (OXFORD CLAY FORMATION)		5.00	(1.00)	70.34					5.00	SPT(S) N=19 (3,3/5,4,5,5)	
Borehole complete at 5.00 m bgl.											

Remarks:
1. Borehole logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Hand dug inspection pit complete to 1.2m bgl. 5. Elevation and location data obtained from GPS survey. 6. SPT/CPT undertaken at 1m intervals. 7. Borehole complete at 5.00m bgl and installed with standpipe, bung and flush cover.

Water Strike			Water Level		Borehole Diameter	
Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
10/02/2022	2.60					

Coordinates:	Elevation (mAOD):	Drilled By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438234.95 N204417.58	**75.34**	**Sherwood Drilling**	**Premier 110**	**BC**	**CB**		**1:32**

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Project No: **21-2605.01**

Hole ID: **DS105**

Page: **1 of 1**

Project: **Land off Cotswold Dene, Whitney**

Dynamic Sampler Log

Date: **10/02/2022**

Client: **Aequitis Estates**

Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results	Backfill
MADE GROUND: Brown very gravelly slightly clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded limestone, pumice, brick, concrete, metals and plastics. Frequent cobbles of limestone and concrete.		0.20	(0.20)	75.24							
MADE GROUND: Soft brown gravelly slightly sandy CLAY. Gravel is fine to coarse subangular to subrounded sandstone, flint, metal, plastics and wood.			(1.80)						1.20	SPT(C) N=9 (5,2/3,2,2,2)	
Black staining.							1.50	ES1	1.50	PID=0.4ppmv	
		2.00		73.44					2.00	SPT(C) N=55 (12,12/18,18,10,9)	
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded to rounded flint. (RIVER TERRACE DEPOSITS)			(1.40)				2.50	ES2	2.50	PID=0.0ppmv	
									3.00	SPT(C) N=13 (1,2/3,5,3,2)	
		3.40		72.04							
Yellow sandy GRAVEL of fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)			(0.80)			3.60 ▼					
									4.00	SPT(C) N=12 (9,6/3,3,3,3)	
		4.20		71.24							
Firm to stiff grey mottled orangish brown slightly sandy CLAY. (OXFORD CLAY FORMATION)			(0.80)								
		5.00		70.44					5.00	SPT(C) N=22 (5,4/5,5,6,6)	
Borehole complete at 5.00 m bgl.											

Remarks:
1. Borehole logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Hand dug inspection pit complete to 1.2m bgl. 5. Elevation and location data obtained from GPS survey. 6. SPT/CPT undertaken at 1m intervals. 7. Borehole complete at 5.00m bgl and installed with standpipe, bung and flush cover.

Water Strike			Water Level		Borehole Diameter	
Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
10/02/2022	3.60					

Coordinates:	Elevation (mAOD):	Drilled By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438354.68 N204420.38	**75.44**	**Sherwood Drilling**	**Premier 110**	**BC**	**CB**		**1:32**

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Project No: 21-2605.01 | Hole ID: DS106 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Dynamic Sampler Log

Date: 10/02/2022 | Client: Aequitis 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: Soft brown gravelly CLAY. Gravel is fine to medium subangular to subrounded limestone, sandstone, concrete, pumice and plastics.		0.40	(0.40)	75.24							
MADE GROUND: Greyish brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded limestone, concrete, plastics and metals.		1.30	(0.90)	74.34			0.50	ES1	0.50	PID=0.0ppmv	
Borehole complete at 1.30 m bgl.											

Remarks:
1. Borehole logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Hand dug inspection pit complete to 1.2m bgl. 5. Elevation and location data obtained from GPS survey. 6. SPT/CPT undertaken at 1m intervals. 7. Borehole terminated at 1.3m bgl due to obstruction and backfilled with arisings.

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

Coordinates:	Elevation (mAOD):	Drilled By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438291.47 N204392.51	75.64	Sherwood Drilling	Premier 110	BC	CB		1:32

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Project No: 21-2605.01 | Hole ID: DS107 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Dynamic Sampler Log

Date: 09/02/2022 | Client: Aequitis Estates

Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results	Backfill
MADE GROUND: Grass overlying greyish brown gravelly fine to coarse SAND. Gravel is fine to medium subangular chalk, brick, glass, tiles, plastics, wood and clinker.		0.30	(0.30)	75.01			0.20	ES1	0.20	PID=0.0ppmv	
MADE GROUND: Soft brown sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded concrete, metal, wood, brick, slate and plastics.		1.80	(1.50)	73.51					1.20	SPT(C) N=6 (1,2/1,2,2,1)	
									1.50	PID=0.0ppmv	
Yellow slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. (RIVER TERRACE DEPOSITS)		3.80	(2.00)	71.51		3.00 ▼			2.00	SPT(C) N=34 (9,8/8,8,9,9)	
									2.50	PID=0.0ppmv	
									3.00	SPT(C) N=34 (12,12/8,8,9,9)	
Firm grey mottled orangish brown CLAY. (OXFORD CLAY FORMATION)		5.00	(1.20)	70.31					4.00	SPT(C) N=24 (5,5/6,6,6,6)	
Becomes stiff at 4.5m bgl.											
Borehole complete at 5.00 m bgl.									5.00	SPT(C) N=14 (3,4/4,3,4,3)	

Remarks:
1. Borehole logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Hand dug inspection pit complete to 1.2m bgl. 5. Elevation and location data obtained from GPS survey. 6. SPT/CPT undertaken at 1m intervals. 7. Borehole complete at 5.00m bgl and installed with standpipe, bung and flush cover.

Water Strike			Water Level		Borehole Diameter	
Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
09/02/2022	3.00					

Coordinates:	Elevation (mAOD):	Drilled By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438387.11 N204358.99	75.31	Sherwood Drilling	Premier 111	BC	CB		1:32

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Project No:	Hole ID:	Page:
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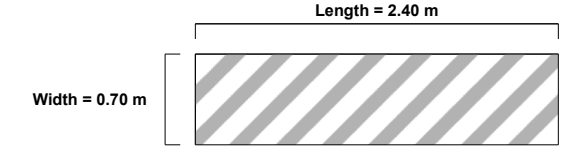
Project: **Land off Cotswold Dene, Whitney**

Trial Pit Log

Date: **08/02/2022** | Client: **Aequitis Estates**

Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results
MADE GROUND: Grass overlying brown slightly clayey slighty gravelly fine to coarse SAND. Gravel is fine to coarse subangular flint, brick, wood, ceramics, concrete, pumice and plastics. Frequent rootlets <2mm diameter.		0.40	74.91		0.20	ES1	0.20	PID=0.00ppmv
MADE GROUND: Soft blackish brown gravelly CLAY. Gravel is fine to coarse subangular brick, chalk, ceramics, pumice, brick, concrete, tiles, plastics and wood.		1.50	73.81		1.00	ES2	1.00	PID=0.00ppmv
Yellow slightly gravelly fine to coarse SAND. Gravel is fine to medium subrounded to rounded flint. (RIVER TERRACE DEPOSITS)		2.80	72.51	2.70 ▼				
Yellow fine to coarse SAND and GRAVEL of subrounded flint. (RIVER TERRACE DEPOSITS)		3.50	71.81					
Trial pit complete at 3.50 m bgl.								

Dimensions and Orientation:



Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438377.71 N204444.78	75.31	LA Lockhart Plant Hire	JCB3X	BC	CB		1:30

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Project No: 21-2605.01 | Hole ID: TP102 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Trial Pit Log

Date: 08/02/2022 | Client: Aequitis 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: Grass overlying brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular flint, brick, wood, ceramics, concrete, pumice and plastics. Frequent rootlets <2mm diameter.		0.40	74.58					
MADE GROUND: Greyish brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular flint, brick, wood, metal, concrete and chalk.		1.20	73.78					
MADE GROUND: Soft black very gravelly CLAY. Gravel is fine to coarse angular to subangular plastics, ash, clinker, metals, concrete and wood.		2.20	72.78		1.50	ES1	1.50	PID=0.30ppmv
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		3.50	71.47	2.40 ▼	3.00	ES2	3.00	PID=0.00ppmv
Trial pit complete at 3.50 m bgl.								

Dimensions and Orientation:

Length = 2.20 m

Width = 0.70 m

Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438295.37 N204467.80	74.97	LA Lockhart Plant Hire	JCB3X	BC	CB		1:30

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Project No: **21-2605.01** | Hole ID: **TP103** | Page: **1 of 1**

Project: **Land off Cotswold Dene, Whitney**

Trial Pit Log

Date: **08/02/2022** | Client: **Aequitis Estates**

Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results
MADE GROUND: Grass overlying brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular flint, brick, wood, ceramics, concrete, pumice and plastics. Frequent rootlets <2mm diameter.		0.40	75.01					
MADE GROUND: Soft brown very gravelly CLAY. Gravel is fine to coarse subangular to subrounded concrete, wood, glass, metals, plastics, brick, breeze blocks and rebar. Rare cobbles of concrete.		1.00	74.41					
MADE GROUND: Blackish brown slighty gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint, plastics and wood.		1.80	73.61		1.50	ES1	1.50	PID=0.10ppmv
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		3.50	71.91	2.75 ▼	2.50	ES2	2.50	PID=0.10ppmv
Trial pit complete at 3.50 m bgl.								

Dimensions and Orientation:

Length = 2.20 m

Width = 0.70 m

Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438342.60 N204411.62	**75.41**	**LA Lockhart Plant Hire**	**JCB3X**	**BC**	**CB**		**1:30**

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Project No:	Hole ID:	Page:
21-2605.01	TP104	1 of 1

Project: **Land off Cotswold Dene, Whitney**

Trial Pit Log

Date: **08/02/2022** | Client: **Aequitis Estates**

Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results
MADE GROUND: Brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded pumice, plastics, wire, wood, concrete and brick.		0.30	74.92					
MADE GROUND: Soft greyish black very gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded metals, plastics, glass, chalk, brick, wire, wood, ceramics and concrete.		1.30	73.92		0.50	ES1	0.50	PID=0.30ppmv
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		1.60	73.62					
Yellow very clayey fine to coarse SAND. (RIVER TERRACE DEPOSITS)		2.30	72.92					
Yellow gravelly fine to coarse SAND. Gravel is fine to coarse subrounded flint. (RIVER TERRACE DEPOSITS)		2.50	72.72					
Yellow very clayey fine to coarse SAND. (RIVER TERRACE DEPOSITS)		2.90	72.32					
Yellow sandy fine to coarse GRAVEL of subangular to subrounded flint. (RIVER TERRACE DEPOSITS)		3.50	71.72	3.20 ▼	3.20	ES2	3.20	PID=0.00ppmv
Trial pit complete at 3.50 m bgl.								

Dimensions and Orientation:

Length = 2.00 m

Width = 0.70 m

Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438396.29 N204384.69	75.22	LA Lockhart Plant Hire	JCB3X	BC	CB		1:30

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Project No: 21-2605.01 | Hole ID: TP105 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Trial Pit Log

Date: 08/02/2022 | Client: Aequitis Estates

Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results
MADE GROUND: Grass overlying brown slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded sandstone, ceramics, brick, plywood, pumice, chalk, plastics and flint. Rootlets <2mm diameter.		0.30	75.34					
MADE GROUND: Blackish brown slightly clayey very gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded brick, plastics, metal, concrete, flint, wire and fabric. Common cobbles of of concrete.		1.20	74.44		0.60	ES1	0.60	PID=0.30ppmv
MADE GROUND: Concrete slab.		1.35	74.29					
Hole extended to excavate further.								
MADE GROUND: Blackish brown, very clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded flint, brick, concrete, wire and plastics.		2.10	73.54		1.50	ES2	1.50	PID=0.60ppmv
Yellow slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. (RIVER TERRACE DEPOSITS)				3.10 ▼				
		3.50	72.14					
Trial pit complete at 3.50 m bgl.								

Dimensions and Orientation:

Length = 2.30 m

Width = 0.70 m

Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438244.95 N204413.34	75.64	LA Lockhart Plant Hire	JCB3X	BC	CB		1:30

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Project No: 21-2605.01 | Hole ID: TP106 | Page: 1 of 1

Project: Land off Cotswold Dene, Whitney

Trial Pit Log

Date: 08/02/2022 | Client: Aequitis Estates

Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results
MADE GROUND: Grass overlying brown slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded sandstone, ceramics, brick, plywood, pumice, chalk, plastics and flint. Rootlets <2mm diameter.		0.50	75.27					
MADE GROUND: Blackish brown slightly clayey very gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded brick, plastics, metal, concrete and flint.		2.60	73.17		1.20	ES1	1.20	PID=0.00ppmv
Yellow sandy fine to coarse GRAVEL of subangular to subrounded flint. (RIVER TERRACE DEPOSITS)		3.50	72.27	2.90 ▼	3.00	ES2	3.00	PID=0.00ppmv
Trial pit complete at 3.50 m bgl.								

Dimensions and Orientation:

Length = 2.20 m

Width = 0.70 m

Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438272.93 N204410.90	75.77	LA Lockhart Plant Hire	JCB3X	BC	CB		1:30

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Project No:	Hole ID:	Page:
21-2605.01	TP107	1 of 1

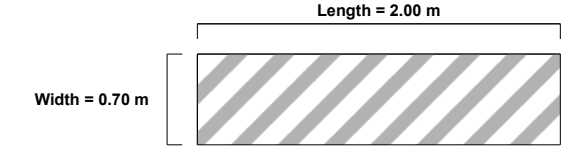
Project: **Land off Cotswold Dene, Whitney**

Trial Pit Log

Date: **08/02/2022** | Client: **Aequitis Estates**

Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details: Depth (m)	Sample Details: Type & Ref	Test Details: Depth (m)	Test Details: Results
MADE GROUND: Grass overlying brown slightly clayey slighty gravelly fine to coarse SAND. Gravel is fine to coarse subangular flint, brick, wood, ceramics, concrete, pumice and plastics. Frequent rootlets <2mm diameter.		0.10	75.52					
MADE GROUND: Greyish brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular chalk, pumice, wood, plastics, metal and tarmacadam.		0.60	75.02		0.30	ES1	0.30	PID=0.10ppmv
MADE GROUND: Brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded pumice, plastics, wire, wood, concrete sandstone, flint, breeze blocks and brick. Frequent cobbles and boulders of metal, flint, concrete and brick.		1.90	73.72					
Yellow slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. (RIVER TERRACE DEPOSITS)				2.80 ▼	2.00	ES2	2.00	PID=0.10ppmv
Trial pit complete at 3.50 m bgl.		3.50	72.12					

Dimensions and Orientation:



Orientation:

Inclination:

Remarks:
1. Trial pit logged in general accordance with BS5930:2015+A1:2020. 2. Location cleared of services prior to any breaking ground. 3. Elevation and location data obtained from GPS survey. 4. Trial Pit complete at 3.5m bgl and backfilled with arisings.

Coordinates:	Elevation (mAOD):	Excavated By:	Plant Used:	Logged:	Checked:	Approved:	Scale:
E438335.40 N204373.83	75.62	LA Lockhart Plant Hire	JCB3X	BC	CB		1:30

Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling
Unit 8
Victory parkway
Victory rd
Derby
DE24 8ZF

Hammer Ref:	GTR780
Test Date:	06/09/2021
Report Date:	09/09/2021
File Name:	GTR780.spt
Test Operator:	B HUNTER

Instrumented Rod Data

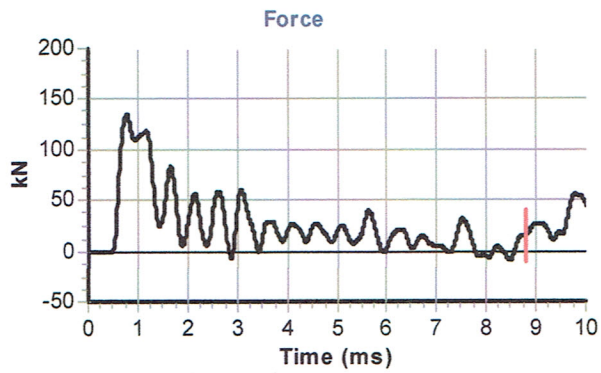
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	62901
Accelerometer No.2:	62902

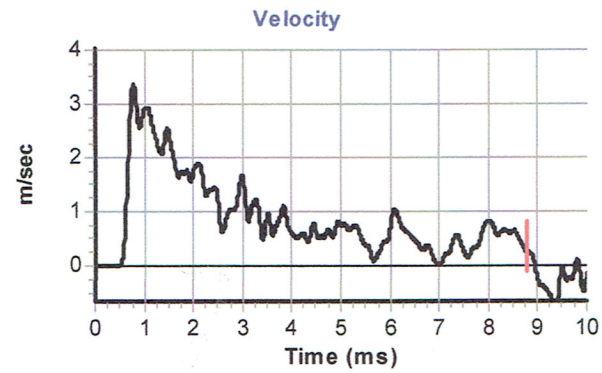
Hammer Information

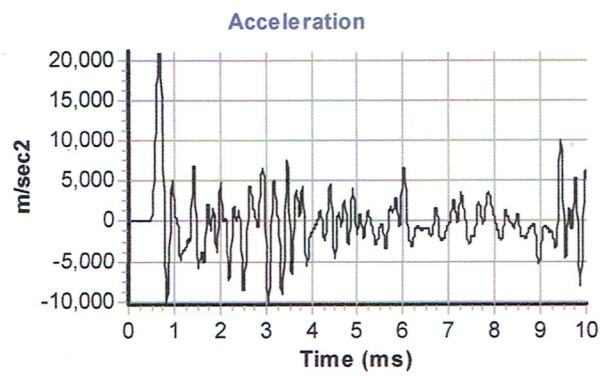
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	10.0

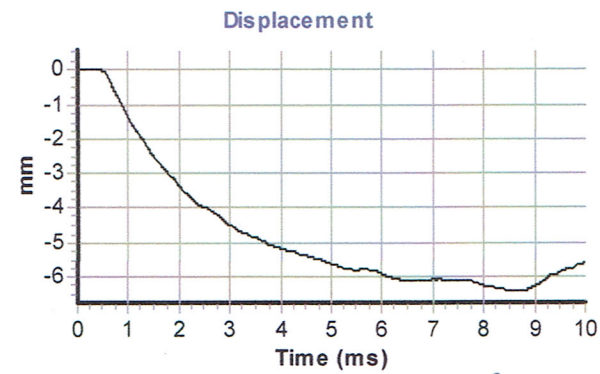
Comments / Location

Sherwood drilling hammer tested at Dynamic samplings yard.





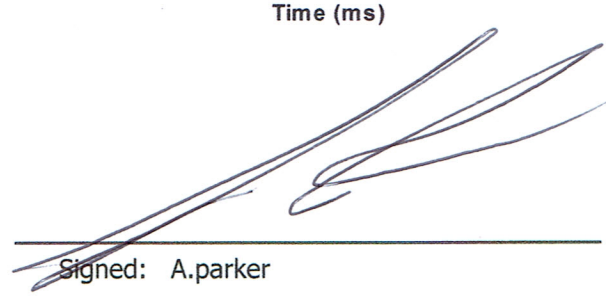




Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	378

Energy Ratio E_r (%): **80**



Signed: A.parker

Title: Associate director

The recommended calibration interval is 12 months

Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling
Unit 8
Victory parkway
Victory rd
Derby
DE24 8ZF

Hammer Ref:	110RP.63
Test Date:	06/09/2021
Report Date:	09/09/2021
File Name:	110RP.63.spt
Test Operator:	B HUNTER

Instrumented Rod Data

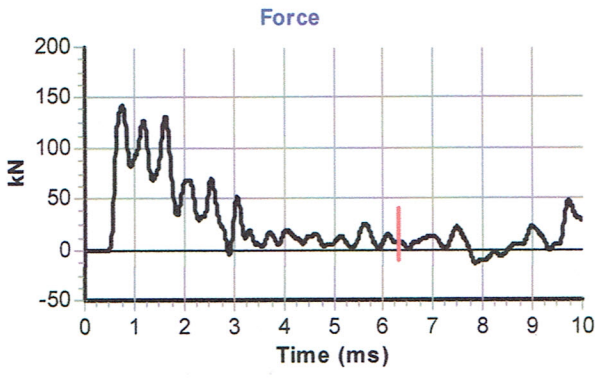
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	62901
Accelerometer No.2:	62902

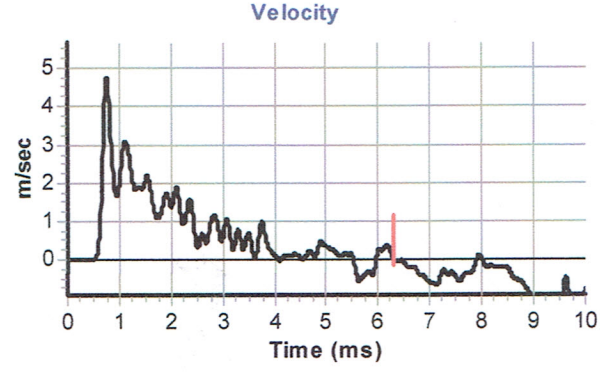
Hammer Information

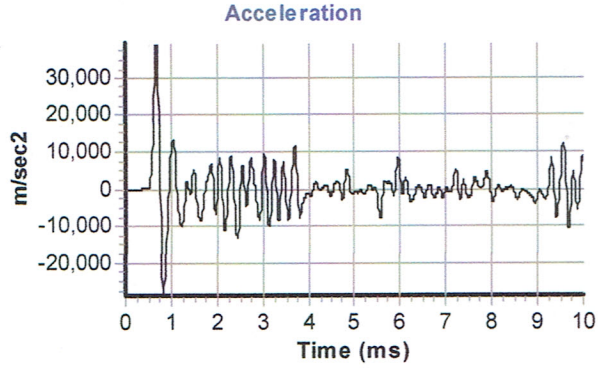
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	10.0

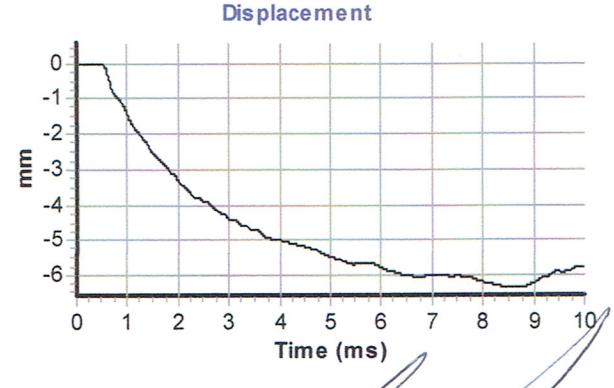
Comments / Location

Sherwood drilling rig tested at Dynamic samplings yard.





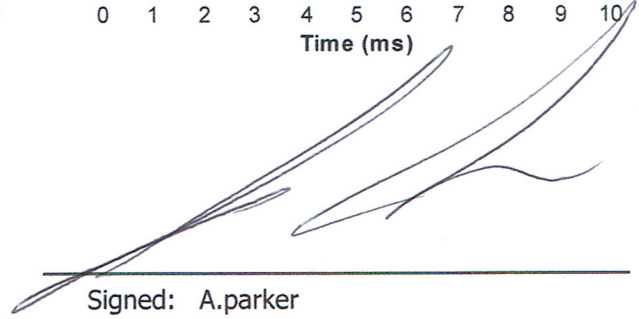




Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	374

Energy Ratio E_r (%): **79**



Signed: A.parker

Title: Associate director

The recommended calibration interval is 12 months

Appendix C – Soil Chemical Analysis Results

Billy Colwill
Delta-Simons
Suite C1
Joseph's Well
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Leeds
LS3 1AB

e: billy.colwill@deltasimons.com

i2 Analytical Ltd.
7 Woodshots Meadow,
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Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 22-39339

Project / Site name:	Cotswold Dene	**Samples received on:**	11/02/2022
Your job number:	21 2605 01	**Samples instructed on/ Analysis started on:**	11/02/2022
Your order number:	DS66226	**Analysis completed by:**	18/02/2022
Report Issue Number:	1	**Report issued on:**	18/02/2022
Samples Analysed:	16 soil samples		

Izabela Wójcik

Signed:

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

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

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

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

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

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

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170893	2170894	2170895	2170896	2170897
Sample Reference				TP101	TP102	TP103	TP104	TP105
Sample Number				ES1	ES1	ES1	ES1	ES1
Depth (m)				0.20	1.50	1.50	0.50	0.60
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	08/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	33	< 0.1	< 0.1	71	< 0.1
Moisture Content	%	0.01	NONE	14	23	12	12	15
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2	1.2

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	8.1	7.8	9.6	7.9
Total Sulphate as SO4	%	0.005	MCERTS	-	-	0.189	4.90	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	3500	5600	1000	3600	4200
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.7	2.8	0.50	1.8	2.1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1740	2820	498	1820	2110
Total Sulphur	%	0.005	MCERTS	-	-	0.094	1.98	-
Organic Matter (automated)	%	0.1	MCERTS	-	-	2.5	2.3	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.44	0.69	< 0.05	1.2	0.52
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.27	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.1	1.3	< 0.05	2.1	1.5
Pyrene	mg/kg	0.05	MCERTS	1.1	1.2	< 0.05	1.8	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.85	0.72	< 0.05	1.2	1.2
Chrysene	mg/kg	0.05	MCERTS	0.67	0.69	< 0.05	0.85	0.86
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1	0.74	< 0.05	1.1	1.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.58	0.42	< 0.05	0.90	0.59
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.91	0.58	< 0.05	1.0	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.69	0.38	< 0.05	0.66	0.82
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	1.0	0.46	< 0.05	0.95	1.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.51	7.21	< 0.80	12.1	10.7

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170893	2170894	2170895	2170896	2170897
Sample Reference				TP101	TP102	TP103	TP104	TP105
Sample Number				ES1	ES1	ES1	ES1	ES1
Depth (m)				0.20	1.50	1.50	0.50	0.60
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	08/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	16	25	16	16
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	29	54	34	25	29
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	54	34	25	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	44	56	24	44	81
Lead (aqua regia extractable)	mg/kg	1	MCERTS	100	130	31	93	340
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	< 0.3	< 0.3	< 0.3	1.1
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	34	34	20	22
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	180	110	160	300

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170893	2170894	2170895	2170896	2170897
Sample Reference				TP101	TP102	TP103	TP104	TP105
Sample Number				ES1	ES1	ES1	ES1	ES1
Depth (m)				0.20	1.50	1.50	0.50	0.60
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	08/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	mg/kg	0.001	MCERTS	< 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
Ethylbenzene	mg/kg	0.001	MCERTS	< 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
o-xylene	mg/kg	0.001	MCERTS	< 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
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	16	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	18	110	< 8.0	21	35
TPH-CWG - Aliphatic >EC35 - EC40 $_{EH\_CU\_1D\_AL}$	mg/kg	10	NONE	12	52	< 10	13	< 10
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	18	130	< 10	22	39
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	11	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	27	52	< 10	33	37
TPH-CWG - Aromatic >EC35 - EC40 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	26	47	< 10	22	16
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	32	63	< 10	43	46
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	38	99	< 10	35	20
VOCs								
Chloromethane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Chloroethane	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
Bromomethane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Vinyl Chloride	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
Trichlorofluoromethane	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
1,1-Dichloroethene	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Trichloromethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
Benzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Tetrachloromethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Trichloroethene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Dibromomethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170893	2170894	2170895	2170896	2170897
Sample Reference				TP101	TP102	TP103	TP104	TP105
Sample Number				ES1	ES1	ES1	ES1	ES1
Depth (m)				0.20	1.50	1.50	0.50	0.60
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	08/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Bromodichloromethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Toluene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Tetrachloroethene	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
Chlorobenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Ethylbenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
p & m-Xylene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Styrene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Tribromomethane	mg/kg	0.001	NONE	-	-	-	< 0.0010	-
o-Xylene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Isopropylbenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Bromobenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	-	-	< 0.0010	-
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	-	-	< 0.0010	-

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170893	2170894	2170895	2170896	2170897
Sample Reference				TP101	TP102	TP103	TP104	TP105
Sample Number				ES1	ES1	ES1	ES1	ES1
Depth (m)				0.20	1.50	1.50	0.50	0.60
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	08/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	1.2	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	0.27	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	2.1	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	1.8	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	1.2	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	0.85	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	1.1	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	0.90	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	1.0	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	0.66	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	0.95	-

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

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170898	2170899	2170900	2170901	2170902
Sample Reference				TP106	TP107	SP1	SP2	DS101
Sample Number				ES1	ES1	None Supplied	None Supplied	ES2
Depth (m)				1.20	0.30	None Supplied	None Supplied	0.50
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	51	56	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	16	22	14
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	DSA	DSA
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.6	8.4	7.8	8.1
Total Sulphate as SO4	%	0.005	MCERTS	-	5.12	11.7	-	0.075
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1900	3800	3600	4600	150
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.96	1.9	1.8	2.3	0.074
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	956	1910	1790	2280	74.4
Total Sulphur	%	0.005	MCERTS	-	2.06	4.35	-	0.042
Organic Matter (automated)	%	0.1	MCERTS	-	2.6	2.4	-	2.1
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.6	0.42	0.49	0.54	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.4	1.2	1.1	2.1	< 0.05
Pyrene	mg/kg	0.05	MCERTS	2.1	1.2	1.0	2.0	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	0.77	0.77	1.1	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.87	0.60	0.66	0.94	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	0.89	1.1	1.2	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.66	0.46	0.52	0.61	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	0.75	0.92	0.95	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.70	0.53	0.63	0.54	< 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	0.85	0.69	0.88	0.72	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	13.1	7.48	8.01	10.7	< 0.80

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170898	2170899	2170900	2170901	2170902
Sample Reference				TP106	TP107	SP1	SP2	DS101
Sample Number				ES1	ES1	None Supplied	None Supplied	ES2
Depth (m)				1.20	0.30	None Supplied	None Supplied	0.50
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	15	14	15	34
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	25	27	23	32	38
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	27	23	32	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	63	74	640	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	98	410	250	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.5	0.9	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	22	18	13	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86	160	240	600	120

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170898	2170899	2170900	2170901	2170902
Sample Reference				TP106	TP107	SP1	SP2	DS101
Sample Number				ES1	ES1	None Supplied	None Supplied	ES2
Depth (m)				1.20	0.30	None Supplied	None Supplied	0.50
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	mg/kg	0.001	MCERTS	< 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
Ethylbenzene	mg/kg	0.001	MCERTS	< 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
o-xylene	mg/kg	0.001	MCERTS	< 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
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	4.4	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	12	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	53	25	15	68	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 $_{EH\_CU\_1D\_AL}$	mg/kg	10	NONE	< 10	13	< 10	19	< 10
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	69	28	15	72	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	2.1	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	27	38	21	50	< 10
TPH-CWG - Aromatic >EC35 - EC40 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	17	10	19	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	34	47	25	61	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	17	29	16	38	< 10
VOCs								
Chloromethane	mg/kg	0.001	ISO 17025	-	-	-	-	-
Chloroethane	mg/kg	0.001	NONE	-	-	-	-	-
Bromomethane	mg/kg	0.001	ISO 17025	-	-	-	-	-
Vinyl Chloride	mg/kg	0.001	NONE	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.001	NONE	-	-	-	-	-
1,1-Dichloroethene	mg/kg	0.001	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	-	-	-	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	-	-	-	-
Trichloromethane	mg/kg	0.001	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	-
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	-
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	-	-	-	-
Benzene	mg/kg	0.001	MCERTS	-	-	-	-	-
Tetrachloromethane	mg/kg	0.001	MCERTS	-	-	-	-	-
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	-	-	-	-
Trichloroethene	mg/kg	0.001	MCERTS	-	-	-	-	-
Dibromomethane	mg/kg	0.001	MCERTS	-	-	-	-	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170898	2170899	2170900	2170901	2170902
Sample Reference				TP106	TP107	SP1	SP2	DS101
Sample Number				ES1	ES1	None Supplied	None Supplied	ES2
Depth (m)				1.20	0.30	None Supplied	None Supplied	0.50
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Bromodichloromethane	mg/kg	0.001	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	-	-	-	-
Toluene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	-	-	-	-
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	-	-	-	-
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	-	-	-	-
Tetrachloroethene	mg/kg	0.001	NONE	-	-	-	-	-
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	-	-	-	-
Chlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	-	-	-	-
Ethylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
p & m-Xylene	mg/kg	0.001	MCERTS	-	-	-	-	-
Styrene	mg/kg	0.001	MCERTS	-	-	-	-	-
Tribromomethane	mg/kg	0.001	NONE	-	-	-	-	-
o-Xylene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	-	-	-	-
Isopropylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
Bromobenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	-	-	-	-
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	-	-	-	-
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	-	-	-	-
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	-	-	-	-
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
Butylbenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	-	-	-	-

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170898	2170899	2170900	2170901	2170902
Sample Reference				TP106	TP107	SP1	SP2	DS101
Sample Number				ES1	ES1	None Supplied	None Supplied	ES2
Depth (m)				1.20	0.30	None Supplied	None Supplied	0.50
Date Sampled				08/02/2022	08/02/2022	08/02/2022	08/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170903	2170904	2170905	2170906	2170907
Sample Reference				DS102	DS103	DS103	DS105	DS106
Sample Number				ES1	ES1	ES2	ES1	ES1
Depth (m)				1.40	0.60	1.40	1.50	0.50
Date Sampled				09/02/2022	10/02/2022	10/02/2022	09/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	40	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	11	13	17	13
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2	1.2

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	11.3	7.9	7.4	8.3
Total Sulphate as SO4	%	0.005	MCERTS	-	0.300	-	0.224	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	310	770	480	1400	3700
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.38	0.24	0.71	1.9
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	154	385	241	707	1870
Total Sulphur	%	0.005	MCERTS	-	0.113	-	0.189	-
Organic Matter (automated)	%	0.1	MCERTS	-	1.2	-	7.8	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.46	< 0.05	< 0.05	1.3
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.52	< 0.05	< 0.05	1.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	4.7	< 0.05	< 0.05	7.8
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.1	< 0.05	< 0.05	1.9
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	7.6	< 0.05	< 0.05	12
Pyrene	mg/kg	0.05	MCERTS	< 0.05	6.9	< 0.05	< 0.05	9.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	3.5	< 0.05	< 0.05	5.7
Chrysene	mg/kg	0.05	MCERTS	< 0.05	2.9	< 0.05	< 0.05	3.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	3.6	< 0.05	< 0.05	5.2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.7	< 0.05	< 0.05	2.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	3.0	< 0.05	< 0.05	3.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.7	< 0.05	< 0.05	2.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	0.60
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	2.1	< 0.05	< 0.05	2.9

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	40.2	< 0.80	< 0.80	59.3

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170903	2170904	2170905	2170906	2170907
Sample Reference				DS102	DS103	DS103	DS105	DS106
Sample Number				ES1	ES1	ES2	ES1	ES1
Depth (m)				1.40	0.60	1.40	1.50	0.50
Date Sampled				09/02/2022	10/02/2022	10/02/2022	09/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	25	16	30	23	19
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	29	17	30	22	26
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	17	30	22	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	12	30	15	69
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	70	300	28	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	16	36	24	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86	80	250	76	170

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170903	2170904	2170905	2170906	2170907
Sample Reference				DS102	DS103	DS103	DS105	DS106
Sample Number				ES1	ES1	ES2	ES1	ES1
Depth (m)				1.40	0.60	1.40	1.50	0.50
Date Sampled				09/02/2022	10/02/2022	10/02/2022	09/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	mg/kg	0.001	MCERTS	< 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
Ethylbenzene	mg/kg	0.001	MCERTS	< 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
o-xylene	mg/kg	0.001	MCERTS	< 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
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	3.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	44
TPH-CWG - Aliphatic >EC35 - EC40 $_{EH\_CU\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	27
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	54
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	2.0	< 2.0	< 2.0	10
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	21	< 10	< 10	48
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	55	< 10	< 10	120
TPH-CWG - Aromatic >EC35 - EC40 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	13	< 10	< 10	42
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	78	< 10	< 10	170
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	13	< 10	< 10	69
VOCs								
Chloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Chloroethane	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
Bromomethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Vinyl Chloride	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
Trichlorofluoromethane	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
1,1-Dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Trichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
Benzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Tetrachloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Trichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Dibromomethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170903	2170904	2170905	2170906	2170907
Sample Reference				DS102	DS103	DS103	DS105	DS106
Sample Number				ES1	ES1	ES2	ES1	ES1
Depth (m)				1.40	0.60	1.40	1.50	0.50
Date Sampled				09/02/2022	10/02/2022	10/02/2022	09/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Bromodichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Toluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Tetrachloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
Chlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Ethylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
p & m-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Styrene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Tribromomethane	mg/kg	0.001	NONE	-	< 0.0010	-	-	-
o-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Isopropylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Bromobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	-
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	-

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170903	2170904	2170905	2170906	2170907
Sample Reference				DS102	DS103	DS103	DS105	DS106
Sample Number				ES1	ES1	ES2	ES1	ES1
Depth (m)				1.40	0.60	1.40	1.50	0.50
Date Sampled				09/02/2022	10/02/2022	10/02/2022	09/02/2022	10/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	0.46	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	0.52	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	4.7	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	1.1	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	7.6	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	6.9	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	3.5	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	2.9	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	3.6	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	1.7	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	3.0	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	1.7	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.45	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	2.1	-	-	-

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

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170908
Sample Reference				DS107
Sample Number				ES1
Depth (m)				0.20
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	14
Total mass of sample received	kg	0.001	NONE	1.2

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8
Total Sulphate as SO4	%	0.005	MCERTS	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	3400
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.7
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1710
Total Sulphur	%	0.005	MCERTS	-
Organic Matter (automated)	%	0.1	MCERTS	-

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	0.55
Anthracene	mg/kg	0.05	MCERTS	0.14
Fluoranthene	mg/kg	0.05	MCERTS	1.3
Pyrene	mg/kg	0.05	MCERTS	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.77
Chrysene	mg/kg	0.05	MCERTS	0.65
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.85
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.56
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.80
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.51
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.65

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.01

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170908
Sample Reference				DS107
Sample Number				ES1
Depth (m)				0.20
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2
Chromium (III)	mg/kg	1	NONE	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	85
Lead (aqua regia extractable)	mg/kg	1	MCERTS	100
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170908
Sample Reference				DS107
Sample Number				ES1
Depth (m)				0.20
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
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
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 $_{EH\_CU\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	15
TPH-CWG - Aromatic >EC35 - EC40 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	21
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10
VOCs				
Chloromethane	mg/kg	0.001	ISO 17025	-
Chloroethane	mg/kg	0.001	NONE	-
Bromomethane	mg/kg	0.001	ISO 17025	-
Vinyl Chloride	mg/kg	0.001	NONE	-
Trichlorofluoromethane	mg/kg	0.001	NONE	-
1,1-Dichloroethene	mg/kg	0.001	NONE	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-
Trichloromethane	mg/kg	0.001	MCERTS	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-
Benzene	mg/kg	0.001	MCERTS	-
Tetrachloromethane	mg/kg	0.001	MCERTS	-
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-
Trichloroethene	mg/kg	0.001	MCERTS	-
Dibromomethane	mg/kg	0.001	MCERTS	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170908
Sample Reference				DS107
Sample Number				ES1
Depth (m)				0.20
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Bromodichloromethane	mg/kg	0.001	MCERTS	-
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-
Toluene	mg/kg	0.001	MCERTS	-
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-
Dibromochloromethane	mg/kg	0.001	ISO 17025	-
Tetrachloroethene	mg/kg	0.001	NONE	-
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-
Chlorobenzene	mg/kg	0.001	MCERTS	-
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-
Ethylbenzene	mg/kg	0.001	MCERTS	-
p & m-Xylene	mg/kg	0.001	MCERTS	-
Styrene	mg/kg	0.001	MCERTS	-
Tribromomethane	mg/kg	0.001	NONE	-
o-Xylene	mg/kg	0.001	MCERTS	-
1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-
Isopropylbenzene	mg/kg	0.001	MCERTS	-
Bromobenzene	mg/kg	0.001	MCERTS	-
n-Propylbenzene	mg/kg	0.001	ISO 17025	-
2-Chlorotoluene	mg/kg	0.001	MCERTS	-
4-Chlorotoluene	mg/kg	0.001	MCERTS	-
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-
tert-Butylbenzene	mg/kg	0.001	MCERTS	-
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-
sec-Butylbenzene	mg/kg	0.001	MCERTS	-
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-
Butylbenzene	mg/kg	0.001	MCERTS	-
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-

SVOCs

Aniline	mg/kg	0.1	NONE	-
Phenol	mg/kg	0.2	ISO 17025	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-
2-Methylphenol	mg/kg	0.3	MCERTS	-
Hexachloroethane	mg/kg	0.05	MCERTS	-
Nitrobenzene	mg/kg	0.3	MCERTS	-
4-Methylphenol	mg/kg	0.2	NONE	-
Isophorone	mg/kg	0.2	MCERTS	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-

Analytical Report Number: 22-39339
Project / Site name: Cotswold Dene
Your Order No: DS66226

Lab Sample Number				2170908
Sample Reference				DS107
Sample Number				ES1
Depth (m)				0.20
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-
Naphthalene	mg/kg	0.05	MCERTS	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-
4-Chloroaniline	mg/kg	0.1	NONE	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-
Acenaphthylene	mg/kg	0.05	MCERTS	-
Acenaphthene	mg/kg	0.05	MCERTS	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-
Dibenzofuran	mg/kg	0.2	MCERTS	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-
Fluorene	mg/kg	0.05	MCERTS	-
Azobenzene	mg/kg	0.3	MCERTS	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-
Phenanthrene	mg/kg	0.05	MCERTS	-
Anthracene	mg/kg	0.05	MCERTS	-
Carbazole	mg/kg	0.3	MCERTS	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-
Anthraquinone	mg/kg	0.3	MCERTS	-
Fluoranthene	mg/kg	0.05	MCERTS	-
Pyrene	mg/kg	0.05	MCERTS	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-
Chrysene	mg/kg	0.05	MCERTS	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-

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

Analytical Report Number : 22-39339
Project / Site name: Cotswold Dene

* 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 *
2170893	TP101	ES1	0.2	Brown loam and sand with vegetation and stones.
2170894	TP102	ES1	1.5	Brown clay and loam with gravel.
2170895	TP103	ES1	1.5	Brown loam with gravel and vegetation.
2170896	TP104	ES1	0.5	Brown clay and loam with vegetation and stones.
2170897	TP105	ES1	0.6	Brown loam and sand with gravel and vegetation.
2170898	TP106	ES1	1.2	Brown loam and sand with gravel and stones.
2170899	TP107	ES1	0.3	Brown loam and clay with vegetation and stones.
2170900	SP1	None Supplied	None Supplied	Brown clay and loam with gravel.
2170901	SP2	None Supplied	None Supplied	Grey clay and sand with gravel and vegetation.
2170902	DS101	ES2	0.5	Brown clay and loam with gravel.
2170903	DS102	ES1	1.4	Brown clay and loam with gravel.
2170904	DS103	ES1	0.6	Brown clay and loam with gravel and concrete.
2170905	DS103	ES2	1.4	Brown clay and loam with gravel.
2170906	DS105	ES1	1.5	Brown clay and loam with gravel.
2170907	DS106	ES1	0.5	Brown clay and loam with gravel.
2170908	DS107	ES1	0.2	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 22-39339
Project / Site name: Cotswold Dene

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
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
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 soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	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
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
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

Analytical Report Number : 22-39339
Project / Site name: Cotswold Dene

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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

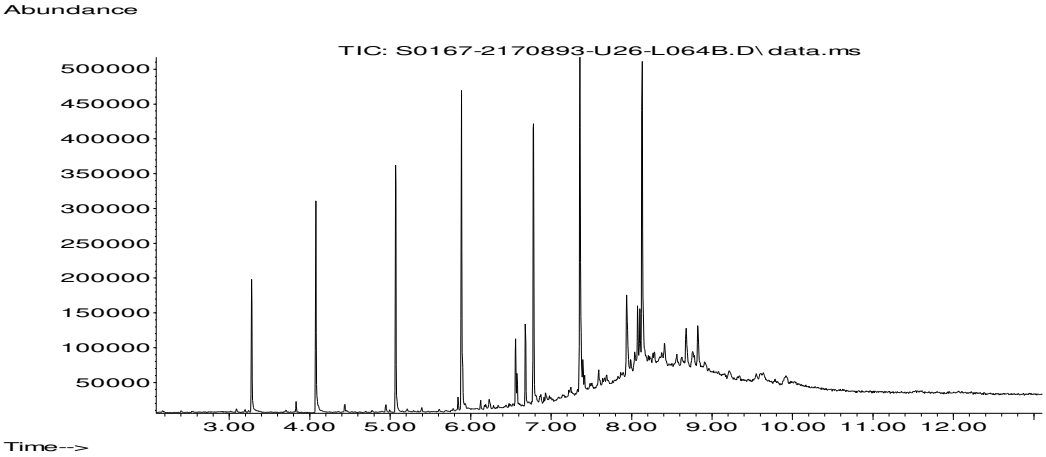
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received 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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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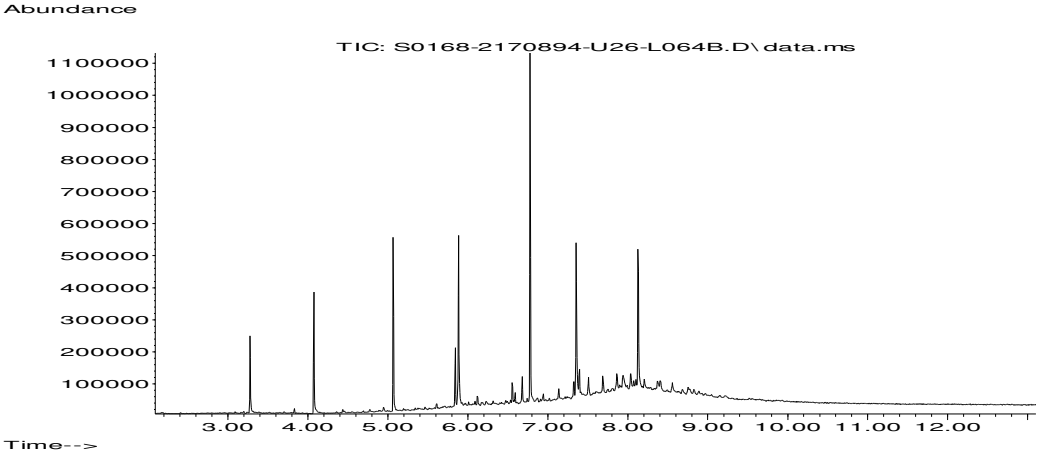

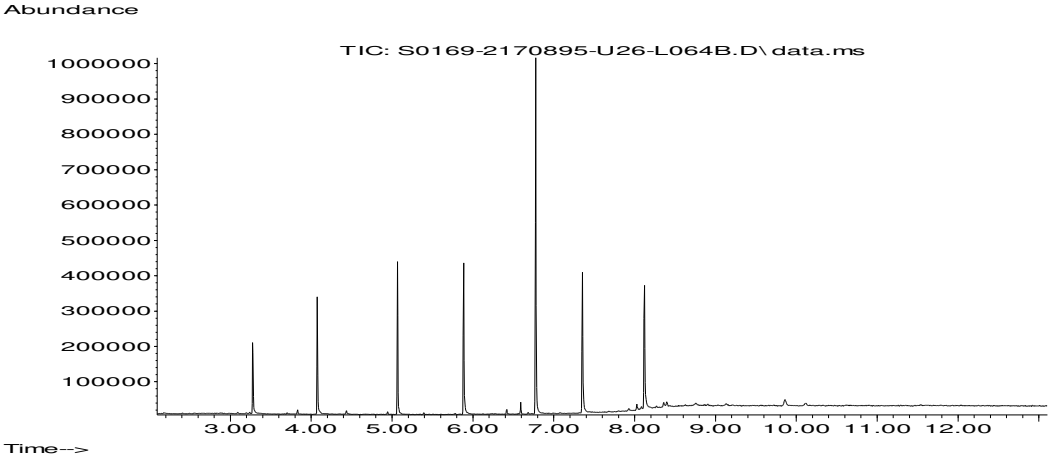

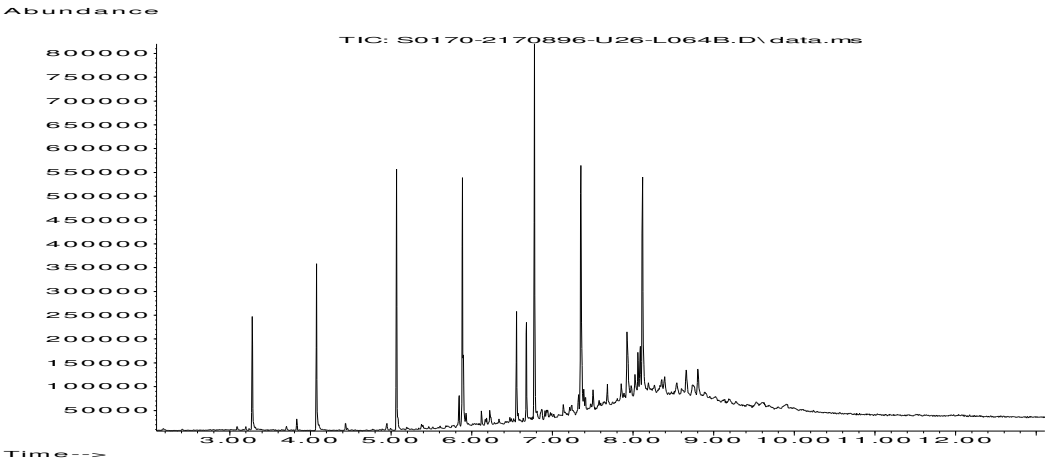

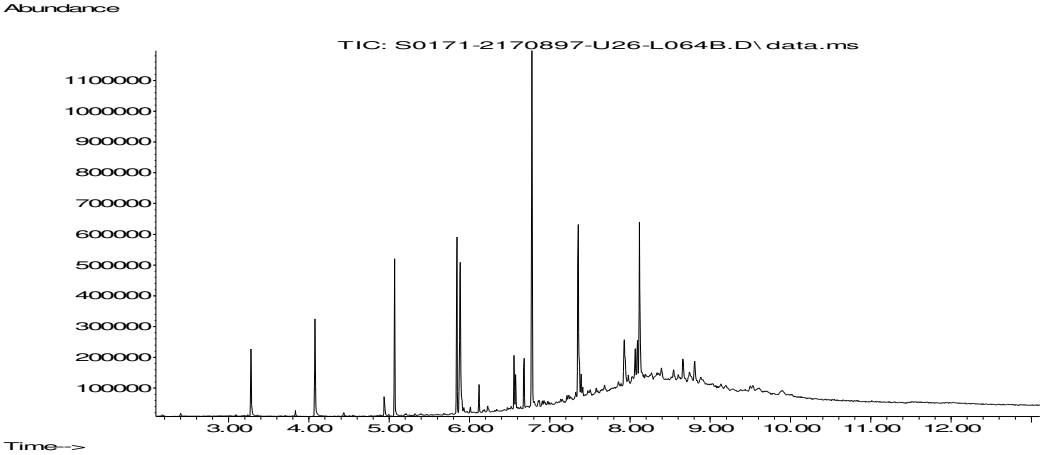

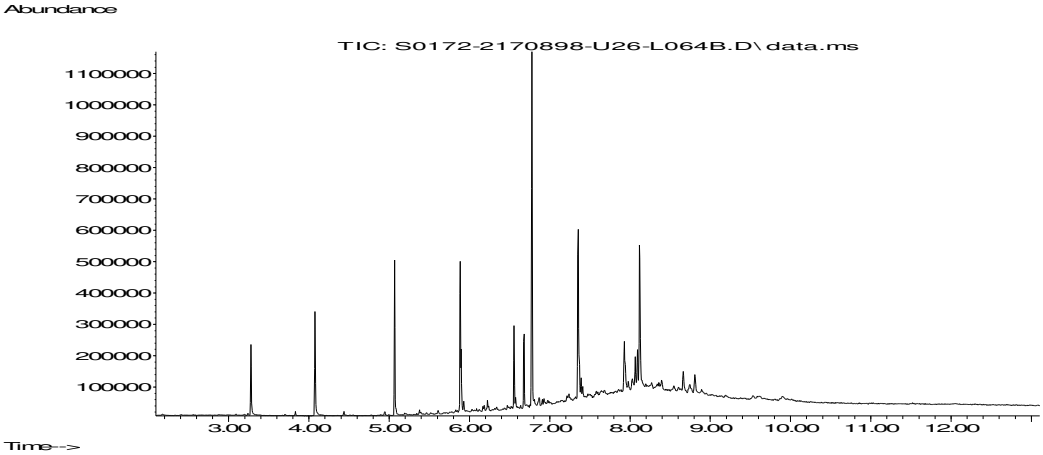

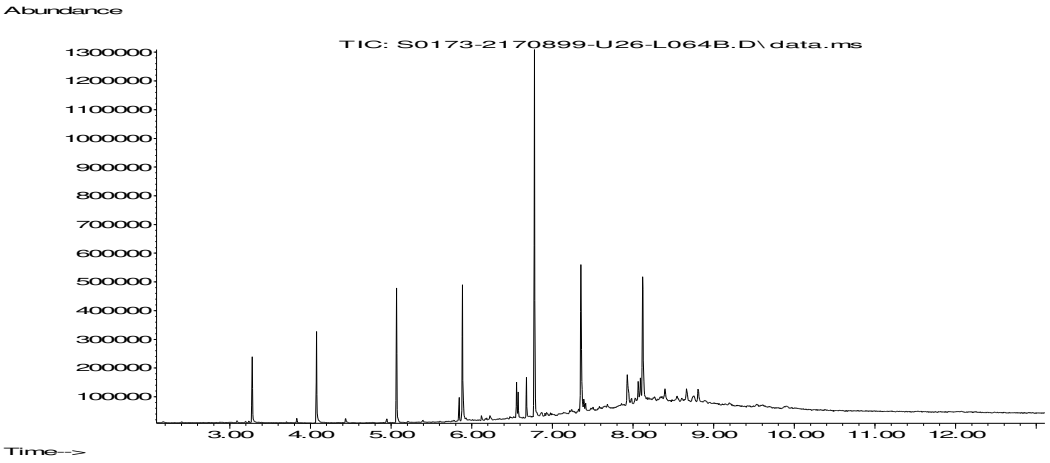

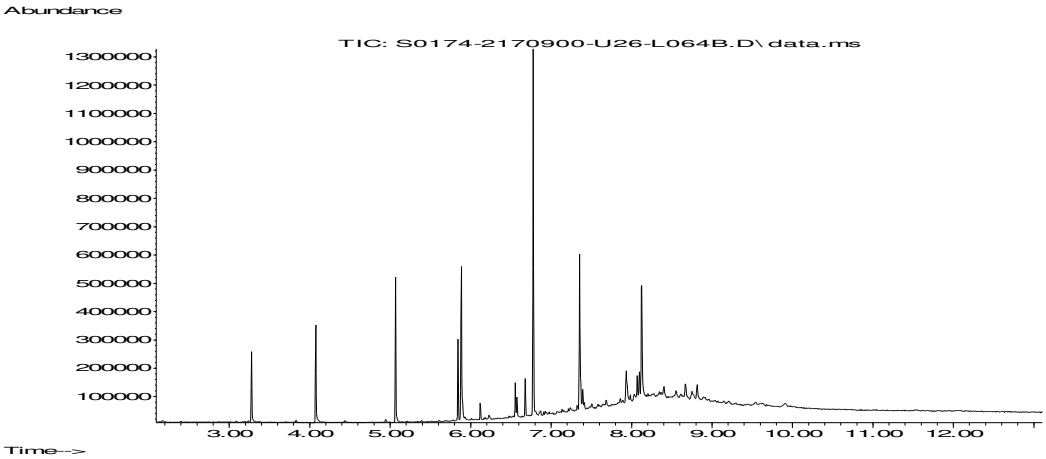

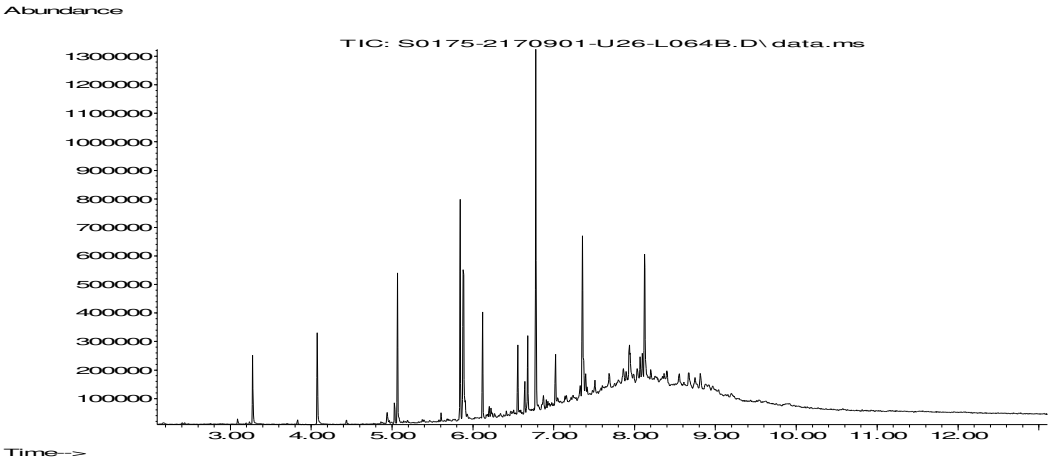

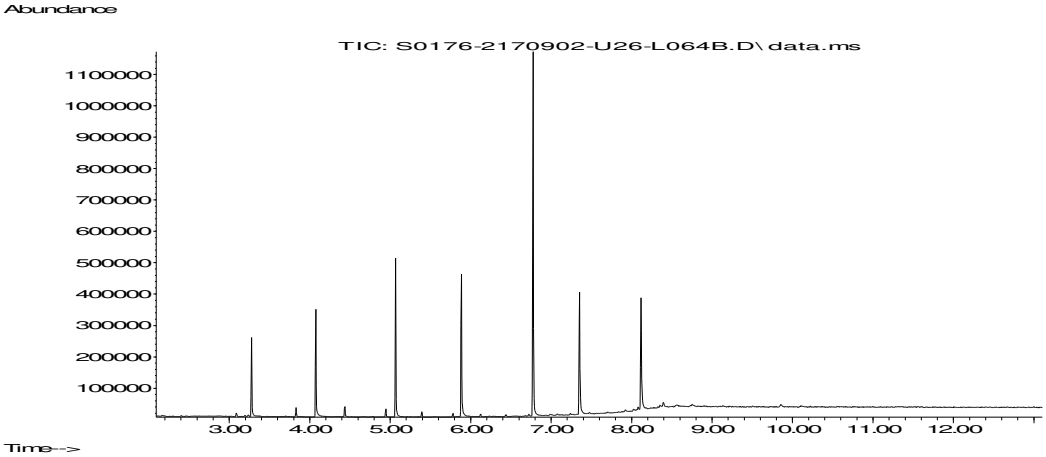

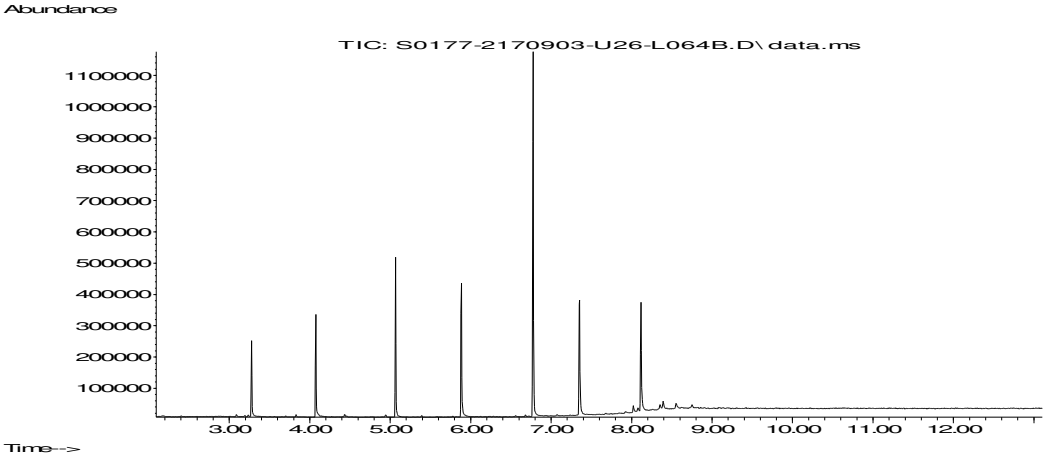

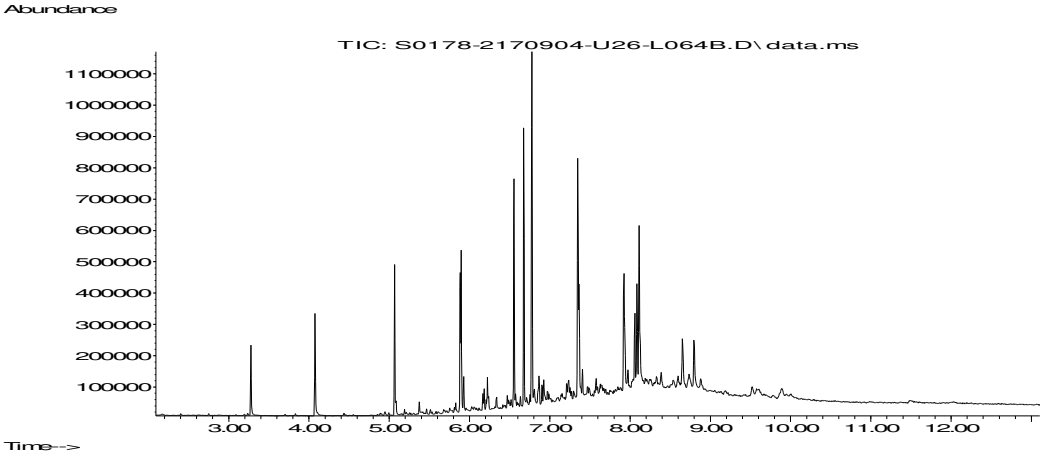

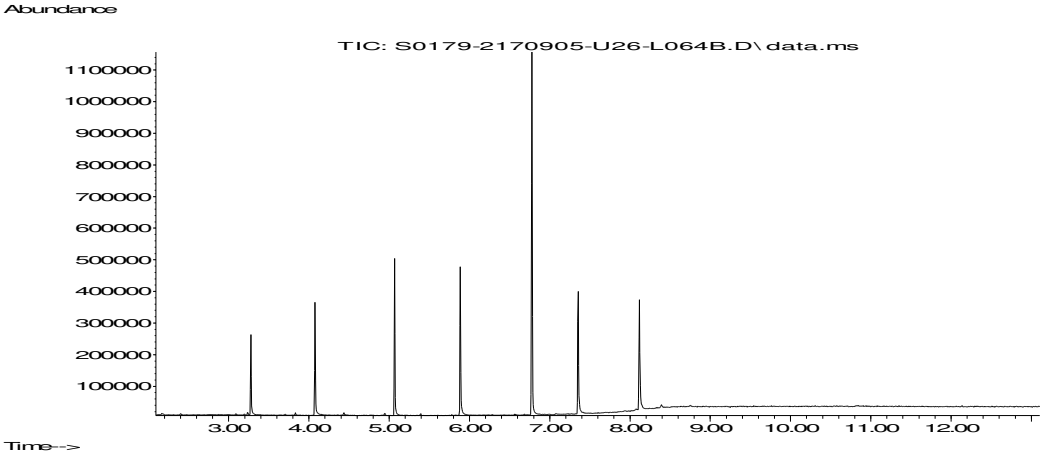

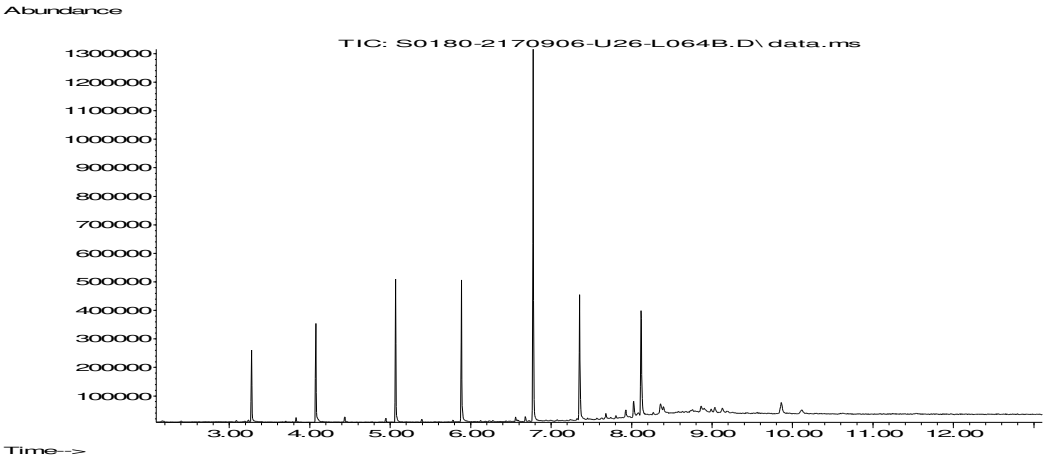

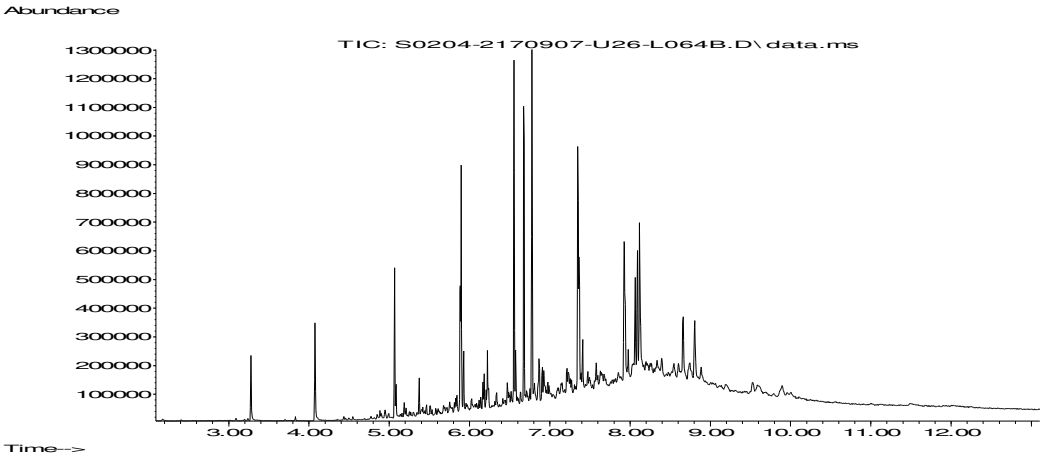

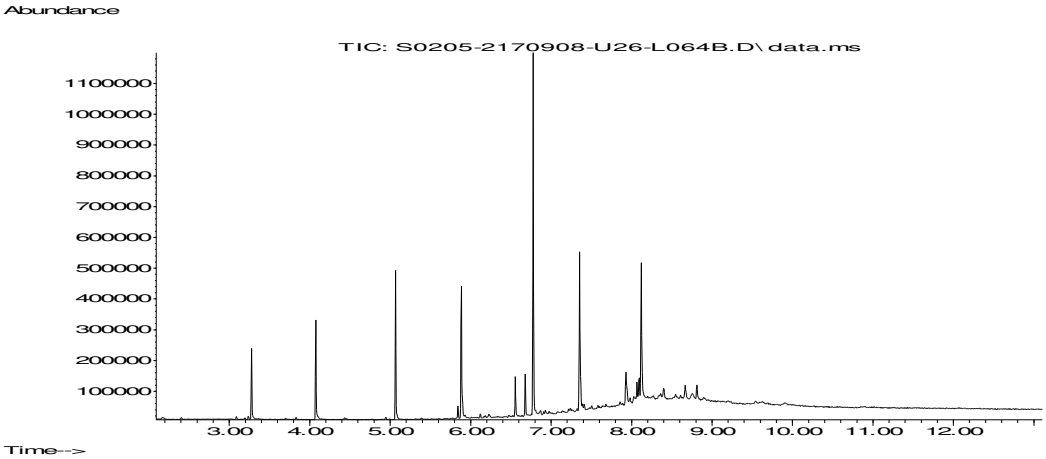

Appendix D – Groundwater Chemical Analysis Results

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Analytical Report Number : 22-40431

Project / Site name:	Cotswold Dene	**Samples received on:**	17/02/2022
Your job number:	21-2605.01	**Samples instructed on/ Analysis started on:**	17/02/2022
Your order number:	DS66344	**Analysis completed by:**	23/02/2022
Report Issue Number:	1	**Report issued on:**	23/02/2022
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

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

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

Analytical Report Number: 22-40431
Project / Site name: Cotswold Dene

Your Order No: DS66344

Lab Sample Number				2176787	2176788	2176789	2176790
Sample Reference				DS 107	DS 102	DS 101	DS 103
Sample Number				1	1	1	1
Depth (m)				3.00	3.00	3.00	3.00
Date Sampled				16/02/2022	16/02/2022	16/02/2022	16/02/2022
Time Taken				0900	0900	0900	0900
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				
General Inorganics							
pH	pH Units	N/A	ISO 17025	7.0	7.0	7.2	7.5
Sulphate as SO4	µg/l	45	ISO 17025	978000	392000	203000	1210000
Hardness - Total	ugCaCO3/L	1000	ISO 17025	1300000	-	-	-
Speciated PAHs							
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 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	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids							
Calcium (dissolved)	mg/l	0.012	ISO 17025	480	-	-	-
Calcium (dissolved)	µg/l	12	ISO 17025	480000	-	-	-
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0
Magnesium (dissolved)	mg/l	0.005	ISO 17025	23	-	-	-
Magnesium (dissolved)	µg/l	5	ISO 17025	23000	-	-	-
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.36	2.59	1.25	1.03
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.21	< 0.02	< 0.02	0.06
Chromium (dissolved)	µg/l	0.2	ISO 17025	2.8	3.0	1.9	2.3
Copper (dissolved)	µg/l	0.5	ISO 17025	11	4.6	4.0	12
Lead (dissolved)	µg/l	0.2	ISO 17025	0.9	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	73	37	5.5	14
Zinc (dissolved)	µg/l	0.5	ISO 17025	16	8.7	5.4	70
Monoaromatics & Oxygenates							
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 22-40431
Project / Site name: Cotswold Dene

Your Order No: DS66344

Lab Sample Number				2176787	2176788	2176789	2176790
Sample Reference				DS 107	DS 102	DS 101	DS 103
Sample Number				1	1	1	1
Depth (m)				3.00	3.00	3.00	3.00
Date Sampled				16/02/2022	16/02/2022	16/02/2022	16/02/2022
Time Taken				0900	0900	0900	0900
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C10 - C12 $_{EH\_2D\_AL\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16 $_{EH\_2D\_AL\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21 $_{EH\_2D\_AL\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Aliphatic >C21 - C35 $_{EH\_2D\_AL\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Aliphatic >C10 - C35 $_{EH\_2D\_AL\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C10 - C12 $_{EH\_2D\_AR\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	89	< 10	< 10
Aromatic >C12 - C16 $_{EH\_2D\_AR\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	92	< 10	< 10
Aromatic >C16 - C21 $_{EH\_2D\_AR\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	89	< 10	< 10
Aromatic >C21 - C35 $_{EH\_2D\_AR\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Aromatic >C10 - C35 $_{EH\_2D\_AR\_\#1\_\#2}$	µg/l	10	ISO 17025	< 10	270	< 10	< 10

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

Analytical Report Number : 22-40431
Project / Site name: Cotswold Dene

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-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 after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
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
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.

Analytical Report Number : 22-40431
Project / Site name: Cotswold Dene

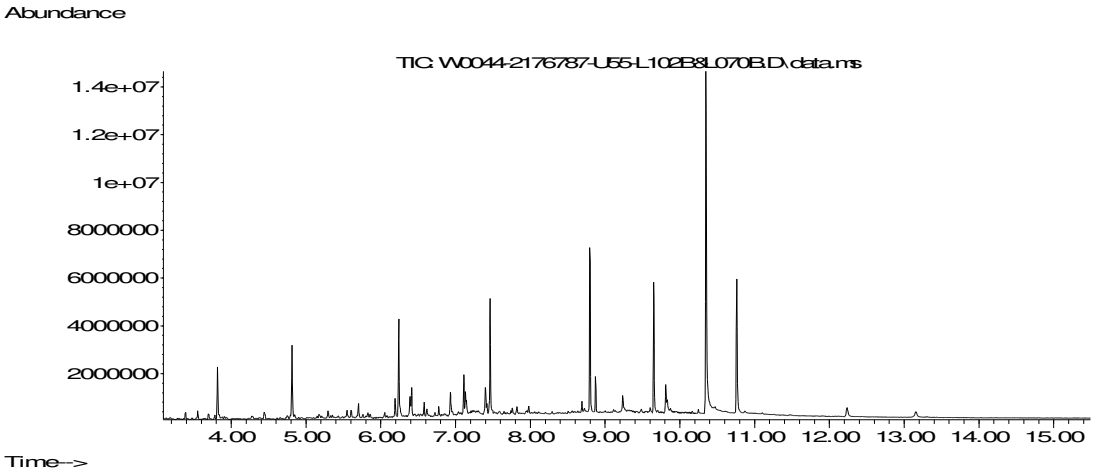
Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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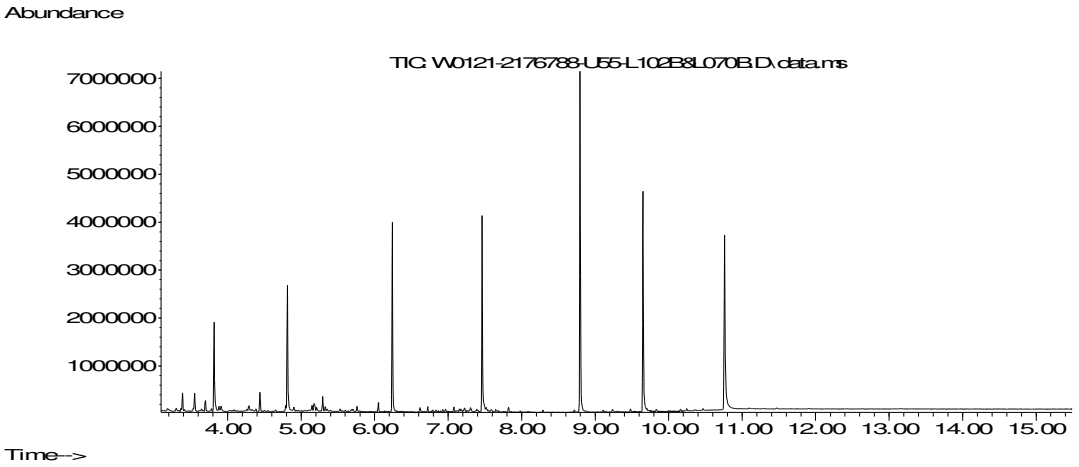
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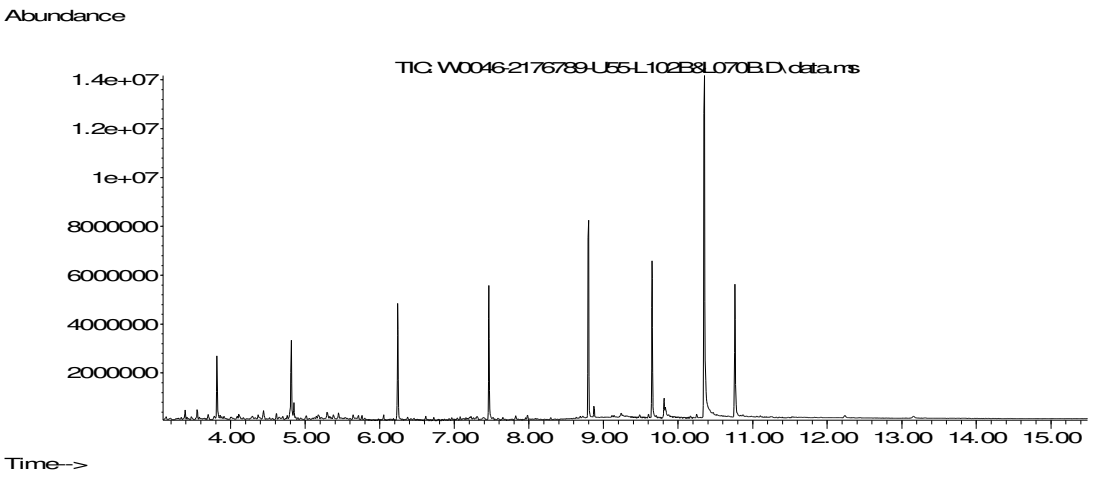
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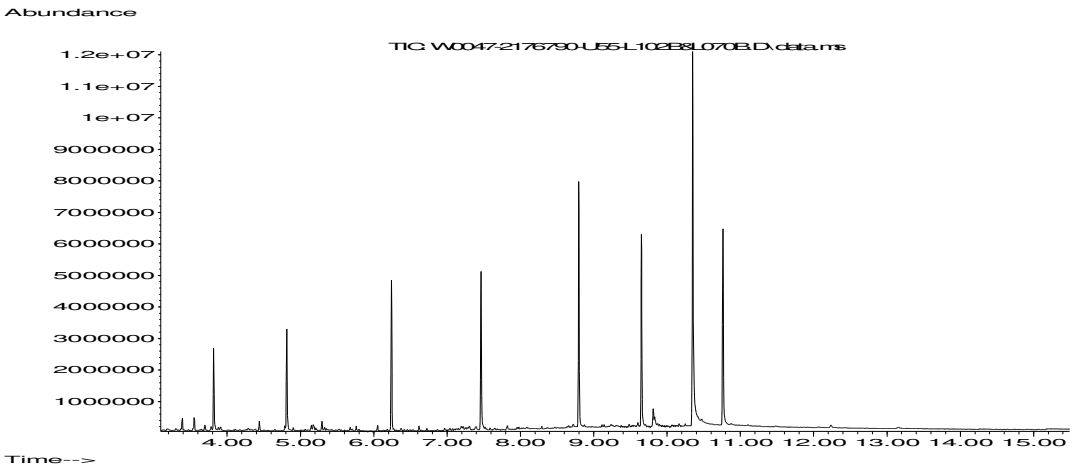
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Appendix E – Ground Gas Monitoring Results

Site Name	Land off Cotswold Dene	Job number	21-2605.01	WEATHER	Start	End
				Time	9:30	11:30
Client	Trinovant	Recorded by	HG	Weather (dry/rain/snow/ice)	Dry	Dry
				Pressure (mb)	989.00	990.00
Date (DD/MM/YYYY)	16/02/2022			Rising/Falling Trend	Falling	
Gas Analyser		Visit Number	1	Wind Speed (m/s)	21.00	22.00
Readings at start	CH_4 (% v/v) 0.0	CO_2 (% v/v) 0.0	O_2 (% v/v) 20.7	H_2S (ppm) 0	Wind Dir. (From)	WSW	WSW
General comments	Bristol GFM436 used				Temperature °C	Start: 13	End: 14
					SWL Measured from	Ground Level	

Ref	GROUND GAS													GROUNDWATER			Notes
	Flow		CH_4		CO_2		O_2		H_2S	CO	VOC	Differential (Relative) Pressure	Atmos. Pressure	Depth to free product	Depth to water	Depth to base	(e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.) **$** For **Depth to water** state **Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)** **# For Depth to Product state** **ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)**
	l/hr		% v/v		% v/v		% v/v		ppm			mb	mb	m	m	m	
	Max	Steady	Max	Steady	Max	Steady	Min	Steady	Max	Max	Max						
	The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet																
DS101	<0.1	<0.1	<0.1	<0.1	3.0	3.0	16.8	16.8	<10	<10	7.7	0.0	991	NR	1.44	3.91	
DS102	<0.1	<0.1	<0.1	<0.1	7.2	7.2	0.8	0.8	<10	<10	11.2	0.0	988	NR	1.76	4.82	
DS103	<0.1	<0.1	<0.1	<0.1	0.8	0.8	14.9	14.9	<10	<10	1.6	0.0	989	NR	1.18	4.85	
DS105	<0.1	<0.1	1.2	1.2	6.4	6.4	0.1	0.1	<10	<10	0.3	0.0	988	NR	2.22	4.85	
DS107	<0.1	<0.1	<0.1	<0.1	8.0	8.0	0.8	0.8	<10	<10	2.2	0.0	989	NR	1.97	4.86	

Site Name	Land off Cotswold Dene	Job number	21-2605.01	WEATHER	Start	End
				Time	9:30	11:00
Client	Trinovant	Recorded by	HG	Weather (dry/rain/snow/ice)	Dry	Dry
				Pressure (mb)	1000.00	1000.00
Date (DD/MM/YYYY)	24/02/2022			Rising/Falling Trend	Falling	
Gas Analyser		Visit Number	2	Wind Speed (m/s)	15.00	15.00
Readings at start	CH_4 (% v/v) 0.0	CO_2 (% v/v) 0.0	O_2 (% v/v) 20.7	H_2S (ppm) 0		
General comments	Bristol GFM436 used			Wind Dir. (From)	W	W
				Temperature °C	Start: 5	End: 5
				SWL Measured from	Ground Level	

Ref	GROUND GAS													GROUNDWATER			Notes
	Flow		CH_4		CO_2		O_2		H_2S	CO	VOC	Differential (Relative) Pressure	Atmos. Pressure	Depth to free product	Depth to water	Depth to base	(e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.) **$** For **Depth to water** state **Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)** **# For Depth to Product state** **ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)**
	l/hr		% v/v		% v/v		% v/v		ppm								
	Max	Steady	Max	Steady	Max	Steady	Min	Steady	Max	Max	Max	mb	mb	m	m	m	
	The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet																
DS101	<0.1	<0.1	<0.1	<0.1	3.1	3.1	16.4	16.4	<10	<10	1.9	0.0	1002	NR	1.35	3.91	
DS102	0.3	<0.1	<0.1	<0.1	6.8	6.8	6.2	6.2	<10	<10	2.2	1.0	1000	NR	1.71	4.82	
DS103	5.5	<0.1	<0.1	<0.1	0.8	0.8	14.8	14.8	<10	<10	0.3	1.0	1000	NR	2.00	4.85	
DS105	0.1	<0.1	1.0	1.0	6.6	6.6	0.4	0.4	<10	<10	0.7	1.0	997	NR	2.16	4.85	
DS107	0.2	<0.1	<0.1	<0.1	4.9	4.9	11.8	11.8	<10	<10	1.5	1.0	997	NR	2.02	4.86	