

Forestry England

Cannop Ponds

Ground Investigation Report

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Job number 292427

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Contents

Executive Summary	1
1. Introduction	2
1.1 Sources of Information	2
1.2 Scope of Report	2
2. Desk Study	4
3. Ground Investigation	7
3.1 Scope of Works	7
3.2 Laboratory Testing	7
3.3 Monitoring installations	8
4. Encountered Ground Conditions	9
4.1 General Description	9
4.1.1 Lower Cannop Pond	9
4.1.2 Upper Cannop Pond	9
4.2 Groundwater	10
5. Geotechnical Testing	12
5.1 Lower Cannop Pond	12
5.1.1 Made Ground	12
5.1.1.1 Embankment Fill	12
5.1.2 Alluvium	12
5.1.3 Coal Measures	12
5.2 Upper Cannop Pond	13
5.2.1 Embankment Fill	13
5.2.2 Head Deposits	13
5.2.3 Coal Measures	13
5.3 Derived Parameters	13
5.4 Buried Concrete Classification	14
6. Outline Conceptual Model	15
6.1 Potential Contamination Sources	17
7. Generic Quantitative Human Health Risk Assessment	18
7.1 Methodology	18
7.1.1 Averaging Areas	18
7.2 Tier 1 Soil Assessment	18
7.3 Potential Contaminants of Concern	19
7.4 Recommendations	19
8. Controlled Waters Risk Assessment	20
8.1 Generic Screening Assessment Methodology	20
8.2 Leachate Tier 1 Screen	20
8.3 Groundwater Tier 1 Screen	21
8.4 Recommendations	22

9.	Engineering Assessment	23
9.1	Potential Failure Modes of Embankment Dams	23
9.2	Dam Composition	23
9.3	Impact of Material Characteristics on Dam Stability	24
9.3.1	Internal Stability	24
9.3.2	Face Stability	24
9.3.3	Spillway Stability	24
9.4	Potential Interventions to Improve Dam Impermeability	24
	Drawings	26
	References	27
	Appendix A	A-1
	Geotechnical Figures	A-1
	Appendix B	B-1
	Chemical Screening Tables	B-1
	Appendix C	C-1
	Chemical Screening Tables	C-1

Executive Summary

Lower and Upper Cannop Ponds have been the subject of a ground investigation to assess the material composition of the existing embankment dams at the site as well as assess the potential for chemical contamination. The lower embankment dam was investigated by 8no dynamic and rotary cored boreholes extending to a maximum depth of 17.5m. The upper embankment dam was similarly investigated by 7no boreholes of similar techniques advanced to a maximum depth of 14m. These were supplemented by additional window sample boreholes and trial pits at the upper dam where borehole access was locally inhibited. Samples were recovered from all exploratory holes for laboratory testing.

The lower embankment dam was observed to comprise of several metres of granular fill overlying a more consistent thickness of cohesive fill. The upper embankment dam was observed to comprise of inconsistently interbedded layers of cohesive and granular fill. Cobbles and boulders were encountered in the upper dam. Natural Coal Measures bedrock comprising of mudstones was found beneath both dams.

Modern embankment dams are typically designed and detailed with impermeable cores (normally clay) to provide effective seepage cutoff. The extensive granular fill found within both dams results in zones with relatively high permeability that will allow water flow through their mass. This makes them susceptible to a range of potential failure mechanisms. There is significant risk of internal erosion of the dams which can lead to long-term deterioration. There is also the potential for seepage and internal erosion beneath and along the underside of both spillways. This has recently been seen at the lower dam where temporary grouting has been undertaken due to voids having formed.

Interventions to improve the watertightness of the dams could include cutting off lateral water flow by installing either (a) grouting – the addition of cementitious slurries into the embankment either through positive injection or through natural permeation; or (b) driving steel corrugated sheet piles to provide a structural cut-off around which seepage groundwater would need to flow. Whilst these techniques, when implemented appropriately, can significantly reduce seepage, the characteristics of the dam fill materials suggest that there may be challenges in achieving a cost-effective solution with either of these options. Issues include the potential for high or uncontrolled migration of grout in the granular layers, or the presence of obstructions in the fill which would preclude driving sheet piles to an appropriate depth.

The desk study identified several potential contamination sources and pollution events occurring upstream of the ponds. On this basis, silt samples from the pond, soil samples from the embankment fill, and groundwater and surface water samples were taken and subject to chemical analysis. These were then screened against relevant human health and environmental assessment criteria.

The pond silt and soil samples showed some elevated concentrations of heavy metals, with some minor exceedances of *Residential without Plant Uptake* criteria. There were no exceedances of limits for *Public Open Space – Park*. Soil leachate analysis indicates that in general, the embankment fill does not exhibit leachable contamination concentrations above the applied screening criteria with the exception of minor amounts of polycyclic aromatic hydrocarbons (PAHs).

Shallow samples of reservoir silt largely could not be collected due to their soft nature. Deeper samples did record leachable heavy metals and PAHs above the applied criteria although it was found that the silts comprise of natural materials with no specific sources of contamination evident. It is likely that the source is from past pollution events where contaminants have settled out of suspension onto the silts.

The groundwater and surface water screening generally found that contaminants fell below the applied limits, and for those metal and PAH limits that were exceeded, exceedances were rarely recorded across successive rounds of monitoring with the exception of manganese.

Overall, no significant sources of contamination were identified. Once final design proposals are known, more detailed human health and environmental assessments will be undertaken to confirm risk drivers and mitigation requirements to address the minor exceedances that have been recorded.

1. Introduction

Upper and Lower Cannop Ponds are two reservoirs located along Cannop Brook within the Forest of Dean. Inspections under the Reservoirs Act 1975 at both sites identified several issues which need to be resolved to ensure the safety of the two reservoirs. A Section 10 Inspection of Lower Cannop Pond was conducted following the formation of a sinkhole near the spillway. The findings of this report were issued May 2021 (Dams and Reservoir Ltd, 2021). The process of inspection and reporting has placed a legal obligation on Forestry England to replace the spillway at Lower Cannop Ponds, or to discontinue the reservoir. In December 2022 the findings of a Section 10 Inspection of Upper Cannop Pond were issued. This identified several issues with the dam and spillway which must be addressed to ensure the safety of the reservoir.

Following consideration of various approaches to address the MITIOS (Measures In The Interest Of Safety) and other key project objectives, four concept options for potential remedial works at the sites were presented at public consultation events held in March 2023. The four options are:

1. Spillway and Dam Upgrade – replacement of the spillways at both sites, upgrades to the embankments, and associated localised improvement works.

2. Storm Water Storage – replacement of the Lower Pond spillway with a notched spillway to attenuate flows and reduce downstream flood risk. The Upper Cannop Pond spillway would be removed, and a series of ponds created in the basin area.

3. Cascade of Ponds – both spillways would be removed. Earth bunds and woody debris ‘dams’ would be used to create a cascade of small ponds through the valley.

4. Re-naturalising Cannop Brook – both spillways would be removed, and a meandering watercourse re-established in the valley.

Ove Arup & Partners (Arup) have been commissioned by Forestry England to provide a geotechnical and geo-environmental assessment of the ground conditions.

Arup previously undertook a desk study for the site (Arup, 2022), and on this basis, a ground investigation was scoped. The key aims of the ground investigation were to confirm the ground conditions and the extent, if any, of contamination at the site.

The ground investigation was undertaken by Geotechnical Engineering Ltd. between 03/07/2023 – 21/07/2023, followed by three rounds of post works monitoring.

Cannop Ponds is centred at National Grid Reference SO 608 106. The locations of Upper and Lower Cannop Pond are presented in Drawings 1 and 2, and Drawings 3 and 4 respectively.

1.1 Sources of Information

This report is based on, but not limited to, the review and interpretation of the following sources:

- Arup’s Geotechnical and Geo-environmental Desk Study (Arup, 2022).
- Geotechnical Engineering Ltd.’s Factual Ground Investigation Report (Geotechnical Engineering Ltd., 2023).
- CIRIA C552 – Contaminated land risk assessment (CIRIA, 2001).

1.2 Scope of Report

The following report has been prepared for and on behalf of Forestry England in response to their instruction of scope. Except as for in our agreement with Forestry England, any other party using this information for any purpose whatsoever does so at their own risk and any duty to that party is excluded.

This report summarises and interprets the results of the ground investigation and monitoring works from Geotechnical Engineering Ltd’s factual report (Geotechnical Engineering Ltd., 2023) and on-site

observations to develop a coherent ground model and typical soil characteristics. This report does not interpret these results in the context of concept options for potential remedial works. High level engineering considerations will be provided separately as part of the options assessment process and level of detail developed once a preferred option has been selected.

2. Desk Study

As part of the commission, Arup prepared a desk study and preliminary risk assessment in support of the planning process and to inform the design (Arup, 2022). The report presents an overview of the setting of the site and potential risks associated with its development. A review of the site history, geology, hydrology, hydrogeology, and surrounding land uses was undertaken, and preliminary geotechnical and geo-environmental advice was provided with respect to the proposed development.

It is recommended that the desk study be read in conjunction with this report, however, a summary of the findings of the desk study is provided in Table 2-1 for ease of reference.

Table 2-1: Desk study summary.

Heading	Summary
Site history, modifications, and remedial works	<p><u>Lower Cannop Pond</u></p> <ul style="list-style-type: none"> • 1825: Constructed. • 1948: Railway no longer annotated on OS Map running across the crest of the embankment. • 1978: Three boreholes drilled through the dam and found voids between ~1.2mBGL – 3.2mBGL. Remedial works comprised filling voids (material unknown) and deposition and compaction of ~200m³ of clay material on the upstream face of the dam either side of the spillway (aim to eliminate viable leaks). • 1983: Former railway annotated as ‘footpath’. • Clay layer ‘put into’ spillway. • 1992: Hole developed behind masonry approach wall to the spillway. Hole as repointed and filled with clay. • 1993: Settlement observed. New hole appeared in same location as 1992. • 1994: Spillway walls repaired. Hole found during drilling. Collapse resulted in a void ~2m×1.5m×1.2m. Concluded that the void had formed over time and that ‘terram’ had bridged void until the span was too great, causing the ‘terram’ to tear. The hole was enlarged and filled with ‘stiff clay’. A geotextile membrane was reinstated, and a cover of ~200mm of sub-base material was place on top. • 2003: Further settlement and voiding as previous instances. The wall of the spillway was repointed, and trees were removed. Repairs also involved excavation of sinkholes, followed by backfilling the spillway wall with ~9m³ of concrete. Three boreholes were also drilled (locations unknown). • 2010: reports of crest being widened without any formal involvement of an All Reservoirs Panel Engineer. • 2012: Weir raised via placing an additional layer of stones to raise water level (again, completed without formal involvement of an All Reservoirs Panel Engineer.). • 2013: Large stones placed at the base of the spillway to prevent scour. • 2014: Elver ladder installed. • 2020: Sinkhole appeared adjacent to the spillway, upstream of the bridge. Concerns raised of the spillway condition. • 2021: Sinkhole identified at the corner of the spillway and dam crest. Slumping of the spillway wall and cracking of mortar also observed. Further investigation showed extensive voiding beneath concrete slabs with evidence of water moving through void spaces. Emergency repairs carried out comprising grouting of void spaces beneath the spillway. <p><u>Upper Cannop Pond</u></p> <ul style="list-style-type: none"> • 1829: Constructed. • 1907: Following reports of leaking, low water levels and pollution, significant repair works were undertaken to make the dams safe and raise the water level by ~4ft (~1.2m). • 1958: Towards the end of the reservoirs use for industrial processes (Wood Distillery to the north demolished in 1966), Upper Cannop Pond is shown to have been largely drained with minimal area or water remaining. • 1965: Reports of leakage and costly remedial measures required. • 1968: Following the closure of Cannop Colliery, reports of significant siltation of Upper Cannop Pond and serious leakage through the embankment.

Heading	Summary																	
	<ul style="list-style-type: none"> • 1973: Repair works to Upper and Lower Cannop Pond recorded. Works stopped leakage at Upper Cannop Pond. This coincides with when Upper Cannop Pond was returned to its current water level. • 1984: Construction of embankment ‘causeway’ to provide a silt-settling lagoon to the north. This divided Upper Cannop Pond into two water bodies, connected via a ~2.5m wide opening in the ‘causeway’. The opening comprises a masonry wall structure, spanned by a timber footbridge. • 2019: Upstream shoulder of the embankment slope protection works comprising randomly placed stone revetment. • 2020: Tree removal works and vegetation management of the downstream toe of the embankment. 																	
Anticipated ground conditions	<p>The table below summarises the anticipated ground conditions as identified within the Desk Study (Arup, 2022).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ff0000; color: white;">Stratum</th> <th style="background-color: #ff0000; color: white;">Thickness (m)</th> <th style="background-color: #ff0000; color: white;">Level of top of stratum mAOD)</th> </tr> </thead> <tbody> <tr> <td>Made ground (compacted gravel and concrete hardstanding)</td> <td>Near-surface covering only.</td> <td>Lower Cannop Pond: ~66.5mAOD Upper Cannop Pond: ~70mAOD</td> </tr> <tr> <td>Embankment fill (granular and cohesive)</td> <td>Lower Cannop Pond: ~7m Upper Cannop Pond: ~5m</td> <td>Lower Cannop Pond: ~66mAOD Upper Cannop Pond: ~69.5mAOD</td> </tr> <tr> <td>Alluvium (clay, silt, sand and gravel)</td> <td rowspan="2">Anticipated to vary.</td> <td>Lower Cannop Pond: ~59mAOD</td> </tr> <tr> <td>Head deposits (clay, silt, sand and gravel)</td> <td>Upper Cannop Pond: ~64.5mAOD</td> </tr> <tr> <td>Coal Measures (Coleford and Cinderford Member’s comprising mudstone, siltstone, and sandstone)</td> <td>To depth.</td> <td>Beneath unknown thickness of Alluvium, and/or Head Deposits.</td> </tr> </tbody> </table>	Stratum	Thickness (m)	Level of top of stratum mAOD)	Made ground (compacted gravel and concrete hardstanding)	Near-surface covering only.	Lower Cannop Pond: ~66.5mAOD Upper Cannop Pond: ~70mAOD	Embankment fill (granular and cohesive)	Lower Cannop Pond: ~7m Upper Cannop Pond: ~5m	Lower Cannop Pond: ~66mAOD Upper Cannop Pond: ~69.5mAOD	Alluvium (clay, silt, sand and gravel)	Anticipated to vary.	Lower Cannop Pond: ~59mAOD	Head deposits (clay, silt, sand and gravel)	Upper Cannop Pond: ~64.5mAOD	Coal Measures (Coleford and Cinderford Member’s comprising mudstone, siltstone, and sandstone)	To depth.	Beneath unknown thickness of Alluvium, and/or Head Deposits.
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Hydrogeology and hydrology	<p>Cannop Brook is situated within the wider catchment of the River Severn. The superficial deposits underlying the site are designated as Secondary A aquifers, and the bedrock underlying the site is designated as a Secondary A aquifer in accordance with the BGS (British Geological Society, 2023). The composition/structure of both embankments is unknown; thus, it is not known if the embankments contain any internal drainage features, i.e., drainage blankets. Therefore, profile of the phreatic head of water within the embankments is unknown and is likely to vary.</p>																	
Unexploded Ordnance (UXO)	<p>Since completion of the Desk Study (Arup, 2022), a detailed Unexploded Ordnance Risk Assessment (SafeLane Global, 2023) has been obtained. Risk level to UXO has been categorised as ‘medium,’ with recommendations provided for both shallow intrusive works and deep intrusive works separately. Further information regarding these recommendations can be found in the Unexploded Ordnance Risk Assessment (SafeLane Global, 2023) (provided separately).</p>																	
Contamination	<p>The materials used to make up the embankments have been described as earth and rockfill which likely forms re-worked natural soils and therefore is relatively low risk for contamination potential. There remain several contaminative land uses within close proximity of the site, largely upstream of the ponds, which may have led to the contamination of site soils and waters. Notably these include the historical mining activities in the area, Cannop Chemical Works, and the Wood Distillation Works which were active adjacent to Cannop Brook leading to the ponds.</p> <p>Anecdotal evidence suggests that the chemical works were used to produce mustard gas during WWI. There are two occurrences of List 1 Dangerous Substances identified within 500m of the site, with one 22m south of Lower Cannop associated with the stone works, and the other 500m north associated with a historical furnace, both with cadmium as the authorised substances. Both locations also have List 2 Dangerous Substances for chromium, copper, iron, nickel, and zinc.</p> <p>Historic evidence indicates that significant pollution events have occurred within the ponds, likely associated with the mine water and/or discharge from the chemical works. Mine water is a known</p>																	

Heading	Summary
	<p>source of heavy metal contamination, often resulting in high concentrations of metals, particularly iron, zinc, copper, lead, cadmium, manganese and aluminium.</p> <p>Contaminants from these land uses and environmental incidents may have impacted the nearby brook and migrated down to the ponds, potentially settling within the site silts. Should these silts be disturbed, there is the potential to mobilise contamination into the water column, impacting groundwater and aquatic life within the surface waters.</p> <p>In addition, zebra mussels are known to be present within the ponds. It is imperative that these invasive species are not allowed to spread offsite and therefore mitigation measures will be required to ensure these are not disturbed.</p>

3. Ground Investigation

Based on the findings of the desk study, an intrusive site investigation was recommended. The investigation was designed and scheduled by Arup and undertaken by Geotechnical Engineering Ltd. between 03/07/2023 – 21/07/2023, followed by a period of post works monitoring. A summary of the investigation is provided in the following sections.

The factual report produced by Geotechnical Engineering Ltd. is appended in Appendix C.

3.1 Scope of Works

The purpose of the investigation was to provide geotechnical and geo-environmental information to inform the design of the proposed development.

This site investigation comprised the following:

Lower Cannop Pond

- 8No Boreholes (dynamic sample drilling with rotary coring follow-on).
- Surface water and silt sampling within the ponds

Upper Cannop Pond

- 7No Boreholes (dynamic sample drilling with rotary coring follow-on).
- 6No Hand-dug pits.
- Surface water and silt sampling within the ponds

The original specification for this ground investigation (Arup, 2023) included two additional boreholes (BH10 and BH13) at Upper Cannop Pond. These boreholes were de-scoped to ensure public access was available across the embankment throughout the ground investigation. These were replaced by six hand-dug pits (three in each location), just off the crest, in the middle, and at the toe of the downstream shoulder of the embankment. BH09 and BH15 were also completed with a smaller window sampling rig to ensure access for the public was unhindered throughout the ground investigation.

3.2 Laboratory Testing

Both geotechnical and chemical laboratory testing were undertaken on soil samples obtained during the ground investigation.

The suite of geotechnical and geo-environmental testing undertaken on selected soil and groundwater samples are summarised in Table 3-1.

Table 3-1: Laboratory testing undertaken.

Test	No. of tests
Geotechnical	
Moisture content	30
Liquid Limit, Plastic Limit, Plasticity Index	29
Particle size distribution (PSD) by wet sieving	41
Compaction (2.5kg rammer)	10
Shear box test (small)	3
BRE SD1 (2005) suite (water soluble sulphate and pH).	10

Test	No. of tests
Geo-environmental	
General suite (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, antimony, beryllium, vanadium, cyanide, pH, boron, phenols, total organic carbon)	33
Asbestos screen	23
Speciated TPH	33
Speciated PAH and BTEX	8
VOCs and SVOCs	21
PCBs	22
Hydrocarbon ID	1
Loss on ignition	21
Hexavalent chromium	28
Waste Acceptance Criteria	23
Leachability	23
Soil leachate general	3
Soil leachate PAH and BTEX	4
Waters - General suite (pH, hardness, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, antimony, ammoniacal nitrogen, chloride, cyanide, phenols, dissolved organic carbon, calcium, manganese)	11
Waters - Speciated TPH	11
Waters - Speciated PAH and BTEX	11
Waters – PCBs	5

3.3 Monitoring installations

During the ground investigation, three exploratory holes were installed with standpipes to allow for post site works monitoring and later collection of groundwater samples. Installation details are provided in the Table 3-2.

Table 3-2: Standpipe Installation Details

Hole ID	Response zone (m bgl)	Response zone (m AOD)	Stratum
BH03	1.00-5.90	60.80-67.10	Embankment Fill
BH07	1.00-10.40	55.60-65.30	Embankment Fill
BH12	1.00-8.60	61.40-70.50	Embankment Fill

4. Encountered Ground Conditions

4.1 General Description

4.1.1 Lower Cannop Pond

A cross section of the encountered ground conditions is presented in Appendix A Figure 1 (alignment also shown on Drawing 1). The elevation of the dam crest descends from ~68 to ~66mAOD over ~75m west-east linearly. BH08 located to the east of the spillway was situated at ~66mAOD.

BH01 showed the west of the site to comprise ~4m of Made Ground comprising clay, sand and gravel with medium sandstone cobble content and rarely clinker. This material is likely associated with historical stockpiling and subsequent compaction of material associated with the adjacent stone masonry works. The lateral extent of this material is not known.

Between BH02-BH07 (west of the spillway), a band of granular fill (referred to hereafter as ‘Embankment Fill’) was encountered comprising clayey sandy gravel (described as ‘medium dense’ in BH02). This band generally thins out from ~3m to ~1m west to east. This granular band is likely attributed to the historical railway, and historical crest-raising works. A large boulder was encountered in BH02, which required rotary drilling to advance the borehole.

This granular band is underlain by a cohesive layer of Embankment Fill comprising very soft–firm slightly silty sandy gravelly clay. Cohesive Embankment Fill should be considered mixed in composition and not necessarily dominated by cohesive material in all areas. The thickness of this layer varies between ~2m–8m between BH02 and BH07. Cohesive Embankment Fill is also encountered in BH08 to the east of the spillway and was found at surface (~66mAOD) down to ~63.5mAOD (a thickness of ~3m).

Coal Measures were encountered immediately beneath Made Ground/Embankment Fill in all exploratory hole locations, except for BH04, where a ~1m thick layer of Alluvium (soft sandy organic clay) was encountered over the Coal Measures (attributed to Alluvium from original watercourse prior to the impoundment of the reservoir). The embankment is predominantly underlain by geologically extremely weak to weak fractured mudstones, with a band of extremely weak laminated sandstone encountered to the west of the site (BH01 and BH02). The site is situated close to a geological boundary between two geological units, the Cinderford Member (mudstone, siltstone, and sandstone) to the east and the Coleford Member (predominantly sandstone) to the west (British Geological Society, 2023). We would therefore expect to encounter more sandstone towards the west of the site than to the east, as encountered on-site.

4.1.2 Upper Cannop Pond

A cross section of the encountered ground conditions is presented in Appendix A Figure 2 (alignment also shown on Drawing 3). The elevation of the crest generally descends linearly by ~0.5m between BH09 (~70.5mAOD) and BH15 (~70mAOD) (chainage of ~120m).

Unlike Lower Cannop Pond, the embankment at Upper Cannop Pond does not show the distinct delineation between granular and cohesive layers of Embankment Fill. The Embankment Fill varies across the crest, with BH09, BH15, and BH16 encountering alternating layers of cohesive and granular material. BH11 and BH12 encountered granular Embankment Fill overlying cohesive Embankment fill, however, the thickness of this material varies by ~1.5m over ~8m east-west and ~4m north-south. Granular Embankment Fill at Upper Cannop Pond generally comprises clayey gravelly sand and very loose clayey sandy gravel.

All hand-dug pits encountered cohesive Embankment Fill. Both HP02 and HP03 were terminated early due to encountering a retaining wall. BH14, located ~8m downstream of the crest of the embankment also immediately encountered cohesive Embankment Fill.

Cohesive Embankment Fill was encountered in all exploratory hole locations and varied in thickness between ~1 to ~7m. This material generally comprises very soft to soft, locally firm to stiff silty sandy gravelly clay. In BH11 between 1.65–6.30mBGL, the cohesive Embankment Fill was very soft orangish brown with frequent partially decomposed wood fragments. In BH12 between 2.50–4.70mBGL, the cohesive Embankment Fill was very soft dark grey and brown slightly sandy silty clay with abundant decomposed

plant debris. This is an example of how the cohesive embankment fill not only varies across the crest of the embankment, but also between the upstream and downstream faces of the embankment.

Another notable difference between the two embankment's is the presence of Head Deposits at Upper Cannop Pond. These Head Deposits are mapped by the BGS as underlying Upper Cannop Pond, predominantly to the east (British Geological Society, 2023). Head Deposits, comprising clayey gravelly sand and silty sandy gravel, were encountered in BH15, BH16, and BH17 (the eastern extent of Upper Cannop Pond). Head Deposits varied in thickness between ~4.15-5.15m.

BH17 situated to the east of the spillway, which is omitted from the cross section for clarity, encountered ~1.20m of cohesive Embankment Fill, overlying ~0.5m of granular embankment Fill. Embankment Fill was underlain by ~5.15m of Head Deposits with Coal Measures thereafter.

4.2 Groundwater

A summary of water strikes at Lower and Upper Cannop Pond are summarised in Table 4-1 and Table 4-2 respectively. The results of groundwater monitoring in BH03, BH07 (Lower Cannop Pond), and BH12 (Upper Cannop Pond) are presented in Figure 4-1 and Figure 4-2.

Table 4-1: Summary of encountered groundwater at Lower Cannop Pond.

Location	Depth of Water Strike (mBGL)	Notes
BH04	3.45	Rose to 2.58mBGL in 20mins.
BH06	5.63	Rose to 5.20mBGL in 20mins.
BH07	4.20	Rose to 4.00mBGL in 20mins.

Table 4-2: Summary of encountered groundwater at Upper Cannop Pond.

Location	Depth of Water Strike (mBGL)	Notes
BH09	3.45	Rose to 2.88mBGL in 20mins.
BH14	1.20	Seepage into base of hole
BH15	5.20	Did not rise after 20mins; noted as seepage
HP06	1.05	Rose to 0.95mBGL in 20min; noted as very slow.

Lower Cannop Pond Groundwater Monitoring

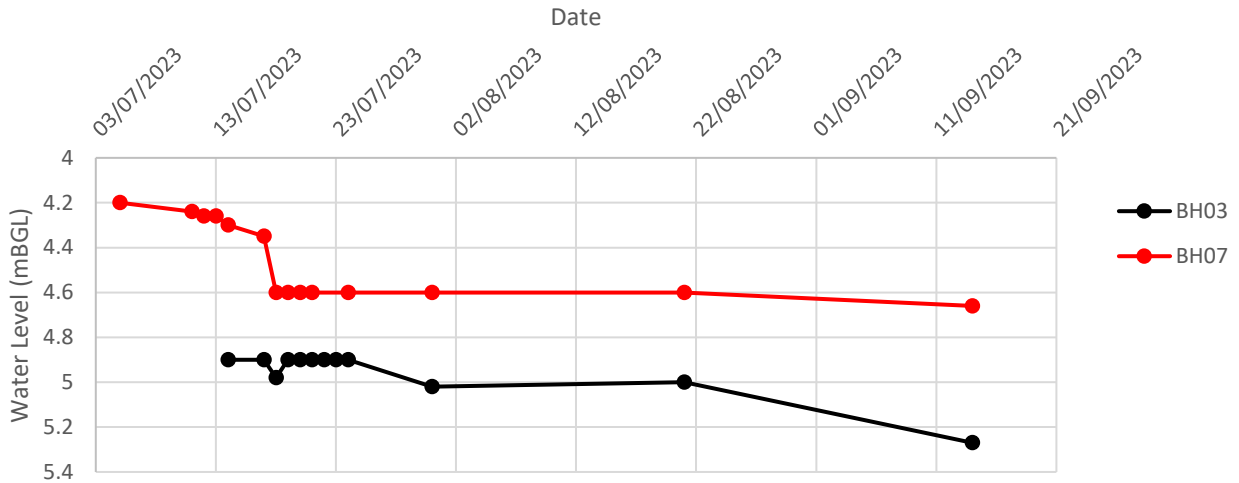


Figure 4-1: Lower Cannop Pond Groundwater monitoring.

Upper Cannop Pond Groundwater Monitoring

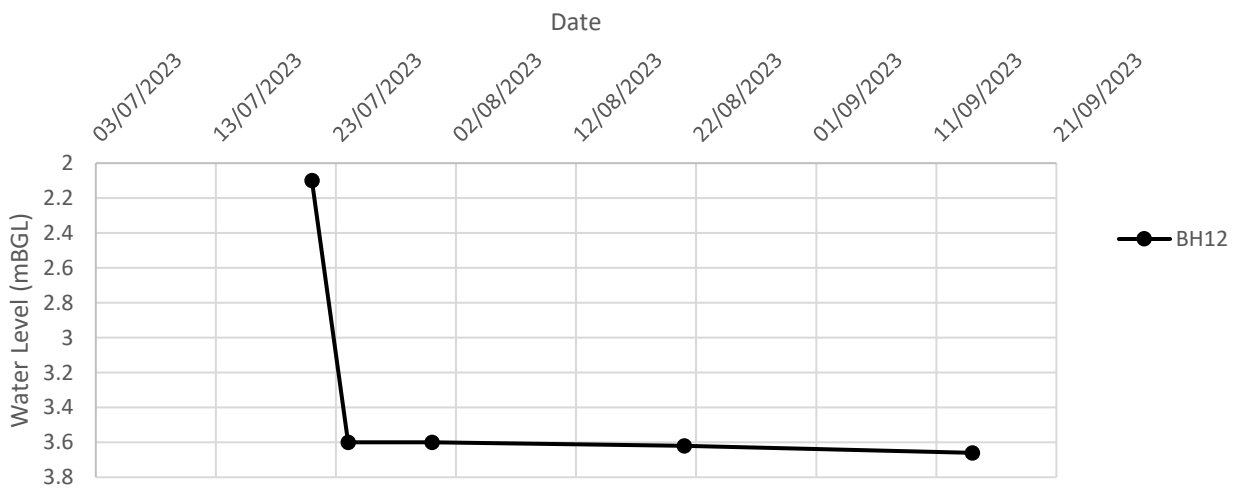


Figure 4-2: Upper Cannop Pond Groundwater Monitoring.

5. Geotechnical Testing

A summary of the total number of geotechnical tests undertaken as part of the ground investigation is presented in Table 3-1. Geotechnical plots for these tests are presented in Appendix A. Derivations of geotechnical parameters have been undertaken in accordance with BS8002:2015 (British Standards Institution, 2015) and appropriate literature.

5.1 Lower Cannop Pond

5.1.1 Made Ground

Two PSD tests were conducted on samples of Made Ground, showing varying fines content percentages between 5-20% (see Appendix A Figure 3).

5.1.1.1 Embankment Fill

Granular

Five PSD tests were conducted on granular samples of Embankment Fill, with percentage fines content varying between 5-25% (see Appendix A Figure 3).

From correlations between SPT N values and drained (effective) Young's modulus, E' , a characteristic E' value of 30MPa can be derived (Stroud, 1989) (CIRIA, 1995). The effective angle of shearing resistance, ϕ' , was calculated in accordance with Equation 3 of BS8002:2015 (British Standards Institution, 2015), using a ϕ'_{ang} of 2° and a ϕ'_{PSD} of 4° , yielding a ϕ' of 36° .

Cohesive

Eight PSD tests were conducted on samples of cohesive Embankment Fill, with percentage fines content ranging between 20-83% (see Appendix A Figure 3). Seven moisture content and Atterberg limit tests were conducted on samples of cohesive Embankment Fill (see Appendix A Figure 5). Appendix A Figure 7 shows that cohesive Embankment Fill can be categorised as a low to high plasticity clay. Six compaction tests were conducted on cohesive samples of Embankment Fill (see Appendix A Figure 12). The optimum moisture content (OMC) ranges between 16-24%, when using a 2.5kg compaction hammer.

An undrained Young's modulus, E_u , is anticipated to lie within the range of 5-10MPa. The undrained shear strength, c_u , was estimated as 25kPa (using $5 \times \text{SPT N}$) (Stroud, 1989) (CIRIA, 1995). The effective angle of shearing resistance, ϕ' , was estimated in accordance with Table 2 of BS8002:2015 (British Standards Institution, 2015) as 24° .

5.1.2 Alluvium

One moisture content and Atterberg limit test was conducted on a sample of Alluvium (see Appendix A Figure 5). Appendix A Figure 7 shows that the Alluvium can be categorised as a high plasticity silt.

5.1.3 Coal Measures

Six PSD tests were conducted on samples of Coal Measures, with percentage fines content ranging between 45-93% (Appendix A Figure 3). Six moisture content and Atterberg limit tests were conducted on samples of Coal Measures (see Appendix A Figure 5). Appendix A Figure 7 shows that the Coal Measures can be categorised as a low to high plasticity clay. One compaction test was conducted on a sample of Coal Measures (see Appendix A Figure 12). The optimum moisture content (OMC) was 16%, when using a 2.5kg compaction hammer.

The undrained shear strength, c_u , was estimated as 175kPa (using $5 \times \text{SPT N}$) (Stroud, 1989). From this, an undrained Young's modulus, E_u , was estimated as 70MPa (using $400 \times c_u$) (Hewitt, 1988).

5.2 Upper Cannop Pond

5.2.1 Embankment Fill

Granular

Two PSD tests were conducted on granular samples of Embankment Fill, with percentage fines content ranging between 22-36% (see Appendix A Figure 4).

From correlations between SPT N values and drained (effective) Young's modulus, E' , a characteristic value of 30MPa can be derived (Stroud, 1989). The effective angle of shearing resistance, ϕ' , was calculated in accordance with Equation 2 and Equation 3 of BS8002:2015 (British Standards Institution, 2015), using a ϕ'_{ang} of 2° , a ϕ'_{PSD} of 4° , and a ϕ'_{dil} of 0° , yielding a ϕ' of 36° .

Cohesive

Ten PSD tests were conducted on cohesive samples of Embankment Fill, with percentage fines content ranging between 36-98% (see Appendix A Figure 4). Nine moisture content and Atterberg limit tests were conducted on cohesive samples of Embankment Fill (see Appendix A Figure 6). Appendix A Figure 8 shows that cohesive Embankment Fill can be characterised as an intermediate plasticity clay. It should be noted that one of these samples was logged as granular, however, the sample contained sufficient fines content to conduct the test. This sample was characterised as a low plasticity clay. One compaction test was conducted on a cohesive sample of Embankment Fill (see Appendix A Figure 13). The optimum moisture content (OMC) was 19.5%, when using a 2.5kg compaction hammer.

An undrained Young's modulus, E_u , was estimated as 10MPa (CIRIA, 1995). The undrained shear strength, c_u , was estimated as 25kPa (using $5 \times \text{SPT N}$) (Stroud, 1989) (CIRIA, 1995). The effective angle of shearing resistance, ϕ' , was estimated in accordance with Table 2 of BS8002:2015 (British Standards Institution, 2015) as 24° .

5.2.2 Head Deposits

Three PSD tests were conducted on samples of Head Deposits, with percentage fines content ranging between 10-20% (see Appendix A Figure 4). Three small shear box tests were conducted on samples of Head Deposits, with ϕ' values of 34.5° , 36.5° , and 38.0° (Appendix A Figure 11). One compaction test was conducted on a sample of Head Deposits (see Appendix A Figure 13). The optimum moisture content (OMC) was 11.5%, when using a 2.5kg compaction hammer.

From correlations between SPT N value and drained (effective) Young's modulus, E' , a characteristic E' value of 50MPa can be derived (Stroud, 1989) (CIRIA, 1995). The effective angle of shearing resistance, ϕ' , was estimated in accordance with Equation 2 and Equation 3 of BS8002:2015, using a ϕ'_{ang} of 2° , a ϕ'_{PSD} of 4° , and a ϕ'_{dil} of 0° yielding a ϕ' of 36° which is in good agreement with the shear box tests.

5.2.3 Coal Measures

Four PSD tests were conducted on samples of Coal Measures, with percentage fines content ranging between 15-98% (see Appendix A Figure 4). Four moisture content and Atterberg limit tests were conducted on samples of Coal Measures (see Appendix A Figure 6). Appendix A Figure 8 shows that the Coal Measures can be characterised as a low to intermediate plasticity clay. One compaction test was conducted on a sample of the Coal Measures (see Appendix A Figure 13). The optimum moisture content (OMC) was 16.5%, when using a 2.5kg compaction hammer.

The undrained shear strength, c_u , was estimated as 175kPa (using $5 \times \text{SPT N}$). From this, an undrained Young's modulus, E_u , was estimated as 70MPa (using $400 \times c_u$) (Hewitt, 1988).

5.3 Derived Parameters

Table 5-1 provides a summary of characteristic geotechnical parameters for each stratum. The unit weight, γ , for each stratum has been determined from the log descriptions in accordance with BS8002:2015 (British Standards Institution, 2015).

Table 5-1: Derived geotechnical parameters for Lower Cannop Pond.

Strata	Unit Weight, γ (kN/m ³)	Effective Angle of Shearing resistance, ϕ' (°)	Undrained Shear Strength, c_u (kPa)	Effective Young's Modulus, E' (MPa)	Undrained Young's Modulus, E_u (MPa)
Embankment Fill (Granular)	18	36	-	20	-
Embankment Fill (Cohesive)	18	24	25	-	5-10
Coal Measures	22	-	175	-	70

Table 5-2: Derived geotechnical parameters for Upper Cannop Pond.

Strata	Unit Weight, γ (kN/m ³)	Effective Angle of Shearing resistance, ϕ' (°)	Undrained Shear Strength, c_u (kPa)	Effective Young's Modulus, E' (MPa)	Undrained Young's Modulus, E_u (MPa)
Embankment Fill (Granular)	18	36	-	30	-
Embankment Fill (Cohesive)	18	24	25	-	10
Head Deposits	20	36	-	50	-
Coal Measures	22	-	175	-	70

5.4 Buried Concrete Classification

The buried concrete classifications for Lower Cannop Pond and Upper Cannop Pond are summarised in Table 5-3 and Table 5-4 respectively.

Table 5-3: Buried concrete classification for Lower Cannop Pond.

Strata	Number of Samples	Characteristic Sulphate (2:1 Water Soluble) as SO_4 (mg/l)	Characteristic pH (2.5:1)	Design Sulphate Classification	ACEC Classification
Cohesive Embankment Fill	4	110	6.3	DS-1	AC-1
Coal Measures	1	22	6.9		

Table 5-4: Buried concrete classification for Upper Cannop Pond.

Strata	Number of Samples	Characteristic Sulphate (2:1 Water Soluble) as SO_4 (mg/l)	Characteristic pH (2.5:1)	Design Sulphate Classification	ACEC Classification
Cohesive Embankment Fill	1	10	7.8	DS-1	AC-1
Head Deposits	3	10	7.7		
Coal Measures	1	10	7.8		

6. Outline Conceptual Model

This section presents the outline conceptual model for the Cannop Ponds scheme based on a review of environmental information and the recent ground investigation undertaken at the site. As design proposals are not yet known, the below presents an overview of the site setting and does not take into account potential receptors or pathways:

- **Current site setting:** The site comprises two dams retaining two reservoirs: Lower Cannop Pond to the south and Upper Cannop Pond to the north, both of which surrounded by dense vegetation and connected by Cannop Brook. Lower Cannop Pond is retained by an earth-fill and rockfill embankment, with a spillway situated on the east of the embankment. A stone supplier with associated car parking and access track is in operation to the south of the embankment. The B4234 bounds the site to the west and a pedestrian footpath is located along the eastern bank. Upper Cannop Pond is also retained by an earth/rockfill embankment to the south with a spillway also situated on the east side of the embankment. A public footpath runs along the crest of the embankment with a picnic area to the east and adjoining the B4234 to the west.
- **Site history:** The reservoirs were constructed between 1825 and 1829 in order to guide water to a wooden aqueduct to power the furnace and various iron mines owned by the Forest of Dean Iron Co. (Parkend Ironworks). The site lies within an area of historical coal mining with several mine entries and shafts located to the south of Lower Cannop Pond and just east of Cannop Brook connecting the two ponds to the centre. From 1878, Upper Cannop Pond extended circa 100m north of its existing position, Cannop Foundry was located some 500m to the north-east, a tramway passing through quarries to the west joins the Railway to the south which borders the eastern bank of the ponds. Cannop Chemical Works was active some 500m upstream of Upper Cannop Pond adjacent to the brook, later being annotated as a charcoal grinding works. By 1918 a Wood Distillation Works was constructed in place of the chemical works and was extended to 300m upstream of the ponds west of the brook, with a stone works to the east. A further stone works (now Forest of Dean Stone Firms Ltd) was constructed to the south of the Lower Cannop embankment. By 1983 the rail and tramways were dismantled, the wood distillation works were no longer present, and the stone works to the south were extended to their current footprint. No further significant changes were noted. The ponds have varied in shape and depth since their construction, largely due to seasonal variations, the build-up of silts, leakages through the retaining banks, and debris damming the spillways.
- **Environmental information:** There are two occurrences of List 1 Dangerous Substances identified within 500m of the site, with one 22m south of Lower Cannop associated with the stone works, and the other 500m north associated with the historical furnace, both with cadmium as the authorised substances. Both locations also have List 2 Dangerous Substances for chromium, copper, iron, nickel, and zinc. There are four recorded pollution incidents within proximity of the ponds, all of which located just south of Lower Cannop Pond adjacent to the stone works. These include inert materials and waste (rocks and gravels) with a minor impact to water, two events relating to diesel being released to surface water with a minor impact, and a significant impact to water noted in 2017 however with no information on the pollutant given.

The reservoir keeper's notes (located in Gloucester Archives) were reviewed. This identified the following environmental information:

- *2nd to 10th July 1968, losses of fish 1,000 carp, 3,000 roach, 17 eels and 2 ducks killed by a pollution incident (pollution unknown). The complete fish stock was killed by pollution;*
- *29th May 1972, in years past the Cannop Colliery pumped thousands of gallons of water into the stream which feeds the ponds, the colliery has now closed for four years.*

Following on from the Desk Study, the Environment Agency released a document pertaining to an inspection of The Wood Distillation Works (known as His Majesty's Chemical Factory), circa 450m north of Upper Cannop Pond and 100m west of Cannop Brook, undertaken by the Clean Rivers Trust in 1997. The site currently exists as vegetated land. The findings of the inspection are summarised below:

- *Forty gallon drums were present on the site and the fractured nature of the ground was immediately apparent. Drums were in a thoroughly 'ropey' state.*
- *Drums were examined that were still draining coal tar and other phenolic resins into the ground.*
- *One mine seep of ferruginous water was also encountered. Across the surface of the water was an oily sheen. It was noted that the discharge precipitated the iron content out before reaching the nearby Cannop Brook.*
- *The number of drums in the open appeared to be around a hundred, with manufacture dates from 1916 to 1962. Many showed signs of having been punctured.*
- *The chemical works was active between 1913 and 1966, and produced acetate of lime, wood tar, charcoal, wood spirit, naphtha solvent.*
- *Between 1917 and 1920 the site was used for acetate production for use in explosives.*
- *Anecdotal evidence from George Read in 1997, who ran transports for the factory, was that the ponds downstream suffered regular pollutions from the factory and that cellars were constructed beneath the factory to act as sumps to take spills and waste.*

The above information indicates that significant pollution events have occurred within the ponds, likely associated with the mine water and/or discharge from the distillation works. Mine water is a known source of heavy metal contamination, often resulting in high concentrations of metals, particularly iron, zinc, copper, lead, cadmium, manganese and aluminium.

Zebra mussels are known to be present within the ponds which are classified as an invasive species, therefore mitigation measures will be required to ensure these are not disturbed and spread to offsite controlled waters.

- **Ground conditions:** The embankment fill from both ponds was typically encountered as an initial gravel layer to ~1.0m bgl before reaching the clay generally comprising soft to firm becoming firm dark greyish brown slightly sandy silty Clay with rare angular fine and medium sandstone. Rare anthropogenic materials such as brick, clinker and glass. A faint hydrocarbon odour was also noted within BH07, adjacent to the spillway at Lower Cannop and north of the Stone Works, between 0.80 and 3.60m bgl.

Superficial sandy gravelly clays were typically identified below the embankment fill before reaching the bedrock comprising Mudstones, Siltstones and Sandstones.

The shallow silts within the pond from Upper Cannop were not able to be logged due to there being no recovery, however the deeper samples (~3.0m depth) comprised a mix of greyish brown gravelly fine to coarse SAND with rare fragments of wood and gravel of fine to coarse coal to the north, and very soft dark grey sandy SILT to the south. Two samples (UC01 and UC02) were also taken within the marshy area north of the pond, formerly part of the Upper Cannop Pond. Here the silt samples were described as a top layer (0.8 to 0.9m thick) of very soft black organic silty CLAY with a strong organic odour, over very soft brown and black CLAY.

The deeper silts from Lower Cannop comprised very soft brownish grey sandy clayey SILT with rare very closely spaced thick laminae of black organic material to the north. Generally soft to firm light brownish grey slightly sandy slightly gravelly silty CLAY to the south, however with Made Ground identified within LC04 comprising coarse SAND with gravel of mudstone, coal and brick.

- **Controlled waters:** Both the superficial and bedrock aquifers are classified as Secondary A. Groundwater at the site is likely to be at similar levels to the levels within the ponds and also likely to be in hydraulic connectivity through any granular layers in the alluvium and bedrock owing to the proximity of these surface waters. The site does not lie within a Source Protection Zone (SPZ), though one active surface water abstraction licence is present onsite to the south of Lower Cannop belonging to Forest of Dean Stone Firm Ltd for hydroelectric power generation, with a maximum daily volume of 17,280m³.

- **Designated sensitive sites:** The majority of the woodland surrounding the ponds is classified as a designated ancient woodland and therefore sensitive to any migratory contamination that may arise from works. In addition, a designated ecological Site of Specific Scientific Interest borders the site to the south belonging to ‘Nagshead’ with a habitat of broadleaved, mixed and yew woodland.

6.1 Potential Contamination Sources

The materials used to make up the embankments have been described as earth and rockfill which is likely to have been derived from re-worked natural soils and therefore relatively low risk for contamination potential. However, there remain several historical contaminative land uses within close proximity of the site, largely upstream of the ponds, which may have led to the contamination of site soils and waters. Notably these include the historical mining activities in the area, and the Cannop Chemical Works, and the Wood Distillation Works which were active adjacent to the brook leading to the ponds. Anecdotal evidence suggests that these land uses once led to pollution events occurring within the ponds.

The potential contamination sources and their associated contaminants are summarised in the below table with locations outlined on the Features and Constraints Plan included as Drawing 5.

Table 6-1: Potential contamination sources

Potential source	Location	Associated Contamination (using DoE Industry Profiles)
Onsite		
Embankment earth fill	Along embankments / spillway	Heavy metals, hydrocarbons. Embankment first built in early 1800’s and therefore no asbestos should be present in the original fill. However there lies the potential for asbestos to be encountered in any fill/Made Ground added over time
Pond silts (potentially impacted by pollution events and mine water)	Within ponds	Potential for mobile contamination to have settled within the pond silts. Could include heavy metals, sulphides, hydrocarbons, solvents. (Metals include iron, zinc, copper, lead, cadmium, manganese and aluminium)
Railway land	East of the ponds	Metals, asbestos, hydrocarbons, creosote from sleepers
Stone workers	Immediately south of Lower Cannop	Metals, notably cadmium, chromium, copper, iron, nickel, and zinc
Offsite		
Coal mining activities	Surrounding site	Metals, low pH, mine gas
Iron foundry	500m north-west of Upper Cannop	Metals, oils, inorganics
Chemical works (mustard gas)	500m north of Upper Cannop	Metals, sulphurs, solvents
Charcoal grinding works	500m north of Upper Cannop	Pyroligneous acid, ethanoic acid, acetone, methanol, naphtha, oils, tars, hydrocarbons, acids, asbestos
Wood distillery	300m north of Upper Cannop	Inorganic compounds, metals, acids/alkalis, asbestos, preservatives, fuels, PCBs, wood tars, wood spirits, solvents

7. Generic Quantitative Human Health Risk Assessment

The results of the chemical analysis undertaken on soil samples obtained from across the site during the Geotechnical Ltd 2023 investigations have been reviewed and compiled in Appendix B of this report. The assessment in relation to human health is presented below.

7.1 Methodology

The available chemical data has been screened against the relevant published Generic Assessment Criteria (GACs). The following assessment criteria/scenarios have been considered for the assessment which are deemed to offer generic criteria for future assessments:

- **Residential without Plant Uptake (RwoPU)**
- **Public Open Space - Park**

A total of 19No soil samples from the two embankments, 9No silt samples from Upper Cannop and 7No silt samples from Lower Cannop were taken during the ground investigation and submitted for dry weight chemical analysis. The results of the chemical screen are provided within Appendix B.

The most conservative assessment criteria results (based on % organic matter) have been selected for the initial assessment.

There are no published assessment criteria for assessing the risks from asbestos in soils. Asbestos has been assessed under the precautionary principle whereby the presence of asbestos detected at <0.001% is considered further.

7.1.1 Averaging Areas

On account of the likely difference in chemical nature of the site soils, the below averaging areas are to be considered within the soil assessments:

- Embankment fill: anticipated to comprise earthfill with limited potential for contaminative materials;
- Upper Cannop silts: based on upstream sources of contamination and anecdotal evidence of pollution events, it is considered that Upper Cannop will have seen greater exposure to contaminants.
- Lower Cannop silts: being downstream of Upper Cannop, it is considered that dilution of contaminants will have taken place within the surface waters, reducing the contaminant load on Lower Cannop.

7.2 Tier 1 Soil Assessment

The results from the Tier 1 Soil Assessment are summarised in the below table:

Table 7-1: Soil chemical screen summary

Determinand	Exceedance
Asbestos	Asbestos was not detected in any soil or silt samples
Heavy metals	Embankment fill: <ul style="list-style-type: none"> • Arsenic – 4No exceedances of the residential criteria (40mg/kg) ranging between 44 and 57mg/kg. All below the POS criteria of 168mg/kg • Beryllium – 3No exceedances of the residential criteria (1.7mg/kg) ranging between 1.7 and 6.1mg/kg. All below the POS criteria of 62.7mg/kg
	Upper Cannop silts:

Determinand	Exceedance
	<ul style="list-style-type: none"> Beryllium – 7No exceedances of the residential criteria (1.7mg/kg) ranging between 2.7 and 6.4mg/kg. All below the POS criteria of 62.7mg/kg
	<p>Lower Cannop silts:</p> <ul style="list-style-type: none"> Beryllium – 2No exceedances of the residential criteria (1.7mg/kg) ranging between 2.0 and 2.4mg/kg. All below the POS criteria of 62.7mg/kg Lead – 1No exceedance of the residential criteria (310mg/kg) with a concentration of 330mg/kg. Below the POS criteria of 1300mg/kg
TPH	No exceedances of either the residential or POS park criteria were recorded for TPH.
PAH and BTEX	No exceedances of either the residential or POS park criteria were recorded for PAHs or BTEX.
PCBs	No screening values are available for PCBs, however all recorded concentrations fell below the laboratory limit of detection for PCBs.
VOCs	<p>Embankment fill: No exceedances of either the residential or POS park criteria were recorded for VOCs.</p> <p>Upper Cannop:</p> <ul style="list-style-type: none"> Vinyl Chloride – 2No exceedances of the residential criteria (0.00077mg/kg) both with a concentration of 0.01mg/kg. Both below the POS criteria of 4.83mg/kg. <p>Lower Cannop silts: No exceedances of either the residential or POS park criteria were recorded for VOCs.</p>
SVOCs	No exceedances of either the residential or POS park criteria were recorded for PAHs or SVOCs.
No exceedances were met for the applied Public Open Space – Park criteria	

7.3 Potential Contaminants of Concern

The metals arsenic and beryllium were found to exceed the residential criteria within the Made Ground embankment fill from both Upper and Lower Cannop. The exceedances within this material are relatively minor (within the same order of magnitude as the GAC), with similar results encountered within the natural soils.

Beryllium was also found within the pond silts from both Upper and Lower Cannop. Again, there was no evidence of anthropogenic materials in soil descriptions for metal contamination, though beryllium is a potential source of contamination from the smelting process, potentially impacting the soils from upstream sources.

Lead was found to marginally exceed the residential criteria within a single silt sample from Lower Cannop.

The VOC vinyl chloride was recorded to exceed the residential criteria within silt samples from Upper Cannop. Vinyl chloride is can also be formed in the environment when soil organisms break down chlorinated solvents. Both vinyl chloride exceedances were recorded at the laboratory limit of detection of 0.01mg/kg, within the deep silt sample from UC04 and the shallow from UC05. All other concentrations of vinyl chloride fell below the laboratory limit of detection.

Phenols including chlorophenols have been recorded within the silt samples from both Upper and Lower Cannop which have found use in pesticides and wood preservatives which are likely to have been sourced from the upstream Wood Distillation Works, though all concentrations were recorded below applied GACs.

All concentrations of contaminants fell below the applied Public Open Space – Park criteria.

7.4 Recommendations

A human health risk assessment should be undertaken to confirm risk drivers and mitigation requirements during construction and operational phases once final design proposals are known.

8. Controlled Waters Risk Assessment

8.1 Generic Screening Assessment Methodology

The risk to controlled waters has been assessed in accordance with the Environment Agency Remedial Targets Methodology (Environment Agency, 2006) which provides a tiered approach towards risk assessment. The assessment starts with an initial screen of leachate and groundwater data against Environmental Standards. This ignores the potential effects of dilution, dispersion and attenuation along the pathway between source and receptor. This is followed by basic calculations for each contaminant to modify the assessment criteria to take into account site-specific conditions if required.

A Tier 1 screening assessment has been undertaken to establish whether dissolved concentrations of contaminants are above threshold values.

A total of 3No rounds of groundwater sampling were undertaken within all 3No installed boreholes on site between the 31st July and 14th September 2023, with the exception of BH07 during the second round due to the well being dry. In addition, 3No rounds of surface water sampling were undertaken from both Upper and Lower Cannop between 6th July and 14th September 2023.

In addition to groundwater samples, the following soil and silt samples were subject to 2:1 L/S leachate analysis:

- 7No silt samples from Lower Cannop, and 5No silt samples from Upper Cannop.
- 3No soil samples from the Lower Cannop embankment fill, and 2No soil samples from the Upper Cannop embankment fill.

On account of the surface waters within Cannop Ponds being the primary controlled waters receptor, concentrations of leachable contaminants and concentrations of dissolved groundwater contaminants have been screened against criteria based on published water quality standards which included data from the following sources:

- Freshwater environmental quality standards (FEQS); and where no FEQS are available,
- UK drinking water standards (UK DWS);
- World Health Organisation (WHO) drinking water standards;

Surface water samples from Cannop Ponds were also tested to determine the baseline contaminant levels within the receiving waters to be used in the assessments, and to determine the bioavailability of particular heavy metal substances (copper, zinc, manganese and nickel) and to produce a site specific EQS using the pH, DOC and Ca values of receiving waters, in line with current guidance.

The results of the leachate and groundwater screening assessment are presented in Appendix B.

8.2 Leachate Tier 1 Screen

The results of the leachate analyses have been screened against the relevant assessment criteria. The results of the Tier 1 screen are summarised below showing the exceedances recorded.

Table 8-1: Tier 1 leachate screen

Determinand		Exceedances	Concentration range of exceedances (ug/l)	Screening Criteria (ug/l)
Metals	Cadmium	1No Lower Cannop silts 2No Upper Cannop silts	2.8 0.3 to 1.5	0.25 (FEQS)
	Lead	3No Lower Cannop silts 4No Upper Cannop silts	2.4 to 12 1.8 to 23	1.2 (FEQS)

Determinand		Exceedances	Concentration range of exceedances (ug/l)	Screening Criteria (ug/l)
	Manganese (bio)	2No Lower Cannop silts 5No Upper Cannop silts	280 to 1,021 434 to 6,042	123 (Bio EQS)
	Nickel (bio)	4No Upper Cannop silts	4.9 to 34	4.0 (Bio EQS)
	Zinc (bio)	1No Lower Cannop silts 5No Upper Cannop silts	21 21 to 288	12.3 (Bio EQS)
Inorganics	pH	1No Upper Cannop silts	5.2	<6 to >9 (FEQS)
PAHs	Anthracene	1No Upper Cannop silts	0.007	0.1 (FEQS)
	Fluoranthene	5No Lower Cannop silts	0.01 to 0.24	0.0063 (FEQS)
		4No Upper Cannop silts	0.01 to 0.45	
		2No Embankment fill	0.01 to 0.03	
Benzo(a)pyrene	1No Lower Cannop silts	0.01	0.00017 (FEQS)	
	2No Upper Cannop silts	0.09 to 0.12		
	1No Embankment fill	0.02		
Naphthalene	1No Lower Cannop Silts	8.4	2.0 (FEQS)	
There were no recorded exceedances of the screening criteria for BTEX or PCBs.				

The leachate screen indicates that in general, the embankment fill does not exhibit leachable contamination concentrations above the applied screening criteria with the exception of minor amounts of PAHs from BH07 at Lower Cannop and BH09 from Upper Cannop.

Soil descriptions from the locations of the PAH exceedances indicate that at the Lower Cannop sample from BH07 at 1.0m bgl, a faint hydrocarbon odour was noted along with anthropogenic materials including brick and clinker which may be the source of contamination.

Whilst the embankment fill was generally devoid of leachable contamination, the reservoir silts did record leachable heavy metals and PAHs over the applied FEQS. The shallow samples largely could not be logged due to there being no recovery, however deeper samples indicate that the silts comprise natural materials with no source of metals or PAHs evident.

On this basis it is likely that the metals and PAHs from past pollution events has settled out of suspension within the surface water onto the silts.

8.3 Groundwater Tier 1 Screen

The following section presents the results of chemical analysis of the groundwater from the 3No rounds of post site works sampling. Surface water average concentrations over the 3No rounds are also included as a baseline contaminant level.

Table 8-2: Tier 1 groundwater screen

Determinand	Exceedances	Exceedance concentration range (ug/l)	Surface water concentration average (ug/l)	Screening criteria
Chromium	LCP SW Round 2	7.1	7.2 (<0.25 during rounds 1 and 3)	4.7 (FEQS)
	UCP SW Round 2	7.3		
Manganese (bio)	BH03 Rounds 1,2,3	1702 to 6297	11.03	123 (FEQS)

Determinand	Exceedances	Exceedance concentration range (ug/l)	Surface water concentration average (ug/l)	Screening criteria
	BH07 Rounds 1,3* BH12 Rounds 1,2,3	1191 to 2382 1361 to 1957		
Zinc (bio)	BH03 Round 2 BH012 Round 2 LCP SW Round 2 UCP SW Round 2	41.57 34.71 13.70 19.18	5.92	12.3ug/l (FEQS)
Flouranthene	BH12 Round 2 UCP SW Round 3	0.03 0.25	<0.01**	0.0063 (FEQS)
Benzo(a)pyrene	UCP SW Round 3	0.08	<0.01**	0.00017 (FEQS)
<p>*No sample taken during the second round from BH07 due to dry well</p> <p>** Ignores UCP SW Round 3 as an outlier</p> <p>There were no recorded exceedances of the screening criteria for BTEX, TPH, PCBs, or pH.</p>				

The groundwater and surface water screen generally found that contaminants fell below the applied FEQS, and for those metals and PAHs that exceeded, exceedances were rarely recorded across successive rounds of monitoring with the exception of manganese.

Chromium exceedances were only identified within the surface waters, and only during the second round of monitoring. No leachable chromium exceedances were identified within either embankment fill or pond silts suggesting that a source is not present.

Bioavailable manganese exceeded the screening criteria with high concentrations in all 3No groundwater samples in all 3No rounds. This was mirrored in the pond silt leachate samples, however was not reflected in any of the surface water samples which showed an average concentration well below the FEQS. Manganese is a known contaminant in minewater, a potential source noted within the CSM, however is also generally found at high concentrations in natural soils due to background levels rather than due to a contamination source.

Bioavailable zinc was identified to exceed the FEQS in all surface and groundwater samples during Round 2, however no other exceedances were noted within Round 1 and 3. Again, zinc is a known contaminant in minewater, and in addition was identified in the CSM as a potential contaminant from the Stone Works to the south of Lower Cannop.

PAH exceedances were recorded in one sample of groundwater from BH12 during Round 2, and the Upper Cannop surface water sample during Round 3. Exceedances of the FEQS for fluoranthene were recorded in both samples, and benzo(a)pyrene within the Upper Cannop sample, with exceedances of both compounds mirrored in the leachate samples of the pond silts, though not encountered within the embankment fill from BH12.

8.4 Recommendations

A controlled waters risk assessment should be undertaken to confirm risk drivers and mitigation requirements during construction and operational phases once final design proposals are known.

9. Engineering Assessment

The following section describes the engineering implications of the material characteristics of the embankment dams.

9.1 Potential Failure Modes of Embankment Dams

The document “Risk Assessment for Reservoir Safety” [DEFRA, 2013] containing information from which the following table has been adapted, and is used herein to correlate potential failure modes to the material characteristics of the embankment dams.

Modern embankment dams are designed and detailed to include impermeable cores (normally clay) to provide effective seepage cutoff, constructed outwards from the core with progressively larger sized soil particles to act as a filter and provide strength to the dam.

Table 3 – Threats, failure modes, and breach types for embankment dams (after DEFRA, 2013)

Initiation threat	Type	Progression (failure mode)	Breach type
Floods	1	Crest overtopping leading to scour	Embankment collapse
	2	Spillway chute overtopping	
Wind generated waves	3	Crest overtopping by waves leading to instability of downstream slope	
Various, such as intense rainfall, wave overtopping	4	Saturation of downstream slope, leading to instability	
Deterioration of body or foundation of dam	5	Internal erosion – piping through the embankment	Local collapse along interface with structure
	6	Piping through foundation, or from embankment to foundation	
	7	Piping along interface between structure and embankment	
	8	Leakage from pipe/through culvert leads to internal erosion along interface between structure and embankment	

9.2 Dam Composition

Lower Cannop embankment dam was described in earlier sections to comprise several metres of granular soil overlying a more consistent thickness of cohesive soils.

Upper Cannop embankment dam was described to comprise interbedded layers of cohesive and granular soils throughout its depth.

The granular nature of these dams, in the upper part of the lower dam and sporadically throughout Upper Cannop dam, leave both with zones of relatively high permeability for groundwater flow through their mass.

Both dams then interface with natural mudstone Coal Measures at depth, which are of naturally low permeability when intact (with permeability increased slightly when fractured throughout its mass).

9.3 Impact of Material Characteristics on Dam Stability

9.3.1 Internal Stability

Neither dam has the characteristics of a modern design where a clay core provides effective seepage cut-off.

The persistent nature of granular soils within the dams' makeup, and associated high permeability, leave them susceptible to internal damage through the natural flow of groundwater due to the hydraulic difference between the dammed side and the downstream side.

This hydraulic difference, or head, results in naturally occurring seepage through the dam, and can result in the washing through of any fine particles (silts and clays) which are present, resulting in progressive increase in permeability throughout the life of the dam. These erosion processes can result in localised 'piping', where a preferential path is taken by seeping groundwater, with the piping becoming larger until a breach failure mode is reached for the dam.

There is a history of remedial works undertaken on both dams¹ to address falling water levels resulting from seepage in Upper Cannop dam and voids formed within Lower Cannop dam. The nature and increasing frequency of these historical remedial works is indicative of this progressive increase in permeability of the embankment material over time.

The presence of these granular layers in both the upper and lower dam places them at risk of failure through deterioration of the body of the dam (Type 5 from the table above).

9.3.2 Face Stability

The downstream faces of the dams are obscured by vegetation growth, however these are anticipated to comprise the same granular soils as encountered within the dam body. Whilst the vegetation does add some benefit to protecting the face of the dam from extreme rainfall (Type 4 from the table above), it can also have a loosening and promote piping seepage where roots die off and decompose.

9.3.3 Spillway Stability

There is potential for seepage beneath and along the underside interface of both spillways of the dams due to the granular nature of the embankment soils, with mechanisms such as the piping described above (and failure modes Type 7/8 from the table above).

It is understood that grouting has been undertaken beneath the spillway of the lower embankment dam due to voids having formed from this mechanism. While this has reduced the risk of the spillway slab failing in the short-term, the root cause has not been addressed and further voids may form in the long-term.

9.4 Potential Interventions to Improve Dam Impermeability

As described above, high permeability dams are prone to internal failure after progressive erosion and piping of the soils which they are made of.

Whilst it is impractical to replace the existing dam material with low permeability soils (such as clays), high permeability soils can be mitigated through reducing their permeability through engineering intervention.

Two typical methods of reducing soil permeability include [a] grouting or [b] sheet piling.

- a. Grouting comprises the addition of cementitious slurries into the ground, either through positive injection (ie. under pressure) or through natural permeability migration. Grouting fills the pore spaces between granular soil particles to reduce the mass permeability, to values similar to having a contemporary clay cored dam.
- b. Driving steel corrugated sheet piles vertically into the core of the embankment dam provides a structural 'cut-off', around which seepage groundwater would need to flow. Where these piles can be

¹ 286412-ARP-XX-XX-RP-CX-6102 Cannop Ponds - Dam Safety Assessment Report, Arup
<https://www.forestryengland.uk/article/press-release-cannop-ponds-engineering-report-released>

embedded into underlying low-permeability soils such as the mudstones beneath this site, the mass permeability can be markedly reduced.

Both of these solutions, when implemented appropriately, can achieve permeability performance equivalent to that of a modern clay cored dam.

It is important to note however that the granular soils comprising Upper and parts of Lower Cannop embankment dams can be susceptible to severe grout losses during treatment (as demonstrated when boreholes of the lower dam found difficulties being backfilled), resulting in the potential for:

- High grout volumes, leading to a potentially unsustainable solution;
- Unpredictable cost and programme implications;
- Migration of grout slurry to areas and habitats beyond the dams, which could be sensitive to such;

The use of steel sheet piles requires the use of heavy plant for driving, which necessarily occupy a substantial footprint on the crest width of a dam. This would require the dam to be assessed for its capacity to support piling equipment.

To provide sufficient groundwater cutoff, the sheet piles would need to be embedded into the mudstone Coal Measures at up to 8m depth below the crest of Upper Cannop dam, and up to 11m depth below the crest of the Lower Cannop dam. It should be noted that these depths are in the middle portion of the original river valley, and the depth to mudstone reduces to the east and west.

The faces of Upper Cannop dam include large boulders to protect from scour and erosion. BH11 and BH16 were noted to include cobbles and boulders within the embankment itself. The mudstone Coal Measures beneath the embankment dam fill is expected to be resistant to sheet piles being driven to a nominal embedment, unless hard percussive driving is used. These characteristics are likely to preclude effective sheet piling of the dam if persistent throughout, and probing in advance to confirm the suitability of these interventions would be prudent.

Drawings

Drawing 1 – Lower Cannop Pond Exploratory Hole Plan A

Drawing 2 – Lower Cannop Pond Exploratory Hole Plan B

Drawing 3 – Upper Cannop Pond Exploratory Hole Plan A

Drawing 4 – Upper Cannop Pond Exploratory Hole Plan B

Drawing 5 – Features and Constraints Plan



Exploratory Hole Locations A3

- BH (DS+RC)
- TP
- WS
- SLSW
- Geological Cross Section

Coordinate System: British National Grid

Metres

1	21/09/2023	RC			
Rev	Date	By	Chkd	Appd	Authd

ARUP

4 Pierhead St
Cardiff CF10 4QP
Tel +44 29 2047 3727
www.arup.com

Client
Forestry England

Project Name
Cannop Ponds

Drawing Title
Lower Cannop Pond Exploratory Hole Locations

Scale at A3
1:500

Role
Ground Investigation Report

Suitability
Issue

Project Number 286412	Rev 1
Drawing Number 1	

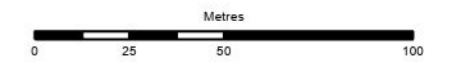




Exploratory Hole Locations

- BH (DS+RC)
- TP
- WS
- SLSW

Coordinate System: British National Grid



1	21/09/2023	RC			
Rev	Date	By	Chkd	Appd	Authd



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Client
Forestry England

Project Name
Cannop Ponds

Drawing Title
Lower Cannop Pond Exploratory Hole Locations Including Silt Samples

Scale at A3
1:2,000

Role
Ground Investigation Report

Suitability
Issue

Project Number 286412	Rev 1
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Drawing Number
2

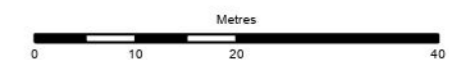


Exploratory Hole Locations

A3

- BH (DS+RC)
- TP
- WS
- SLSW
- Geological Cross Section

Coordinate System: British National Grid



1	21/09/2023	RC			
Rev	Date	By	Chkd	Appd	Authd

ARUP

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Client
Forestry England

Project Name
Cannop Ponds

Drawing Title
Upper Cannop Pond Exploratory Hole Locations

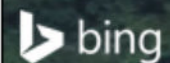
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Role
Ground Investigation Report

Suitability
Issue

Project Number 286412	Rev 1
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Drawing Number
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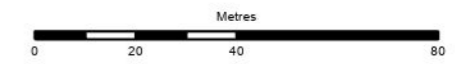




Exploratory Hole Locations

- BH (DS+RC)
- TP
- WS
- SLSW

Coordinate System: British National Grid



1	21/09/2023	RC			--
Rev	Date	By	Chkd	Appd	Authd



4 Pierhead St
Cardiff CF10 4QP
Tel +44 29 2047 3727
www.arup.com

Client
Forestry England

Project Name
Cannop Ponds

Drawing Title
Upper Cannop Pond Exploratory Hole Locations Including Silt Samples

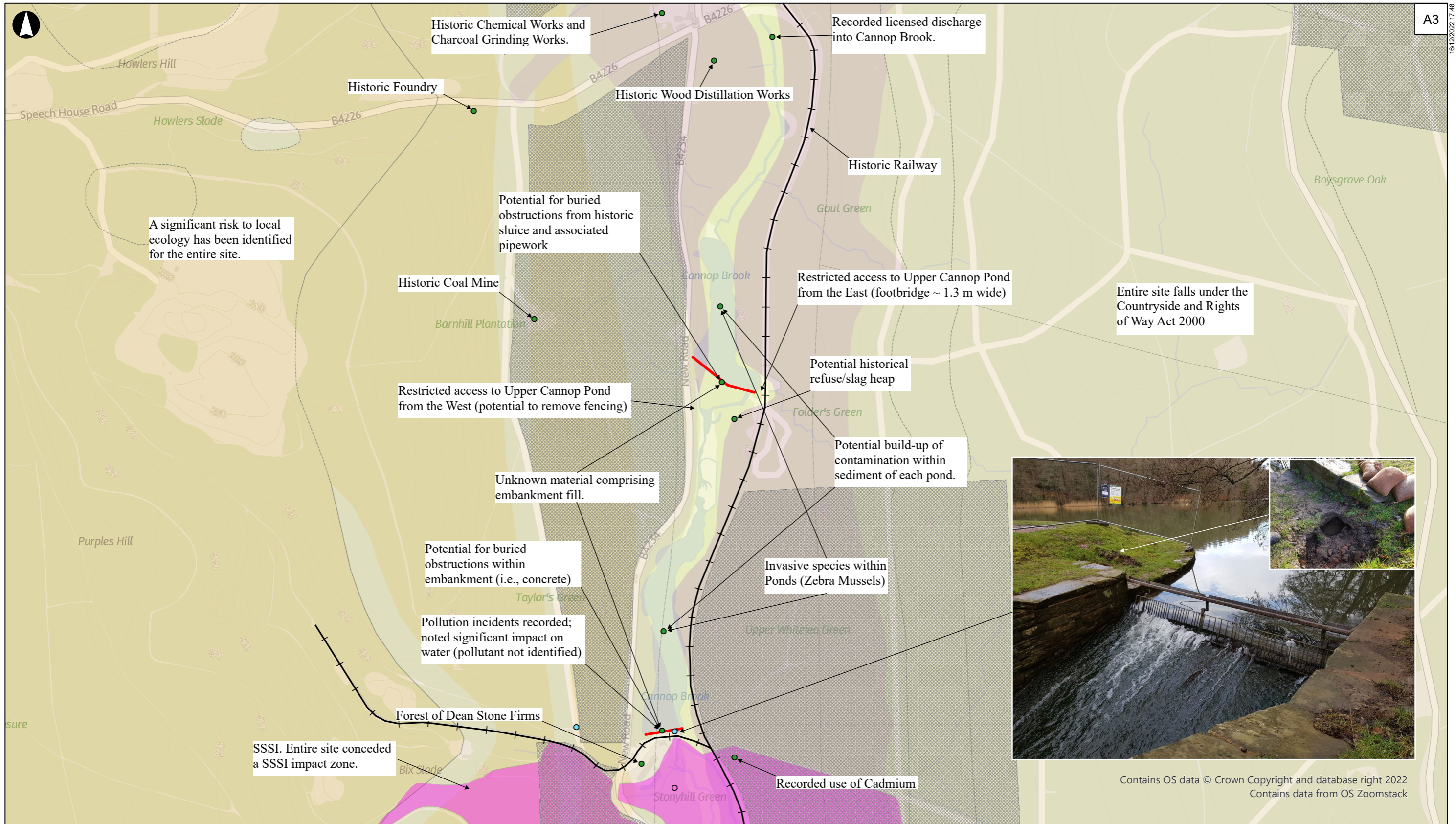
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Role
Ground Investigation Report

Suitability
Issue

Project Number 286412	Rev 1
---------------------------------	-----------------

Drawing Number
4



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Contains data from OS Zoomstack

● Surface Water Abstraction
● Groundwater Abstraction
● Potential Sources of Contamination
— Dams
— Historic Railway

Coleford Member (Sandstone)
 Coleford Member (Mudstone, Siltstone and Sandstone)
 Head Deposits
 Alluvium

● Potential Sources of Contamination
● Groundwater Abstraction License Point
● Surface Water Abstraction License Point

Coordinate System: British National Grid
 Geology and mining extent sourced from BGS

Issue	14/12/2022	RC	CJ		
Rev	Date	By	Chkd	Appd	Authd

Scale at A3
1:8,000
 Role
Geotechnical and Geo-Environmental Desk Study
 Suitability
Issue
 Project Number
286412
 Drawing Name
Drawing 5

ARUP
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 Cardiff CF10 4QP
 Tel +44 29 2047 3727
 www.arup.com
 Client
Forestry England

Project Name
Cannop Ponds
 Drawing Title
Features and Constraints Plan

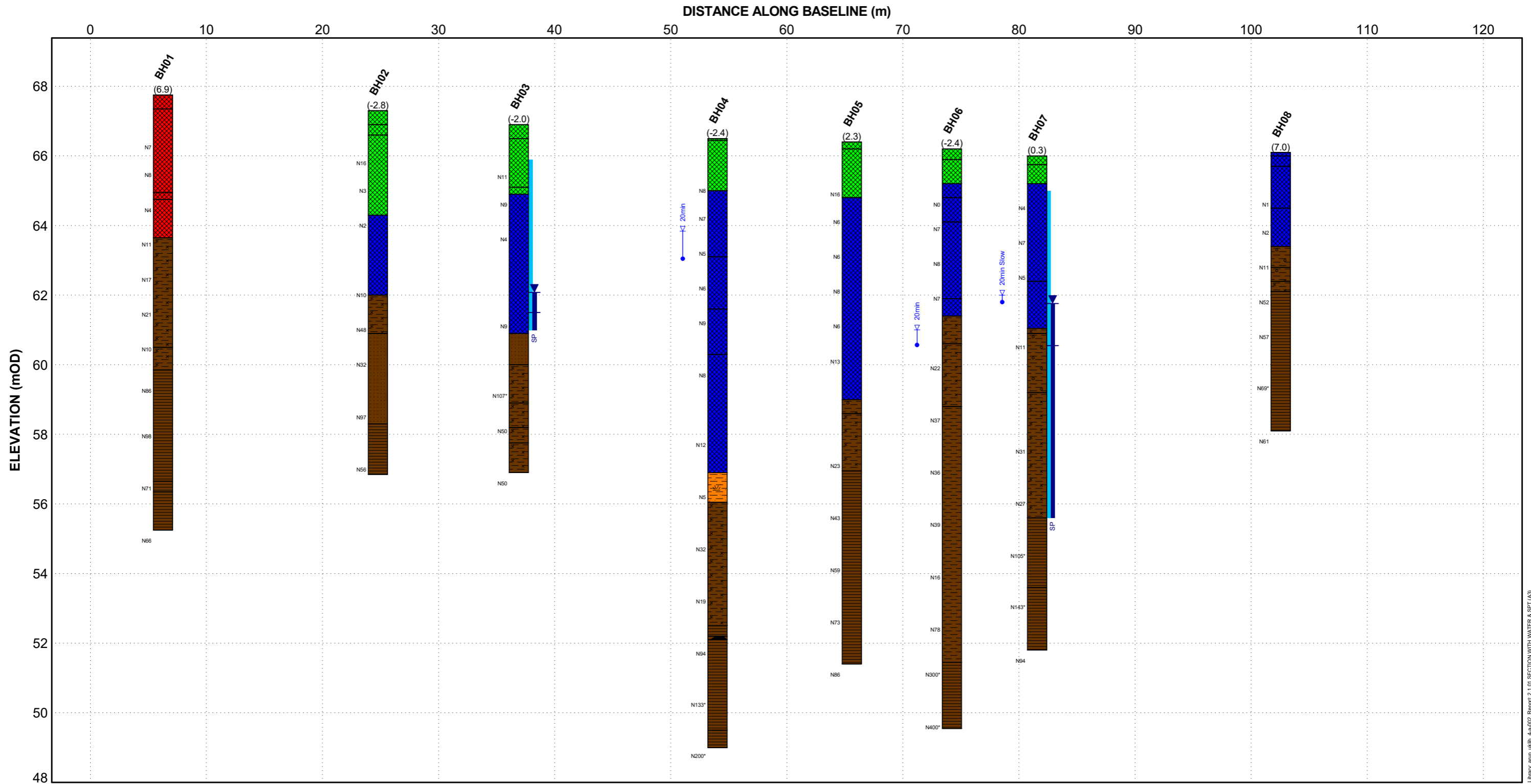
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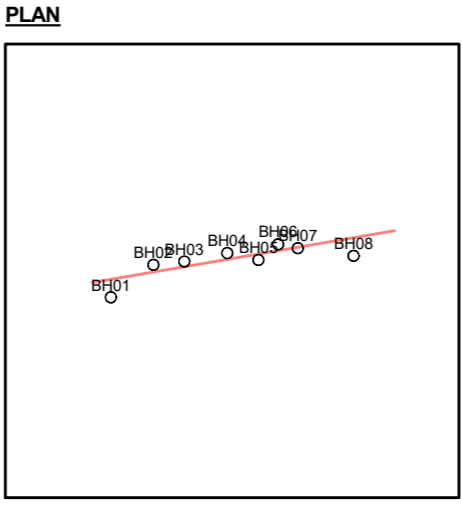
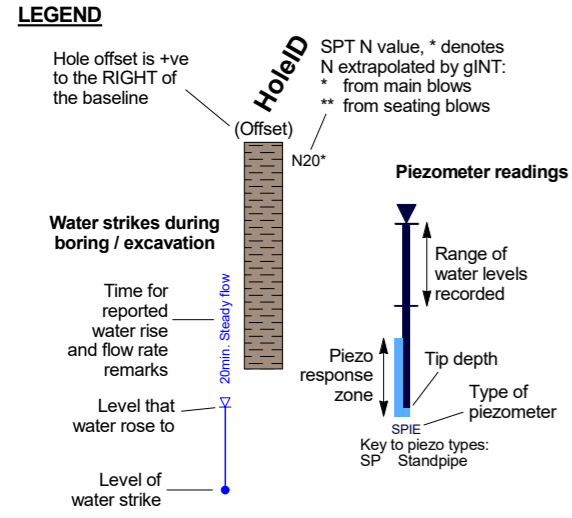
Appendix A

Geotechnical Figures



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SCALE 1:111V 1:333H @ A3-L



COLOUR LEGEND

- Made Ground [MG]
- Embankment Fill Granular [EFG]
- Embankment Fill Cohesive [EFC]
- Alluvium [ALV]
- Coal Measures [CM]

MATERIALS

- Fill (MADE GROUND)
- Silty Clay
- MUDSTONE
- SANDSTONE
- Sandy organic CLAY
- COAL
- Gravelly CLAY
- CLAY

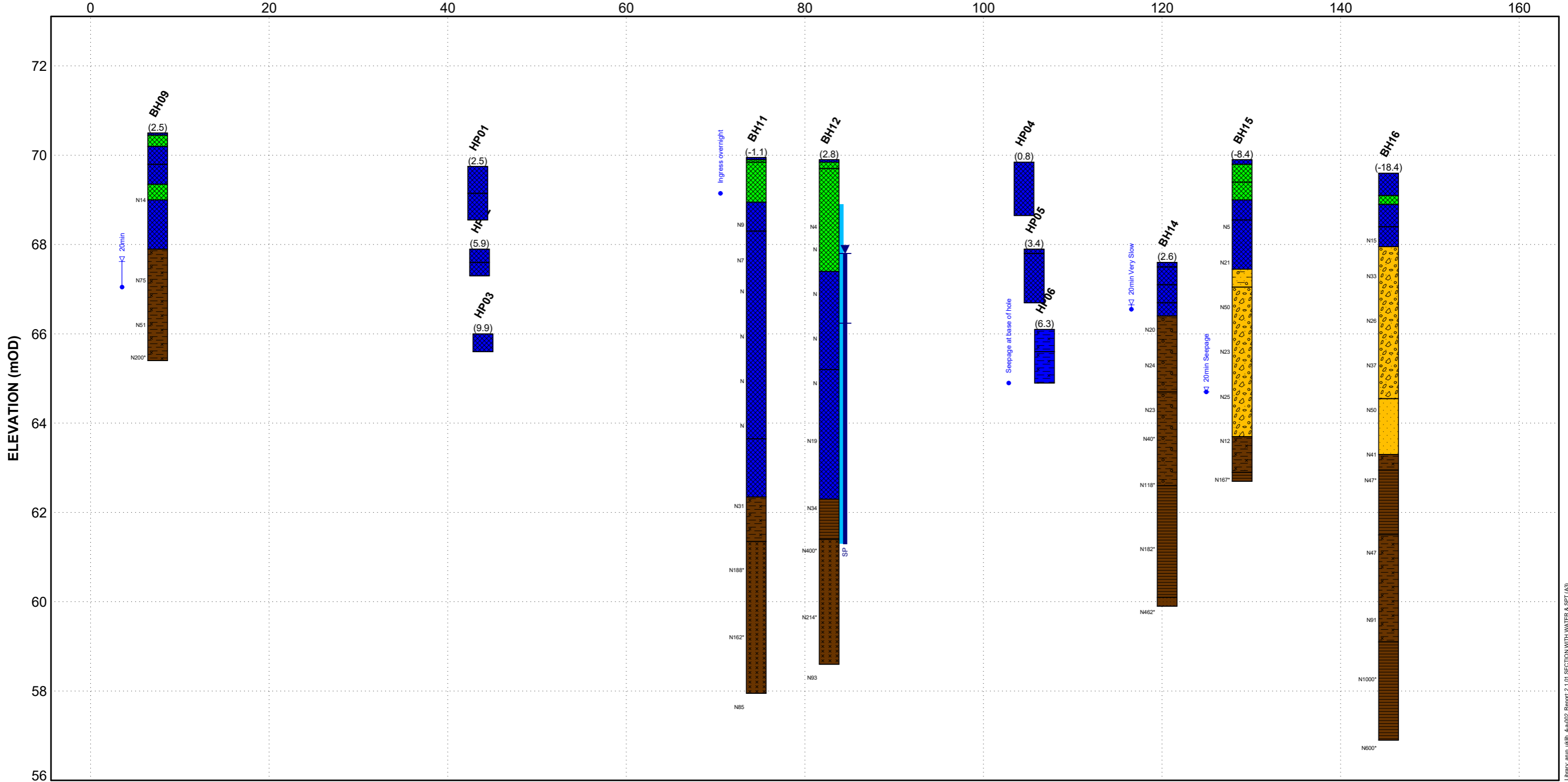
**CANNOP PONDS
GEOLOGICAL CROSS SECTION**

286412

FIGURE 1

A:\P\g\NT\41010\0117
 Made by Richard Giffell on 5-Oct-23

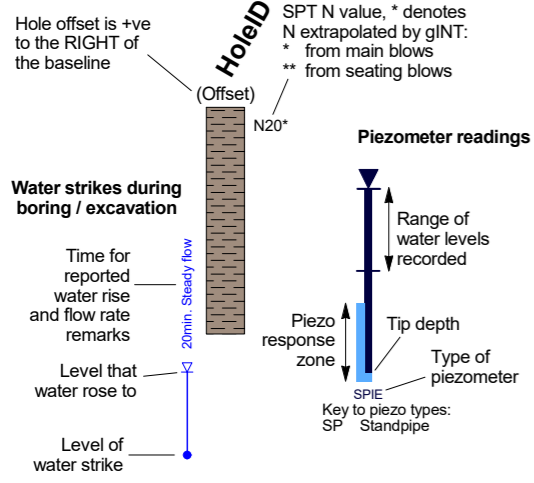
DISTANCE ALONG BASELINE (m)



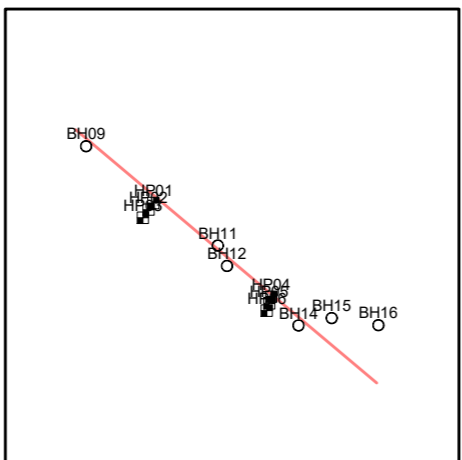
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SCALE 1:89V 1:444H @ A3-L

LEGEND



PLAN



COLOUR LEGEND

- Embankment Fill Granular [EFG]
- Embankment Fill Cohesive [EFC]
- Head Deposits [HD]
- Coal Measures [CM]

MATERIALS

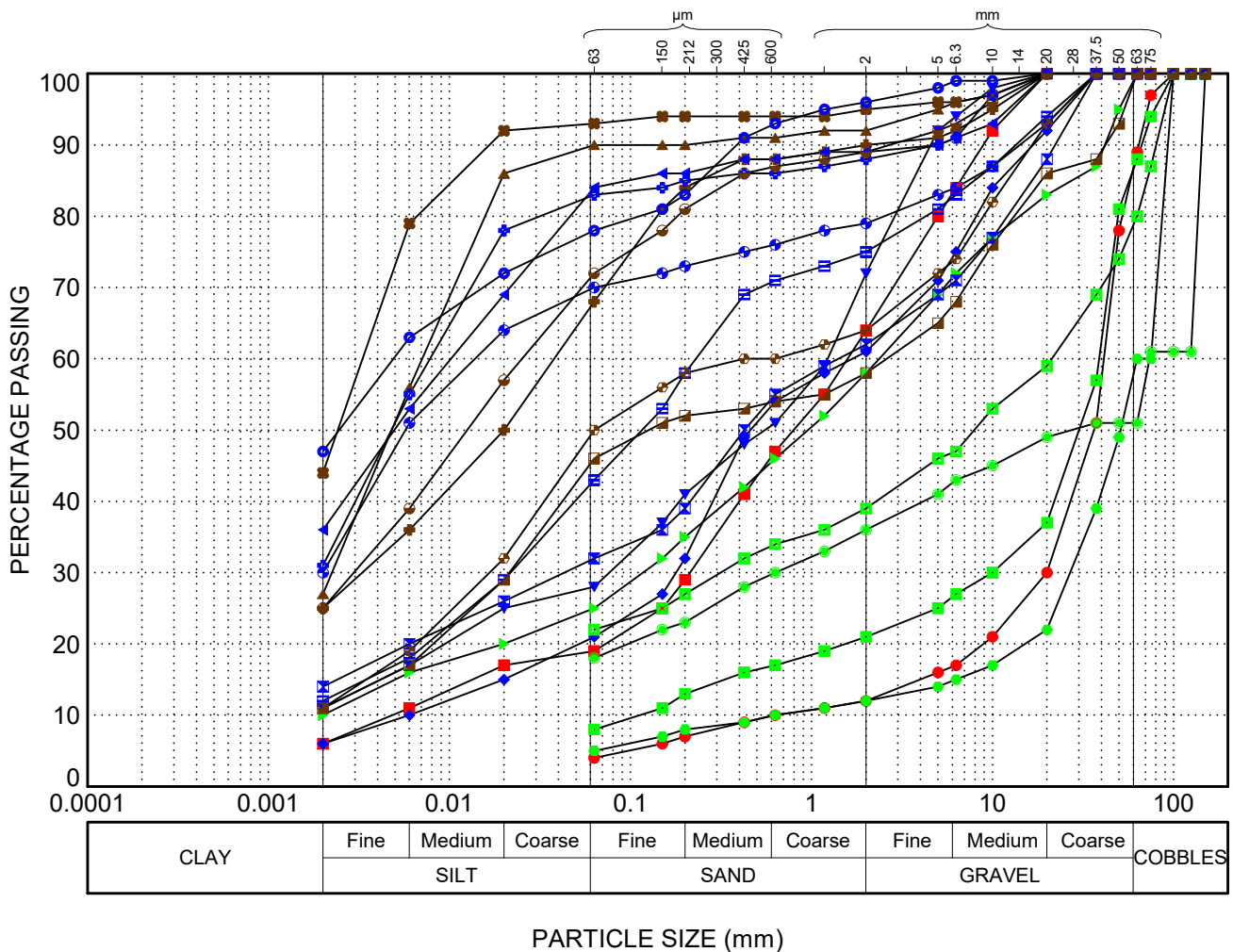
- Fill (MADE GROUND)
- Silty sandy CLAY
- Silty Clay
- SAND
- SILTSTONE
- MUDSTONE
- Sandy gravelly CLAY
- SANDSTONE
- Clayey gravelly SAND
- Sandy GRAVEL

**CANNOP PONDS
GEOLOGICAL CROSS SECTION**

286412

FIGURE 2

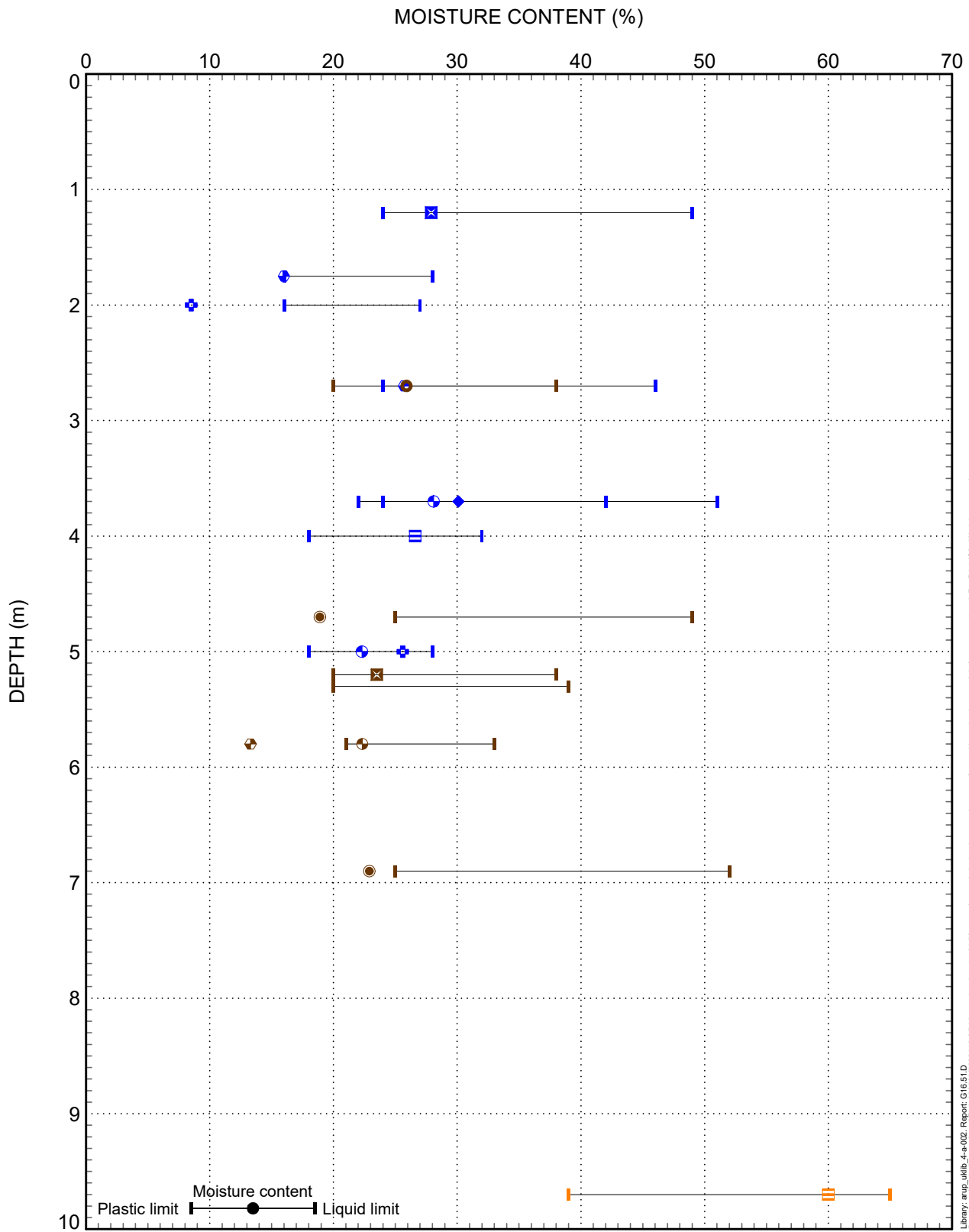
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- Made Ground (MG)
- Embankment Fill Granular (EFG)
- Embankment Fill Cohesive (EFC)
- Coal Measures (CM)
- BH01, 1.00m
- BH01, 3.20m
- ▲ BH01, 5.80m
- ⊠ BH01, 7.00m
- BH02, 2.00m
- ▼ BH02, 3.00m
- + BH02, 5.30m
- BH03, 1.00m
- ▲ BH03, 3.70m
- ▼ BH04, 1.00m
- ⊠ BH04, 4.00m
- BH05, 0.80m
- ⊕ BH05, 2.50m
- ◆ BH05, 5.00m
- ▤ BH06, 1.40m
- ⊕ BH06, 2.70m
- ⊕ BH06, 6.50m
- ⊠ BH07, 0.50m
- BH07, 1.20m
- BH07, 5.70m
- BH08, 2.70m

CANNOP PONDS PARTICLE SIZE DISTRIBUTION

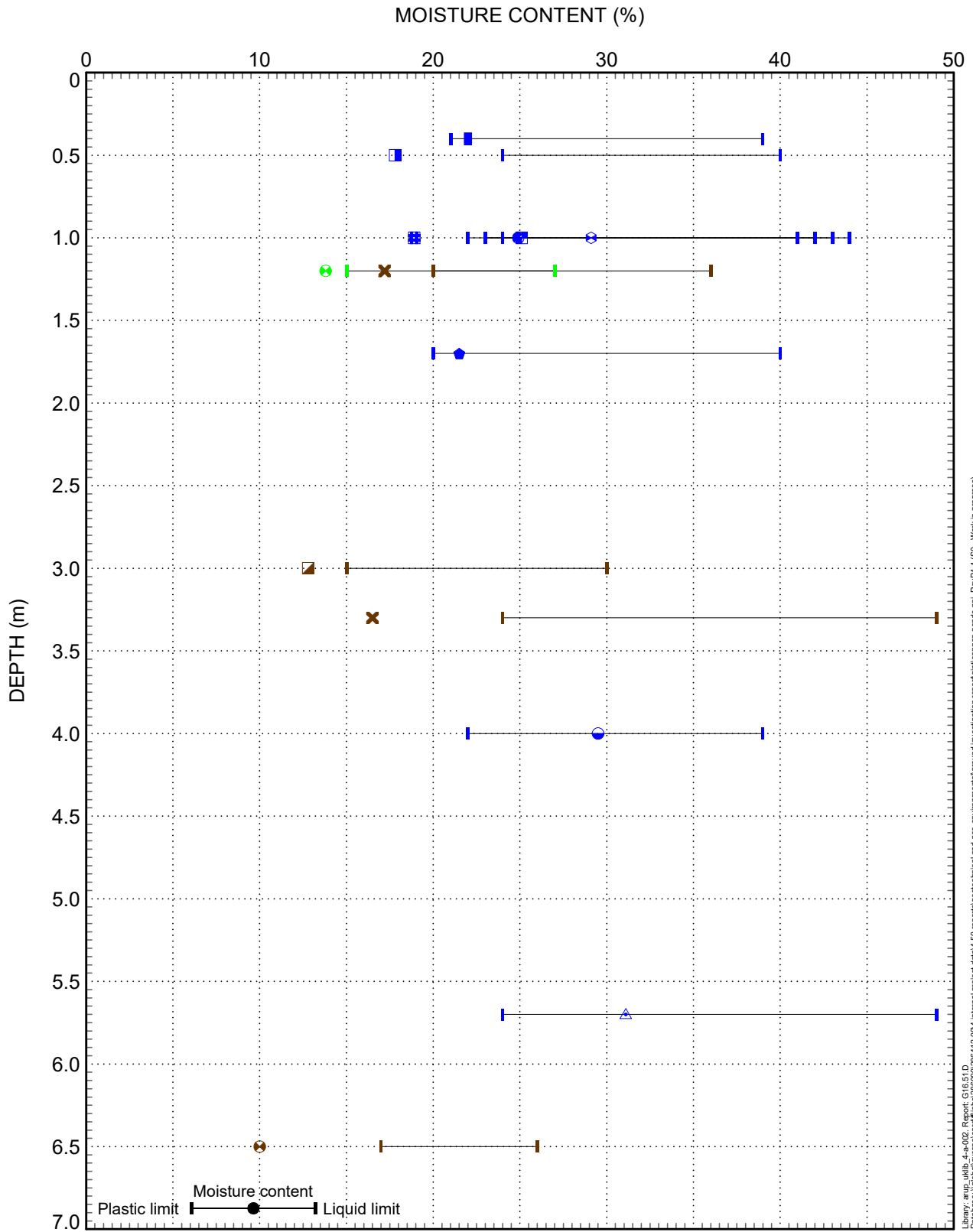


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CANNOP PONDS ATTERBERG LIMITS

286412

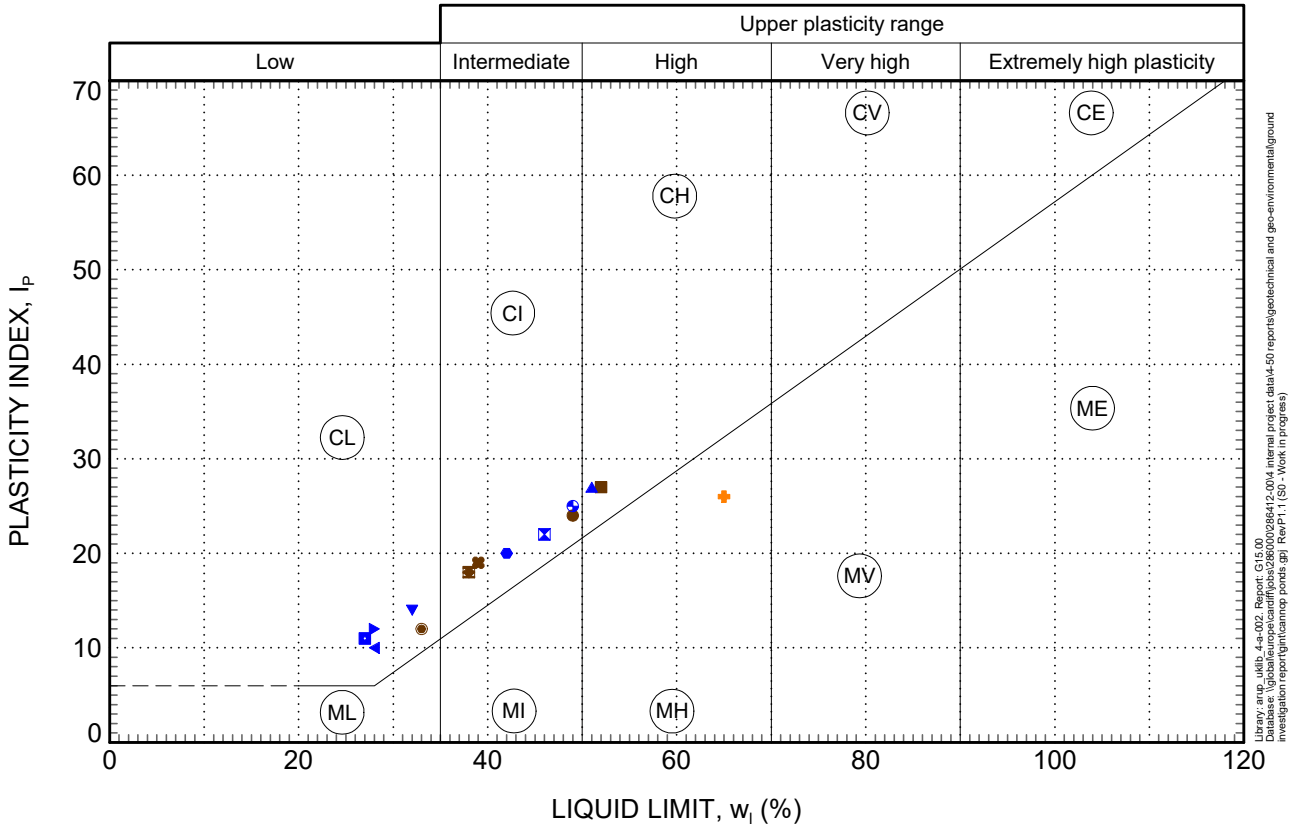
FIGURE 5



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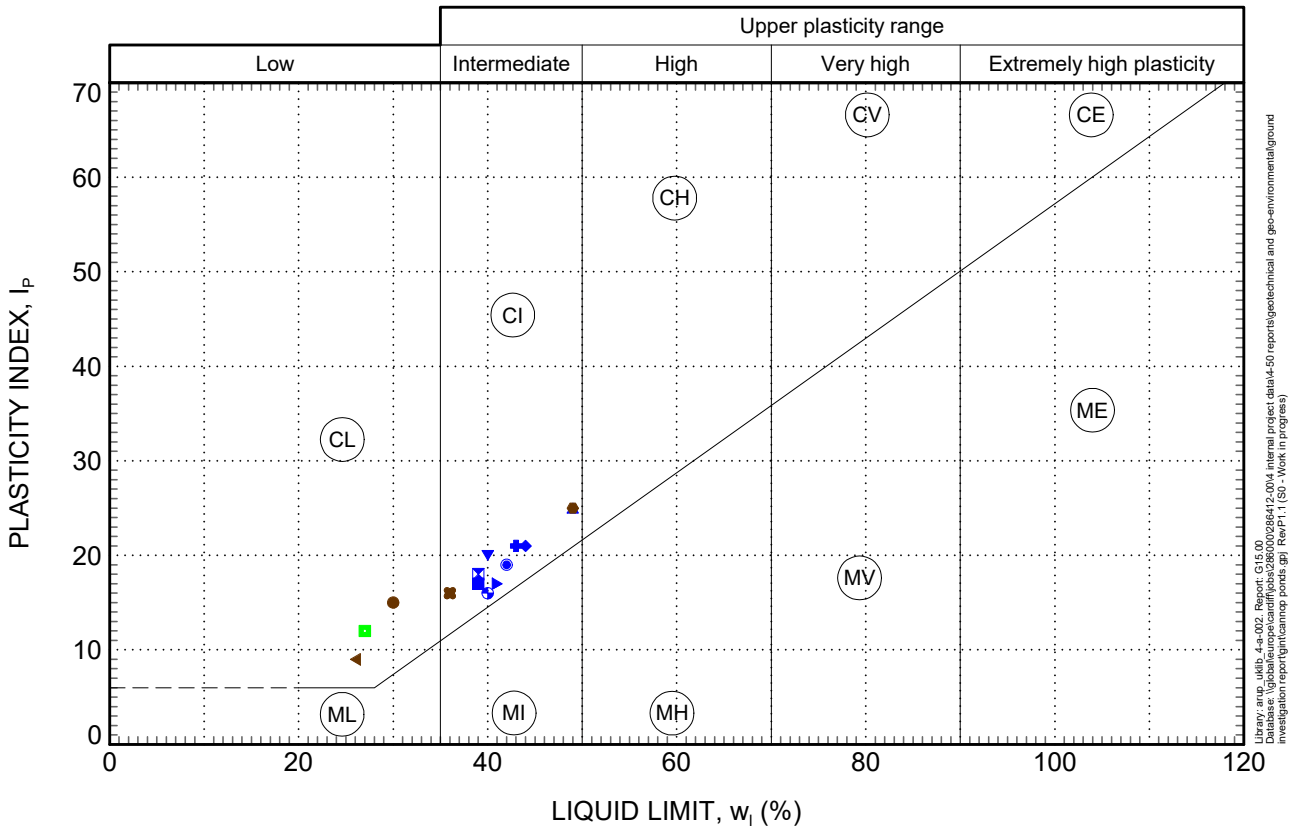
- Embankment Fill Cohesive (EFC)
- Head Deposits (HD)
- Coal Measures (CM)
- BH09
- BH11
- ▲ BH12
- ✕ BH14
- ◆ BH15
- BH16
- ⊗ BH17
- ⊗ HP01
- HP02
- HP04
- HP05
- HP06

CANNOP PONDS ATTERBERG LIMITS



- Embankment Fill Cohesive (EFC)
- Alluvium (ALV)
- Coal Measures (CM)
- BH01, 4.70m
- BH01, 6.90m
- ▲ BH02, 3.70m
- BH02, 5.30m
- BH03, 3.70m
- ▼ BH04, 4.00m
- BH04, 9.70m
- BH05, 2.00m
- ▲ BH05, 5.00m
- ▼ BH06, 1.75m
- BH06, 2.70m
- BH06, 5.80m
- BH07, 1.20m
- ◆ BH07, 5.20m
- BH08, 2.70m

CANNOP PONDS PLASTICITY CHART

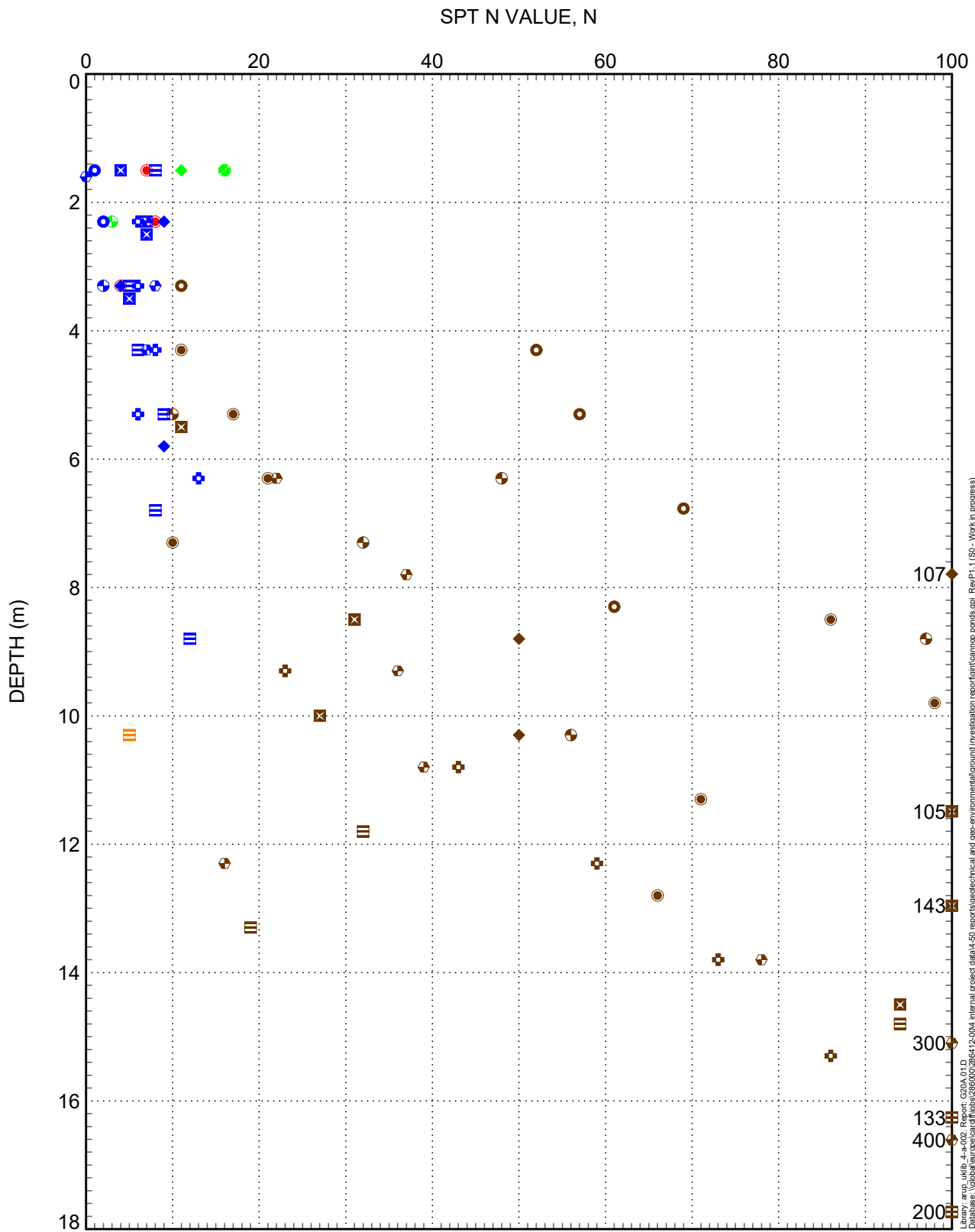


- Embankment Fill Cohesive (EFC)
- Head Deposits (HD)
- Coal Measures (CM)
- BH09, 3.00m
- BH11, 4.00m
- ▲ BH12, 5.70m
- BH14, 1.20m
- BH14, 3.30m
- ▼ BH15, 1.70m
- BH16, 1.00m
- BH17, 1.20m
- ▲ BH17, 6.50m
- ▼ HP01, 1.00m
- ⊠ HP02, 0.40m
- ⊙ HP04, 1.00m
- ⊕ HP05, 0.50m
- ◆ HP06, 1.00m

CANNOP PONDS PLASTICITY CHART

286412

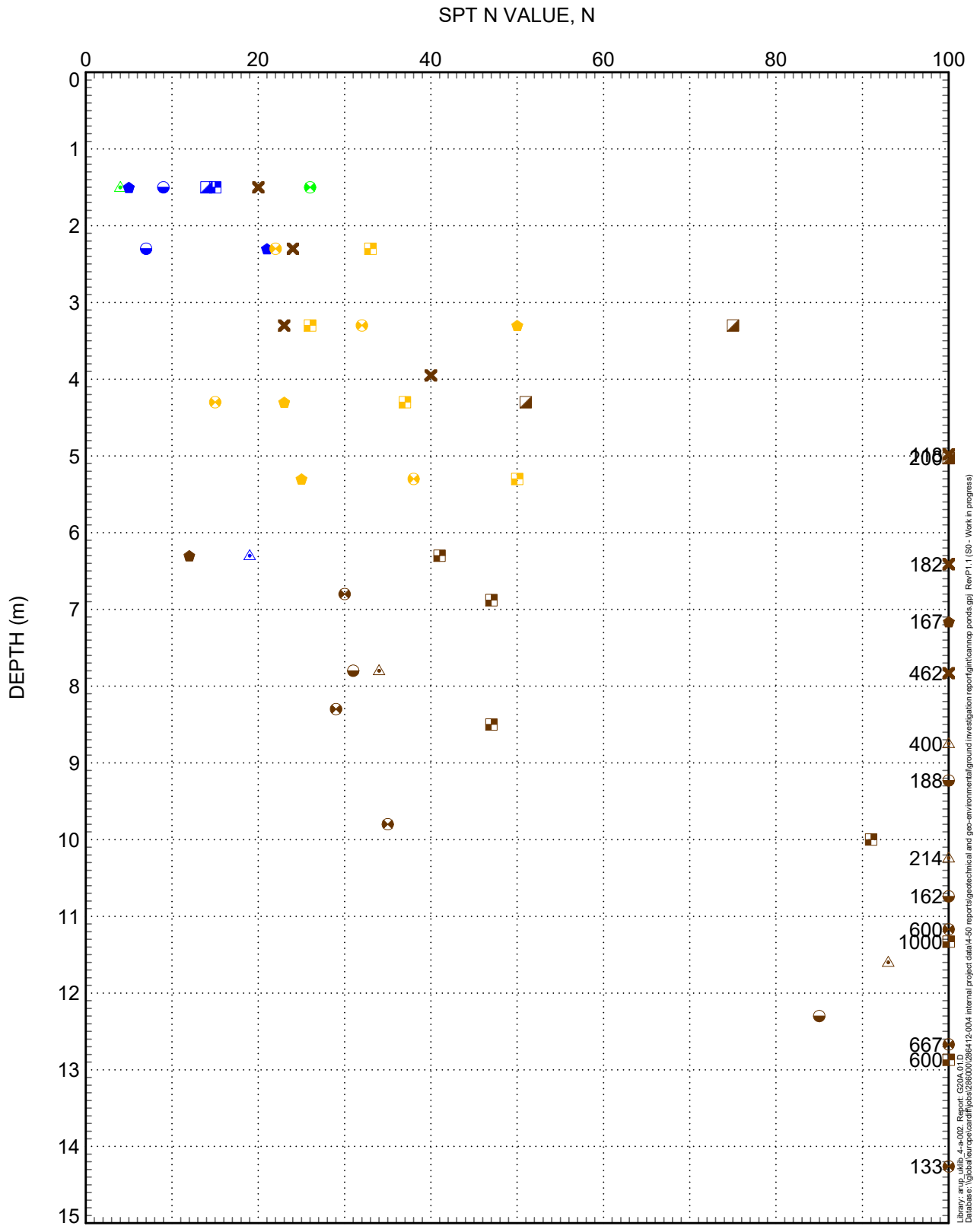
FIGURE 8



- Made Ground (MG)
- Embankment Fill Granular (EFG)
- Embankment Fill Cohesive (EFC)
- Alluvium (ALV)
- Coal Measures (CM)

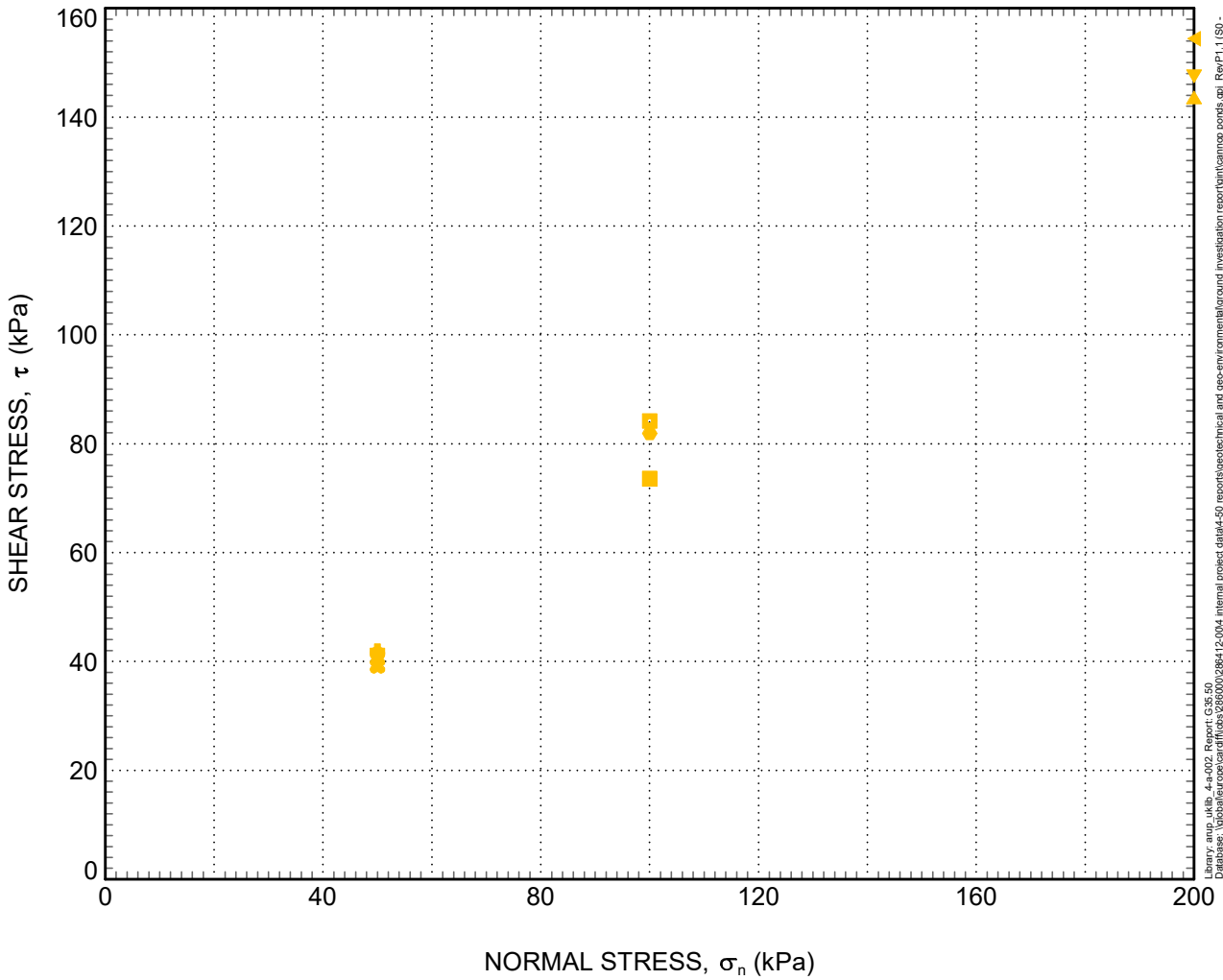
- BH01
- BH02
- BH03
- BH04
- BH05
- BH06
- BH07
- BH08

CANNOP PONDS STANDARD PENETRATION TESTS



Library: \\global\corp\cardiff\psa\286412\004 internal project data\4-50 reports\geotechnical and geo-environmental\ground investigation report\gnit\cannop ponds.gpi Rev.P1.1 (SO - Work in progress)

CANNOP PONDS STANDARD PENETRATION TESTS

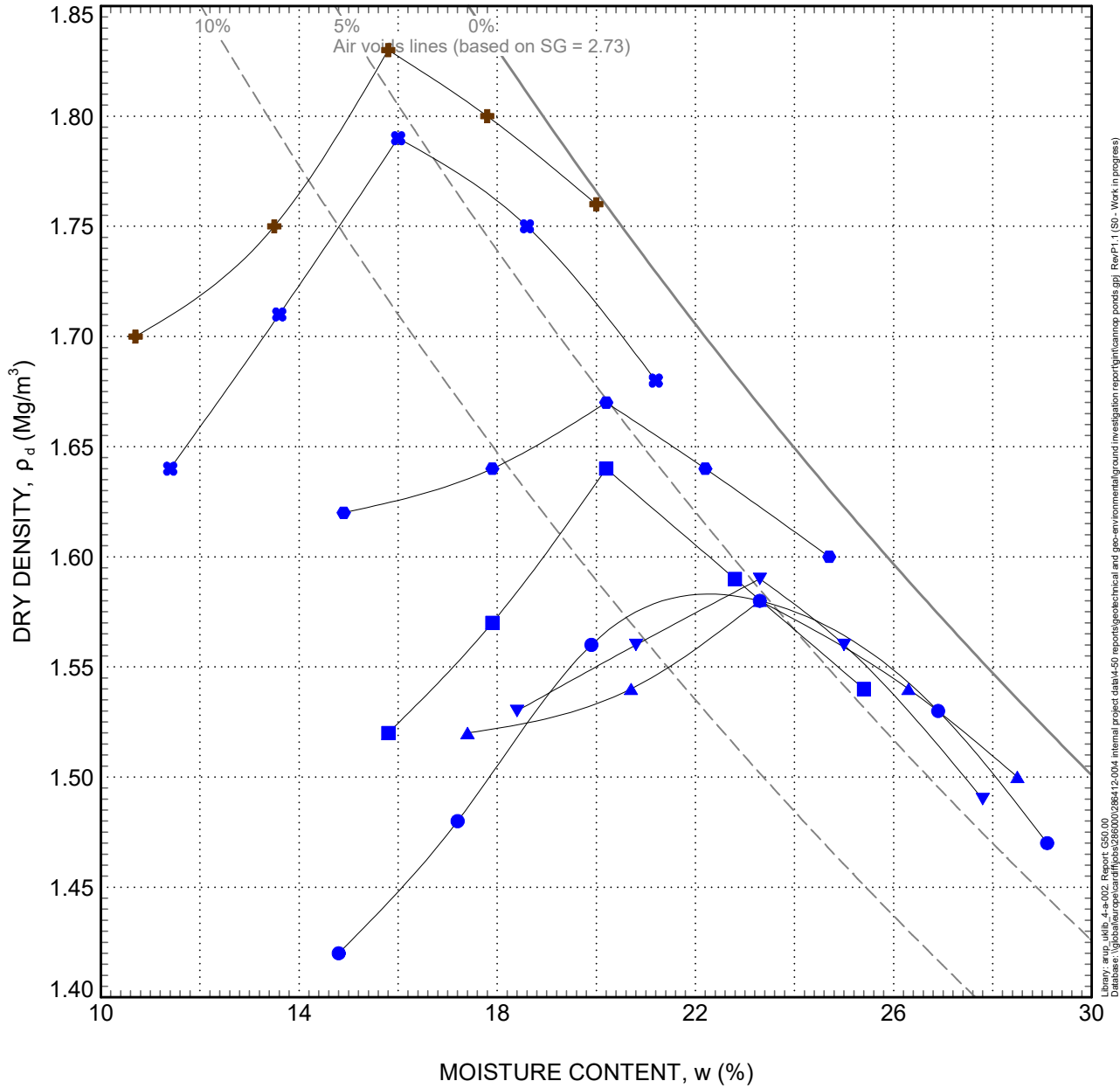


- Head Deposits (HD)
- BH15, 4.00m
- BH15, 4.00m
- ▲ BH15, 4.00m
- ⊠ BH16, 3.00m
- BH16, 3.00m
- ▼ BH16, 3.00m
- ⊕ BH17, 3.00m
- BH17, 3.00m
- ◀ BH17, 3.00m

**CANNOP PONDS
SHEAR BOX TESTS**

286412

FIGURE 11



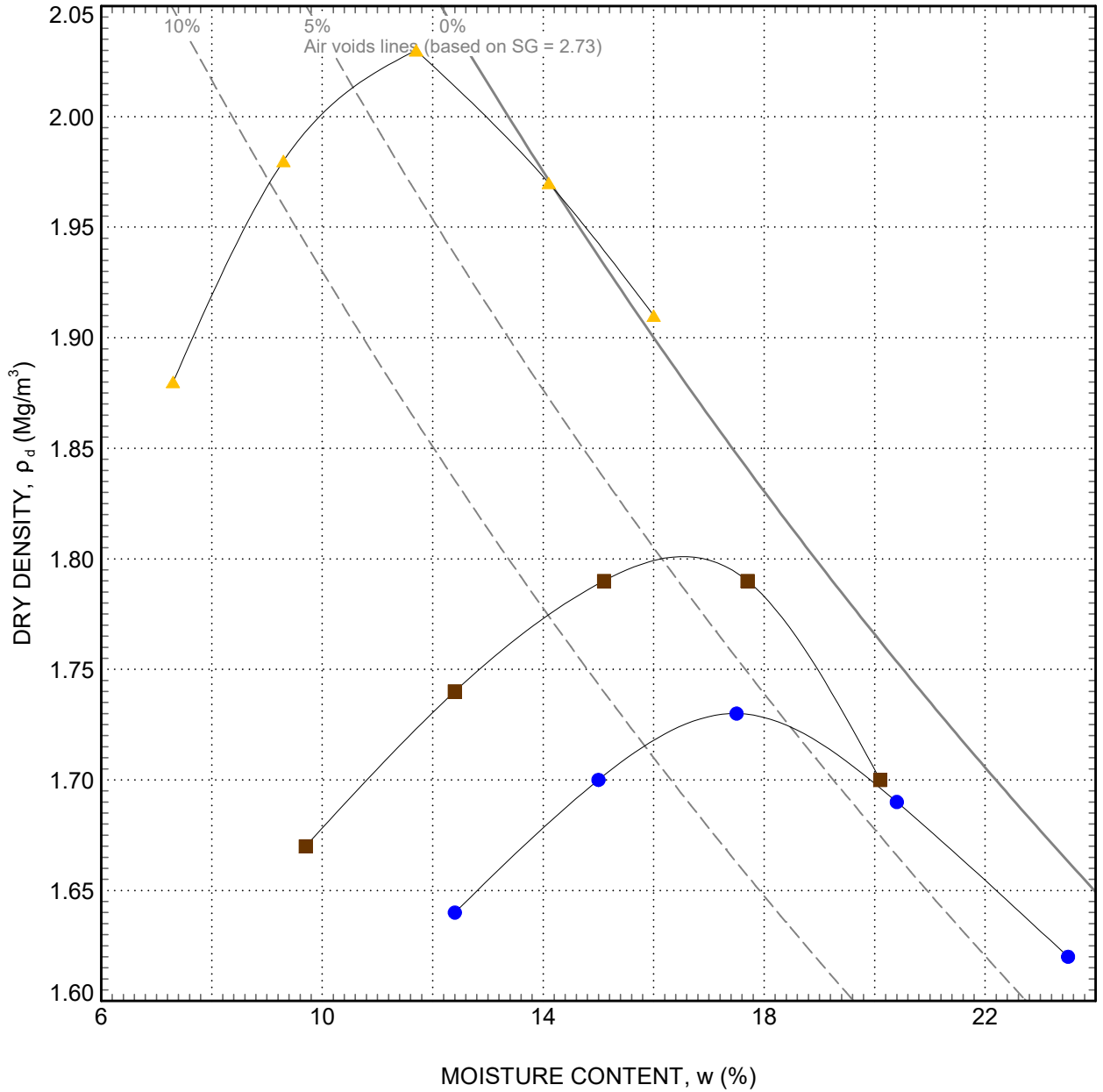
- Embankment Fill Granular (EFG)
- Embankment Fill Cohesive (EFC)
- Coal Measures (CM)
- BH02, 3.00m
- BH03, 3.00m
- ▲ BH04, 4.00m
- ⊠ BH05, 5.00m
- BH06, 3.00m
- ▼ BH07, 2.20m
- ⊠ BH08, 3.00m

Library: erup_wklib_4-e-002; Report: G50.00; Database: \\globalneurcal\drif\gis\286412\004 internal project data\4-50 reports\geotechnical and geo-environmental\ground investigation report\git\cannop_ponds\gpi Rev/P1.1(S)- Work in progress)

CANNOP PONDS COMPACTION TESTS

286412

FIGURE **12**



- Embankment Fill Cohesive (EFC)
- ▲ Head Deposits (HD)
- BH11, 4.00m
- BH14, 1.20m
- ▲ BH15, 4.00m

CANNOP PONDS COMPACTION TESTS

286412

FIGURE 13

Appendix B

Chemical Screening Tables

Summary of Asbestos Analysis

Asbestos in Soil Samples

CANNOP PONDS

Lab No	Sample ID	Material		Comment*	Analyst
		Type	Result		
2225542	UC03 1	SOIL	NAD	none	Josh Best
2225543	UC03 2 3.00	SOIL	NAD	none	Josh Best
2225544	UC04 1 3.00	SOIL	NAD	none	Josh Best
2225545	UC05 1	SOIL	NAD	none	Josh Best
2225546	UC05 2 3.00	SOIL	NAD	none	Josh Best
2225547	UC06 1	SOIL	NAD	none	Josh Best
2225548	UC06 2 2.75	SOIL	NAD	none	Josh Best
2202169	BH01 1.00-1.20	SOIL	NAD	none	Michael Kay
2226248	BH09 2 0.10-0.30	SOIL	NAD	none	Lee Kerridge
2205262	LC01 2 2.45	SOIL	NAD	none	Michael Kay
2205263	LC02 1	SOIL	NAD	none	Michael Kay
2205264	LC02 2 3.00	SOIL	NAD	none	Michael Kay
2205265	LC03 1	SLUDGE	NAD	none	Michael Kay
2205266	LC03 2 3.00	SOIL	NAD	none	Michael Kay
2205267	LC04 1 3.00	SOIL	NAD	none	Michael Kay
2205268	LC05 1 1.80	SOIL	NAD	none	Michael Kay
2206318	BH12 2 0.30-0.50	SOIL	NAD	none	Darryl Fletcher
2208055	HP05 2 1.00-1.20	SOIL	NAD	none	Darryl Fletcher
2202379	BH07 3 1.00-1.20	SOIL	NAD	none	Michael Kay
2204660	BH06 2 0.50-0.70	SOIL	NAD	none	Keith Wilson
2204661	UC01 1 0.00-0.30	SOIL	NAD	none	Keith Wilson
2204799	BH15 2.80-3.00	SOIL	NAD	none	Keith Wilson
2205310	BH07 6 4.00-4.20	SOIL	NAD	none	Darryl Fletcher
2205311	BH05 6 4.80-5.00	SOIL	NAD	none	Darryl Fletcher
2205315	BH04 2 0.50-0.70	SOIL	NAD	none	Vicky Convery
2207304	BH09 5 2.45-2.55	SOIL	NAD	none	Michael Kay
2208055	HP05 2 1.00-1.20	SOIL	NAD	none	Darryl Fletcher
2204792	BH08 0.50-0.70	SOIL	NAD	none	Keith Wilson
2204793	BH08 1.00-1.20	SOIL	NAD	none	Keith Wilson
2202177	BH03 0.50-0.70	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Location	Waterbody	Date	Measured Cu Concentration (dissolved) (µg/l)	Measured Zn Concentration (dissolved) (µg/l)	Measured Mn Concentration (dissolved) (µg/l)	Measured Ni Concentration (dissolved) (µg/l)	pH	DOC	Ca	RESULTS (Copper)			RESULTS (Zinc)			RESULTS (Mn)			RESULTS (Ni)						
										Site-specific PNEC Dissolved Copper (µg/l)	BioF	Bioavailable Copper Concentration (µg/l)	Risk Characterisation Non Ratio	Site-specific PNEC Dissolved Zinc (µg/l)	BioF	Bioavailable Zinc Concentration (µg/l)	Risk Characterisation Non Ratio	Site-specific PNEC Dissolved Manganese (µg/l)	BioF	Bioavailable Manganese Concentration (µg/l)	Risk Characterisation Non Ratio	Site-specific PNEC Dissolved Nickel (µg/l)	BioF	Bioavailable Nickel Concentration (µg/l)	Risk Characterisation Non Ratio
LC01			0.4	9.5	70	1.2	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	6.34	0.40	144.53	0.85	59.57	0.48	9.04	0.44	0.53	0.13
LC01			2.5	16	44	0.9	7.9	3.8	45	12.50	0.08	0.20	0.20	23.86	0.46	7.71	0.67	144.53	0.85	37.44	0.30	9.04	0.44	0.40	0.10
LC02			0.8	14	330	0.8	7.9	3.8	45	12.50	0.08	0.06	0.06	23.86	0.46	6.39	0.59	144.53	0.85	389.11	3.72	9.04	0.44	0.37	0.07
LC02			0.4	6.9	8.5	0.7	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	3.15	0.29	144.53	0.85	3.25	0.06	9.04	0.44	0.31	0.08
LC03			0.7	46	1200	0.8	7.9	3.8	45	12.50	0.08	0.06	0.06	23.86	0.46	21.91	1.83	144.53	0.85	1023.12	8.30	9.04	0.44	0.27	0.07
LC03			0.4	6.9	11	0.5	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	3.15	0.29	144.53	0.85	9.36	0.08	9.04	0.44	0.22	0.06
LC04			0.4	14	63	8.3	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	6.39	0.59	144.53	0.85	53.61	0.44	9.04	0.44	3.67	0.92
UC02			1	220	2800	11	7.9	3.8	45	12.50	0.08	0.08	0.08	23.86	0.46	190.49	9.22	144.53	0.85	2212.63	17.99	9.04	0.44	4.87	1.22
UC02			0.4	46	510	2.1	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	21.91	1.83	144.53	0.85	454.02	3.33	9.04	0.44	0.93	0.23
UC01			1.3	630	5200	76	7.9	3.8	45	12.50	0.08	0.10	0.10	23.86	0.46	287.78	26.46	144.53	0.85	4423.28	35.98	9.04	0.44	53.62	8.41
UC01			3.3	270	4200	52	7.9	3.8	45	12.50	0.08	0.26	0.26	23.86	0.46	123.33	11.31	144.53	0.85	3574.25	29.06	9.04	0.44	23.01	5.75
UC06			1.4	75	7100	30	7.9	3.8	45	12.50	0.08	0.11	0.11	23.86	0.46	34.28	3.14	144.53	0.85	6042.15	48.12	9.04	0.44	13.22	3.32
BH12			0.7	4.2	4.2	0.5	7.9	3.8	45	12.50	0.08	0.06	0.06	23.86	0.46	1.92	0.16	144.53	0.85	3.57	0.03	9.04	0.44	0.22	0.06
BH07			2.2	14	33	0.7	7.9	3.8	45	12.50	0.08	0.18	0.18	23.86	0.46	6.39	0.59	144.53	0.85	2.81	0.02	9.04	0.44	0.31	0.08
BH07			3.9	8.5	16	1.5	7.9	3.8	45	12.50	0.08	0.31	0.31	23.86	0.46	3.88	0.36	144.53	0.85	12.77	0.10	9.04	0.44	0.66	0.17
BH04			0.6	2.5	6.8	0.5	7.9	3.8	45	12.50	0.08	0.05	0.05	23.86	0.46	1.14	0.10	144.53	0.85	5.79	0.05	9.04	0.44	0.22	0.06
BH09			1	13	23	0.5	7.9	3.8	45	12.50	0.08	0.08	0.08	23.86	0.46	0.59	0.05	144.53	0.85	1.96	0.02	9.04	0.44	0.22	0.06
LCP SW			0.5	1.8	36	2.8	7.9	3.8	45	12.50	0.08	0.04	0.04	23.86	0.46	0.87	0.08	144.53	0.85	30.64	0.25	9.04	0.44	1.24	0.31
UCP SW			0.7	1.3	27	2.7	7.9	3.8	45	12.50	0.08	0.08	0.08	23.86	0.46	0.59	0.05	144.53	0.85	22.96	0.19	9.04	0.44	1.19	0.30
BH03			0.8	3.5	3800	5.8	7.9	3.8	45	12.50	0.08	0.08	0.08	23.86	0.46	1.60	0.15	144.53	0.85	3233.88	26.28	9.04	0.44	2.57	0.64
BH07			1.3	3.4	2800	3	7.9	3.8	45	12.50	0.08	0.10	0.10	23.86	0.46	1.55	0.14	144.53	0.85	2282.85	19.37	9.04	0.44	1.33	0.33
BH12			0.9	15	2300	6	7.9	3.8	45	12.50	0.08	0.07	0.07	23.86	0.46	6.85	0.63	144.53	0.85	1957.23	15.91	9.04	0.44	2.60	0.66
LCP SW			2.7	30	7.7	1.7	7.9	3.8	45	12.50	0.08	0.22	0.22	23.86	0.46	13.78	1.28	144.53	0.85	6.55	0.05	9.04	0.44	0.75	0.19
UCP SW			2.8	42	3	2.6	7.9	3.8	45	12.50	0.08	0.22	0.22	23.86	0.46	19.18	1.78	144.53	0.85	3.55	0.02	9.04	0.44	1.15	0.29
BH03			0.4	91	2000	5.7	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	41.57	3.81	144.53	0.85	1703.02	13.84	9.04	0.44	2.52	0.63
BH12			1.8	76	1600	5.8	7.9	3.8	45	12.50	0.08	0.14	0.14	23.86	0.46	34.71	3.18	144.53	0.85	1361.62	11.07	9.04	0.44	2.57	0.64
BH03			0.4	1.6	7400	7.5	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	0.73	0.07	144.53	0.85	6277.45	51.26	9.04	0.44	3.32	0.83
BH07			0.7	1.3	1400	3	7.9	3.8	45	12.50	0.08	0.06	0.06	23.86	0.46	0.59	0.05	144.53	0.85	1191.42	9.69	9.04	0.44	1.33	0.33
BH12			1.7	7.5	2200	7.5	7.9	3.8	45	12.50	0.08	0.14	0.14	23.86	0.46	3.43	0.31	144.53	0.85	1872.23	12.22	9.04	0.44	3.32	0.83
LCP SW			0.4	1.3	23	2.1	7.9	3.8	45	12.50	0.08	0.03	0.03	23.86	0.46	0.59	0.05	144.53	0.85	1.96	0.02	9.04	0.44	0.93	0.23
UCP SW			0.7	1.3	1.8	1.2	7.9	3.8	45	12.50	0.08	0.06	0.06	23.86	0.46	0.59	0.05	144.53	0.85	1.53	0.01	9.04	0.44	0.53	0.13

Appendix C

Chemical Screening Tables



CANNOP PONDS INTRUSIVE GI

FACTUAL GROUND INVESTIGATION REPORT

Prepared for FORESTRY ENGLAND

Report Ref: 37707

Geotechnical Engineering Ltd
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CANNOP PONDS INTRUSIVE GI



FACTUAL GROUND INVESTIGATION REPORT

Prepared for FORESTRY ENGLAND

Report Ref: 37707

PROJECT: Proposed remedial works associated with the ponds and dams.

CONSULTANT: Ove Arup and Partners

VOLUME - VERSION	STATUS	ORIGINATOR	CHECKER	APPROVED	DATE
1 of 1 – A	DRAFT	JH	CT	-	14/09/23
1 of 1 - A	FINAL	JH	CT	CT	25/10/23
ORIGINATOR			APPROVER		
					
JOHN HANSON Director			Colin Thomas Consultant		

The report is not to be used for contractual or engineering purposes unless this sheet is signed and the report designated "Final".

The report has been prepared for the sole use and reliance by Forestry England. GEL accepts no liability as a result of the use or reliance of this report by any other parties.



CONTENTS

REPORT	PAGE
1. INTRODUCTION	1
2. SITE LOCATION AND GEOLOGY.....	1
3. GROUND INVESTIGATION.....	2
3.1 Fieldwork	2
3.2 Logging.....	5
3.3 Monitoring.....	6
3.4 Laboratory Testing.....	7
4. REFERENCES	9

FIGURES	Nos.
EXPLORATORY HOLE LOCATION PLAN	1 & 2

APPENDICES

APPENDIX A	FIELDWORK DATA
APPENDIX B	LABORATORY TESTING
APPENDIX C	CHEMICAL ANALYSES



1. INTRODUCTION

Proposals for the potential remediation of Cannop Ponds are being considered. Geotechnical Engineering Limited (GEL) was instructed by Forestry England to carry out an investigation to determine the ground conditions.

The scope of works and terms and conditions of appointment were specified by the Consultant and the Client respectively and GEL correspondence reference T34150 dated 29th March 2023. The investigation was carried out under direction and supervision of the Consultant.

This report describes the investigation and presents the findings.

2. SITE LOCATION AND GEOLOGY

The site is situated at Cannop Ponds, West Dean, Lydney and may be located by its National Grid co-ordinates SO 608 106.

British Geological Survey (BGS) England and Wales (Sheet No. SO 61 SW, 1:10,560, 1958) and the BGS online geology (1:50,000) indicate the site is locally underlain by head and alluvial deposits. Solid geology comprises mudstone, siltstone, and sandstone of the Coleford and Cinderford Members of the Upper Coal Measures. Made Ground associated with the dam construction at each pond and past coal mining activities is also anticipated.



3. GROUND INVESTIGATION

3.1 Fieldwork

The fieldwork was carried out in general accordance with BS5930:2015+A1:2020 during the period the 3rd to the 21st July 2023 and comprised twenty-six boreholes, six hand dug pits and surface water sampling.

The exploratory hole locations were selected by the Consultant and set out by this Company and are shown on Figures 1 and 2. The co-ordinates at each exploratory hole were established by this Company using either GPS techniques or in the case of boreholes UC01 and UC02 by What-Three-Words. The ground level at each exploratory hole, with the exception of boreholes LC01 to LC05 and UC01 to UC06, was determined using GPS techniques. The surface water samples were taken from the following locations:

Location	Sample id	Easting	Northing
Lower Cannop pond	LCP SW	360791.1	210031.2
Upper Cannop pond	UCP SW	360869.9	210801.4

The boreholes, referenced BH01 to BH08, BH11, BH12, BH14, BH16 and BH17 (Appendix A), were formed using a track-mounted Geotechnical Pioneer Rig. Initially, an inspection pit was hand excavated at each borehole location to a maximum depth of 1.20m to check for buried services. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars.

Heavy duty dynamic sampling techniques were then employed to produce a continuous disturbed sample of 112mm nominal diameter. The samples were recovered in semi-rigid plastic liner. The exception being BH02, where rotary coring techniques were initially



employed to penetrate a sandstone boulder obstruction prior to continuing with heavy duty dynamic sampling techniques.

On refusal to dynamic sampling the boreholes were continued by rotary core drilling techniques utilising a water or polymer flush. A double-tube swivel core barrel with semi-rigid plastic liner was utilised to recover a continuous sample of 120mm diameter.

The dynamic samples and rotary core were extracted horizontally from the sampler and core barrel respectively, the semi-rigid liner was cut to length and caps placed at each end to retain moisture content. All samples and core were retained in sequence in labelled, wooden coreboxes.

Due to access restrictions, boreholes referenced BH09 and BH15 (Appendix A), were formed using a Terrier rig. Initially, an inspection pit was hand excavated at each borehole location to a maximum depth of 1.20m to check for buried services. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars. Dynamic sampling techniques were then employed to produce a continuous disturbed sample of 83 or 97mm nominal diameter reducing to a minimum of 50mm as the borehole was advanced. The samples were recovered in semi-rigid plastic liner. The samples were extracted horizontally from the sampler, labelled and caps placed each end to retain moisture.

Undisturbed samples of 100mm nominal diameter were taken in suitable cohesive soils using a thin walled, open drive sampler (UT100). Samples were capped on site to prevent moisture loss.

Standard penetration tests (SPT) were carried out in general accordance with BS EN ISO 22476-3:2005+A1:2011. A split barrel or a solid cone was used depending upon the materials encountered and the split barrel samples retained in airtight jars. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm



seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive generally completed after a further 100 blows. Detailed SPT results, together with the energy ratio (E_r), are presented in Appendix A and summarised as uncorrected N values on the borehole logs.

Boreholes were monitored for groundwater ingress as dynamic sampling proceeded. Upon encountering water, sampling was temporarily stopped to allow the level to stabilise. Water levels were also recorded at the start and finish of each day's work and on completion of the borehole and are presented on the relevant log.

On completion, gas/water monitoring standpipes were installed in BH03, BH07 and BH12. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response zone of non-calcareous pea gravel. The installation was sealed above and below with a bentonite or cement grout and accessed via a double valve assembly. The installations were protected at the surface by a lockable stopcock cover set in concrete. Installation details are given on the relevant borehole log.

On completion, the remainder of the boreholes were backfilled with cementitious grout and capped with bentonite and concrete.

Trial pits, referenced HP01 to HP06 (Appendix A), were hand excavated in two sections down the dam profile to replace proposed boreholes (BH10 and BH13). Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars prior to backfilling the trial pits with arisings.

The boreholes, referenced LC01 to LC05 and UC03 to UC06 (Appendix A), were located overwater within the existing ponds in order to obtain silt samples from the pond beds. The boreholes were carried out using a Terrier 2000 rig set upon a floating pontoon. Boreholes



UC01 and UC02 (Appendix A) were located in a marshy area and conducted using a hand auger.

Initially and where possible, a disturbed sample was taken from the pond bed surface using a sample scoop. Dynamic sampling techniques were employed to produce a continuous disturbed sample of 83 or 97mm nominal diameter. The samples were recovered in semi-rigid plastic liner.

The samples were extracted horizontally from the sampler, labelled and caps placed each end to retain moisture.

On completion, the casing was removed to allow the boreholes to collapse.

Samples for chemical analyses were dispatched daily from site directly to DETS under a Chain of Custody. The remaining samples were brought to this Company's laboratory for testing and storage.

3.2 Logging

The logging of soils and rocks was carried out by an Engineering Geologist in general accordance with BS5930:2015+A1:2020. A key to the exploratory hole logs is presented in Appendix A.

Detailed descriptions of the core and samples are given in the borehole logs, Appendix A, along with details of sampling, in situ testing, groundwater ingress, installations and relevant comments on drilling techniques.

Hand vane tests were carried out on suitable samples. The results are summarised on the borehole logs.



Suitable core subsamples were selected and the core was carefully logged and prepared prior to preserving the subsample by wrapping in clingfilm/tinfoil and coating with at least three layers of wax. The sample was further protected by a covering of waxed cheesecloth, labelled and transported horizontally in padded, wooden coreboxes.

Prior to logging, photographs of the heavy duty dynamic samples and core were taken and are presented separately.

3.3 Monitoring

The standpipes were developed by bailing until at least three well volumes of water had been removed. Water levels recorded within the installations are presented in Appendix A, these include a number of hourly readings undertaken on the 24th July 2023.

Three post fieldwork visits were undertaken to carry out gas monitoring and water sampling. The visits were undertaken on the 31st July, 21st August and the 14th September 2023.

The installations were monitored for gas flow and then tested for methane, carbon dioxide, oxygen, hydrogen sulphide and carbon monoxide using a Gas Data GFM 435 gas analyser. Subsequent readings are tabulated in Appendix A.

The installations were monitored for Volatile Organic Compounds (VOC's) using a MiniRAE Lite Portable Photo-Ionisation Detector (PID) with a 10.6eV gas discharge lamp. The detector uses an ultra violet light source to break down the chemicals into positive and negative ions (ionisation). The detector measures the charge of the ionised gas and converts the signal into current. The current is then amplified and displayed as "ppm"; after



measurement the ions reform the original gas or vapour allowing it to be sampled. The readings are presented in Appendix A.

3.4 Laboratory Testing

A series of laboratory testing schedules were prepared by the Consultant, the results are presented in Appendix B.

The natural water content was determined on thirty selected samples in accordance with BS EN ISO 17892-1:2014.

Liquid limit and plastic limit tests were carried out on twenty-nine selected samples in accordance with BS EN ISO 17892-12:2018:5.3 & 5.5. An Atterberg line plot has also been presented.

Particle size distributions were determined in accordance with BS EN ISO 17892-4:2016 for forty-one samples by wet sieving [5.2]. The fine fractions of thirty-five of these samples were further analysed by sedimentation using the pipette method [5.4]. The results are presented as grading curves.

The compaction characteristics of ten selected soil samples were investigated using a 2.5kg rammer in accordance with BS 1377-4:1990:3.2 and 3.3/3.4. The results are presented as a plot of dry density against moisture content.

Three specimens were prepared from samples remoulded at received moisture content. Three sub-specimens, each 60mm square in plan, were tested in accordance with BS EN ISO 17892-10:2018 using the small shear box apparatus. The sub-specimens were tested at different normal stresses, specified by the Consultant. Following consolidation, the samples



were sheared under drained conditions to give the peak effective shear strength parameters.

The BRE SD1 (2005) suite; water soluble sulphate and pH were determined for ten samples by Chemtest using in-house methods. The dependant options of magnesium, nitrate and chloride were not triggered.

Selected samples were despatched to Derwentside Environmental Testing Services Limited where chemical analyses were carried out to in-house methods for a suite of contaminants. The results are presented in Appendix C.

GEOTECHNICAL ENGINEERING LIMITED



4. REFERENCES

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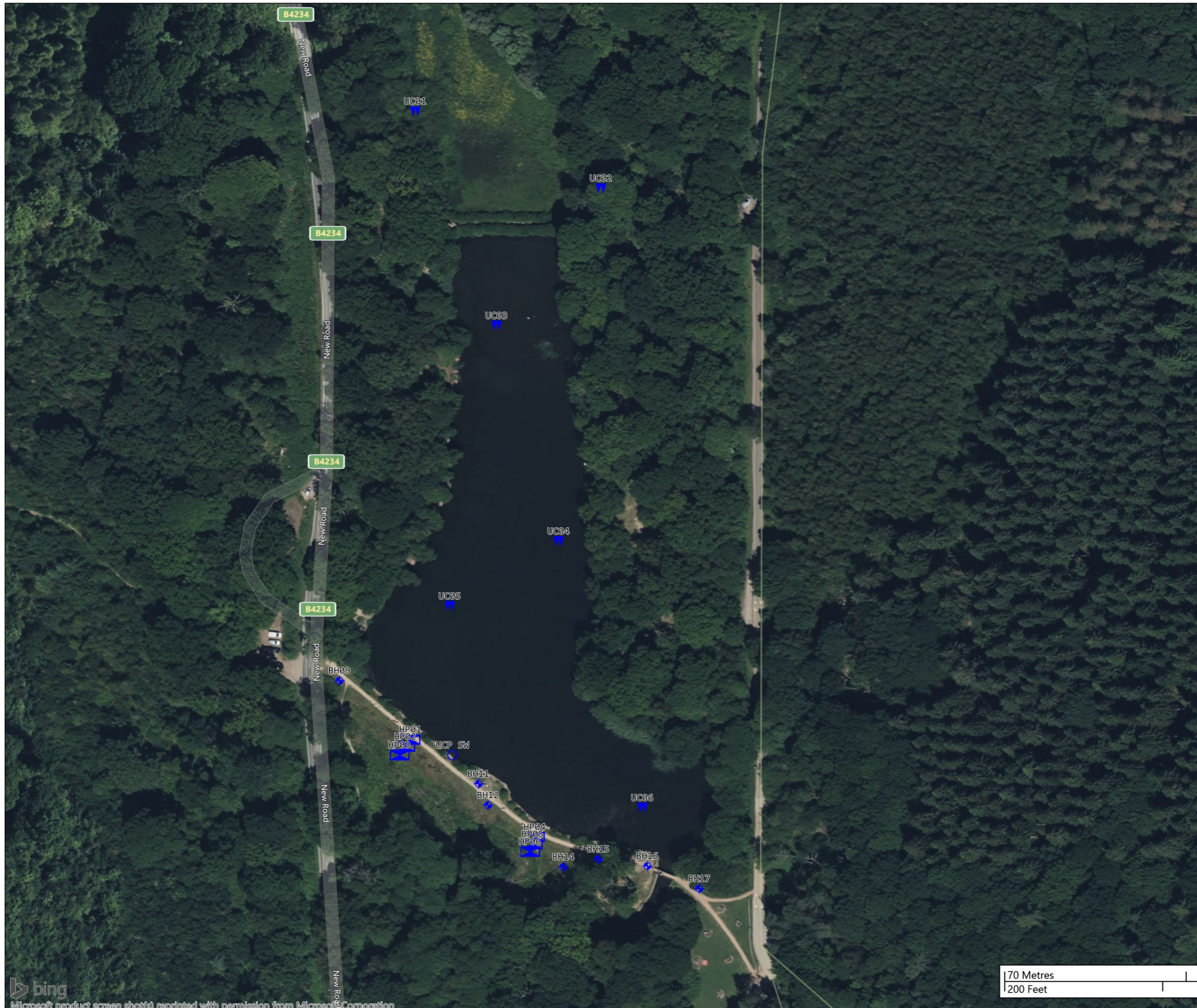
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Key.

- Borehole location
- Surface water sample location
- Hand dug trial pit location
- Silt sample location

North

Notes:
 Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation

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Site:
CANNOP PONDS INTRUSIVE GI




Title:
EXPLORATORY HOLE LOCATION PLAN

Drawn By:	JH	Checked By:	AT	Paper Size:	A3
Scale:	1:1500	Date:	August 2023		
Contract:	37707	Figure:	1		





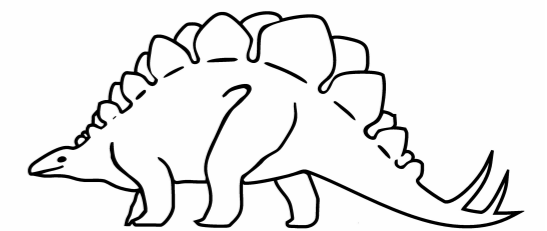
Key.

-  Borehole location
-  Surface water sample location
-  Silt sample location



Notes:

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Title:

EXPLORATORY HOLE LOCATION PLAN

Drawn By:	JH	Checked By:	AT	Paper Size:	A3
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Scale:	1:1800	Date:	August 2023
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Contract:	37707	Figure:	2
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APPENDIX A

FIELDWORK DATA

KEY TO EXPLORATORY HOLE LOGS



Sample type

D Small disturbed	U Undisturbed	L Dynamic	ES Environmental - soil	CS Core subsample (prepared)
B Bulk disturbed	UT Undisturbed thin wall	C Core	EW Environmental - water	LS Dynamic subsample (prepared)
LB Large bulk disturbed	P Piston	W Water		

Test type

- S SPT - Split spoon sampler followed by uncorrected SPT 'N' Value
- C SPT - Solid cone followed by uncorrected SPT 'N' Value
 (*250 - Where full test drive not completed, linearly extrapolated 'N' value reported, ** - Denotes no effective penetration). Arrow length reflects test depth range.
- H Hand vane - direct reading in kPa - not corrected for BS1377 (1990). Re* denotes refusal. Where the limit of the equipment is reached during a test, the reported value is the minimum recorded shear strength of the material.
- M Mackintosh probe - number of blows to achieve 100mm penetration
- Mx Mexe cone - average reading of equivalent CBR value in %
- PP Pocket penetrometer - calculated reading in kPa
- Vo Headspace vapour reading, uncorrected peak values in ppm, using a PID (calibrated with isobutylene, using a 10.6eV bulb)
- TR In situ thermal resistivity by needle probe in mK/W

Sample/core range/l_r

Dynamic sample Undisturbed sample - open drive including thin wall. Symbol length reflects recovery

x x = Total Core Recovery (TCR) as percentage of core run

y y = Solid Core Recovery (SCR) as percentage of core run. Assessment of core is based on full diameter

z z = Rock Quality Designation (RQD). The amount of solid core greater than 100mm expressed as percentage of core run

Where SPT has been carried out at the beginning of core run, disturbed section of core excluded from SCR and RQD assessment

l_f - fracture spacing - the modal fracture spacing (mm) over the indicated length of core. Where spacing varies significantly, the minimum, mode and maximum values are also given. NI = non-intact core NA = not applicable NR = no recovery

Instrumentation

- Piezometer
- Perforated standpipe
- Inclinometer
- Extensometer

Backfill

- Granular response zone
- Bentonite seal
- Cement/bentonite grout
- Soil backfill
- Concrete
- Cover
- Raised cover
- Stopcock cover

Stratum boundaries

----- Estimated boundary Grading boundary

Logging

The logging of soils and rocks has been carried out in general accordance with BS 5930:2015+A1:2020

Chalk is logged in general accordance with Lord et al (2002) CIRIA C574. Where possible, dynamic samples in chalk have been logged in accordance with CIRIA C574; descriptions and gradings (if presented) should be treated with caution given the potential for sample disturbance.

For rocks the term fracture has been used to identify a mechanical break within the core. Where possible incipient and drilling induced fractures have been excluded from the assessment of fracture state. Where doubt exists, a note has been made in the descriptions. All fractures are considered to be continuous unless otherwise reported.

Made Ground is readily identified when, within the natural make up, man made constituents are evident. Where Made Ground appears to be reworked natural material the differentiation between in situ natural deposits and Made Ground is much more difficult to ascertain. The interpretation of Made Ground within the logs should therefore be treated with caution.

The descriptors "topsoil" and "tarmacadam" are used as generic terms and do not imply conformation to any particular standard or composition.

Rootlets are defined as being less than 2mm in diameter, roots are defined as in excess of 2mm diameter.

General comments

The process of drilling and sampling will inevitably lead to sample disturbance, mixing or loss of material in some soil and rocks.

Indicated water levels are those recorded during the process of drilling or excavating exploratory holes and may not represent standing water levels.

All depths are measured along the axis of the borehole and are related to ground level at the point of entry. All inclinations are measured normal to the axis of the core.

Where provided, the stratigraphical names/geological rock units are for guidance only and may not be wholly accurate.

BOREHOLE LOG



BH01

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 03 July 2023

Easting 360723

Scale 1:50

End Date 04 July 2023

Northing 209999

Ground Level 67.75mOD

Depth 12.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instrument	test type & value	description	depth (m)	reduced level (m)	legend		
1B 1ES	0.10 - 0.30							Grey locally orangish brown slightly clayey sandy angular fine to coarse sandstone rarely clinker GRAVEL. (MADE GROUND)	0.40	67.35			
2B	0.50 - 0.70												
2ES 3B 3ES 4L	1.00 - 1.20 1.00 - 1.20 1.20 - 1.60 1.20 - 2.00	Nil					C 7	1.20m: Loose.					
5L	2.00 - 3.00											2.00	C 8
4ES 6D 7D 8L	2.80 - 2.90 2.90 - 3.00 3.00 - 3.45 3.00 - 4.00											3.00	S 4
5ES	3.60 - 3.80												
9D 10D 11L	3.90 - 4.00 4.00 - 4.45 4.00 - 5.00	4.00					S 11	3.30 - 3.40m: Thin bed of soft black sandy clay. 3.70 - 3.80m: Thin bed of soft black sandy clay. 3.80 - 3.90m: Subangular sandstone cobble.	4.10	63.65			
12D 6ES 13D 14L	4.70 - 4.80 4.80 - 5.00 5.00 - 5.45 5.00 - 6.00											4.00	S 17
15D	5.70 - 5.80							5.50 - 5.55m: Extremely weak mudstone.					
16D 17L	6.00 - 6.45 6.00 - 7.00	6.00					S 21						
18D 19D 20L	6.90 - 7.00 7.00 - 7.45 7.00 - 8.20											7.00	S 10
7ES 21D	7.65 - 7.75 7.75 - 7.80						H 101 S 10 H 58	Firm dark grey becoming greenish grey slightly sandy silty CLAY with very closely spaced thin laminae to very thin beds of extremely weak black coal. 7.65 - 7.80m: Greenish grey. Extremely weak thinly laminated dark grey MUDSTONE locally disintegrated to claybound gravel with very closely and closely spaced thin laminae to very thin beds of extremely weak black coal. Fractures are 10-20° extremely slightly and very closely spaced undulating smooth and 70° to subvertical planar smooth.	7.25 7.90	60.50 59.85			

Continued Next Page

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
0.00	1.20	Inspection Pit	Hand tools				
1.20	8.20	Windowless Sample	Geotechnical Pioneer Rig				
8.20	12.50	Rotary Core	Geotechnical Pioneer Rig				

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	8.20	128	8.20	0.00	0.50	Concrete		
		146	12.50	0.50	2.90	Bentonite		
				2.90	12.50	Grout		

HOLE PROGRESS				REMARKS	
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Water flush 8.20-12.50m (approx. 100% returns). Backfill completed 10/07/2023.	
03-07-2023 10:50	0.00	Nil			
03-07-2023 17:00	7.00	7.00	1.87		
04-07-2023 08:10	7.00	7.00	3.42		
04-07-2023 13:45	12.50	8.20	2.22		

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH01

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 03 July 2023

Easting 360723

Scale 1:50

End Date 04 July 2023

Northing 209999

Ground Level 67.75mOD

Depth 12.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
22D 23C	8.20 - 8.65 8.20 - 9.50	8.20	62 0 0	NI			S 86				
24C	9.50 - 11.00	8.20	100 0 0				C 98	9.70 - 11.10m: Very closely and closely spaced thin and thick laminae of very weak brown mudstone.			
25CS	10.35 - 10.70										
26C	11.00 - 12.50	8.20	100 0 0	NI NI			C 71	Extremely weak black carbonaceous MUDSTONE. Bedding fractures are 40-50° extremely closely spaced planar smooth. Extremely weak grey silty MUDSTONE with frequent fragments (up to 5x10x50mm) of black carbonised organic material. Fractures are randomly orientated extremely closely and very closely spaced planar smooth.	11.10 11.40	56.65 56.35	
		8.20					C 66	Borehole Completed at 12.50m	12.50	55.25	

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH02

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 03 July 2023

Easting 360739

Scale 1:50

End Date 04 July 2023

Northing 210011

Ground Level 67.30mOD

Depth 10.45 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instrument	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES 2C	0.10 - 0.30 0.10 - 0.30 0.40 - 1.20		Nil 64					Grey locally orangish brown slightly clayey sandy angular fine to coarse sandstone rarely clinker GRAVEL. (MADE GROUND)	0.40	66.90	[Cross-hatch pattern]
							Grey sandstone BOULDER. (MADE GROUND)	0.70	66.60		
2ES 3D 4L	1.20 - 2.00 1.20 - 1.65 1.20 - 2.00	1.20	Nil			S 16		Medium dense grey, dark grey and orangish brown slightly clayey locally clayey sandy angular and subangular predominantly coarse sandstone rarely clinker GRAVEL with a high cobble content. (MADE GROUND)			[Cross-hatch pattern]
						S 3	1.80m: Steel wire mesh 3mm diam (30x30mm). 2.00m: Very loose.				
3ES 5D 6L	2.00 - 3.00 2.00 - 2.45 2.00 - 3.00	2.00				S 2		Very soft locally soft to firm greenish grey and dark grey mottled orangish brown slightly sandy slightly gravelly silty CLAY with a faint organic odour. Gravel is angular fine and medium carbonaceous mudstone. (MADE GROUND)	3.00	64.30	[Cross-hatch pattern]
7D 8L	3.00 - 3.45 3.00 - 4.00	2.00				H 40	3.00 - 3.45m: Sandy.				
9D 4ES 10UT 13L	3.70 - 3.80 3.80 - 4.00 4.00 - 4.45 4.00 - 5.00	4.00				H 80		4.50 - 5.30m: Firm.			[Cross-hatch pattern]
11D 12D	4.45 - 4.55 4.55 - 4.60					S 10					
14D 15D 16L	4.90 - 5.00 5.00 - 5.45 5.00 - 6.00	4.00				S 48		Firm becoming very stiff orangish brown mottled grey slightly sandy silty CLAY with rare pockets (up to 5x5x5mm) of black silt.	5.30	62.00	[Cross-hatch pattern]
5ES 17D 18L 19C	5.80 - 6.00 6.00 - 6.45 6.00 - 6.30 6.30 - 7.00	6.00 6.30				S 32		Extremely weak laminated brown and orangish brown fine SANDSTONE with extremely closely and very closely spaced wisps of black coal. Fractures are subhorizontal very closely and closely spaced planar and undulating smooth and rough.	6.40	60.90	
20D 21C	7.00 - 7.45 7.00 - 8.50	6.30	100 71 71 NA 100 80 37	NI 150 200				6.90 - 7.30m: Very stiff orangish brown mottled grey slightly gravelly slightly sandy silty clay. Gravel is angular fine to coarse sandstone. 7.70 - 7.80m: Extremely closely spaced thin and thick laminae of black coal.			[Dotted pattern]

Continued Next Page

HOLE CONSTRUCTION			PLANT USED		WATER STRIKE Groundwater not encountered prior to use of flush				
TOP (m)	BASE (m)	TYPE			DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	0.40	Inspection Pit	Hand Tools						
0.40	1.20	Rotary Core	Geotechnical Pioneer Rig						
1.20	6.30	Windowless Sample	Geotechnical Pioneer Rig						

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	6.30	146	1.20	0.00	0.50	Concrete		
		128	6.30	0.50	10.45	Grout		
		146	10.00					

HOLE PROGRESS				REMARKS						
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Pit terminated at 0.40m due to sandstone boulder.						
03-07-2023 12:30	0.00	Nil		Water flush 0.40-1.20m and polymer flush 6.30-10.00m (approx 100% returns).						
03-07-2023 17:10	3.00	2.00	1.00	Backfill completed 07/07/2023.						
04-07-2023 08:30	3.00	2.00	1.60							
04-07-2023 14:00	10.45	6.30	2.28							
05-07-2023 11:00	10.45	6.30	4.10							
						<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>	CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED									
37707	CT									



BOREHOLE LOG

BH02

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 03 July 2023

Easting 360739

Scale 1:50

End Date 04 July 2023

Northing 210011

Ground Level 67.30mOD

Depth 10.45 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
22D 23C	8.50 - 8.95 8.50 - 10.00	6.30	93 47 33				S 97	Extremely weak grey silty MUDSTONE. Fractures are 10° - 30° extremely closely and very closely spaced and 80° to subvertical frequently extremely closely spaced planar smooth with orangish brown staining.	9.00	58.30	
24D	10.00 - 10.45	6.30	NI 40 80				S 56		10.45	56.85	
Borehole Completed at 10.45m											

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
6.30	10.45	Rotary Core	Geotechnical Pioneer Rig				

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH03

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 04 July 2023

Easting 360751

Scale 1:50

End Date 11 July 2023

Northing 210013

Ground Level 66.90mOD

Depth 10.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10 - 0.30							Grey and reddish brown sandy angular and subangular fine to coarse sandstone and limestone GRAVEL with a low angular sandstone cobble content. (MADE GROUND)	0.40	66.50	
1ES	0.50 - 0.70							Dark grey clayey very sandy angular and subangular fine to coarse sandstone and limestone GRAVEL with a medium subangular cobble content. (MADE GROUND)			
2B	0.50 - 0.70										
2ES	1.00 - 1.20							1.20m: Medium dense.			
3B	1.00 - 1.20										
4L	1.20 - 2.00		Nil			C 11					
3ES	1.65 - 1.80							Brown and brownish grey clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a low subangular sandstone cobble content. (MADE GROUND)	1.80	65.10	
5L	2.00 - 3.00		Nil			C 9					
6D	2.70 - 2.80							Soft and very soft locally firm laminated orangish brown and grey locally slightly sandy slightly gravelly silty CLAY. Gravel is angular fine and medium coal and rare sandstone. (MADE GROUND)	2.00	64.90	
4ES	2.80 - 3.00										
7L	3.00 - 4.00		Nil			C 4					
8D	3.70 - 3.80							Extremely and very weak laminated brown and orangish brown fine and medium SANDSTONE with laminae and very thin beds of disintegrated sandstone, mudstone and claybound mudstone gravel. Fractures are randomly orientated extremely closely and very closely spaced planar smooth. 6.30 - 6.35m: Soft thinly laminated brown mottled orangish brown slightly gravelly slightly sandy silty clay. Gravel is angular and subangular fine and medium mudstone. 6.35 - 6.55m: Extremely weak brown thinly laminated mudstone disintegrated to claybound fine and medium gravel sized mudstone lithorelicts			
5ES	3.80 - 4.00					H 17					
10L	4.00 - 5.50		Nil			S 9					
9UT	4.00 - 4.60		3.00					Very stiff brown mottled grey and orangish brown slightly gravelly slightly sandy silty CLAY with very thin beds of claybound gravel. Gravel is angular and subangular fine and medium mudstone lithorelicts. 7.80 - 8.00m: Becoming stiff.			
11D	5.20 - 5.30					H 46					
6ES	5.30 - 5.50										
12D	5.50 - 5.95		5.50					Continued Next Page	6.00	60.90	
13L	5.50 - 7.00										
14UT	7.00 - 7.50		7.00	NA					6.90	60.00	
15C	7.00 - 8.50		7.00			C *107			8.00	58.90	

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
0.00	1.20	Inspection Pit	Hand tools				
1.20	7.00	Windowless Sample	Geotechnical Pioneer Rig				
7.00	10.00	Rotary Core	Geotechnical Pioneer Rig				

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	7.00	128	7.00	0.00	0.50	Concrete	5.90	Standpipe (50mm) with geosock
		146	10.00	0.50	1.00	Bentonite		
				1.00	5.90	Gravel		
				5.90	7.00	Bentonite		

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Water flush 7.00-10.00m (approx 100% 7.00-8.50m, 75% 8.50-10.00m).			
04-07-2023 15:00	0.00	Nil		Installation completed on 13/07/2023.			
04-07-2023 16:00	1.20	Nil	Dry				
10-07-2023 11:10	1.20	Nil	Dry				
10-07-2023 16:30	8.50	7.00	1.50				
11-07-2023 08:00	8.50	7.00	4.70				
11-07-2023 09:30	10.00	7.00	6.80				

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH03

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 04 July 2023

Easting 360751

Scale 1:50

End Date 11 July 2023

Northing 210013

Ground Level 66.90mOD

Depth 10.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
16C	8.50 - 10.00	7.00	93				C 50	Stiff becoming very stiff grey locally mottled orangish brown silty CLAY.	8.70	58.20	
								8.35m: Very thin bed (40mm) of moderately weak light grey siltstone. 8.35 - 8.60m: Extremely weak grey and orangish brown slightly sandy siltstone. 8.60 - 8.70m: Slightly gravelly. Gravel is angular and subangular fine to coarse siltstone.			
		7.00					C 50	Very stiff grey slightly gravelly silty CLAY. Gravel is subangular fine and medium mudstone and siltstone. Very stiff/extremely weak grey silty CLAY/MUDSTONE.	9.15	57.75	
								Borehole Completed at 10.00m	10.00	56.90	

HOLE CONSTRUCTION			PLANT USED			WATER STRIKE Groundwater not encountered prior to use of flush				
TOP (m)	BASE (m)	TYPE				DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
				7.00	10.00	Grout		

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)				
13-07-2023 11:00	7.00	7.00	6.80				
				CONTRACT		CHECKED	
				37707		CT	

BOREHOLE LOG



BH04

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 3

Start Date 13 July 2023

Easting 360768

Scale 1:50

End Date 17 July 2023

Northing 210016

Ground Level 66.50mOD

Depth 17.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instrument	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.10 - 0.30 0.10 - 0.30							Dark greyish brown sandy angular and subangular fine to coarse sandstone GRAVEL with a low angular sandstone cobble content. (MADE GROUND)	0.05	66.45	
2B 2ES	0.50 - 0.70 0.50 - 0.70						Dark grey clayey very sandy angular and subangular fine to coarse carbonaceous mudstone and sandstone GRAVEL with a low angular sandstone cobble content. (MADE GROUND)				
3B 3ES 4D 5L	1.00 - 1.20 1.00 - 1.20 1.20 - 1.65 1.20 - 2.00	Nil 1.20					S 8 0.50m: Very thin bed of black angular fine to coarse carbonaceous mudstone.		1.50	65.00	
6D 4ES 7D 8L	1.70 - 1.80 1.80 - 2.00 2.00 - 2.45 2.00 - 2.50	1.20					S 7 Soft orangish brown and grey slightly gravelly sandy silty CLAY with a low angular sandstone cobble content. Gravel is angular fine to coarse sandstone rarely carbonaceous mudstone. (MADE GROUND)				
9L 10D 5ES 11D 12L	2.50 - 3.00 2.70 - 2.80 2.80 - 3.00 3.00 - 3.45 3.00 - 4.00	1.20			3.45		S 5				
13D 6ES 14D 15L	3.70 - 3.80 3.80 - 4.00 4.00 - 4.45 4.00 - 5.00	1.20 4.00					S 6 Soft locally very soft greyish brown slightly sandy gravelly silty CLAY with a low angular sandstone cobble content. Gravel is angular fine to coarse sandstone. (MADE GROUND)		3.40	63.10	
7ES 16D 17D 18L	4.70 - 4.90 4.90 - 5.00 5.00 - 5.45 5.00 - 6.50	5.00					S 9 Soft to firm dark grey slightly sandy clayey organic SILT with closely spaced thin beds of grey slightly sandy CLAY with frequent partially decomposed roots (up to 20mm diam). (MADE GROUND)		4.90	61.60	
19D 8ES 20D 21L	6.20 - 6.30 6.30 - 6.50 6.50 - 6.95 6.50 - 8.00	6.50					S 8 Soft to firm orangish brown and greyish brown slightly gravelly silty CLAY. Gravel is angular and subangular fine and medium siltstone. (MADE GROUND) 7.00m: Subangular sandstone cobble.		6.20	60.30	
22D 9ES	7.70 - 7.80 7.80 - 8.00										

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.20	Inspection Pit	Hand Tools
1.20	11.50	Windowless Sample	Geotechnical Pioneer Rig
11.50	17.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
3.45	1.20	2.56	20	

CASING DEPTH

DIAM (mm)	BASE (m)
168	11.50

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	10.50
146	17.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.10	Gravel
0.10	0.50	Concrete
0.50	0.98	Bentonite
0.98	17.50	Grout

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
13-07-2023 11:30	0.00	Nil	
13-07-2023 16:40	4.00	4.00	0.00
14-07-2023 08:10	4.00	4.00	2.22
14-07-2023 15:45	14.50	11.50	1.52
17-07-2023 08:15	14.50	11.00	3.43
17-07-2023 12:45	17.50	11.00	2.82

REMARKS

Position moved 4.00m East from original position due to overhead vegetation.
Water Flush used 11.50-17.50m (approx. 100% returns).

CONTRACT	CHECKED
37707	CT



BOREHOLE LOG



BH04

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 3

Start Date 13 July 2023

Easting 360768

Scale 1:50

End Date 17 July 2023

Northing 210016

Ground Level 66.50mOD

Depth 17.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-	test type & value	description	depth (m)	reduced level (m)	legend
23D 24L	8.50 - 8.95 8.50 - 10.00	8.00					S 12	8.00 - 8.50m: No recovery.			
25D 10ES	9.70 - 9.80 9.80 - 10.00							9.40 - 9.60m: Frequent partially decomposed rootlets.	9.60	56.90	
26D 27L	10.00 - 10.45 10.00 - 11.50	10.00					S 5	Soft dark brown sandy organic CLAY with frequent partially decomposed rootlets and a faint organic odour.			
28D 11ES	11.20 - 11.30 11.30 - 11.50							Stiff locally very stiff dark grey gravelly locally slightly gravelly silty CLAY with very closely and closely spaced very thin beds of extremely weak grey siltstone. Gravel is angular aligned 30°-40° medium and coarse mudstone lithorelicts.	10.45	56.05	
29D 30C	11.50 - 11.95 11.50 - 13.00	11.50	90				S 32				
31D 12ES	12.70 - 12.80 12.80 - 13.00										
32D 33C	13.00 - 13.45 13.00 - 14.50	11.50	73 0 0				S 19				
34D 35C	14.50 - 14.95 14.50 - 16.00	11.50	100 10 10	NI			S 94	Extremely weak highly fractured dark grey silty MUDSTONE with extremely closely and very closely spaced thin laminae to very thin beds of extremely weak black coal. Fractures are randomly orientated extremely closely and very closely spaced planar smooth. Limited recovery. Extremely weak and very weak highly fractured black COAL.	14.00 14.30 14.40	52.50 52.20 52.10	
36C	16.00 - 17.50	11.50		150 NI			C *133	Extremely weak highly fractured dark grey silty MUDSTONE with rare very thin beds of very weak grey siltstone and rare thin and thick laminae of black coal. Fractures are randomly orientated extremely closely spaced planar smooth. 15.45 - 15.60m: Very weak dark grey silty mudstone. No fractures observed.			

Continued Next Page

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE					
TOP (m)	BASE (m)	TYPE						DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS	
CASING DEPTH				BARREL DIAMETER				BACKFILL					
DIAM (mm)	BASE (m)			DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE			
HOLE PROGRESS								REMARKS					
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)									
										CONTRACT 37707		CHECKED CT	

BOREHOLE LOG



BH04

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 3 of 3

Start Date 13 July 2023

Easting 360768

Scale 1:50

End Date 17 July 2023

Northing 210016


Ground Level 66.50mOD

Depth 17.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
			93 33 16			C *200		16.45m: Thin bed of extremely weak highly fractured black coal. Fractures are 20°-30° and 70°-80° extremely closely spaced planar smooth.			
			40 80 140					Very weak grey silty MUDSTONE with frequent carbonised plant remains (up to 60x5x5mm). Fractures are 20-30° very closely and closely spaced planar smooth.	17.00	49.50	
		11.50						Borehole Completed at 17.50m	17.50	49.00	

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			
				 CONTRACT CHECKED 37707 CT			

BOREHOLE LOG



BH05

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 04 July 2023

Easting 360780

Scale 1:50

End Date 07 July 2023

Northing 210013

Ground Level 66.40mOD

Depth 15.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.20 - 0.40							Grey and reddish brown sandy angular fine to coarse sandstone rarely clinker GRAVEL. (MADE GROUND)	0.20	66.20	
2B 2ES	0.80 - 1.00						Dark grey clayey sandy angular fine to coarse sandstone and carbonaceous mudstone GRAVEL with a high angular and subangular sandstone cobble content. (MADE GROUND)				
3D 4L	1.20 - 1.65 1.20 - 2.00	Nil 1.20				S 16	1.20m: Medium dense.				
5D 3ES	1.70 - 1.80 1.80 - 2.00					S 6	Soft locally soft to firm orangish brown, brown and grey slightly sandy slightly gravelly locally gravelly silty CLAY with rare pockets (up to 50x50x50mm) of orangish brown clayey sand. Gravel is angular and subangular fine to coarse sandstone, coal and carbonaceous mudstone. (MADE GROUND)	1.60	64.80		
6D 7L	2.00 - 2.45 2.00 - 3.00	1.20				S 6					
8D 4ES	2.70 - 2.80 2.80 - 3.00					S 6					
10L 9D	3.00 - 4.00 3.00 - 3.45	1.20				S 6					
11D 5ES	3.70 - 3.80 3.80 - 4.00					S 8	3.80 - 4.00m: Soft to firm orangish brown slightly gravelly clay. Gravel is angular fine and medium coal.				
12D 13L	4.00 - 4.45 4.00 - 5.00	1.20				S 8					
14D 6ES	4.70 - 4.80 4.80 - 5.00					S 6	4.70m: locally very clayey sand and gravel.				
15D 16L	5.00 - 5.45 5.00 - 6.00	1.20 5.00				S 6					
17D 7ES	5.70 - 5.80 5.80 - 6.00					S 13					
18D 19L	6.00 - 6.45 6.00 - 7.50	6.00				S 13					
8ES 20D 21UT 22L	7.20 - 7.40 7.40 - 7.50 7.50 - 7.95 7.50 - 9.00	7.50					Firm grey slightly gravelly CLAY with frequent partially decomposed rootlets and a faint organic odour. Gravel is angular fine and medium sandstone and coal. Stiff brown silty CLAY with rare angular lithorelicts (up to 20x20x5mm) of extremely weak mudstone. Fissures are randomly orientated extremely closely spaced planar smooth with bluish grey gleying.	7.40 7.80	59.00 58.60		

Continued Next Page

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
0.00	1.20	Inspection Pit	Hand tools				
1.20	9.50	Windowless Sample	Geotechnical Pioneer Rig				
9.50	15.00	Rotary Core	Geotechnical Pioneer Rig				

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	9.00	128	10.50	0.00	0.30	Concrete		
		146	15.00	0.30	2.81	Bentonite		
				2.81	15.00	Grout		

HOLE PROGRESS				REMARKS						
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Polymer flush 9.50-15.00m (approx. 100% returns). Backfill completed 10/07/2023.						
04-07-2023 15:00	0.00	Nil				<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>	CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED									
37707	CT									
04-07-2023 16:05	1.20	Nil	Dry							
06-07-2023 09:30	1.20	Nil	Dry							
06-07-2023 16:35	12.00	9.00	3.86							
07-07-2023 08:40	12.00	9.00	3.83							
07-07-2023 11:30	15.00	9.00	4.11							

BOREHOLE LOG



BH05

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 04 July 2023

Easting 360780

Scale 1:50

End Date 07 July 2023

Northing 210013

Ground Level 66.40mOD

Depth 15.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp./core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
23D 9ES	8.70 - 8.80 8.80 - 9.00										
24D 25L	9.00 - 9.45 9.00 - 9.50	9.00					S 23				
26C	9.50 - 10.50	9.00	100 0 0	NI				Very stiff/extremely weak dark grey locally carbonaceous silty CLAY/MUDSTONE. Fissures/fractures are randomly orientated extremely closely spaced planar smooth.	9.45	56.95	
27D 28C	10.50 - 10.95 10.50 - 12.00	9.00	77 0 0				S 43				
29D 30C	12.00 - 12.45 12.00 - 13.50	9.00	100 0 0				S 59				
31C	13.50 - 15.00	9.00	87 0 0				C 73	13.45m: Very thin bed of extremely weak black coal.			
		9.00					C 86	Borehole Completed at 15.00m	15.00	51.40	

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH06

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 3

Start Date 10 July 2023

Easting 360788

Scale 1:50

End Date 13 July 2023

Northing 210019

Ground Level 66.20mOD

Depth 16.65 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.10 - 0.30 0.10 - 0.30							Grey slightly clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a low angular sandstone cobble content. (MADE GROUND)	0.30	65.90	
2B 2ES	0.50 - 0.70 0.50 - 0.70							Dark grey sandy angular and subangular fine to coarse sandstone GRAVEL with a medium angular sandstone cobble content. (MADE GROUND)			
3B 3ES	1.00 - 1.20 1.00 - 1.20							Firm dark grey and orangish brown slightly gravelly sandy silty CLAY. Gravel is angular fine to coarse sandstone rarely limestone. (MADE GROUND)	1.00	65.20	
4D 5L	1.30 - 1.75 1.30 - 2.00	Nil					S <1	Very soft orangish brown slightly gravelly sandy silty CLAY with rare partially decomposed rootlets. Gravel is angular fine to coarse sandstone. (MADE GROUND)	1.40	64.80	
6D 4ES 7D 8L	1.75 - 1.85 1.85 - 2.00 2.00 - 2.45 2.00 - 3.00	1.30					S 7	Soft locally firm grey and orangish brown slightly gravelly slightly sandy silty CLAY with rare partially decomposed rootlets. Gravel is angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)	2.10	64.10	
9D 5ES	2.70 - 2.80 2.80 - 3.00						H 59				
10D 11L	3.00 - 3.45 3.00 - 4.00	1.30					S 8				
12D 6ES 13D 14L	3.70 - 3.80 3.80 - 4.00 4.00 - 4.45 4.00 - 5.00	1.30					S 7				
7ES	4.80 - 5.00							Firm dark grey and greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subrounded fine to coarse sandstone. (MADE GROUND)	4.30	61.90	
15UT 18L	5.00 - 5.45 5.00 - 6.00	1.30						Stiff orangish brown mottled grey slightly gravelly silty CLAY. Gravel is angular subhorizontally aligned fine and medium lithorelicts of extremely weak silty mudstone.	4.80	61.40	
16D 17D	5.45 - 5.55 5.55 - 5.63				5.63			Stiff greyish brown and orangish brown slightly gravelly becoming gravelly silty CLAY. Gravel is angular subhorizontally aligned fine to coarse lithorelicts of extremely weak silty mudstone.	5.60	60.60	
19D	5.80 - 5.90										
20D 21L	6.00 - 6.45 6.00 - 7.50	1.30 6.00					S 22				
22D 23C	7.50 - 7.95 7.50 - 9.00	6.00	100				S 37	Very stiff locally thinly laminated dark grey CLAY locally tending to extremely weak very thinly bedded MUDSTONE with rare very thin beds of very weak grey siltstone. 7.40 - 8.60m: Locally stained orangish brown.	7.40	58.80	

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.30	Inspection Pit	Hand Tools
1.30	7.50	Windowless Sample	Geotechnical Pioneer Rig
7.50	16.65	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
5.63	1.30	5.20	20	

CASING DEPTH

DIAM (mm)	BASE (m)
168	6.00

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	7.50
146	16.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.10	Gravel
0.10	0.50	Concrete
0.50	16.65	Grout

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
10-07-2023 13:25	0.00	Nil	
10-07-2023 15:50	1.30	Nil	Dry
11-07-2023 08:40	1.30	Nil	Dry
11-07-2023 15:55	9.00	6.00	3.86
12-07-2023 08:35	9.00	6.00	2.32
12-07-2023 16:55	16.65	6.00	2.71

REMARKS

Water flush 7.50-16.50m (approx. 100% returns).
Borehole backfilled on the 13/07/23.



CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH06

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 3

Start Date 10 July 2023

Easting 360788

Scale 1:50

End Date 13 July 2023

Northing 210019

Ground Level 66.20mOD

Depth 16.65 m

sample no & type	sample depth (m) from to	casing depth (m)	samp./core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
24D 25C	9.00 - 9.45 9.00 - 10.50	6.00	70				S 36				
26D 27C	10.50 - 10.95 10.50 - 12.00	6.00	70				S 39	10.40 - 11.70m: Very closely spaced very thin beds of very weak grey siltstone. 11.20 - 12.00m: Rare thin laminae of black coal.			
28D 29C	12.00 - 12.45 12.00 - 13.50	6.00	73 0 0				S 16	12.00 - 12.40m: Extremely weak black coal recovered in SPT. 12.60 - 14.20m: Very closely spaced very thin beds of very weak grey siltstone			
30D 31C	13.50 - 13.95 13.50 - 15.00	6.00	87 0 0				S 78	13.90 - 14.10m: Extremely weak black coal. 14.60 - 14.75m: Extremely weak black coal.			
32D 33C	15.00 - 15.15 15.00 - 16.50	6.00	100 0 0	NI			S *300	Weak grey silty MUDSTONE. Fractures are subhorizontal to 20° very closely spaced, 45°-60° closely spaced locally intersecting and 80° to subvertical locally extremely closely spaced planar smooth.	14.75	51.45	

Continued Next Page

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
CASING DEPTH			BARREL DIAMETER		BACKFILL		INSTRUMENTATION
DIAM (mm)	BASE (m)		DIAM (mm)	BASE (m)	TOP (m)	BASE (m) MATERIAL	DEPTH (m) TYPE
HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			
						CONTRACT	CHECKED
						37707	CT

BOREHOLE LOG



BH06

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 3 of 3

Start Date 10 July 2023

Easting 360788

Scale 1:50

End Date 13 July 2023

Northing 210019

Ground Level 66.20mOD

Depth 16.65 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
34D	16.50 - 16.65	6.00					S *400	Borehole Completed at 16.65m	16.65	49.55	

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH07

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 05 July 2023

Easting 360796

Scale 1:50

End Date 07 July 2023

Northing 210018

Ground Level 66.00mOD

Depth 14.20 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instrument	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.10 - 0.25 0.10 - 0.25							Reddish grey sandy angular fine to coarse sandstone GRAVEL. (MADE GROUND) 0.25m: White fabric membrane.	0.25	65.75	
2B 2ES	0.50 - 0.70 0.50 - 0.70							Brown very clayey sandy angular and subangular fine to coarse sandstone rarely coal and clinker GRAVEL with a high angular sandstone cobble content. (MADE GROUND)	0.80	65.20	
3B 3ES 4D 5L	1.00 - 1.20 1.00 - 1.20 1.20 - 1.65 1.20 - 2.20	Nil					S 4	Soft dark grey slightly sandy locally sandy slightly gravelly CLAY with a low angular sandstone cobble content and a faint hydrocarbon odour. Gravel is angular and subangular fine to coarse sandstone, coal, brick rarely clinker. (MADE GROUND)			
6D 4ES	1.90 - 2.00 2.00 - 2.20	Nil					S 7	1.40 - 2.40m: Rare pockets (up to 40x40x40mm) of orangish brown clayey fine sand 2.10m: Fragment (50x50x10mm) of glass.			
9D 5ES 10D 11L	2.90 - 3.00 3.00 - 3.20 3.20 - 3.65 3.20 - 4.20	Nil					H 29 S 5				
12D 6ES 13UT 16L	3.90 - 4.00 4.00 - 4.20 4.20 - 4.60 4.20 - 5.20	Nil			4.20		H 36	Soft to firm becoming firm dark greyish brown slightly sandy silty CLAY with rare angular fine and medium sandstone gravel. (MADE GROUND)	3.60	62.40	
14D 15D	4.60 - 4.70 4.70 - 4.80						H 110				
17D 18D 19L	5.00 - 5.10 5.20 - 5.65 5.20 - 6.70	5.20					H 71 S 11	Firm orangish brown mottled grey slightly gravelly silty CLAY. Gravel is angular fine to coarse lithorelicts of extremely weak and very weak siltstone. Firm becoming stiff orangish brown slightly sandy gravelly silty CLAY. Gravel is angular fine to coarse lithorelicts of very weak siltstone.	4.95 5.10	61.05 60.90	
20D 7ES 21UT 24L	6.40 - 6.50 6.50 - 6.70 6.70 - 7.10 6.70 - 8.20	6.70					H 95				
22D 23D	7.10 - 7.20 7.20 - 7.30							Stiff to very stiff dark grey silty CLAY with very closely and closely spaced very thin beds of very weak light grey siltstone. Fissures are randomly orientated extremely closely spaced planar smooth.	6.80	59.20	
25D 8ES	7.90 - 8.00 8.00 - 8.20										

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.20	Inspection Pit	Hand tools
1.20	8.20	Windowless Sample	Comacchio 205
8.20	14.20	Rotary Core	Comacchio 205

WATER STRIKE

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
4.20	Nil	4.00	20	Slow

CASING DEPTH

DIAM (mm)	BASE (m)
168	11.20

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	8.20
146	14.20

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.50	Concrete
0.50	1.00	Bentonite
1.00	10.40	Gravel
10.40	14.20	Grout

INSTRUMENTATION

DEPTH (m)	TYPE
10.40	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
05-07-2023 09:25	0.00	Nil	
05-07-2023 16:20	4.20	Nil	Dry
06-07-2023 09:05	4.20	Nil	Dry
06-07-2023 16:55	12.70	8.20	3.29
07-07-2023 08:45	12.70	8.20	4.36
07-07-2023 15:15	14.20	11.20	2.72

REMARKS

Water flush 8.20-14.20m (approx. 90% returns).
Installation completed 10/07/2023.



CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH07

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 05 July 2023

Easting 360796

Scale 1:50

End Date 07 July 2023

Northing 210018

Ground Level 66.00mOD

Depth 14.20 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
26D 27C	8.20 - 8.65 8.20 - 9.70	8.20	87				S 31				
28D 29C	9.50 - 9.60 9.70 - 11.20	8.20	73 0 0				C 27				
30C	11.20 - 12.70	8.20	100 0 0	NI			C *105	Extremely weak and very weak dark grey locally carbonaceous silty MUDSTONE. Fractures are subhorizontal to 10° extremely closely and very closely spaced and randomly orientated extremely closely spaced planar smooth. 10.95m: Very thin bed of extremely weak black coal.	10.40	55.60	
31C	12.70 - 14.20	8.20 11.20	97 0 0	NI			C *143	Extremely weak and very weak grey silty MUDSTONE. Fractures are randomly orientated extremely closely spaced planar smooth.	12.40	53.60	
		11.20					C 94	Borehole Completed at 14.20m	14.20	51.80	

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH08

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 11 July 2023

Easting 360818

Scale 1:50

End Date 12 July 2023

Northing 210015

Ground Level 66.10mOD

Depth 8.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.10 - 0.30 0.10 - 0.30							Grass over soft greyish brown slightly gravelly slightly sandy silty CLAY with frequent rootlets. Gravel is angular fine and medium sandstone and brick. (MADE GROUND)	0.10	66.00	
2B 2ES	0.50 - 0.70 0.50 - 0.70							Firm brownish grey slightly sandy gravelly CLAY with a low angular sandstone cobble content. Gravel is angular and subangular fine to coarse sandstone, brick and limestone. (MADE GROUND)	0.40	65.70	
3B 3ES 4D 5L	1.00 - 1.20 1.00 - 1.20 1.20 - 1.65 1.20 - 2.00		Nil				S 1	Very soft dark grey and black slightly sandy slightly gravelly silty CLAY. Gravel is angular fine and medium sandstone, coal and brick. (MADE GROUND) 1.50m: angular sandstone cobble.	1.60	64.50	
6D 4ES 7D 8L	1.70 - 1.80 1.80 - 2.00 2.00 - 2.45 2.00 - 3.00	2.00					S 2	Very soft and soft brown, dark grey and orangish brown slightly gravelly sandy CLAY. Gravel is angular fine to coarse sandstone rarely coal. (MADE GROUND)			
9D 5ES 10D 11L	2.70 - 2.80 2.80 - 3.00 3.00 - 3.45 3.00 - 4.00	3.00					S 11	Firm grey slightly sandy slightly gravelly silty CLAY. Gravel is angular and subangular fine to coarse siltstone rarely coal.	2.70	63.40	
6ES 12D 7ES 13D 14C	3.50 - 3.70 3.70 - 3.80 3.80 - 4.00 4.00 - 4.45 4.00 - 5.00	3.00 3.50	95 0 0	NI			S 52	Firm brown and orangish brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse sandstone rarely coal. Stiff grey mottled orangish brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine and medium siltstone. 3.90m: Very thin bed of extremely weak black coal. Extremely weak highly fractured grey silty MUDSTONE. Fractures are subhorizontal to 10°, 80° to subvertical and randomly orientated extremely closely spaced planar smooth with orangish brown staining.	3.30 3.70 4.00	62.80 62.40 62.10	
15D 16C	5.00 - 5.45 5.00 - 6.50	3.50	90 0 0				S 57	4.00 - 5.50m: Mottled greyish brown. Locally disintegrated to clay bound gravel. 5.50 - 5.70m: Slightly sandy.			
17C	6.50 - 8.00	3.50	100 0 0				C 69	6.20 - 6.40m: Slightly sandy.			
		3.50					C 61	Continued Next Page	8.00	58.10	

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
0.00	1.20	Inspection Pit	Hand Tools				
1.20	4.00	Windowless Sample	Comacchio 305				
4.00	8.00	Rotary Core	Comacchio 305				

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	3.50	128	4.00	0.00	0.10	Arisings		
		146	8.00	0.10	0.40	Concrete		
				0.40	1.20	Bentonite		
				1.20	8.00	Grout		

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Water flush 4.00-8.00m (approx. 90% returns).			
11-07-2023 12:30	0.00	Nil					
11-07-2023 13:10	1.20	Nil	Dry				
12-07-2023 08:25	1.20	Nil	Dry				
12-07-2023 16:40	8.00	3.50	1.20				

CONTRACT	CHECKED
37707	CT



BOREHOLE LOG

BH08

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 11 July 2023

Easting 360818

Scale 1:50

End Date 12 July 2023

Northing 210015

Ground Level 66.10mOD


Depth 8.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
								Borehole Completed at 8.00m			

HOLE CONSTRUCTION				WATER STRIKE Groundwater not encountered prior to use of flush							
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS			

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE

HOLE PROGRESS				REMARKS							
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)							



CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH09

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 18 July 2023

Easting 360826

Scale 1:50

End Date 19 July 2023

Northing 210831

Ground Level 70.50mOD

Depth 5.10 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10 - 0.30							Grass over soft dark brown slightly sandy silty CLAY with frequent rootlets. (MADE GROUND)	0.05	70.45	
1ES	0.10 - 0.30								0.30	70.20	
2B	0.30 - 0.50							Reddish brown gravelly clayey fine to coarse SAND. Gravel is angular fine to coarse mudstone and sandstone. (MADE GROUND)	0.70	69.80	
2ES	0.30 - 0.50										
3B	0.70 - 0.90							Firm dark brown slightly gravelly sandy CLAY. Gravel is angular fine to coarse sandstone rarely coal. (MADE GROUND)	1.15	69.35	
3ES	1.00 - 1.15										
4B	1.00 - 1.15							Firm orangish brown, grey and yellowish brown slightly sandy silty CLAY with rare partially decomposed rootlets. (MADE GROUND)	1.50	69.00	
5D	1.20 - 1.65					S 14					
6L	1.20 - 2.00	1.20	Nil					Medium dense dark grey and black slightly gravelly clayey fine to coarse SAND with a low subrounded sandstone cobble content. Gravel is angular fine to coarse carbonaceous mudstone, coal and sandstone. (MADE GROUND)	2.60	67.90	
4ES	1.80 - 2.00										
7UT	2.00 - 2.45	2.00						Firm becoming stiff orangish brown and grey slightly sandy silty CLAY. (MADE GROUND)			
8L	2.00 - 2.60										
5ES	2.45 - 2.55							1.50 - 1.75m: Rare pockets (up to 40x30x20mm) of black silty fine sand. 2.40 - 2.55m: Soft greyish brown clayey silt.			
10D	2.60 - 2.70	2.00									
9L	2.60 - 3.00							Very stiff brownish grey mottled orangish brown slightly sandy silty CLAY with rare angular lithorelicts (up to 10x10x10mm) of extremely weak brownish grey siltstone.			
6ES	2.70 - 3.00										
11D	3.00 - 3.45	2.00					S 75				
12L	3.00 - 4.00										
13D	3.45 - 3.70				3.45						
7ES	3.70 - 4.00										
14D	4.00 - 4.45	2.00					S 51				
15L	4.00 - 4.80										
16D	4.50 - 4.80										
17D	4.80 - 5.10	2.00					S *200				
Borehole Completed at 5.10m									5.10	65.40	

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit	Hand Tools	3.45	2.00	2.88	20	
1.20	5.10	Windowless Sample	Geotechnical Terrier Rig					

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
128	2.00	113	2.00	0.00	0.10	Arisings		
		98	3.00	0.10	0.50	Concrete		
		84	4.00	0.50	5.10	Grout		
		64	4.80					

HOLE PROGRESS				REMARKS
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	
18-07-2023 16:05	0.00	Nil		
18-07-2023 16:50	1.20	Nil	Dry	
19-07-2023 08:35	1.20	Nil	Dry	
19-07-2023 11:05	5.10	2.00	Dry	

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH11

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 19 July 2023

Easting 360880

Scale 1:50

End Date 21 July 2023

Northing 210790

Ground Level 69.95mOD

Depth 12.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instrument	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.10 - 0.30 0.10 - 0.30							Grass over soft dark brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. (MADE GROUND)	0.05 0.10	69.90 69.85	
2B 2ES	0.60 - 0.80 0.60 - 0.80				0.80			Reddish brown clayey gravelly fine to coarse SAND. Gravel is angular fine to coarse sandstone and mudstone. (MADE GROUND)			
3B 3ES 4D 5L	1.00 - 1.20 1.00 - 1.20 1.00 - 1.20 1.20 - 2.00		Nil 1.20				S 9	Dark grey sandy very clayey angular and subangular fine to coarse sandstone, carbonaceous mudstone and coal GRAVEL with a medium angular sandstone cobble content. (MADE GROUND) 0.60 - 1.00m: Reddish brown.	1.00	68.95	
6D 4ES	1.70 - 1.80 1.80 - 2.00						S 7	Soft to firm dark grey slightly sandy gravelly silty CLAY. Gravel is angular and subangular fine to coarse sandstone rarely coal. (MADE GROUND) 1.55m: Angular sandstone cobble.	1.65	68.30	
7D 8L	2.00 - 2.45 2.00 - 3.00		2.00				S <1	Very soft orangish brown and grey slightly gravelly slightly sandy silty CLAY with rare locally frequent partially decomposed wood fragments (up to 30x20x20mm). Gravel is angular and subangular fine to coarse sandstone rarely coal. (MADE GROUND)			
9D 5ES 10D 11L	2.70 - 2.80 2.80 - 3.00 3.00 - 3.45 3.00 - 4.00		3.00				S <1				
12D 6ES	3.45 - 3.70 3.70 - 4.00						S <1				
13D 14L	4.00 - 4.45 4.00 - 5.00		4.00				S <1				
15D 7ES 16D 17L	4.70 - 4.80 4.80 - 5.00 5.00 - 5.45 5.00 - 6.00		5.00				S <1				
18D 8ES 19D 20L	5.70 - 5.80 5.80 - 6.00 6.00 - 6.45 6.00 - 7.50		6.00				S <1				
21D 9ES 22D 23L	7.20 - 7.30 7.30 - 7.50 7.50 - 7.95 7.50 - 7.90		7.50				S 31	Very soft greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular fine and medium rarely coarse carbonaceous mudstone and sandstone. (MADE GROUND)	6.30	63.65	
24C	7.90 - 9.00							Very stiff grey slightly sandy slightly gravelly becoming gravelly silty CLAY. Gravel is angular subhorizontally aligned lithorelicts (up to 40x40x20mm) of extremely weak mudstone.	7.60	62.35	

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED	WATER STRIKE	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit	Hand Tools	0.80	0.80	Nil	0.00	0	Ingress overnight
1.20	7.90	Windowless Sample	Geotechnical Terrier Rig						
7.90	12.00	Rotary Core	Geotechnical Pioneer Rig						

CASING DEPTH

DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL
200	2.00	128	7.90	0.00	0.10	Arisings
168	7.90	146	12.00	0.10	0.50	Concrete
				0.50	12.00	Grout

BARREL DIAMETER

BACKFILL

INSTRUMENTATION

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
19-07-2023 11:30	0.00	Nil	
19-07-2023 12:25	1.20	Nil	Dry
20-07-2023 13:40	1.20	Nil	0.80
20-07-2023 17:10	7.50	7.50	1.46
21-07-2023 08:00	7.50	7.50	2.21
21-07-2023 14:20	12.00	7.90	3.33

REMARKS

Water flush 7.90-12.00m (approx. 100% returns).



CONTRACT 37707	CHECKED CT
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BOREHOLE LOG



BH11

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 19 July 2023

Easting 360880

Scale 1:50

End Date 21 July 2023

Northing 210790

Ground Level 69.95mOD

Depth 12.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp./core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
25D 10ES	8.30 - 8.40 8.40 - 8.60		91 24 9	NA				Very weak grey SILTSTONE with closely and medium spaced very thin and thin beds of highly fractured siltstone. Fractures are subhorizontal to 15° very closely and closely spaced planar smooth. Highly fractured beds are randomly orientated extremely closely spaced planar smooth.	8.60	61.35	
26C	9.00 - 10.50	7.90	73 40 16	NI 60 120		C *188					
27C	10.50 - 12.00	7.90	87 37 14			C *162					
		7.99					C 85	Borehole Completed at 12.00m	12.00	57.95	

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH12

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 18 July 2023

Easting 360884

Scale 1:50

End Date 19 July 2023

Northing 210782

Ground Level 69.90mOD

Depth 11.30 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.05 - 0.20							Grass over soft dark brown slightly sandy silty CLAY with frequent rootlets. (MADE GROUND)	0.05	69.85	
1ES	0.05 - 0.20								0.20	69.70	
2B	0.30 - 0.50							Reddish brown clayey gravelly fine to coarse SAND. Gravel is angular fine to coarse sandstone and mudstone. (MADE GROUND)			
2ES	0.30 - 0.50										
3B	1.00 - 1.20							Very loose dark grey and black very clayey very sandy angular fine to coarse carbonaceous mudstone, coal and sandstone GRAVEL with a low subrounded sandstone cobble content. (MADE GROUND)			
3ES	1.00 - 1.20	Nil					S 4				
4D	1.20 - 1.65										
5L	1.20 - 2.00										
6D	1.70 - 1.80							Very soft dark grey and dark brown slightly sandy silty CLAY with abundant partially decomposed plant debris (up to 40x40x10mm). (MADE GROUND)			
4ES	1.80 - 2.00	Nil					S <1				
7D	2.00 - 2.45										
8L	2.00 - 3.00										
9D	2.70 - 2.80							Very soft and soft dark greyish brown mottled orangish brown slightly sandy locally sandy slightly gravelly silty CLAY with rare pockets (up to 40x40x40mm) of black slightly sandy clay with a mild organic odour. Gravel is angular fine to coarse sandstone and coal. (MADE GROUND)	2.50	67.40	
5ES	2.80 - 3.00	3.00					S <1				
10L	3.00 - 4.00										
11D	3.45 - 3.70										
6ES	3.70 - 4.00							Very soft and soft dark greyish brown mottled orangish brown slightly sandy locally sandy slightly gravelly silty CLAY with rare pockets (up to 40x40x40mm) of black slightly sandy clay with a mild organic odour. Gravel is angular fine to coarse sandstone and coal. (MADE GROUND)			
12L	4.00 - 5.00	4.00					S <1				
7ES	4.80 - 5.00										
13L	5.00 - 6.00	5.00					S <1				
14D	5.70 - 5.80							5.95 - 6.00m: Firm bluish grey mottled orangish brown silty clay. 6.00m: Locally firm and firm to stiff.			
15D	5.70 - 5.80										
8ES	5.80 - 5.95	6.00					S 19				
16D	6.00 - 6.45										
17L	6.00 - 7.50							Extremely weak highly fractured grey and orangish brown silty MUDSTONE locally disintegrated to claybound gravel. Fractures are randomly orientated extremely closely spaced planar smooth with rare orangish brown staining.			
18D	7.20 - 7.30										
9ES	7.30 - 7.50										
19D	7.50 - 7.95	7.50					S 34				
20L	7.50 - 7.80								7.60	62.30	
21C	7.80 - 8.60	7.80	75	NI							

Continued Next Page

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE Groundwater not encountered prior to use of flush				
TOP (m)	BASE (m)	TYPE						DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit										
1.20	7.80	Windowless Sample										
7.80	11.30	Rotary Core										

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	7.80	128	7.80	0.00	0.50	Concrete	8.60	Standpipe (50mm) with geosock
		146	11.30	0.50	1.00	Bentonite		
				1.00	8.60	Gravel		
				8.60	11.30	Bentonite		

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)				
18-07-2023 12:45	0.00	Nil		Water flush 7.80-10.10m (approx. 100% returns), 10.10-11.30m (approx. 50% returns).			
18-07-2023 16:00	1.20	Nil	Dry	Installation completed on 20/07/2023.			
19-07-2023 08:20	1.20	Nil	Dry				
19-07-2023 16:45	11.30	7.80	3.20				

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH12

CLIENT FORESTRY ENGLAND
SITE CANNOP PONDS INTRUSIVE GI


Sheet 2 of 2

Start Date 18 July 2023 Easting 360884 Scale 1:50
End Date 19 July 2023 Northing 210782 Ground Level 69.90mOD Depth 11.30 m

sample no & type	sample depth (m) from to	casing depth (m)	samp /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
22C	8.60 - 9.60	7.80	18 12	NI NI 90		C *400		Limited recovery: Very weak highly fractured dark grey SILTSTONE with closely spaced very thin beds of very stiff dark grey silty clay. Fractures are 10°-25° very closely rarely closely spaced, 80° to subvertical locally extremely closely spaced and 40°-60° very closely spaced locally closely spaced planar smooth.	8.50	61.40	XXXXXX
23C	9.60 - 10.10	7.80	55 4 0							XXXXXX	
24C	10.10 - 11.30	7.80	50 8 0			C *214				XXXXXX	
Borehole Completed at 11.30m									11.30	58.60	XXXXXX

HOLE CONSTRUCTION	WATER STRIKE
TOP (m) BASE (m) TYPE PLANT USED	Groundwater not encountered prior to use of flush DEPTH (m) CASING (m) ROSE TO (m) AFTER (min) REMARKS

CASING DEPTH DIAM (mm) BASE (m)	BARREL DIAMETER DIAM (mm) BASE (m)	BACKFILL TOP (m) BASE (m) MATERIAL	INSTRUMENTATION DEPTH (m) TYPE
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HOLE PROGRESS DATE TIME DEPTH (m) CASING (m) WATER (m)	REMARKS
<p style="text-align: right;"> CONTRACT CHECKED 37707 CT</p>	

BOREHOLE LOG



BH14

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 13 July 2023

Easting 360913

Scale 1:50

End Date 13 July 2023

Northing 210758

Ground Level 67.60mOD

Depth 7.70 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.30 - 0.50							Grass over soft brown slightly sandy CLAY. (MADE GROUND)	0.10	67.50	
1ES	0.30 - 0.40							Soft orangish brown mottled grey sandy CLAY. (MADE GROUND)	0.50	67.10	
2D	0.40										
2ES	0.60 - 0.80							Soft orangish brown mottled grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to coarse sandstone. (MADE GROUND)	0.90	66.70	
3B	0.60 - 0.80										
4D	0.70				1.05						
3ES	1.00 - 1.20						S 20	Soft to firm greyish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse sandstone. (MADE GROUND)	1.20	66.40	
5B	1.00 - 1.20										
6D	1.10	Nil									
7D	1.20 - 1.65							Stiff locally firm greyish brown slightly sandy slightly gravelly locally gravelly silty CLAY. Gravel is subangular to subrounded, fine to coarse sandstone.			
8L	1.20 - 2.00										
9D	1.80										
10D	2.00 - 2.45	Nil					S 24				
11L	2.00 - 3.00										
4ES	2.20 - 2.40										
12D	2.50										
13D	3.00 - 3.45	Nil					S 23	Very stiff greenish grey rarely mottled brown slightly sandy slightly gravelly becoming gravelly CLAY. Gravel is subangular to subrounded, fine to coarse sandstone.	2.90	64.70	
14L	3.00 - 3.70	3.00									
5ES	3.20 - 3.40										
15D	3.30										
16D	3.70 - 4.10	3.00					S 40				
17C	3.70 - 4.70		100								
18D	4.00										
19D	4.70 - 5.11	3.00	100				S *118	4.70m: Becoming claybound gravel.			
20C	4.70 - 6.20		60 24								
21D	5.50			NI 80 130				Very weak light greyish brown and grey MUDSTONE locally disintegrated to claybound gravel. Fractures very closed spaced intersecting subhorizontal to 20° and 45 to 60° planar rough and smooth, with brown staining on fracture surfaces	5.00	62.60	
6ES	5.80 - 6.00										
22D	6.20 - 6.49	3.00	100				S *182				
23C	6.20 - 7.70		73								
24D	6.50		27								
		3.00		NI 90			C *462	Moderately weak light grey fine SANDSTONE. Fractures very closely and closely spaced subhorizontal to 30° and 60-90° planar and undulating rough and smooth stained orangish brown.	7.50 7.70	60.10 59.90	

Borehole Completed at 7.70m

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit	Hand Tools	1.05	Nil	0.95	20	Very Slow
1.20	3.70	Windowless Sample	Geotechnical Pioneer Rig					
3.70	7.70	Rotary Core	Geotechnical Pioneer Rig					
CASING DEPTH			BARREL DIAMETER		BACKFILL			INSTRUMENTATION
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
168	3.00	128	3.70	0.00	0.10	Arisings		
		146	7.70	0.10	0.50	Concrete		
				0.50	7.70	Grout		
HOLE PROGRESS				REMARKS				
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Water flush 3.70-7.70m (approx. 90% returns).				
13-07-2023 08:35	0.00	Nil						
13-07-2023 16:00	7.70	3.00	2.40					
				CONTRACT		CHECKED		
				37707		CT		

BOREHOLE LOG



BH15

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 10 July 2023

Easting 360926

Scale 1:50

End Date 11 July 2023

Northing 210761

Ground Level 69.90mOD

Depth 7.20 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.20 - 0.40							Grass over firm dark brown slightly sandy CLAY with abundant rootlets. (MADE GROUND)	0.10	69.80	
1ES	0.20 - 0.40							Reddish brown gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse limestone, rare brick, concrete and sandstone. (MADE GROUND)	0.50	69.40	
2D	0.20 - 0.40										
2ES	0.60 - 0.80							Orangish brown clayey gravelly fine to coarse SAND with rare rootlets and fragments (up to 2mm) of wood. Gravel is subangular and subrounded fine to coarse brick and concrete. (MADE GROUND)	0.90	69.00	
3B	0.60 - 0.80										
4D	0.60 - 0.80							Soft orangish brown slightly sandy slightly gravelly CLAY. (MADE GROUND)	1.35	68.55	
3ES	0.90 - 1.20										
5B	0.90 - 1.20							Firm becoming stiff brown and orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse sandstone and rare brick. (MADE GROUND)	2.45	67.45	
6D	0.90 - 1.20										
7D	1.20 - 1.65							Orangish brown clayey gravelly fine to coarse SAND. Gravel is subangular and subrounded fine to coarse sandstone.	2.85	67.05	
8L	1.20 - 2.00										
9D	1.70							Dense becoming medium dense greyish brown silty very sandy subangular and subrounded fine to coarse sandstone GRAVEL.			
4ES	1.90 - 2.10										
10L	2.00 - 3.00										
11D	2.70										
5ES	2.80 - 3.00										
12D	3.00 - 3.45										
13L	3.00 - 4.00										
14D	3.50										
6ES	3.80 - 4.00										
15L	4.00 - 5.00										
16D	4.50										
7ES	4.80 - 5.00										
17D	5.00 - 5.45										
18L	5.00 - 6.00				5.20						
19D	5.50										
8ES	5.80 - 6.00										
20D	6.00 - 6.45							5.85 - 6.00m: Greyish brown, dark grey and reddish brown, slightly clayey.			
21L	6.00 - 7.00							Firm brown and brownish grey slightly sandy silty CLAY.	6.20	63.70	
22D	6.50										
9ES	6.80 - 7.00										
23D	7.00 - 7.20							Very weak grey MUDSTONE.	7.00	62.90	
									7.20	62.70	

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE				
TOP (m)	BASE (m)	TYPE						DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit		Hand Tools		5.20	3.00	5.20		20		Seepage
1.20	7.00	Windowless Sample		Geotechnical Terrier Rig								

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
113	6.00	98	3.00	0.00	0.05	Arisings		
		84	5.00	0.05	0.50	Concrete		
		98	6.00	0.50	7.00	Grout		
		84	7.00					

HOLE PROGRESS				REMARKS
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	
10-07-2023 12:55	0.00	Nil		
10-07-2023 17:00	5.00	5.00	5.20	
11-07-2023 08:20	5.00	5.00	3.91	
11-07-2023 15:45	7.20	6.00	5.61	

CONTRACT	CHECKED
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BOREHOLE LOG



BH16

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 14 July 2023

Easting 360945

Scale 1:50

End Date 18 July 2023

Northing 210758

Ground Level 69.60mOD

Depth 12.70 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instrument	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.30 - 0.50 0.30 - 0.50 0.40				0.70			Soft light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse sandstone. (MADE GROUND)	0.50	69.10	
3B 2ES 4D 5D 6L	0.80 - 1.20 1.00 - 1.20 1.00 1.20 - 1.65 1.20 - 2.00		Nil				S 15	Light grey sandstone BOULDER. (MADE GROUND) Soft light grey mottled brownish orange slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse sandstone. (MADE GROUND)	0.70 1.20	68.90 68.40	
3ES 7D 8L	1.80 - 2.00 2.00 - 2.45 2.00 - 2.50		Nil				S 33	Firm to stiff orangish brown, brown and dark grey slightly sandy slightly gravelly CLAY. Gravel is angular fine sandstone. (MADE GROUND) Dense locally medium dense orangish brown silty very sandy angular to rounded fine to coarse sandstone and siltstone GRAVEL. (Possibly Made Ground).	1.65	67.95	
9L 4ES 10D 11L	2.50 - 3.00 2.80 - 3.00 3.00 - 3.45 3.00 - 4.00		Nil				S 26				
5ES 12D 13L	3.80 - 4.00 4.00 - 4.45 4.00 - 5.00		Nil				S 37				
6ES 14D 15L	4.80 - 5.00 5.00 - 5.45 5.00 - 6.00		Nil				S 50	Dense orangish brown slightly gravelly fine and medium SAND. Gravel is angular fine and medium sandstone.	5.05	64.55	
16D 17L	6.00 - 6.45 6.00 - 6.70		Nil				S 41				
7ES 18D 19C	6.45 - 6.65 6.70 - 7.03 6.70 - 8.20		93 0 0	NI			S 47	Stiff laminated orangish brown and grey slightly sandy silty CLAY. Extremely weak highly fractured grey silty MUDSTONE locally disintegrated to claybound gravel. Fractures are subhorizontal to 20° extremely closely and very closely spaced and randomly orientated extremely closely spaced planar smooth rarely with orangish brown staining. 7.00m: Weak grey siltstone.	6.30 6.65	63.30 62.95	

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit	Hand Tools	0.70	Nil	0.00	0	Ingress overnight
1.20	6.70	Windowless Sample	Geotechnical Pioneer Rig					
6.70	12.70	Rotary Core	Geotechnical Pioneer Rig					

CASING DEPTH

DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL
200	1.70	128	6.70	0.00	0.10	Arisings
168	6.00	146	12.70	0.10	0.50	Concrete
				0.50	1.50	Bentonite
				1.50	12.70	Grout

BARREL DIAMETER

BACKFILL

INSTRUMENTATION

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
14-07-2023 13:00	0.00	Nil	
14-07-2023 15:00	1.20	Nil	Dry
17-07-2023 09:00	1.20	Nil	0.70
17-07-2023 16:30	6.70	6.00	4.00
18-07-2023 07:45	6.70	6.00	3.10
18-07-2023 13:00	12.70	6.00	2.91

REMARKS

Water flush 6.70-12.70m (approx. 100% returns).



CONTRACT	CHECKED
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BOREHOLE LOG



BH16

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 14 July 2023

Easting 360945

Scale 1:50

End Date 18 July 2023

Northing 210758

Ground Level 69.60mOD

Depth 12.70 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
20C	8.20 - 9.70	6.00	100	NA			C 47	Very stiff grey locally dark grey gravelly silty CLAY. Gravel is angular subhorizontally aligned fine to coarse lithorelicts of extremely weak grey silty mudstone.	8.10	61.50	
21C	9.70 - 11.20	6.00	77 6 0				C 91				
22C	11.20 - 12.70	6.00	93 43 13	NI NI 40			C **	Very weak highly fractured grey and greyish brown silty MUDSTONE. Fractures are subhorizontal to 20° very closely spaced and randomly orientated extremely closely locally very closely spaced planar smooth rarely with orangish brown staining. 11.60 - 12.50m: Very closely and closely spaced very thin and thin beds of firm grey mottled orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine and medium silty mudstone.	10.50	59.10	
		6.00					C *600	Borehole Completed at 12.70m	12.70	56.90	

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE

HOLE PROGRESS				REMARKS			
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)			

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



BH17

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 2

Start Date 10 July 2023

Easting 360965

Scale 1:50

End Date 12 July 2023

Northing 210749

Ground Level 70.00mOD

Depth 14.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES	0.00 - 0.30							Grass over firm dark brown slightly sandy CLAY with abundant rootlets. (MADE GROUND)	0.05	69.95	
2B	0.50 - 0.80							Firm becoming stiff brown mottled reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse sandstone. (MADE GROUND)			
2ES	0.80 - 1.20										
3B	1.00 - 1.20										
4D 5L	1.20 - 1.65 1.20 - 2.00	1.20					S 26	Medium dense orangish brown, brown and grey slightly gravelly very clayey fine to medium SAND. Gravel is subangular fine to coarse sandstone. (MADE GROUND)	1.20	68.80	
3ES	1.50				1.80			Medium dense and dense greyish brown very silty fine to coarse SAND and subangular and subrounded fine to coarse sandstone GRAVEL.	1.70	68.30	
4ES 6D 7L	2.00 2.00 - 2.45 2.00 - 3.00	1.20					S 22				
8D	2.50										
10L 9D	3.00 - 4.00 3.00 - 3.45	3.00					S 32				
11D	3.50										
12D 13L	4.00 - 4.45 4.00 - 5.00	4.00					S 15				
14D	4.50										
15D 16L	5.00 - 5.45 5.00 - 5.80	5.00					S 38				
17C 18D	5.80 - 6.50 6.00	5.00	100					Brown sandy subangular and subrounded fine to coarse sandstone GRAVEL.	5.80	64.20	
19D 20C 5ES	6.50 - 6.95 6.50 - 8.00 6.50 - 6.70	5.00	73 0 0				S 30	Stiff to very stiff greyish brown slightly sandy gravelly CLAY. Gravel is subangular and subrounded fine to coarse sandstone.	6.50	63.50	
21D 6ES	7.00 - 7.20 7.20 - 7.40			NI				Moderately weak greyish brown fine and medium SANDSTONE. Fractures are subhorizontal to 30°, 30-60° and 60-90° very closely and closely spaced planar and undulating rough stained dark brown and dark grey. Assessed zone of core loss.	6.85	63.15	
22D	8.00 - 8.45	5.00		NR			S 29		7.60	62.40	
Continued Next Page									8.00	62.00	

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE				
TOP (m)	BASE (m)	TYPE						DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.20	Inspection Pit		Hand Tools				1.80	1.20	1.45	20	Very Slow
1.20	5.80	Windowless Sample		Geotechnical Pioneer Rig								
5.80	14.00	Rotary Core		Geotechnical Pioneer Rig								

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
200	1.20	128	5.80	0.00	0.05	Arisings		
168	5.00	146	14.00	0.05	0.50	Concrete		
				0.50	14.00	Grout		

HOLE PROGRESS				REMARKS
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	
10-07-2023 11:00	0.00	Nil		Polymer flush 5.80-8.00m (approx. 90% returns), 8.00-8.80m (approx. 50% returns), 8.80-11.00m (approx. 80% returns) and 11.00-14.00m (approx. 90% returns).
10-07-2023 15:15	3.00	1.20	1.40	
11-07-2023 08:20	3.00	1.20	1.50	
11-07-2023 17:30	11.00	5.00	3.20	
12-07-2023 08:25	11.00	5.00	2.70	
12-07-2023 11:45	14.00	5.00	2.50	

CONTRACT	CHECKED
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BOREHOLE LOG



BH17

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 2 of 2

Start Date 10 July 2023

Easting 360965

Scale 1:50

End Date 12 July 2023

Northing 210749

Ground Level 70.00mOD

Depth 14.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru- ment	test type & value	description	depth (m)	reduced level (m)	legend	
23C 7ES	8.00 - 8.80 8.20 - 8.40		90 0 0					Stiff grey locally mottled brown silty CLAY.				
				NI				Moderately weak light grey MUDSTONE. Fractures are subhorizontal to 20° and 70-90° extremely closely to closely spaced planar rough stained orangish brown and brown.	8.55	61.45		
24D 25C 8ES	8.80 - 8.90 8.80 - 9.50 9.00 - 9.20	5.00						9.30 - 9.50m: Firm light grey gravelly clay. Gravel is angular and subangular fine to coarse mudstone.				
26D 27C	9.50 - 9.95 9.50 - 11.00	5.00	100 0 0	NA			S 35	Very stiff thinly laminated light grey locally dark grey silty CLAY.	9.60	60.40		
9ES	10.00 - 10.20											
28D	10.30 - 10.50											
29D 30C	11.00 - 11.19 11.00 - 12.50	5.00	100 57 57	NI 110 260			S *600	Medium strong locally weak very thinly laminated light grey MUDSTONE. Fractures are subhorizontal to 20° and 70-90° closely and medium spaced planar and undulating smooth and rough stained orangish brown.	11.20	58.80		
10ES	12.00 - 12.20											
31D	12.30 - 12.50							12.30m: Subhorizontal fracture infilled (5mm) with orangish brown slightly gravelly clay.				
32C	12.50 - 14.00	5.00	100 80 73				C *667					
33D	13.50											
11ES	13.80 - 14.00	5.00		NA			C *133	Very stiff thinly laminated dark grey silty CLAY.	13.85 14.00	56.15 56.00		
									Borehole Completed at 14.00m			

HOLE CONSTRUCTION				WATER STRIKE					
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS	
CASING DEPTH			BARREL DIAMETER		BACKFILL		INSTRUMENTATION		
DIAM (mm)	BASE (m)		DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
HOLE PROGRESS				REMARKS					
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)					
CONTRACT					CHECKED				
37707					CT				

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %						
						blows	pen (mm)	blows		pen (mm)										
BH01	1.20		1.65	Nil	Dry	1	2	75	75	2	1	2	2	75	75	75	75	C	7	85
BH01	2.00		2.45	2.00	Dry	2	4	75	75	2	2	2	2	75	75	75	75	C	8	85
BH01	3.00		3.45	3.00	1.70	1	0	75	75	1	1	1	1	75	75	75	75	S	4	85
BH01	4.00		4.45	4.00	1.36	2	1	75	75	2	3	3	3	75	75	75	75	S	11	85
BH01	5.00		5.45	4.00	3.10	2	2	75	75	3	4	4	6	75	75	75	75	S	17	85
BH01	6.00		6.45	6.00	2.23	4	4	75	75	5	5	6	5	75	75	75	75	S	21	85
BH01	7.00		7.45	7.00	1.87	1	3	75	75	2	2	2	4	75	75	75	75	S	10	85
BH01	8.20		8.65	8.20	3.03	6	11	75	75	22	18	22	24	75	75	75	75	S	86	85
BH01	9.50		9.95	8.20	1.41	4	13	75	75	17	18	33	30	75	75	75	75	C	98	85
BH01	11.00		11.45	8.20	1.61	4	11	75	75	18	18	18	17	75	75	75	75	C	71	85
BH01	12.50		12.95	8.20	2.22	10	13	75	75	16	14	14	22	75	75	75	75	C	66	85
BH02	1.20		1.65	Nil	Dry	1	7	75	75	3	3	5	5	75	75	75	75	S	16	88
BH02	2.00		2.45	1.20	0.50	1	1	75	75	1	0	1	1	75	75	75	75	S	3	88
BH02	3.00		3.45	2.00	1.00	1	0	75	75	1	0	0	1	75	75	75	75	S	2	88
BH02	5.00		5.45	4.00	2.30	3	3	75	75	1	2	3	4	75	75	75	75	S	10	88
BH02	6.00		6.45	6.00	2.20	2	6	75	75	9	11	13	15	75	75	75	75	S	48	88
BH02	7.00		7.45	6.30	1.20	4	6	75	75	6	6	8	12	75	75	75	75	S	32	88
BH02	8.50		8.95	6.30	2.00	6	14	75	75	25	22	26	24	75	75	75	75	S	97	88
BH02	10.00		10.45	6.30	2.28	8	10	75	75	12	12	13	19	75	75	75	75	S	56	88
BH03	1.20		1.65	Nil	Dry	2	4	75	75	4	4	1	2	75	75	75	75	C	11	65

- notes:
 1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
 2. s.w.p = self weight penetration.
 3. N values have not been subjected to any correction.
 4. Test carried out using split spoon S, solid cone C.
 5. Where full test drive not completed, linearly extrapolated N value reported.
 6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %						
						blows	pen (mm)	blows		pen (mm)										
BH03	2.00		2.45	Nil	Dry	1	2	75	75	2	2	3	2	75	75	75	75	C	9	65
BH03	3.00		3.45	Nil	Dry	1	1	75	75	0	1	2	1	75	75	75	75	C	4	65
BH03	5.50		5.95	5.50	1.50	1	0	75	75	1	4	3	1	75	75	75	75	S	9	65
BH03	7.50		7.93	7.00	1.50	7	10	75	75	20	25	30	25	75	75	75	55	C	107	65
BH03	8.50		8.95	7.00	1.50	6	11	75	75	13	12	13	12	75	75	75	75	C	50	65
BH03	10.00		10.45	7.00	3.00	8	13	75	75	12	13	12	13	75	75	75	75	C	50	65
BH04	1.20		1.65	Nil	Dry	2	2	75	75	2	2	2	2	75	75	75	75	S	8	88
BH04	2.00		2.45	1.20	Dry	1	1	75	75	2	2	1	2	75	75	75	75	S	7	88
BH04	3.00		3.45	1.20	Dry	1	1	75	75	1	1	1	2	75	75	75	75	S	5	88
BH04	4.00		4.45	1.20	3.10	1	1	75	75	2	1	1	2	75	75	75	75	S	6	88
BH04	5.00		5.45	5.00	2.22	1	2	75	75	1	3	2	3	75	75	75	75	S	9	88
BH04	6.50		6.95	6.50	2.66	2	2	75	75	2	3	2	1	75	75	75	75	S	8	88
BH04	8.50		8.95	8.00	2.32	1	2	75	75	2	4	2	4	75	75	75	75	S	12	88
BH04	10.00		10.45	10.00	1.63	1	1	75	75	1	0	0	4	75	75	75	75	S	5	88
BH04	11.50		11.95	11.50	4.00	4	5	75	75	6	8	8	10	75	75	75	75	S	32	88
BH04	13.00		13.45	11.50	3.44	3	3	75	75	3	5	5	6	75	75	75	75	S	19	88
BH04	14.50		14.95	11.50	1.52	2	9	75	75	12	14	38	30	75	75	75	75	S	94	88
BH04	16.00		16.38	11.50	3.43	5	8	75	75	10	36	44	10	75	75	75	0	C	133	88
BH04	17.50		17.80	11.50	2.82	8	15	75	75	48	51	1		75	75	0		C	200	88
BH05	1.20		1.65	Nil	Dry	2	2	75	75	5	5	3	3	75	75	75	75	S	16	85

- notes:
 1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
 2. s.w.p = self weight penetration.
 3. N values have not been subjected to any correction.
 4. Test carried out using split spoon S, solid cone C.
 5. Where full test drive not completed, linearly extrapolated N value reported.
 6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %						
						blows	pen (mm)	blows		pen (mm)										
BH05	2.00		2.45	1.20	Dry	1	2	75	75	1	1	2	2	75	75	75	75	S	6	85
BH05	3.00		3.45	1.20	Dry	1	2	75	75	1	1	2	2	75	75	75	75	S	6	85
BH05	4.00		4.45	1.20	Dry	1	2	75	75	2	2	2	2	75	75	75	75	S	8	85
BH05	5.00		5.45	1.20	Dry	1	1	75	75	1	1	2	2	75	75	75	75	S	6	85
BH05	6.00		6.45	6.00	2.00	1	1	75	75	2	2	5	4	75	75	75	75	S	13	85
BH05	9.00		9.45	9.00	2.54	3	3	75	75	3	4	7	9	75	75	75	75	S	23	85
BH05	10.50		10.95	9.00	3.46	4	6	75	75	9	12	12	10	75	75	75	75	S	43	85
BH05	12.00		12.45	9.00	3.86	7	10	75	75	12	13	15	19	75	75	75	75	S	59	85
BH05	13.50		13.95	9.00	3.83	4	5	75	75	11	16	17	29	75	75	75	75	C	73	85
BH05	15.00		15.45	9.00	4.11	12	12	75	75	18	18	22	28	75	75	75	75	C	86	85
BH06	1.30		1.75	Nil	Dry	0	0	75	75	0	0	0	0	75	75	75	75	S	<1	88
BH06	2.00		2.45	1.30	Dry	1	1	75	75	1	2	2	2	75	75	75	75	S	7	88
BH06	3.00		3.45	1.30	Dry	1	1	75	75	1	2	2	3	75	75	75	75	S	8	88
BH06	4.00		4.45	1.30	Dry	1	1	75	75	2	2	1	2	75	75	75	75	S	7	88
BH06	6.00		6.45	1.30	Dry	2	3	75	75	5	5	6	6	75	75	75	75	S	22	88
BH06	7.50		7.95	6.00	2.86	7	5	75	75	7	9	10	11	75	75	75	75	S	37	88
BH06	9.00		9.45	6.00	3.86	5	7	75	75	8	9	9	10	75	75	75	75	S	36	88
BH06	10.50		10.95	6.00	2.32	6	10	75	75	9	11	9	10	75	75	75	75	S	39	88
BH06	12.00		12.45	6.00	1.98	3	4	75	75	3	5	4	4	75	75	75	75	S	16	88
BH06	13.50		13.95	6.00	2.26	2	10	75	75	21	19	17	21	75	75	75	75	S	78	88

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %				
						blows	pen (mm)	blows		pen (mm)								
BH06	15.00		15.15	6.00	2.55	25	50	77	23	75	25	S	300	88				
BH06	16.50		16.65	6.00	2.71	24	1 75 0	91	9	75	0	S	400	88				
BH07	1.20		1.65	Nil	Dry	1	1 75 75	1	0	1	2	75	75	75	75	S	4	88
BH07	2.20		2.65	Nil	Dry	1	1 75 75	1	2	2	2	75	75	75	75	S	7	88
BH07	3.20		3.65	Nil	Dry	1	1 75 75	0	2	2	1	75	75	75	75	S	5	88
BH07	5.20		5.65	5.20	1.80	2	1 75 75	3	3	2	3	75	75	75	75	S	11	88
BH07	8.20		8.65	8.20	1.79	4	6 75 75	7	8	8	8	75	75	75	75	S	31	88
BH07	9.70		10.15	8.20	2.36	5	8 75 75	7	7	5	8	75	75	75	75	C	27	88
BH07	11.20		11.64	8.20	2.28	11	18 75 75	25	26	27	22	75	75	75	60	C	105	88
BH07	12.70		13.06	8.20	3.00	16	21 75 75	24	29	47		75	75	60		C	143	88
BH07	14.20		14.65	11.20	2.72	13	18 75 75	17	18	29	30	75	75	75	75	C	94	88
BH08	1.20		1.65	Nil	Dry	1	0 75 75	0	0	1	0	75	75	75	75	S	1	65
BH08	2.00		2.45	2.00	0.90	3	2 75 75	1	0	1	0	75	75	75	75	S	2	65
BH08	3.00		3.45	3.00	0.00	1	2 75 75	2	2	2	5	75	75	75	75	S	11	65
BH08	4.00		4.45	3.00	1.20	4	6 75 75	10	11	18	13	75	75	75	75	S	52	65
BH08	5.00		5.45	3.50	0.80	3	7 75 75	13	10	12	22	75	75	75	75	S	57	65
BH08	6.50		6.92	3.50	1.20	11	14 75 40	13	16	17	23	75	75	75	75	C	69	65
BH08	8.00		8.45	3.50	1.20	7	11 75 75	15	15	15	16	75	75	75	75	C	61	65
BH09	1.20		1.65	Nil	Dry	3	4 75 75	4	4	3	3	75	75	75	75	S	14	66
BH09	3.00		3.45	2.00	3.45	5	11 75 75	26	20	20	9	75	75	75	75	S	75	66

- notes:
 1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
 2. s.w.p = self weight penetration.
 3. N values have not been subjected to any correction.
 4. Test carried out using split spoon S, solid cone C.
 5. Where full test drive not completed, linearly extrapolated N value reported.
 6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %						
						blows	pen (mm)	blows		pen (mm)										
BH09	4.00		4.45	2.00	2.79	7	8	75	75	10	12	13	16	75	75	75	75	S	51	66
BH09	4.80		5.10	2.00	Dry	9	11	75	75	42	46	12		75	75	0		S	200	66
BH11	1.20		1.65	Nil	0.77	2	3	75	75	3	3	1	2	75	75	75	75	S	9	88
BH11	2.00		2.45	2.00	0.00	1	1	75	75	1	2	2	2	75	75	75	75	S	7	88
BH11	3.00	450	3.45	3.00	0.70													S	<1	88
BH11	4.00	450	4.45	4.00	1.15													S	<1	88
BH11	5.00	450	5.45	5.00	0.88													S	<1	88
BH11	6.00	450	6.45	6.00	1.11													S	<1	88
BH11	7.50		7.95	7.50	1.46	3	4	75	75	6	7	9	9	75	75	75	75	S	31	88
BH11	9.00		9.31	7.90	1.99	12	12	75	75	42	33	25		75	75	10		C	188	88
BH11	10.50		10.84	7.90	1.97	12	13	75	75	35	33	32		75	75	35		C	162	88
BH11	12.00		12.45	7.99	2.01	10	14	75	75	23	20	22	20	75	75	75	75	C	85	88
BH12	1.20		1.65	Nil	Dry	1	1	75	75	1	1	1	1	75	75	75	75	S	4	85
BH12	2.00	450	2.45	Nil	Dry													S	<1	85
BH12	3.00	450	3.45	3.00	1.30													S	<1	85
BH12	4.00	450	4.45	4.00	0.00													S	<1	85
BH12	5.00	450	5.45	5.00	0.00													S	<1	85
BH12	6.00		6.45	6.00	0.00	1	1	75	75	2	4	4	9	75	75	75	75	S	19	85
BH12	7.50		7.95	7.50	0.00	2	3	75	75	3	7	8	16	75	75	75	75	S	34	85
BH12	8.60		8.79	7.80	2.00	12	13	75	40	93	7			75	0			C	400	85

- notes:
 1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
 2. s.w.p = self weight penetration.
 3. N values have not been subjected to any correction.
 4. Test carried out using split spoon S, solid cone C.
 5. Where full test drive not completed, linearly extrapolated N value reported.
 6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %						
						blows	pen (mm)	blows		pen (mm)										
BH12	10.10		10.31	7.80	3.10	25	70	45	55	75	65	C	214	85						
BH12	11.30		11.75	7.80	3.20	6	12	75	75	22	30	26	15	75	75	75	75	C	93	85
BH14	1.20		1.65	Nil	0.95	1	2	75	75	4	4	5	7	75	75	75	75	S	20	85
BH14	2.00		2.45	Nil	1.15	2	2	75	75	3	7	7	7	75	75	75	75	S	24	85
BH14	3.00		3.45	Nil	1.00	4	3	75	75	4	5	6	8	75	75	75	75	S	23	85
BH14	3.70		4.10	3.00	1.10	21	4	75	20	16	7	8	9	75	75	75	75	S	40	85
BH14	4.70		5.11	3.00	1.60	8	17	75	75	24	25	30	21	75	75	75	30	S	118	85
BH14	6.20		6.49	3.00	1.50	12	13	75	50	30	55	15		75	75	15		S	182	85
BH14	7.70		7.86	3.00	2.40	15	10	75	20	100				65				C	462	85
BH15	1.20		1.65	Nil	Dry	1	1	75	75	1	1	1	2	75	75	75	75	S	5	78
BH15	2.00		2.45	2.00	Dry	2	3	75	75	3	6	6	6	75	75	75	75	S	21	78
BH15	3.00		3.45	3.00	Dry	10	14	75	75	14	15	14	7	75	75	75	75	S	50	78
BH15	4.00		4.45	3.00	Dry	4	5	75	75	5	6	6	6	75	75	75	75	S	23	78
BH15	5.00		5.45	3.00	Dry	6	7	75	75	6	7	7	5	75	75	75	75	S	25	78
BH15	6.00		6.45	6.00	5.80	3	3	75	75	2	2	2	6	75	75	75	75	S	12	78
BH15	7.00		7.20	6.00	5.61	11	14	75	35	29	21			75	15			S	167	78
BH16	1.20		1.65	Nil	0.70	1	1	75	75	1	2	5	7	75	75	75	75	S	15	85
BH16	2.00		2.45	Nil	0.80	4	6	75	75	7	8	8	10	75	75	75	75	S	33	85
BH16	3.00		3.45	3.00	1.90	5	7	75	75	8	6	6	6	75	75	75	75	S	26	85
BH16	4.00		4.45	4.00	1.71	4	8	75	75	8	9	10	10	75	75	75	75	S	37	85

- notes:
 1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
 2. s.w.p = self weight penetration.
 3. N values have not been subjected to any correction.
 4. Test carried out using split spoon S, solid cone C.
 5. Where full test drive not completed, linearly extrapolated N value reported.
 6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

STANDARD PENETRATION TEST



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %
						blows	pen (mm)	blows		pen (mm)				
BH16	5.00		5.45	5.00	3.20	7 9	75 75	11 11 12 16	75 75 75 75	S	50	85		
BH16	6.00		6.45	5.00	3.60	10 14	75 75	14 11 10 6	75 75 75 75	S	41	85		
BH16	6.70		7.03	6.00	4.00	25	30	24 9 7 7	75 75 75 75	S	47	85		
BH16	8.20		8.65	6.00	1.60	7 10	75 75	12 12 11 12	75 75 75 75	C	47	85		
BH16	9.70		10.15	6.00	1.98	8 10	75 75	17 27 21 26	75 75 75 75	C	91	85		
BH16	11.20		11.34	6.00	2.80	8 17	75 35	100	30	C	**	85		
BH16	12.70		12.89	6.00	2.91	9 16	75 65	100	50	C	600	85		
BH17	1.20		1.65	1.20	Dry	3 3	75 75	4 8 9 5	75 75 75 75	S	26	85		
BH17	2.00		2.45	1.20	Dry	4 6	75 75	5 6 5 6	75 75 75 75	S	22	85		
BH17	3.00		3.45	3.00	0.50	7 6	75 75	8 7 9 8	75 75 75 75	S	32	85		
BH17	4.00		4.45	4.00	0.60	1 2	75 75	2 4 4 5	75 75 75 75	S	15	85		
BH17	5.00		5.45	5.00	0.80	7 8	75 75	9 9 10 10	75 75 75 75	S	38	85		
BH17	6.50		6.95	5.00	1.90	3 3	75 75	6 9 6 9	75 75 75 75	S	30	85		
BH17	8.00		8.45	5.00	2.30	4 2	75 75	4 8 9 8	75 75 75 75	S	29	85		
BH17	9.50		9.95	5.00	2.50	4 9	75 75	8 8 10 9	75 75 75 75	S	35	85		
BH17	11.00		11.19	5.00	2.80	9 16	75 65	100	50	S	600	85		
BH17	12.50		12.70	5.00	2.30	9 14	75 75	100	45	C	667	85		
BH17	14.00		14.38	5.00	2.50	10 12	75 75	21 33 46	75 75 75	C	133	85		

- notes:
 1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
 2. s.w.p = self weight penetration.
 3. N values have not been subjected to any correction.
 4. Test carried out using split spoon S, solid cone C.
 5. Where full test drive not completed, linearly extrapolated N value reported.
 6. ** Denotes no effective penetration.

CONTRACT	CHECKED
37707	JH

TRIAL PIT LOG



HP01

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 19 July 2023 Easting 360854

Scale 1:25

End Date 19 July 2023 Northing 210808 Ground Level 69.75mOD

Depth 1.20 m

sample no & type	sample depth (m) from to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30 0.10 - 0.30 0.10 - 0.30			Grass over firm brown and orangish brown slightly sandy gravelly silty CLAY with a low angular sandstone cobble content. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)			
2ES 3B 4D	0.60 - 0.80 0.60 - 0.80 0.60 - 0.80				Firm orangish brown mottled grey and brown slightly sandy slightly gravelly silty CLAY. Gravel is angular and subangular fine to coarse sandstone rarely coal. (MADE GROUND)	0.60	
3ES 5B 6D	1.00 - 1.20 1.00 - 1.20 1.00 - 1.20			Trial pit Completed at 1.20m	1.20	68.55	

Equipment: Pit excavated by Hand Tools

Pit width x length: 0.30m x 0.30m

Sidewall stability: Vertical and stable

Groundwater:
Not encountered

Backfill: Arisings 0.00 - 1.20m.



CONTRACT	CHECKED
37707	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

TRIAL PIT LOG



HP02

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 20 July 2023 Easting 360852

Scale 1:25

End Date 20 July 2023 Northing 210805 Ground Level 67.90mOD

Depth 0.60 m

sample no & type	sample depth (m) from to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30			Vegetation over soft dark brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.30	67.60	
2ES 3B 4D	0.40 - 0.60			Soft orangish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subrounded fine to coarse sandstone and mudstone. (MADE GROUND)			
				0.60m: Two subangular sandstone cobbles dipping parallel with slope. <small>Trial pit Completed at 0.60m</small>	0.60	67.30	

Equipment: Pit excavated by Hand Tools

Pit width x length: 0.30m x 0.30m

Sidewall stability: Vertical and stable

Groundwater:
Not encountered

Backfill: Arisings 0.00 - 0.60m.

Remarks: Terminated at 0.60m due to retaining wall.



CONTRACT	CHECKED
37707	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

TRIAL PIT LOG



HP03

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI


Sheet 1 of 1

Start Date 19 July 2023 Easting 360849

Scale 1:25

End Date 19 July 2023 Northing 210802 Ground Level 66.00mOD

Depth 0.40 m

sample no & type	sample depth (m) from to	test type & value	water record	description	depth (m)	reduced level (m)	legend
				Very soft dark brown sandy CLAY with abundant roots (up to 10mm diam x 100mm), rootlets and plant debris.			
				0.40m: Angular sandstone cobbles and boulders. <small>Trial pit Completed at 0.40m</small>	0.40	65.60	

Equipment: Pit excavated by Hand Tools
 Pit width x length: 0.30m x 0.80m with long side orientated 040°
 Sidewall stability: Vertical and stable.
 Groundwater: Not encountered
 Backfill: Arisings 0.00 - 0.40m.
 Remarks: Hole terminated at 0.40m due to retaining wall.



CONTRACT	CHECKED
37707	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

TRIAL PIT LOG



HP04

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 19 July 2023 Easting 360902

Scale 1:25

End Date 19 July 2023 Northing 210769 Ground Level 69.85mOD

Depth 1.20 m

sample no & type	sample depth (m) from to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30 0.10 - 0.30 0.10 - 0.30			Grass over soft brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subrounded fine to coarse sandstone rarely coal. (MADE GROUND) 0.00 - 0.60m: Frequent roots (up to 20mm diam x 100mm) and rootlets	1.20	68.65	
2ES 3B 4D	0.70 - 0.90 0.70 - 0.90 0.70 - 0.90			0.70 - 1.20m: Rare pockets (up to 10x10x10mm) of soft black sandy clay.			
5D	1.00 - 1.20			Trial pit Completed at 1.20m			

Equipment: Pit excavated by Hand Tools

Pit width x length: 0.30m x 0.30m

Sidewall stability: Vertical and stable

Groundwater:
Not encountered

Backfill: Arisings 0.00 - 1.20m.



CONTRACT	CHECKED
37707	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

TRIAL PIT LOG



HP05

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 20 July 2023 Easting 360901

Scale 1:25

End Date 20 July 2023 Northing 210767 Ground Level 67.90mOD

Depth 1.20 m

sample no & type	sample depth (m) from to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30 0.10 - 0.30 0.10 - 0.30			Grass over soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular fine and medium sandstone. (MADE GROUND) Firm brown slightly sandy slightly gravelly silty CLAY with frequent roots (up to 10mm diam x 50mm), rootlets and wood fragments (up to 60x40x40mm). Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.10	67.80	
3B 4D 5D	0.50 - 0.70 0.50 - 0.70 0.50 - 0.70						
2ES 6B	1.00 - 1.20 1.00 - 1.20			Trial pit Completed at 1.20m	1.20	66.70	

Equipment: Pit excavated by Hand Tools

Pit width x length: 0.30m x 0.30m

Sidewall stability: Vertical and stable

Groundwater:
Not encountered

Backfill: Arisings 0.00 - 1.20m.



CONTRACT	CHECKED
37707	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

TRIAL PIT LOG



HP06

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 19 July 2023 Easting 360900

Scale 1:25

End Date 19 July 2023 Northing 210764 Ground Level 66.10mOD

Depth 1.20 m

sample no & type	sample depth (m) from to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30 0.10 - 0.30 0.10 - 0.30			Vegetation over soft brown slightly sandy silty CLAY with frequent roots (up to 30mm diam x 100mm), rootlets and wood fragments (up to 50x20x20mm).	0.50	65.60	
2ES 3B 4D	0.60 - 0.80 0.60 - 0.80 0.60 - 0.80			Firm grey mottled orangish brown slightly sandy silty CLAY with rare rootlets.			
3ES 5B 6D	1.00 - 1.20 1.00 - 1.20 1.00 - 1.20		▼	Trial pit Completed at 1.20m	1.20	64.90	

Equipment: Pit excavated by Hand tools
 Pit width x length: 0.30m x 0.30m
 Sidewall stability: Vertical and stable
 Groundwater: Groundwater encountered at 1.20m Seepage at base of hole
 Backfill: Arisings 0.00 - 1.20m.



CONTRACT	CHECKED
37707	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

BOREHOLE LOG



LC01

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 04 July 2023

Easting 360826

Scale 1:50

End Date 04 July 2023

Northing 210437

Depth 2.45 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00							No recovery. Self weight penetration of casing.			
1L	1.95 - 2.45	1.95						Very soft brownish grey sandy clayey SILT with rare very closely spaced thick laminae of black organic material.	2.00		
2ES	2.45	2.45						Borehole Completed at 2.45m	2.45		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	2.45	Windowless Sample	Geotechnical Terrier 2000 rig					

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
128	2.45	113	2.45	0.00	2.45	Sidewall collapse		

HOLE PROGRESS				REMARKS								
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 0.75m below water surface. All depths are measured from top of pond bed. Environmental sample 1ES obtained via surface sample scoop.								
04-07-2023 09:30	0.00	Nil						<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>	CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED											
37707	CT											
04-07-2023 10:30	2.45	2.45										



BOREHOLE LOG

LC02

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 04 July 2023 Easting 360757

Scale 1:50

End Date 04 July 2023 Northing 210365

Depth 3.00 m

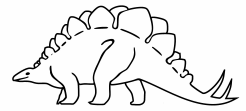
sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00							No recovery. Self weight penetration of casing.			
1L	1.50 - 2.50	1.50						Very soft firm greyish brown mottled grey sandy silty CLAY.	1.50		
2L	2.50 - 3.00	2.50									
2ES	3.00	3.00						Borehole Completed at 3.00m	3.00		

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE				
TOP (m)	BASE (m)	TYPE		Geotechnical Terrier 2000 rig				DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	3.00	Windowless Sample										

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
128	3.00	113	3.00	0.00	3.00	Sidewall collapse		

HOLE PROGRESS				REMARKS				
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 1.10m below water surface. All depths are measured from top of pond bed. Environmental sample 1ES obtained via surface sample scoop.				
04-07-2023 10:45	0.00	Nil						CONTRACT 37707
04-07-2023 11:40	3.00	3.00						

BOREHOLE LOG



LC03

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 04 July 2023

Easting 360798

Scale 1:50

End Date 04 July 2023

Northing 210236

Depth 3.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00							No recovery. Self weight penetration of casing.			
1L	1.00 - 2.00	1.00						Soft light brownish grey slightly sandy slightly gravelly silty CLAY. Gravel is angular and subangular fine to coarse mudstone and coal.	1.00		
2L	2.00 - 3.00	2.00						Dark grey and black slightly sandy angular and subangular fine to medium coal GRAVEL.	1.65		
								Soft to firm light grey slightly sandy silty CLAY.	2.45		
2ES	3.00	3.00						Borehole Completed at 3.00m	3.00		

HOLE CONSTRUCTION				WATER STRIKE			
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min) REMARKS
0.00	3.00	Windowless Sample	Geotechnical Terrier 2000 rig				

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
128	3.00	113	3.00	0.00	3.00	Sidewall collapse		

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 1.60m below water surface. All depths are measured from top of pond bed. Environmental sample 1ES obtained via surface sample scoop.			
04-07-2023 12:00	0.00	Nil					
04-07-2023 13:15	3.00	3.00					
				CONTRACT		CHECKED	
				37707		CT	





BOREHOLE LOG

LC04

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 04 July 2023 Easting 360783

Scale 1:50

End Date 04 July 2023 Northing 210148

Depth 3.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
								No recovery. Self weight penetration of casing.			
1L	2.10 - 3.10	2.10						Dark grey silty gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse mudstone, coal and brick. (MADE GROUND)	2.10		
1ES	3.00	3.10						Soft to firm grey sandy silty CLAY.	2.90		
								Borehole Completed at 3.00m	3.10		

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE				
TOP (m)	BASE (m)	TYPE						DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	3.10	Windowless Sample		Geotechnical Terrier 2000 rig								

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
128	3.10	113	3.10	0.00	3.10	Sidewall collapse		

HOLE PROGRESS				REMARKS		AGS				
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)						
04-07-2023	14:00	0.00	Nil		Borehole drilled from Pontoon. Top of pond bed located 4.40m below water surface. All depths are measured from top of pond bed. Unable to obtain environmental sample from top of pond bed via surface sample scoop due to depth of water.	<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>	CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED									
37707	CT									
04-07-2023	17:00	3.00	3.00							

BOREHOLE LOG



LC05

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 05 July 2023 Easting 360798

Scale 1:50

End Date 05 July 2023 Northing 210054

Depth 1.80 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1L	0.50 - 1.00	0.50						No recovery. Self weight penetration of casing.	0.50		
2L	1.00 - 1.80	1.00						Soft to firm light brownish grey slightly sandy slightly gravelly silty CLAY. Gravel is angular and subangular fine to coarse mudstone.			
1ES	1.80	1.80						Borehole Completed at 1.80m	1.80		

HOLE CONSTRUCTION				PLANT USED				WATER STRIKE				
TOP (m)	BASE (m)	TYPE		Geotechnical Terrier 2000 rig				DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.80	Windowless Sample										

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
113	1.80	98	1.80	0.00	1.80	Sidewall collapse		

HOLE PROGRESS				REMARKS									
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 2.50m below water surface. All depths are measured from top of pond bed. Unable to obtain environmental sample from top of pond bed via surface sample scoop due to amount of pond weed in the area.								
05-07-2023	10:10	0.00	Nil										
05-07-2023	11:10	1.80	1.80						<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>	CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED												
37707	CT												

BOREHOLE LOG



UC01

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 10 July 2023 Easting 360857

Scale 1:50

End Date 10 July 2023 Northing 211051

Depth 1.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES 1LB 3ES	0.00 - 0.30 0.00 - 0.90 0.00 - 0.90				0.00			Very soft black organic silty CLAY. Strong organic odour.			
2LB 4ES	0.90 - 1.50 0.90 - 1.50							Very soft brown and black CLAY.	0.90		
2ES	1.30 - 1.50							Borehole Completed at 1.50m	1.50		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.50	Hand Auger	Hand Auger	0.00	Nil	0.00	0	Water ingress from lake.

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
				0.00	1.50	Sidewall collapse		

HOLE PROGRESS				REMARKS							
DATE	TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole co-ordinates approximate, vegetative cover precluded accurate GPS surveying, no levels obtained.						
10-07-2023	10:30	0.00	Nil	0.00							
10-07-2023	10:45	1.50	Nil	0.00							
				<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>		CONTRACT	CHECKED	37707	CT		
CONTRACT	CHECKED										
37707	CT										

BOREHOLE LOG



UC02

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 10 July 2023 Easting 360929

Scale 1:50

End Date 10 July 2023 Northing 211020

Depth 1.10 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00 - 0.30				0.00			Very soft black and grey organic silty CLAY. Strong organic odour.			
1LB	0.00 - 0.50										
3ES	0.00 - 0.50										
2LB	0.50 - 1.10							Very soft to soft brown CLAY.	0.80		
4ES	0.50 - 1.10										
2ES	0.80 - 1.10							Borehole Completed at 1.10m	1.10		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	1.10	Hand Auger	Hand Auger	0.00	Nil	0.00	0	Water ingress from lake.

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
				0.00	1.10	Sidewall collapse		

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole co-ordinates approximate, vegetative cover precluded accurate GPS surveying, no levels obtained.			
10-07-2023 09:45	0.00	Nil	0.00				
10-07-2023 10:30	1.10	Nil	0.00				
				CONTRACT		CHECKED	
				37707		CT	





BOREHOLE LOG

UC03

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 06 July 2023 Easting 360888

Scale 1:50

End Date 06 July 2023 Northing 210968

Depth 3.80 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00							No recovery. Self weight penetration of casing.			
1L 2ES	3.00 - 3.80 3.00	3.00						Greyish brown gravelly fine to coarse SAND with rare fragments (up to 5x5x10mm) of wood. Gravel is angular and subangular fine to coarse coal.	3.00		
		3.80						Borehole Completed at 3.80m	3.80		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
3.80	0.00	Windowless Sample	Geotechnical Terrier 2000 rig					

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
113	3.80	98	3.80	0.00	3.80	Sidewall collapse		

HOLE PROGRESS				REMARKS							
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 0.80m below water surface. All depths are measured from top of pond bed. Environmental sample 1ES obtained via surface sample scoop.							
06-07-2023 14:00	0.00	Nil									
10-07-2023 15:30	3.80	3.80		<table border="1" style="float: right;"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>				CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED										
37707	CT										

BOREHOLE LOG



UC04

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 06 July 2023 Easting 360912

Scale 1:50

End Date 06 July 2023 Northing 210884

Depth 4.00 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1L 1ES	3.00 - 4.00 3.00	3.00						No recovery. Self weight penetration of casing.			
								Very soft dark grey sandy clayey SILT.	3.00		
		4.00						Borehole Completed at 4.00m	4.00		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
4.00	0.00	Windowless Sample	Geotechnical Terrier 2000 rig					

CASING DEPTH		BARREL DIAMETER		BACKFILL		INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m) TYPE
113	4.00	98	4.00	0.00	4.00	Sidewall collapse	

HOLE PROGRESS				REMARKS			
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 1.60m below water surface. All depths are measured from top of pond bed. Unable to obtain environmental sample from top of pond bed via surface sample scoop due to amount of pond weed in the area.			
06-07-2023 16:00	0.00	Nil					
06-07-2023 16:40	4.00	4.00					
				CONTRACT		CHECKED	
				37707		CT	





BOREHOLE LOG

UC05

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 07 July 2023 Easting 360869

Scale 1:50

End Date 07 July 2023 Northing 210859

Depth 2.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00							No recovery. Self weight penetration of casing.			
1L	1.50 - 2.50	1.50						Very soft dark grey sandy clayey SILT.	1.50		
2ES	2.50	2.50						Borehole Completed at 2.50m	2.50		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
2.50	0.00	Windowless Sample	Geotechnical Terrier 2000 rig					

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
113	2.50	98	2.50	0.00	2.50	Sidewall collapse		

HOLE PROGRESS				REMARKS				
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 1.70m below water surface. All depths are measured from top of pond bed. Environmental sample 1ES obtained via surface sample scoop.				
07-07-2023 09:15	0.00	Nil						
07-07-2023 10:00	2.50	2.50						

CONTRACT	CHECKED
37707	CT

BOREHOLE LOG



UC06

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

Sheet 1 of 1

Start Date 07 July 2023 Easting 360943

Scale 1:50

End Date 07 July 2023 Northing 210780

Depth 2.75 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	lf	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.00							No recovery. Self weight penetration of casing.			
1L 3ES	1.75 - 2.75 1.75 - 2.75	1.75						Very soft dark grey sandy clayey SILT.	1.75		
2ES	2.75	2.75						Greyish brown silty fine and medium SAND. Borehole Completed at 2.75m	2.55 2.75		

HOLE CONSTRUCTION				WATER STRIKE				
TOP (m)	BASE (m)	TYPE	PLANT USED	DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS
0.00	2.75	Windowless Sample	Geotechnical Terrier 2000 rig					

CASING DEPTH		BARREL DIAMETER		BACKFILL			INSTRUMENTATION	
DIAM (mm)	BASE (m)	DIAM (mm)	BASE (m)	TOP (m)	BASE (m)	MATERIAL	DEPTH (m)	TYPE
113	2.75	98	2.75	0.00	2.75	Sidewall collapse		

HOLE PROGRESS				REMARKS								
DATE TIME	DEPTH (m)	CASING (m)	WATER (m)	Borehole drilled from Pontoon. Top of pond bed located 1.50m below water surface. All depths are measured from top of pond bed. Environmental sample 1ES obtained via surface sample scope.								
07-07-2023 10:10	0.00	Nil						<table border="1"> <tr> <td>CONTRACT</td> <td>CHECKED</td> </tr> <tr> <td>37707</td> <td>CT</td> </tr> </table>	CONTRACT	CHECKED	37707	CT
CONTRACT	CHECKED											
37707	CT											
07-07-2023 11:00	2.75	2.75										

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/07/2023 08:05											4.82	Fieldwork dip
17/07/2023 08:00											4.90	Fieldwork dip - Pre development
17/07/2023 10:30											5.40	Fieldwork dip - Post development
18/07/2023 12:00											4.98	Fieldwork dip
19/07/2023 12:00											4.90	Fieldwork dip
20/07/2023 12:00											4.90	Fieldwork dip
21/07/2023 12:00											4.90	Fieldwork dip
24/07/2023 08:30											4.90	Fieldwork dip
24/07/2023 09:30											4.90	Fieldwork dip
24/07/2023 10:30											4.90	Fieldwork dip
24/07/2023 11:30											4.90	Fieldwork dip
24/07/2023 12:30											4.90	Fieldwork dip
24/07/2023 13:30											4.90	Fieldwork dip
24/07/2023 14:30											4.90	Fieldwork dip
24/07/2023 15:30											4.90	Fieldwork dip
31/07/2023 06:25	998 / 0.00	16								0.0		Upper tube
31/07/2023 06:26	998 / 0.00	16								0.0		Upper tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 06:27	998 / 0.00	16								0.0		Upper tube
31/07/2023 06:28	998 / 0.00	16								0.0		Upper tube
31/07/2023 06:29	998 / 0.00	16								0.0		Lower tube
31/07/2023 06:30	998 / 0.00	16								0.0		Lower tube
31/07/2023 06:31	998 / 0.00	16								0.0		Lower tube
31/07/2023 06:32	998 / 0.00	16								0.0		Lower tube
31/07/2023 06:33			1.1	0.0	19.2	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:33			1.4	0.0	17.7	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:33			1.4	0.0	17.5	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:34			1.4	0.0	17.5	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:36			4.5	0.0	13.2	0.0	0.0	0.0	0.6			Lower tube
31/07/2023 06:36			5.4	0.0	10.5	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 06:36			5.3	0.0	10.5	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 06:37			5.2	0.0	10.7	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 06:41			1.2	0.0	19.0	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:42			1.4	0.0	17.5	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:43			1.4	0.0	17.5	0.0	0.0	0.0	0.0			Circulation

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 06:44			1.3	0.0	17.6	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:45			1.2	0.0	17.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:46			1.2	0.0	17.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:47			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:48			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:49			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:50			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:51			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 06:52			1.2	0.0	18.6	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:52			1.2	0.0	18.0	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:52			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:53			1.2	0.0	17.9	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 06:56			4.6	0.0	12.7	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 06:56			4.6	0.0	12.0	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 06:56			4.6	0.0	11.9	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 06:57			4.7	0.0	11.7	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 07:00	998 / 0.00	16								0.0		Upper tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 07:01	998 / 0.00	16								0.0		Upper tube
31/07/2023 07:02	998 / 0.00	16								0.0		Upper tube
31/07/2023 07:03	998 / 0.00	16								0.0		Upper tube
31/07/2023 07:04	998 / 0.00	16								0.0		Lower tube
31/07/2023 07:05	998 / 0.00	16								0.0		Lower tube
31/07/2023 07:06	998 / 0.00	16								0.0		Lower tube
31/07/2023 07:07	998 / 0.00	16								0.0		Lower tube
31/07/2023 07:10											5.02	Water sample obtained
21/08/2023 14:15	1013 / 0.00	18								0.0		Upper tube
21/08/2023 14:16	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:17	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:18	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:19	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:20	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:21	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:22	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:25			1.2	0.0	18.7	0.0	0.0	0.0	0.0			Upper tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 14:25			0.9	0.0	19.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:25			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:26			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:27			6.2	0.0	11.8	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:27			6.1	0.0	11.7	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:27			6.4	0.0	11.3	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:28			6.4	0.0	11.3	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:29			0.9	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:30			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:31			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:32			1.1	0.0	18.9	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:33			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:34			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:35			1.1	0.0	19.1	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:36			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:37			0.9	0.0	19.3	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:38			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation

remarks
 # denotes results exceeding capacity of gas monitoring equipment
 VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT

37707

CHECKED

CT

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 14:39			1.0	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
21/08/2023 14:40			1.1	0.0	19.3	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:40			1.1	0.0	19.1	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:40			1.0	0.0	19.0	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:41			1.0	0.0	19.0	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 14:42			6.3	0.0	12.7	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:42			6.3	0.0	12.0	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:42			6.3	0.0	11.9	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:43			6.3	0.0	11.7	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 14:45	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:46	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:47	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:48	1012 / 0.00	18								0.0		Upper tube
21/08/2023 14:49	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:50	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:51	1012 / 0.00	18								0.0		Lower tube
21/08/2023 14:52	1012 / 0.00	18								0.0		Lower tube

remarks
 # denotes results exceeding capacity of gas monitoring equipment
 VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT
37707

CHECKED
CT

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 14:53											5.00	Water sample obtained
14/09/2023 08:45	1013 / 0.00	13								0.0		Upper tube
14/09/2023 08:46	1013 / 0.00	13								0.0		Upper tube
14/09/2023 08:47	1013 / 0.00	13								0.0		Upper tube
14/09/2023 08:48	1013 / 0.00	13								0.0		Upper tube
14/09/2023 08:49	1013 / 0.00	13								0.0		Lower tube
14/09/2023 08:50	1013 / 0.00	13								0.0		Lower tube
14/09/2023 08:51	1013 / 0.00	13								0.0		Lower tube
14/09/2023 08:52	1013 / 0.00	13								0.0		Lower tube
14/09/2023 08:53			1.2	0.0	19.3	0.0	0.0	0.0	2.3			Upper tube
14/09/2023 08:53			1.0	0.0	19.7	0.0	0.0	0.0	0.1			Upper tube
14/09/2023 08:53			1.0	0.0	19.8	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 08:54			1.1	0.0	19.1	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 08:57			8.4	0.1	10.5	0.0	0.0	0.0	2.2			Lower tube
14/09/2023 08:57			8.4	0.1	10.5	0.0	0.0	0.0	3.2			Lower tube
14/09/2023 08:57			8.4	0.1	10.5	2.1	0.0	0.0	0.0			Lower tube
14/09/2023 08:58			8.5	0.1	10.4	3.6	0.0	0.0	0.0			Lower tube

remarks	CONTRACT	CHECKED
# denotes results exceeding capacity of gas monitoring equipment	37707	CT
VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene		

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 09:00			1.3	0.0	19.1	0.0	0.0	0.0	0.1			Circulation
14/09/2023 09:01			1.3	0.0	19.2	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:02			1.3	0.0	19.3	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:03			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:04			1.2	0.0	19.5	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:05			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:06			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:07			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:08			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:09			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:10			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 09:13			1.2	0.0	19.4	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 09:13			0.8	0.0	19.7	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 09:13			0.8	0.0	20.7	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 09:14			1.1	0.0	19.7	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 09:15			7.4	0.0	11.8	0.0	0.6	0.0	0.1			Lower tube
14/09/2023 09:15			7.4	0.0	11.7	0.0	0.6	0.0	0.0			Lower tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH03

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

5.90

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 09:15			7.5	0.0	11.7	0.0	0.6	0.0	0.0			Lower tube
14/09/2023 09:16			7.5	0.0	11.4	0.0	0.8	0.0	0.0			Lower tube
14/09/2023 09:20	1013 / 0.00	13								0.0		Upper tube
14/09/2023 09:21	1013 / 0.00	13								0.0		Upper tube
14/09/2023 09:22	1013 / 0.00	13								0.0		Upper tube
14/09/2023 09:24	1013 / 0.00	13								0.0		Lower tube
14/09/2023 09:25	1013 / 0.00	13								0.0		Lower tube
14/09/2023 09:26	1013 / 0.00	13								0.0		Lower tube
14/09/2023 09:27	1013 / 0.00	13								0.0		Lower tube
14/09/2023 09:28											5.27	Water sample obtained

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
11/07/2023 08:00											4.24	Fieldwork dip
12/07/2023 08:00											4.26	Fieldwork dip
13/07/2023 08:00											4.26	Fieldwork dip
14/07/2023 08:00											4.30	Fieldwork dip
17/07/2023 10:15											4.35	Fieldwork dip - Pre development
17/07/2023 13:00											5.45	Fieldwork dip - Post development
18/07/2023 12:00											4.60	Fieldwork dip
19/07/2023 12:00											4.60	Fieldwork dip
20/07/2023 12:00											4.60	Fieldwork dip
21/07/2023 12:00											4.60	Fieldwork dip
24/07/2023 08:35											4.60	Fieldwork dip
24/07/2023 09:35											4.60	Fieldwork dip
24/07/2023 10:35											4.60	Fieldwork dip
24/07/2023 11:35											4.60	Fieldwork dip
24/07/2023 12:35											4.60	Fieldwork dip
24/07/2023 13:35											4.60	Fieldwork dip
24/07/2023 14:35											4.60	Fieldwork dip

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
24/07/2023 15:35											4.60	Fieldwork dip
31/07/2023 07:45	997 / 0.00	18								0.0		Upper tube
31/07/2023 07:46	997 / 0.00	18								0.0		Upper tube
31/07/2023 07:47	997 / 0.00	18								0.0		Upper tube
31/07/2023 07:48	997 / 0.00	18								0.0		Upper tube
31/07/2023 07:49	997 / -0.04	18								-0.9		Lower tube
31/07/2023 07:50	998 / 0.00	18								0.0		Lower tube
31/07/2023 07:51	998 / 0.00	18								0.0		Lower tube
31/07/2023 07:52	998 / 0.00	18								0.0		Lower tube
31/07/2023 07:53			1.6	0.0	5.2	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 07:53			1.6	0.0	4.2	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 07:53			1.6	0.0	4.1	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 07:54			1.7	0.0	4.0	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 07:58			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 07:58			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 07:58			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 07:59			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube

remarks	CONTRACT	CHECKED
# denotes results exceeding capacity of gas monitoring equipment	37707	CT
VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene		

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 08:02			1.5	0.0	4.5	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:03			1.6	0.0	4.2	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:04			1.7	0.0	3.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:05			1.7	0.0	3.9	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:06			1.7	0.0	3.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:07			1.7	0.0	3.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:08			1.7	0.0	3.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:09			1.7	0.0	3.7	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:10			1.7	0.0	3.7	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:11			1.7	0.0	3.7	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:12			1.7	0.0	3.6	0.0	0.0	0.0	0.0			Circulation
31/07/2023 08:13			1.6	0.0	5.4	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 08:13			1.6	0.0	4.0	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 08:13			1.6	0.0	3.9	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 08:14			1.7	0.0	3.9	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 08:17			0.0	0.0	19.8	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 08:17			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 08:17			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 08:18			0.0	0.0	20.6	0.0	0.0	0.0	0.0			Lower tube
31/07/2023 08:21	996 / 0.00	18								0.0		Upper tube
31/07/2023 08:22	996 / 0.00	18								0.0		Upper tube
31/07/2023 08:23	996 / 0.00	18								0.0		Upper tube
31/07/2023 08:24	996 / 0.00	18								0.0		Upper tube
31/07/2023 08:25	996 / 0.00	18								0.0		Lower tube
31/07/2023 08:26	996 / 0.00	18								0.0		Lower tube
31/07/2023 08:27	997 / 0.00	18								0.0		Lower tube
31/07/2023 08:28	997 / 0.00	18								0.0		Lower tube
31/07/2023 08:30											4.60	Water sample obtained
21/08/2023 15:35	1013 / 0.00	18								0.0		Upper tube
21/08/2023 15:36	1013 / 0.00	18								0.0		Upper tube
21/08/2023 15:37	1013 / 0.00	18								0.0		Upper tube
21/08/2023 15:38	1013 / 0.00	18								0.0		Upper tube
21/08/2023 15:39	1013 / 0.00	18								0.0		Lower tube
21/08/2023 15:40	1013 / 0.00	18								0.0		Lower tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 15:41	1013 / 0.00	18								0.0		Lower tube
21/08/2023 15:42	1013 / 0.00	18								0.0		Lower tube
21/08/2023 15:44			0.1	0.0	21.3	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 15:44			0.0	0.0	21.1	0.0	0.0	0.0	0.9			Upper tube
21/08/2023 15:44			0.0	0.0	20.9	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 15:45			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 15:47			0.0	0.0	21.5	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 15:47			0.0	0.0	21.3	0.0	0.0	0.0	0.3			Lower tube
21/08/2023 15:47			0.0	0.0	21.0	0.0	0.0	0.0	0.4			Lower tube
21/08/2023 15:48			0.0	0.0	20.9	0.0	0.0	0.0	0.5			Lower tube
21/08/2023 15:50			0.0	0.0	20.9	0.0	0.0	0.0	0.5			Circulation
21/08/2023 15:51			0.0	0.0	20.9	0.0	0.0	0.0	0.5			Circulation
21/08/2023 15:52			0.0	0.0	20.8	0.0	0.0	0.0	0.4			Circulation
21/08/2023 15:53			0.0	0.0	20.8	0.0	0.0	0.0	0.4			Circulation
21/08/2023 15:54			0.0	0.0	20.8	0.0	0.0	0.0	0.4			Circulation
21/08/2023 15:55			0.0	0.0	20.8	0.0	0.0	0.0	0.4			Circulation
21/08/2023 15:56			0.0	0.0	20.8	0.0	0.0	0.0	0.3			Circulation

remarks
 # denotes results exceeding capacity of gas monitoring equipment
 VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT

37707

CHECKED

CT

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 15:57			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Circulation
21/08/2023 15:58			0.0	0.0	20.8	0.0	0.0	0.0	0.2			Circulation
21/08/2023 15:59			0.0	0.0	20.8	0.0	0.0	0.0	0.1			Circulation
21/08/2023 16:00			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Circulation
21/08/2023 16:02			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 16:02			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 16:02			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 16:03			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 16:05			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 16:05			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 16:05			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 16:06			0.0	0.0	20.8	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 16:13	1013 / 0.00	18								0.0		Upper tube
21/08/2023 16:14	1013 / 0.00	18								0.0		Upper tube
21/08/2023 16:15	1013 / 0.00	18								0.0		Upper tube
21/08/2023 16:16	1013 / 0.00	18								0.0		Upper tube
21/08/2023 16:17	1013 / 0.00	18								0.0		Lower tube

remarks	CONTRACT	CHECKED
# denotes results exceeding capacity of gas monitoring equipment	37707	CT
VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene		

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 16:18	1013 / 0.00	18								0.0		Lower tube
21/08/2023 16:19	1013 / 0.00	18								0.0		Lower tube
21/08/2023 16:20	1013 / 0.00	18								0.0		Lower tube
21/08/2023 16:21											4.60	Unable to obtain water sample
14/09/2023 10:00	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:01	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:02	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:03	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:04	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:05	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:06	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:07	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:09			2.4	0.0	7.8	0.0	0.0	0.0	4.2			Upper tube
14/09/2023 10:09			2.4	0.0	7.4	0.0	0.0	0.0	0.4			Upper tube
14/09/2023 10:09			2.4	0.0	5.4	0.0	0.0	0.0	0.4			Upper tube
14/09/2023 10:10			2.3	0.0	4.9	0.0	0.0	0.0	0.4			Upper tube
14/09/2023 10:11			2.3	0.0	4.9	0.0	0.0	0.0	2.2			Lower tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 10:11			2.0	0.0	5.6	0.0	0.0	0.0	0.6			Lower tube
14/09/2023 10:11			2.0	0.0	4.0	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 10:12			2.0	0.0	3.7	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 10:13			1.7	0.0	5.3	0.0	0.0	0.0	0.3			Circulation
14/09/2023 10:14			2.2	0.0	4.3	0.0	0.0	0.0	0.3			Circulation
14/09/2023 10:15			2.2	0.0	4.1	0.0	0.0	14.0	0.3			Circulation
14/09/2023 10:16			2.3	0.0	3.9	0.0	0.0	0.0	0.2			Circulation
14/09/2023 10:17			2.3	0.0	3.9	0.0	0.0	0.0	0.2			Circulation
14/09/2023 10:18			2.3	0.0	4.0	0.0	0.0	0.0	0.1			Circulation
14/09/2023 10:19			2.3	0.0	3.9	0.0	0.0	0.0	0.0			Circulation
14/09/2023 10:20			2.3	0.0	3.9	0.0	0.0	0.0	0.0			Circulation
14/09/2023 10:21			2.3	0.0	8.8	0.0	0.0	0.0	0.0			Circulation
14/09/2023 10:22			2.4	0.0	4.0	0.0	0.0	0.0	0.0			Circulation
14/09/2023 10:23			2.4	0.0	4.0	0.0	0.0	0.0	0.0			Circulation
14/09/2023 10:24			2.3	0.0	5.0	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 10:24			2.3	0.0	5.0	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 10:24			2.3	0.0	4.2	0.0	0.0	0.0	0.0			Upper tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH07

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

10.40

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 10:25			2.3	0.0	4.1	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 10:26			2.2	0.0	4.1	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 10:26			2.1	0.0	5.5	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 10:26			2.0	0.0	3.7	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 10:27			2.0	0.0	3.5	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 10:29	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:30	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:31	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:32	1013 / 0.00	13								0.0		Upper tube
14/09/2023 10:33	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:34	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:35	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:36	1013 / 0.00	13								0.0		Lower tube
14/09/2023 10:37											4.66	Water sample obtained

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/07/2023 08:00											2.10	Fieldwork dip - Pre development
21/07/2023 10:00											3.64	Fieldwork dip - Post development
24/07/2023 09:00											3.60	Fieldwork dip
24/07/2023 10:00											3.60	Fieldwork dip
24/07/2023 11:00											3.60	Fieldwork dip
24/07/2023 12:00											3.60	Fieldwork dip
24/07/2023 13:00											3.60	Fieldwork dip
24/07/2023 14:00											3.60	Fieldwork dip
24/07/2023 15:00											3.60	Fieldwork dip
24/07/2023 16:00											3.60	Fieldwork dip
31/07/2023 08:58	997 / 0.00	18								0.0		Upper tube
31/07/2023 08:59	996 / 0.00	18								0.0		Upper tube
31/07/2023 09:00	996 / 0.00	18								0.0		Upper tube
31/07/2023 09:01	996 / 0.00	18								0.0		Upper tube
31/07/2023 09:02	996 / 0.00	18								0.0		Lower tube
31/07/2023 09:03	996 / 0.00	18								0.0		Lower tube
31/07/2023 09:04	996 / 0.00	18								0.0		Lower tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 09:05	996 / 0.00	18								0.0		Lower tube
31/07/2023 09:06			6.5	0.0	5.4	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:06			6.8	0.0	4.9	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:06			6.8	0.0	4.7	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:07			6.9	0.0	4.6	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:11			14.3	1.7	2.5	40.2	0.0	0.0	0.0			Lower tube
31/07/2023 09:11			14.7	1.9	1.8	43.1	0.0	0.0	0.0			Lower tube
31/07/2023 09:11			14.7	1.8	1.7	41.2	0.0	0.0	0.0			Lower tube
31/07/2023 09:12			14.7	1.7	1.7	38.4	0.0	0.0	0.0			Lower tube
31/07/2023 09:15			6.7	0.1	6.8	2.2	0.0	0.0	0.0			Circulation
31/07/2023 09:16			6.8	0.0	4.6	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:17			6.6	0.0	4.6	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:18			6.4	0.0	4.6	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:19			6.2	0.0	4.7	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:20			5.9	0.0	4.7	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:21			5.7	0.0	4.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:22			5.6	0.0	4.8	0.0	0.0	0.0	0.0			Circulation

remarks
 # denotes results exceeding capacity of gas monitoring equipment
 VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT
37707

CHECKED
CT

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 09:23			5.4	0.0	4.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:24			5.3	0.0	4.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:25			5.2	0.0	4.8	0.0	0.0	0.0	0.0			Circulation
31/07/2023 09:26			4.9	0.0	7.0	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:26			5.0	0.0	5.1	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:26			4.9	0.0	5.0	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:27			4.9	0.0	4.9	0.0	0.0	0.0	0.0			Upper tube
31/07/2023 09:30			12.9	0.8	3.5	18.2	0.0	0.0	0.0			Lower tube
31/07/2023 09:30			13.3	1.0	2.5	23.2	0.0	0.0	0.0			Lower tube
31/07/2023 09:30			13.4	1.0	2.3	24.3	0.0	0.0	0.0			Lower tube
31/07/2023 09:31			13.4	1.0	2.3	23.4	0.0	0.0	0.0			Lower tube
31/07/2023 09:34	997 / 0.00	18								0.0		Upper tube
31/07/2023 09:35	997 / 0.00	18								0.0		Upper tube
31/07/2023 09:36	997 / 0.00	18								0.0		Upper tube
31/07/2023 09:37	997 / 0.00	18								0.0		Upper tube
31/07/2023 09:38	997 / 0.00	18								0.0		Lower tube
31/07/2023 09:39	997 / 0.00	18								0.0		Lower tube

remarks	CONTRACT	CHECKED
# denotes results exceeding capacity of gas monitoring equipment	37707	CT
VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene		

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/07/2023 09:40	997 / 0.00	18								0.0		Lower tube
31/07/2023 09:41	997 / 0.00	18								0.0		Lower tube
31/07/2023 09:45											3.60	Water sample obtained
21/08/2023 17:07	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:08	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:09	1012 / 0.01	17								0.2		Upper tube
21/08/2023 17:10	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:11	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:12	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:13	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:14	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:16			12.7	0.0	0.9	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:16			12.7	0.0	0.9	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:16			12.7	0.0	0.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:17			12.7	0.0	0.8	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:19			14.7	1.7	0.5	38.4	0.0	0.0	0.0			Lower tube
21/08/2023 17:19			14.7	1.7	0.5	39.7	0.0	0.0	0.0			Lower tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 17:19			14.6	1.7	0.6	37.2	0.0	0.0	0.0			Lower tube
21/08/2023 17:20			14.6	1.6	0.6	32.9	0.0	0.0	0.0			Lower tube
21/08/2023 17:21			12.5	0.0	1.1	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:22			12.7	0.0	0.9	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:23			12.7	0.0	0.8	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:24			12.7	0.0	0.8	0.0	0.0	0.0	0.3			Circulation
21/08/2023 17:25			12.7	0.0	0.7	0.0	0.0	0.0	0.2			Circulation
21/08/2023 17:26			12.7	0.0	0.7	0.0	0.0	0.0	0.2			Circulation
21/08/2023 17:27			12.7	0.0	0.7	0.0	0.0	0.0	0.1			Circulation
21/08/2023 17:28			12.7	0.0	0.7	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:29			12.7	0.0	0.7	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:30			12.7	0.0	0.7	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:31			12.8	0.0	0.6	0.0	0.0	0.0	0.0			Circulation
21/08/2023 17:33			12.8	0.0	0.6	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:33			12.7	0.0	0.6	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:33			12.7	0.0	0.6	0.0	0.0	0.0	0.0			Upper tube
21/08/2023 17:34			12.7	0.0	0.6	0.0	0.0	0.0	0.0			Upper tube

remarks	CONTRACT	CHECKED
# denotes results exceeding capacity of gas monitoring equipment	37707	CT
VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene		

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/08/2023 17:35			12.5	0.0	0.6	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 17:35			12.5	0.0	0.6	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 17:35			12.5	0.0	0.6	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 17:36			12.5	0.0	0.6	0.0	0.0	0.0	0.0			Lower tube
21/08/2023 17:37	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:38	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:39	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:40	1012 / 0.00	17								0.0		Upper tube
21/08/2023 17:41	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:42	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:43	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:44	1012 / 0.00	17								0.0		Lower tube
21/08/2023 17:45											3.62	Water sample obtained
14/09/2023 14:20	1014 / 0.00	18								0.0		Upper tube
14/09/2023 14:21	1014 / 0.00	18								0.0		Upper tube
14/09/2023 14:22	1014 / 0.00	18								0.0		Upper tube
14/09/2023 14:23	1014 / 0.00	18								0.0		Upper tube

remarks	CONTRACT	CHECKED
# denotes results exceeding capacity of gas monitoring equipment	37707	CT
VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene		

GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 14:24	1014 / 0.00	18								0.0		Lower tube
14/09/2023 14:25	1014 / 0.00	18								0.0		Lower tube
14/09/2023 14:26	1014 / 0.00	18								0.0		Lower tube
14/09/2023 14:27	1014 / 0.00	18								0.0		Lower tube
14/09/2023 14:29			11.1	0.0	9.8	0.0	0.0	0.0	5.5			Upper tube
14/09/2023 14:29			11.1	0.0	9.7	0.0	0.0	0.0	0.6			Upper tube
14/09/2023 14:29			11.2	0.0	8.4	0.0	0.0	0.0	0.6			Upper tube
14/09/2023 14:30			11.6	0.0	7.9	0.0	0.0	0.0	0.7			Upper tube
14/09/2023 14:31			11.1	0.0	8.5	0.0	0.0	0.0	1.5			Lower tube
14/09/2023 14:31			11.1	0.0	8.4	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 14:31			11.3	0.0	8.6	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 14:32			11.4	0.0	8.3	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 14:34			12.2	0.0	7.4	0.0	0.0	0.0	4.0			Circulation
14/09/2023 14:35			12.0	0.0	7.2	0.0	0.0	0.0	0.4			Circulation
14/09/2023 14:36			12.1	0.0	7.1	0.0	0.0	0.0	0.2			Circulation
14/09/2023 14:37			12.2	0.0	7.0	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:38			12.1	0.0	7.1	0.0	0.0	0.0	0.1			Circulation

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 14:39			11.8	0.0	7.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:40			11.8	0.0	7.4	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:41			12.0	0.0	7.2	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:42			12.0	0.0	7.2	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:43			11.9	0.0	7.3	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:44			11.8	0.0	7.3	0.0	0.0	0.0	0.0			Circulation
14/09/2023 14:45			11.4	0.0	7.7	0.0	0.0	0.0	1.4			Upper tube
14/09/2023 14:45			11.6	0.0	7.6	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 14:45			11.3	0.0	7.8	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 14:46			11.1	0.0	8.0	0.0	0.0	0.0	0.0			Upper tube
14/09/2023 14:47			10.6	0.0	8.4	0.0	0.0	0.0	0.4			Lower tube
14/09/2023 14:47			13.6	0.0	6.8	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 14:47			14.3	0.0	3.2	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 14:48			14.6	0.0	2.6	0.0	0.0	0.0	0.0			Lower tube
14/09/2023 14:50	1012 / 0.00	18								0.0		Upper tube
14/09/2023 14:51	1012 / 0.00	18								0.0		Upper tube
14/09/2023 14:52	1012 / 0.00	18								0.0		Upper tube

remarks # denotes results exceeding capacity of gas monitoring equipment VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene	CONTRACT 37707	CHECKED CT
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GAS AND GROUNDWATER LEVELS



CLIENT: FORESTRY ENGLAND

LOCATION ID

BH12

SITE: CANNOP PONDS INTRUSIVE GI

INSTALLED PIPE DEPTH (m)

8.60

PIPE DIAMETER (mm)

50

date and time	barometric pressure / differentiation (mb)	temperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/09/2023 14:53	1012 / 0.00	18								0.0		Upper tube
14/09/2023 14:54	1012 / 0.00	18								0.0		Lower tube
14/09/2023 14:55	1012 / 0.00	18								0.0		Lower tube
14/09/2023 14:56	1012 / 0.00	18								0.0		Lower tube
14/09/2023 14:57	1012 / 0.00	18								0.0		Lower tube
14/09/2023 15:05											3.66	Water sample obtained

remarks
 # denotes results exceeding capacity of gas monitoring equipment
 VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT
37707

CHECKED
CT



APPENDIX B

LABORATORY TESTING



GEOTECHNICAL ENGINEERING LIMITED

Version No. 1
 Reason for update N/A
 Page No. 1 of 71
 Date of Issue 13/09/2023

For the attention of Richard Heathc / John Hanson

TEST REPORT

PROJECT/SITE	CANNOP PONDS INTRUSIVE GI	Samples received	11/07/2023
GEL REPORT NUMBER	37707	Schedule received	10/08/2023
Your ref/PO:		Testing commenced	15/08/2023
Test report refers to	Schedule 1	Status	Final

SUMMARY OF RESULTS ATTACHED


TEST METHOD & DESCRIPTION	QUANTITY	ACCREDITED TEST
(S) denotes testing was subcontracted		
BS EN ISO 17892-1: 2014:5, Water Content	30	YES
BS EN ISO 17892-12:2018, Liquid & Plastic Limits	29	YES
BS EN ISO 17892-4: 2016: 5.2, Particle Size Distribution - Wet Sieve	41	YES
BS EN ISO 17892-4: 2016: 5.4, Particle Size Distribution - Pipette	35	YES
BS1377: Part 4: 1990:3, Dry Density/Moisture Content Relationship 2.5Kg	10	YES
BS EN ISO 17892-10:2018, Shear Strength by Direct Shear (Small Shear Box)	3	YES
BRE SD1 Suite C	(S) 10	YES

General Remarks
 This report may not be partially reproduced without written permission from this laboratory.
 The results reported relate to samples received in the laboratory and the items tested.

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Approved Signatories:
 W Jones (Laboratory Manager) J Hanson (Director)
 T Best (Deputy Laboratory Manager) N Parry (Director)



LIQUID AND PLASTIC LIMITS

BS EN ISO 17892-12:2018



CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

borehole /trial pit no.	sample		specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks
	no./type	depth (m)								
BH01	12D	4.70	4.70	18.9	BXE	0	49	25	24	Brown mottled grey slightly sandy silty CLAY
BH01	18D	6.90	6.90	22.9	BXE	17	52	25	27	Greyish brown slightly sandy slightly gravelly silty CLAY
BH02	9D	3.70	3.70	28.1	BXE	10	51	24	27	Brown mottled grey slightly gravelly slightly sandy silty CLAY.
BH02	16L	5.00	5.30	22.3	BXE	11	39	20	19	Brown mottled orange and grey slightly gravelly slightly sandy silty CLAY
BH03	8D	3.70	3.70	30.1	BXE	13	42	22	20	Brown and grey slightly sandy slightly gravelly silty CLAY
BH04	14D	4.00	4.00	26.6	BXE	51	32	18	14	Brown slightly sandy gravelly silty CLAY
BH04	25D	9.70	9.70	60	BXD	6	65	39	26	Brown slightly gravelly slightly sandy organic silty CLAY
BH05	6D	2.00	2.00	8.5	BXE	49	27	16	11	Light brown slightly sandy gravelly silty CLAY
BH05	15D	5.00	5.00	25.6	BXE	58	28	18	10	Brown very clayey SAND and GRAVEL
BH06	6D	1.75	1.75	16	BXE	28	28	16	12	Brown slightly sandy slightly gravelly CLAY
BH06	9D	2.70	2.70	25.7	BXE	12	46	24	22	Brown and grey slightly sandy slightly gravelly silty CLAY
BH06	19D	5.80	5.80	13.3	BXE	11	33	21	12	Brown slightly sandy slightly gravelly silty CLAY
BH07	4D	1.20	1.20	27.9	BXE	10	49	24	25	Brown mottled orange and grey slightly gravelly slightly sandy silty CLAY
BH07	18D	5.20	5.20	23.5	BXE	14	38	20	18	Brown slightly sandy slightly gravelly silty CLAY
BH08	9D	2.70	2.70	25.9	BXE	13	38	20	18	Brown mottled grey slightly gravelly slightly sandy silty CLAY
BH09	11D	3.00	3.00	12.8	BXE	9	30	15	15	Greyish brown slightly sandy slightly gravelly CLAY
BH11	13D	4.00	4.00	29.5	BXE	17	39	22	17	Greyish brown slightly gravelly slightly sandy silty CLAY
BH12	14D	5.70	5.70	31.1	BXD	21	49	24	25	Brown mottled grey slightly sandy slightly gravelly silty CLAY
BH14	7D	1.20	1.20	17.2	BXE	5	36	20	16	Light brown mottled orange slightly gravelly slightly sandy silty CLAY

general remarks

natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified)

NP denotes non plastic

denotes sample tested is smaller than that which is recommended in accordance with BS EN ISO 17892 or BS1377

specimen preparation	test method	CONTRACT	CHECKED
A - as received	D - oven dried (60oC)	37707	TB
B - washed on 0.425mm sieve	E - oven dried (105oC)		
C - air dried	F - not known		
	X - cone penetrometer (4 point)		
	Y - cone penetrometer (1 point)		
	Z - casagrande apparatus		

LIQUID AND PLASTIC LIMITS

BS EN ISO 17892-12:2018



CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

borehole /trial pit no.	sample		specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks
	no./type	depth (m)								
BH14	15D	3.30	3.30	16.5	BXE	7	49	24	25	Brown and grey mottled orange slightly gravelly slightly sandy silty CLAY
BH15	9D	1.70	1.70	21.5	BXE	10	40	20	20	Orangish brown mottled black and grey slightly gravelly slightly sandy CLAY
BH16	4D	1.00	1.00	25.1	BXE	7	43	22	21	Brown slightly sandy slightly gravelly CLAY
BH17	4D	1.20	1.20	13.8	BYE	53	27	15	12	Brown slightly sandy gravelly CLAY
BH17	9D	3.00	3.00	10.6	E					Brown slightly clayey sandy GRAVEL
BH17	19D	6.50	6.50	10	BYE	50	26	17	9	Greyish brown slightly sandy gravelly silty CLAY
HP01	6D	1.00	1.00	29.1	BXD	26	41	24	17	Brown mottled black slightly sandy slightly gravelly silty CLAY
HP02	4D	0.40	0.40	22	BXE	28	39	21	18	Brown slightly gravelly slightly sandy silty CLAY
HP04	5D	1.00	1.00	24.9	BXE	29	42	23	19	Brown slightly sandy slightly gravelly silty CLAY with occasional wood fragments
HP05	5D	0.50	0.50	17.8	BXE	54	40	24	16	Brown slightly sandy gravelly silty CLAY
HP06	6D	1.00	1.00	18.9	BXE	6	44	23	21	Greyish brown slightly gravelly slightly sandy silty CLAY

general remarks

natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified)

NP denotes non plastic

denotes sample tested is smaller than that which is recommended in accordance with BS EN ISO 17892 or BS1377

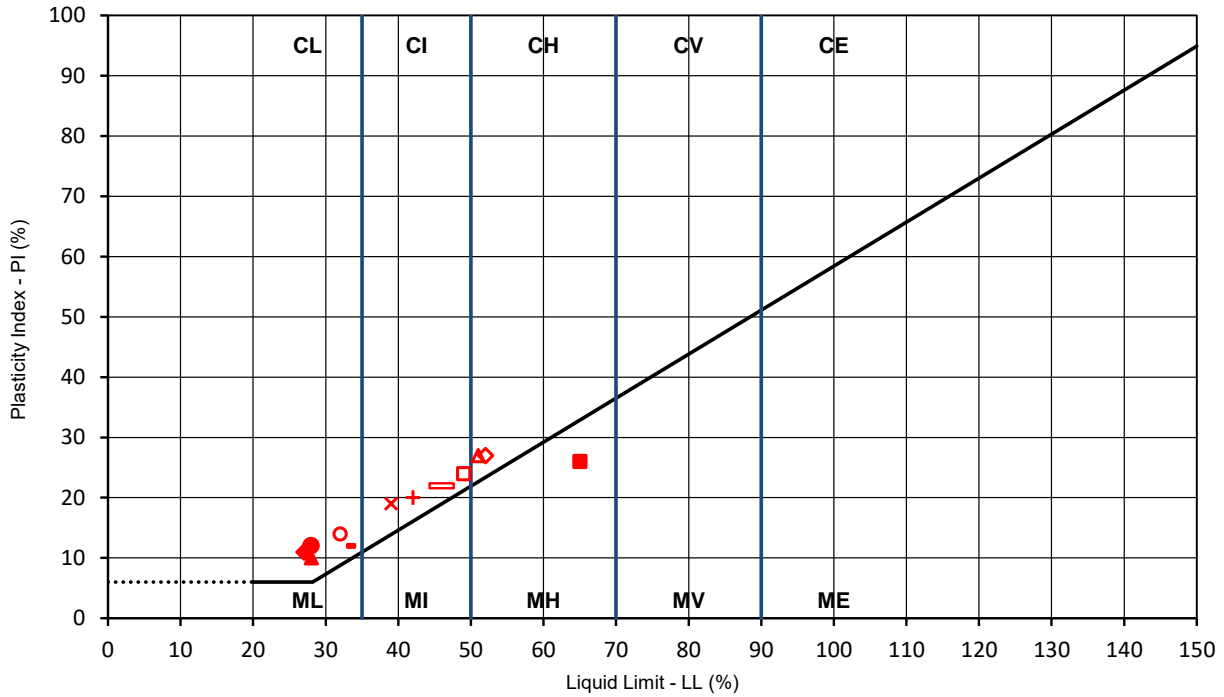
specimen preparation	test method	CONTRACT	CHECKED
A - as received	D - oven dried (60oC)	37707	TB
B - washed on 0.425mm sieve	E - oven dried (105oC)		
C - air dried	F - not known		
	X - cone penetrometer (4 point)		
	Y - cone penetrometer (1 point)		
	Z - casagrande apparatus		

Geotechnical Engineering Limited
ATTERBERG LINE PLOT



CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI



BH/TP No.	depth (m)	LL	PL	PI	remarks	
□	BH01	4.70	49	25	24	
◇	BH01	6.90	52	25	27	
△	BH02	3.00	51	24	27	
×	BH02	5.30	39	20	19	
+	BH03	3.70	42	22	20	
○	BH04	4.00	32	18	14	
■	BH04	9.70	65	39	26	
◆	BH05	2.00	27	16	11	
▲	BH05	5.00	28	18	10	
●	BH06	1.75	28	16	12	
▢	BH06	2.70	46	24	22	
▪	BH06	5.80	33	21	12	

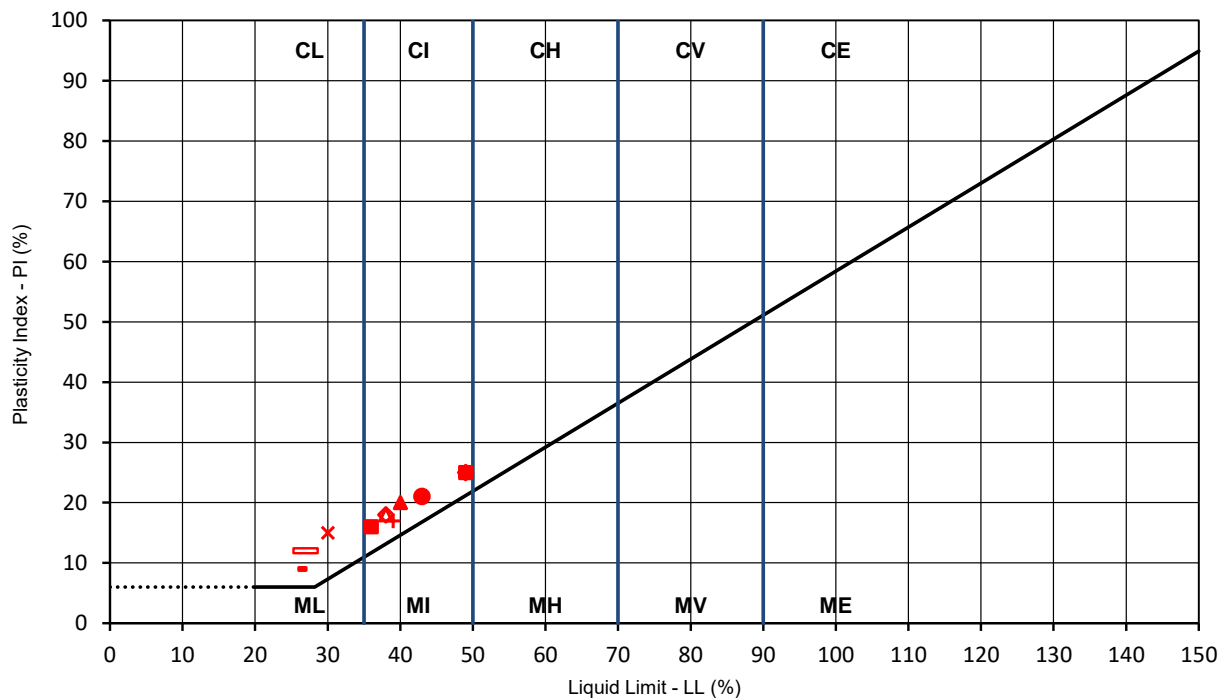
CONTRACT	CHECKED
37707	TB

Geotechnical Engineering Limited
ATTERBERG LINE PLOT



CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI



BH/TP No.	depth (m)	LL	PL	PI	remarks	
□	BH07	1.20	49	24	25	
◇	BH07	5.20	38	20	18	
△	BH08	2.70	38	20	18	
×	BH09	3.00	30	15	15	
+	BH11	4.00	39	22	17	
○	BH12	5.70	49	24	25	
■	BH14	1.20	36	20	16	
◆	BH14	3.30	49	24	25	
▲	BH15	1.70	40	20	20	
●	BH16	1.00	43	22	21	
▢	BH17	1.20	27	15	12	
▪	BH17	6.50	26	17	9	

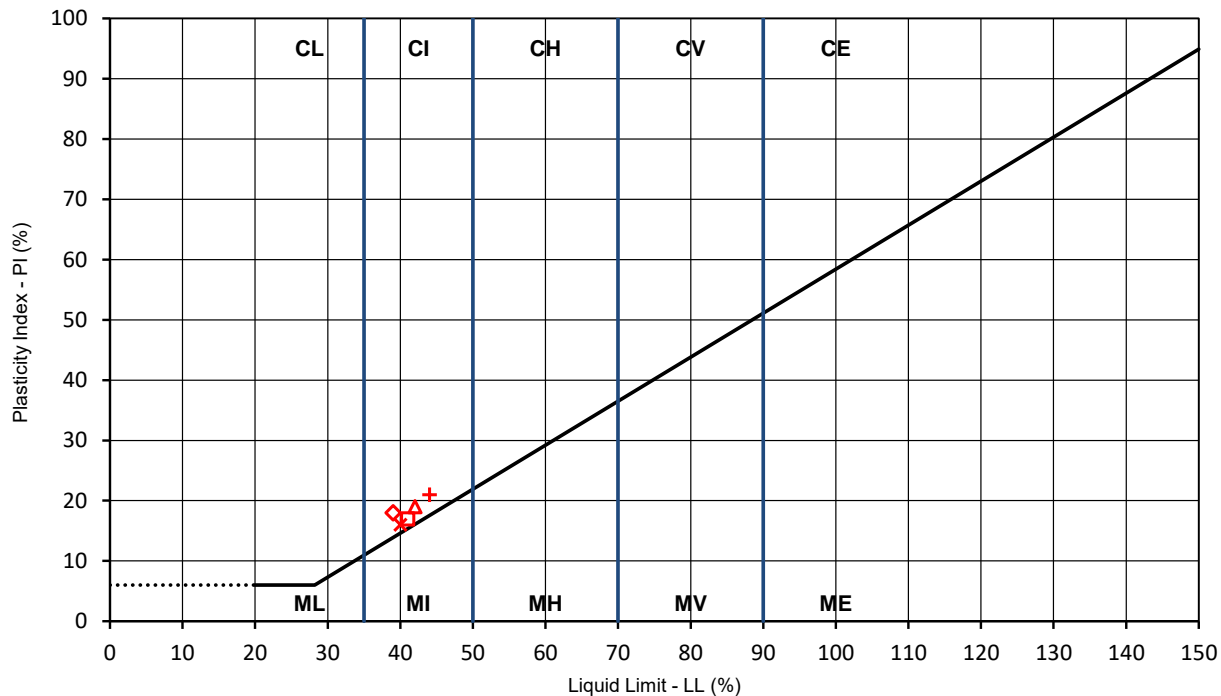
CONTRACT	CHECKED
37707	TB

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ATTERBERG LINE PLOT



CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI



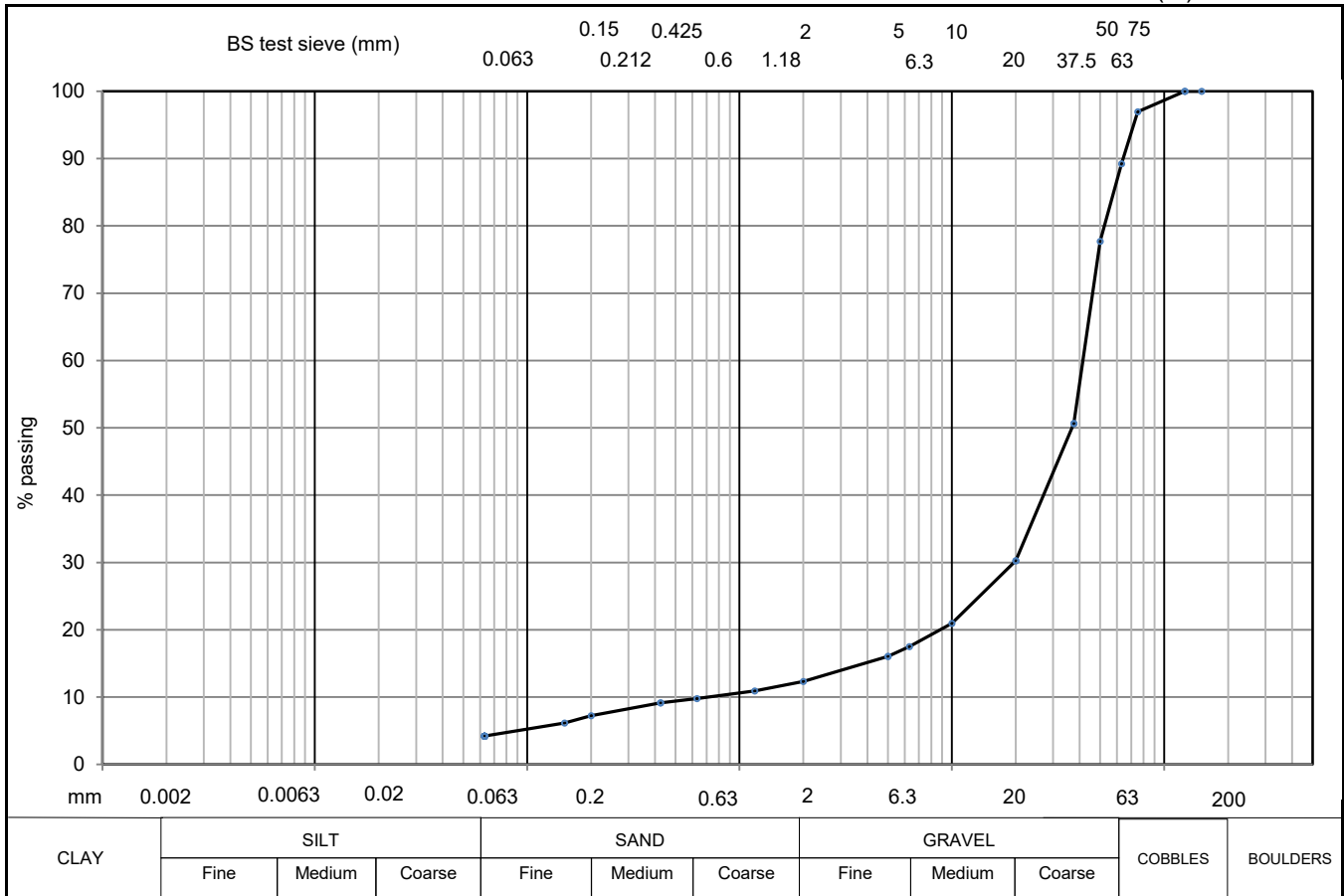
BH/TP No.	depth (m)	LL	PL	PI	remarks
□ HP01	1.00	41	24	17	
◇ HP02	0.40	39	21	18	
△ HP04	1.00	42	23	19	
× HP05	0.50	40	24	16	
+ HP06	1.00	44	23	21	

CONTRACT	CHECKED
37707	TB

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PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH01
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Grey slightly silty sandy GRAVEL with medium cobble content	SAMPLE DEPTH (m)	1.00
		SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



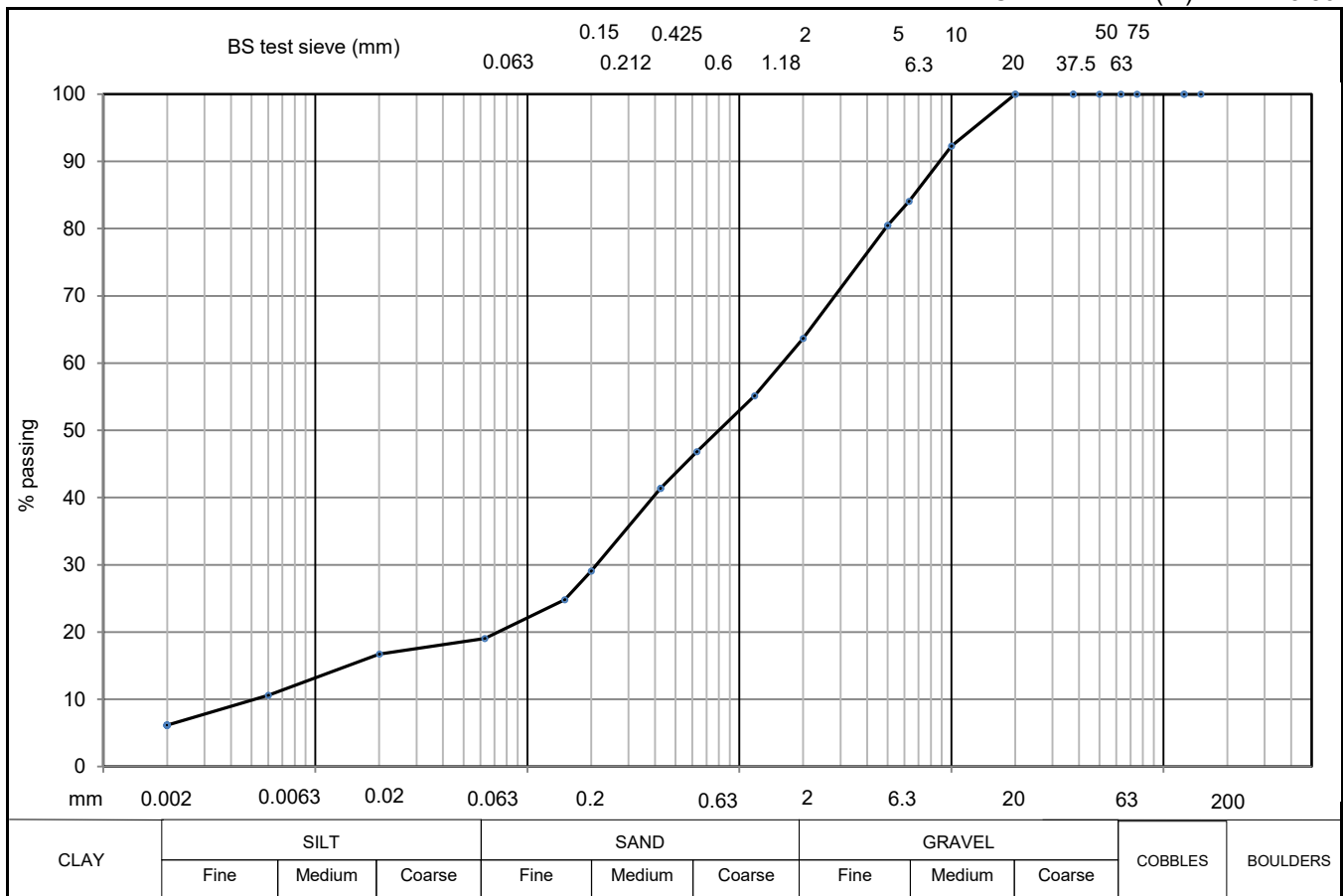
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150	100	5	16	20	
SILT & CLAY	4						
SAND	8	75	97	2	12	6	
GRAVEL	77						
COBBLE & BOULDER	11	63	89	1.18	11	2	
test method(s)	5.2	50	78	0.63	10		
test method		37.5	51	0.425	9		
5.2 - sieving		20	30	0.2	7		
5.3 - sedimentation by hydrometer		10	21	0.15	6		
5.4 - sedimentation by pipette		6.3	17	0.063	4		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH01
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	8L
DESCRIPTION	Dark blackish brown clayey very gravelly SAND	SAMPLE DEPTH (m)	3.00
		SPECIMEN TOP (m)	3.20
		SPECIMEN BASE (m)	3.50



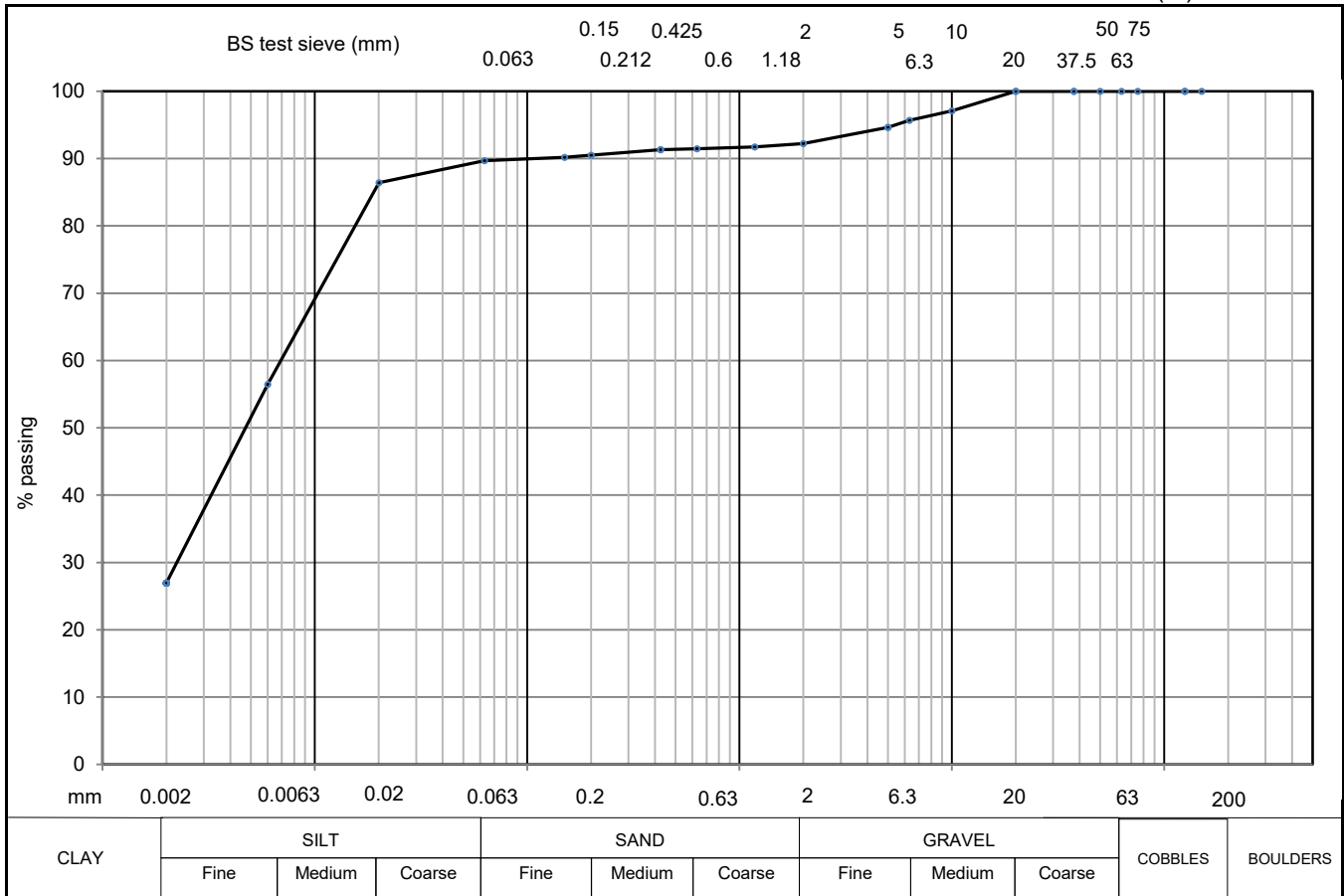
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	6						
SILT	13	150		5	80	20	17
SILT & CLAY	19						
SAND	45	75		2	64	6	11
GRAVEL	36						
COBBLE & BOULDER	0	63		1.18	55	2	6
test method(s)	5.2 & 5.4	50		0.63	47		
test method		37.5		0.425	41		
5.2 - sieving		20	100	0.2	29		
5.3 - sedimentation by hydrometer		10	92	0.15	25		
5.4 - sedimentation by pipette		6.3	84	0.063	19		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH01
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	14L
DESCRIPTION	Light brown mottled orange and grey slightly sandy slightly gravelly clayey SILT	SAMPLE DEPTH (m)	5.00
		SPECIMEN TOP (m)	5.80
		SPECIMEN BASE (m)	6.00



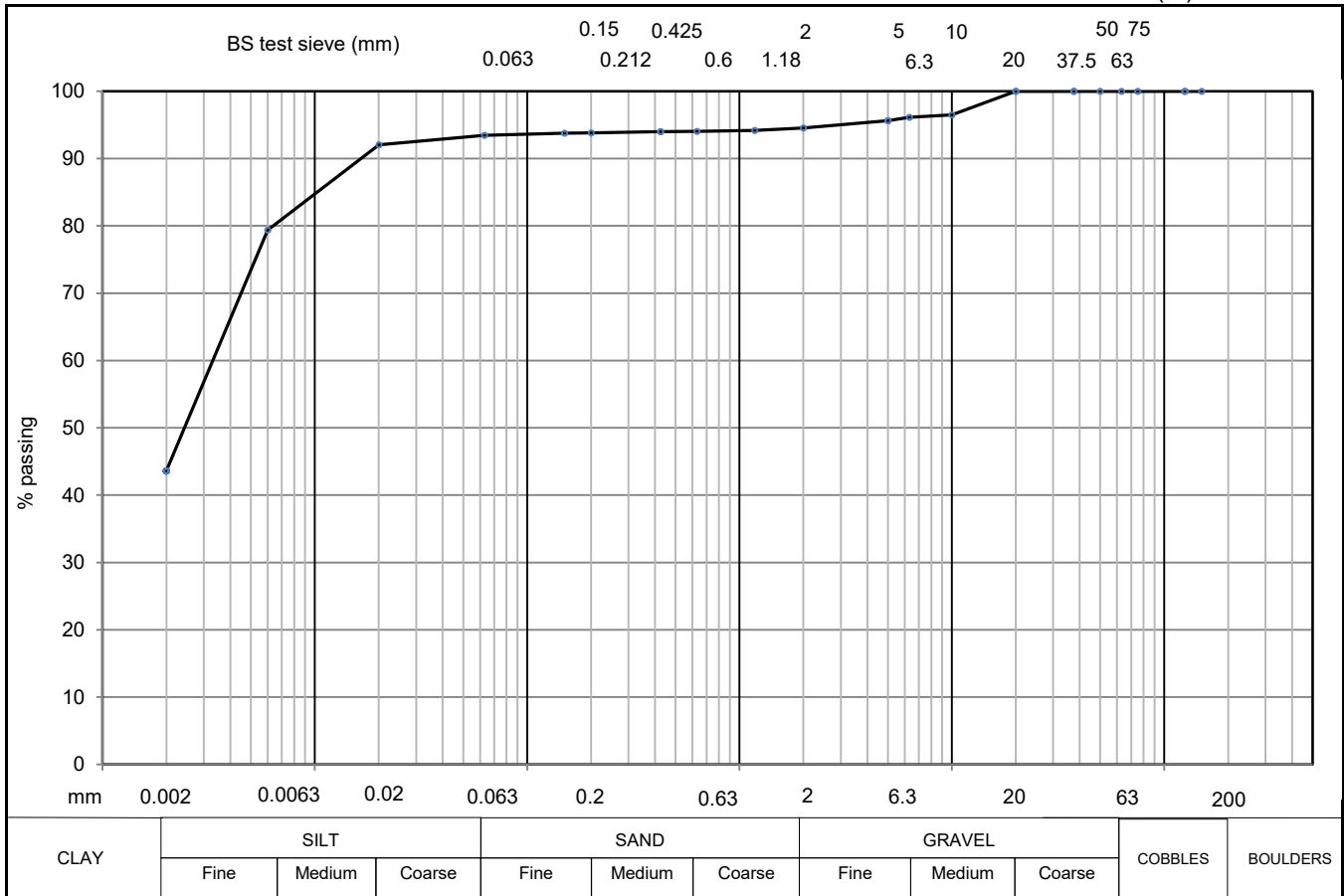
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	27						
SILT	63	150		5	95	20	86
SILT & CLAY	90						
SAND	3	75		2	92	6	56
GRAVEL	8						
COBBLE & BOULDER	0	63		1.18	92	2	27
test method(s)	5.2 & 5.4	50		0.63	91		
test method		37.5		0.425	91		
5.2 - sieving		20	100	0.2	90		
5.3 - sedimentation by hydrometer		10	97	0.15	90		
5.4 - sedimentation by pipette		6.3	96	0.063	90		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH01
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	20L
DESCRIPTION	Greyish brown slightly sandy slightly gravelly silty CLAY	SAMPLE DEPTH (m)	7.00
		SPECIMEN TOP (m)	7.00
		SPECIMEN BASE (m)	7.45



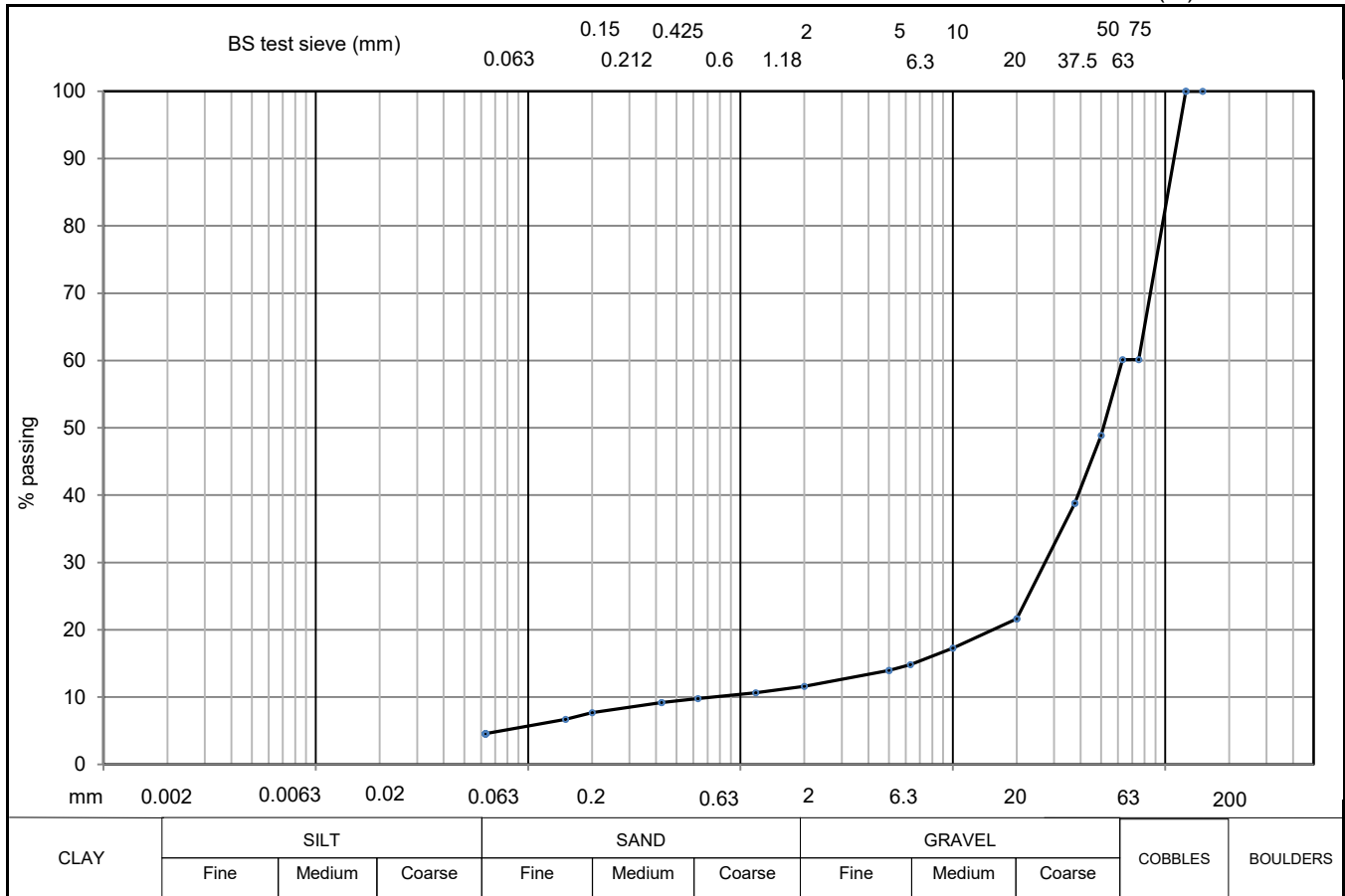
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	44						
SILT	50	150		5	96	20	92
SILT & CLAY	93						
SAND	1	75		2	95	6	79
GRAVEL	5						
COBBLE & BOULDER	0	63		1.18	94	2	44
test method(s)	5.2# & 5.4	50		0.63	94		
test method		37.5		0.425	94		
5.2 - sieving		20	100	0.2	94		
5.3 - sedimentation by hydrometer		10	97	0.15	94		
5.4 - sedimentation by pipette		6.3	96	0.063	93		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH02
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	6L
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SAMPLE DEPTH (m)	2.00
		SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	3.00



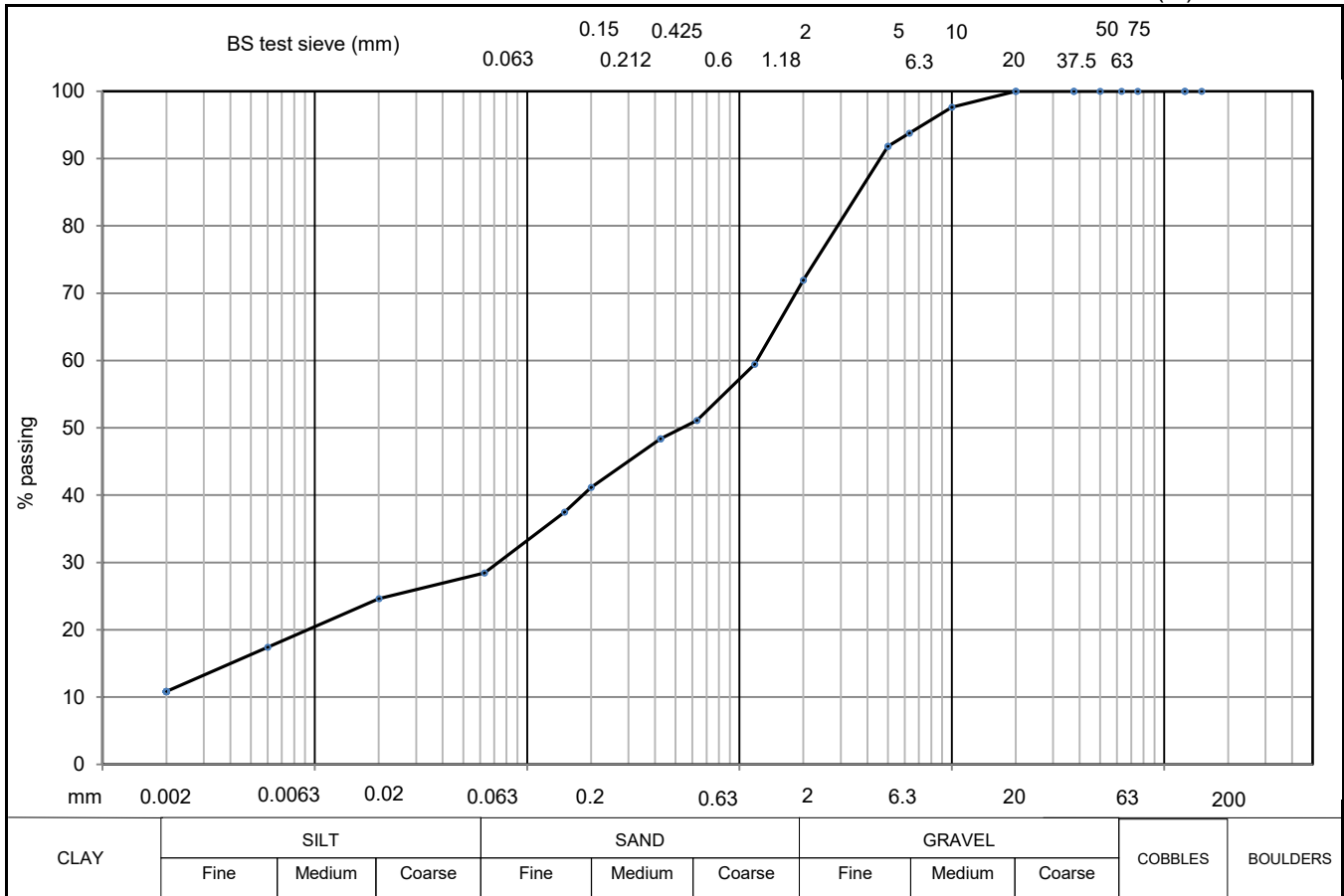
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150	100	5	14	20	
SILT & CLAY	5						
SAND	7	75	60	2	12	6	
GRAVEL	49						
COBBLE & BOULDER	40	63	60	1.18	11	2	
test method(s)	5.2#	50	49	0.63	10		
test method		37.5	39	0.425	9		
5.2 - sieving		20	22	0.2	8		
5.3 - sedimentation by hydrometer		10	17	0.15	7		
5.4 - sedimentation by pipette		6.3	15	0.063	5		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m ³	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH02
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	7D
DESCRIPTION	Brown mottled grey very gravelly very clayey SAND	SAMPLE DEPTH (m)	3.00
		SPECIMEN TOP (m)	3.00
		SPECIMEN BASE (m)	3.45



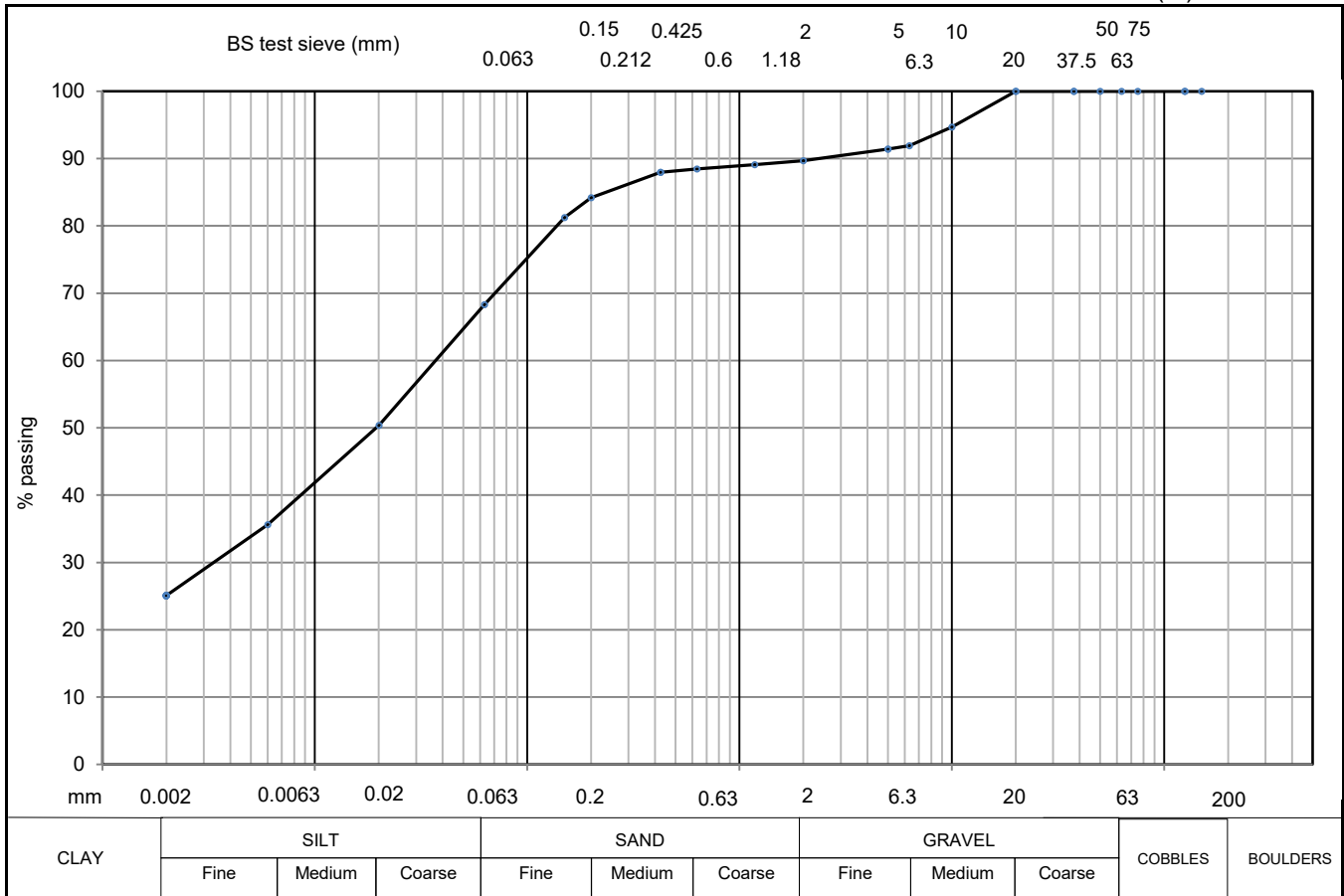
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	11						
SILT	18	150		5	92	20	25
SILT & CLAY	28						
SAND	44	75		2	72	6	17
GRAVEL	28						
COBBLE & BOULDER	0	63		1.18	59	2	11
test method(s)	5.2# & 5.4	50		0.63	51		
test method		37.5		0.425	48		
5.2 - sieving		20	100	0.2	41		
5.3 - sedimentation by hydrometer		10	98	0.15	37		
5.4 - sedimentation by pipette		6.3	94	0.063	28		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH02
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	16L
DESCRIPTION	Brown mottled orange and grey slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	5.00
		SPECIMEN TOP (m)	5.30
		SPECIMEN BASE (m)	6.00



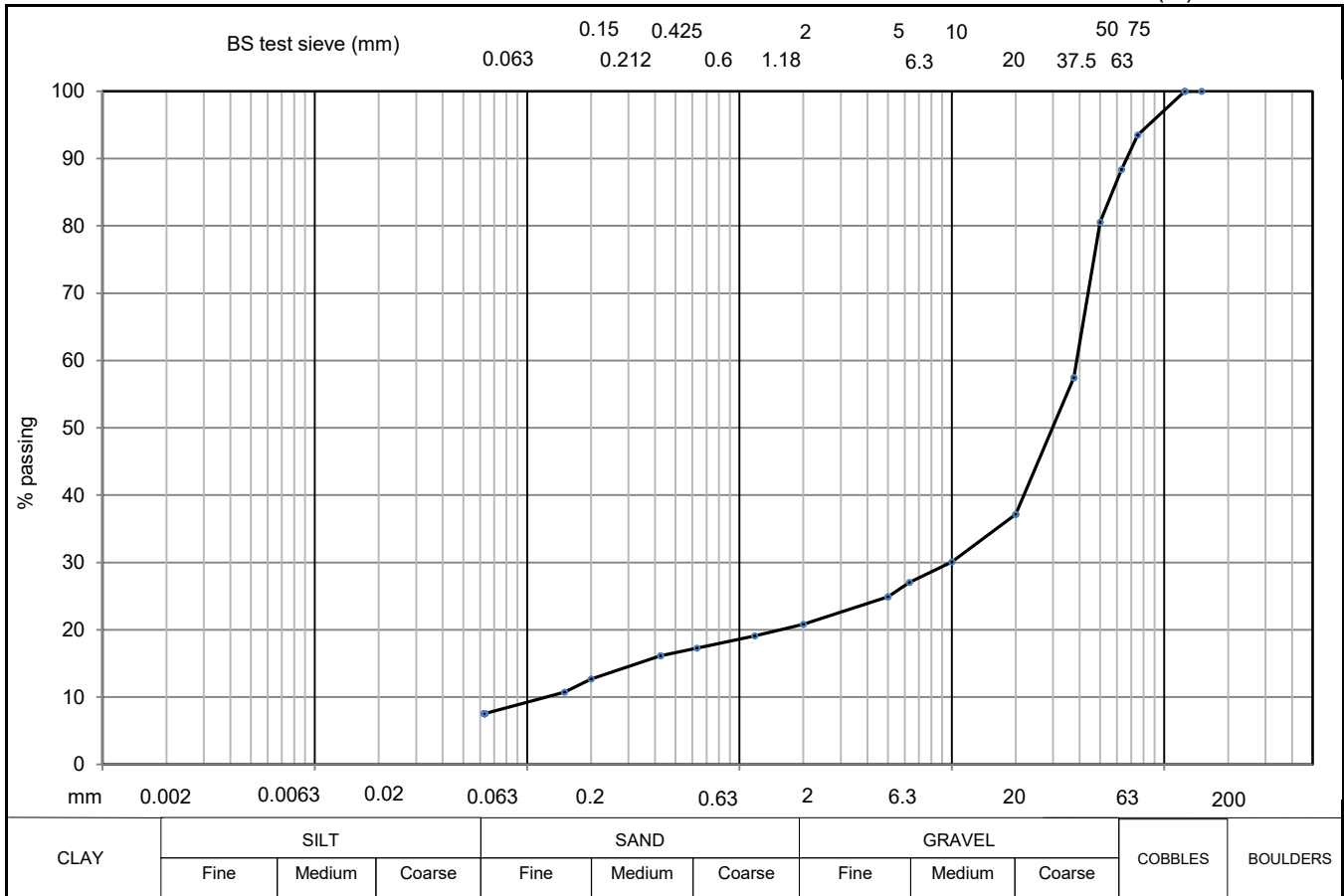
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	25						
SILT	43	150		5	91	20	50
SILT & CLAY	68						
SAND	21	75		2	90	6	36
GRAVEL	10						
COBBLE & BOULDER	0	63		1.18	89	2	25
test method(s)	5.2 & 5.4	50		0.63	88		
test method		37.5		0.425	88		
5.2 - sieving		20	100	0.2	84		
5.3 - sedimentation by hydrometer		10	95	0.15	81		
5.4 - sedimentation by pipette		6.3	92	0.063	68		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH03
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Dark brown clayey sandy GRAVEL with medium cobble content	SAMPLE DEPTH (m)	1.00
		SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



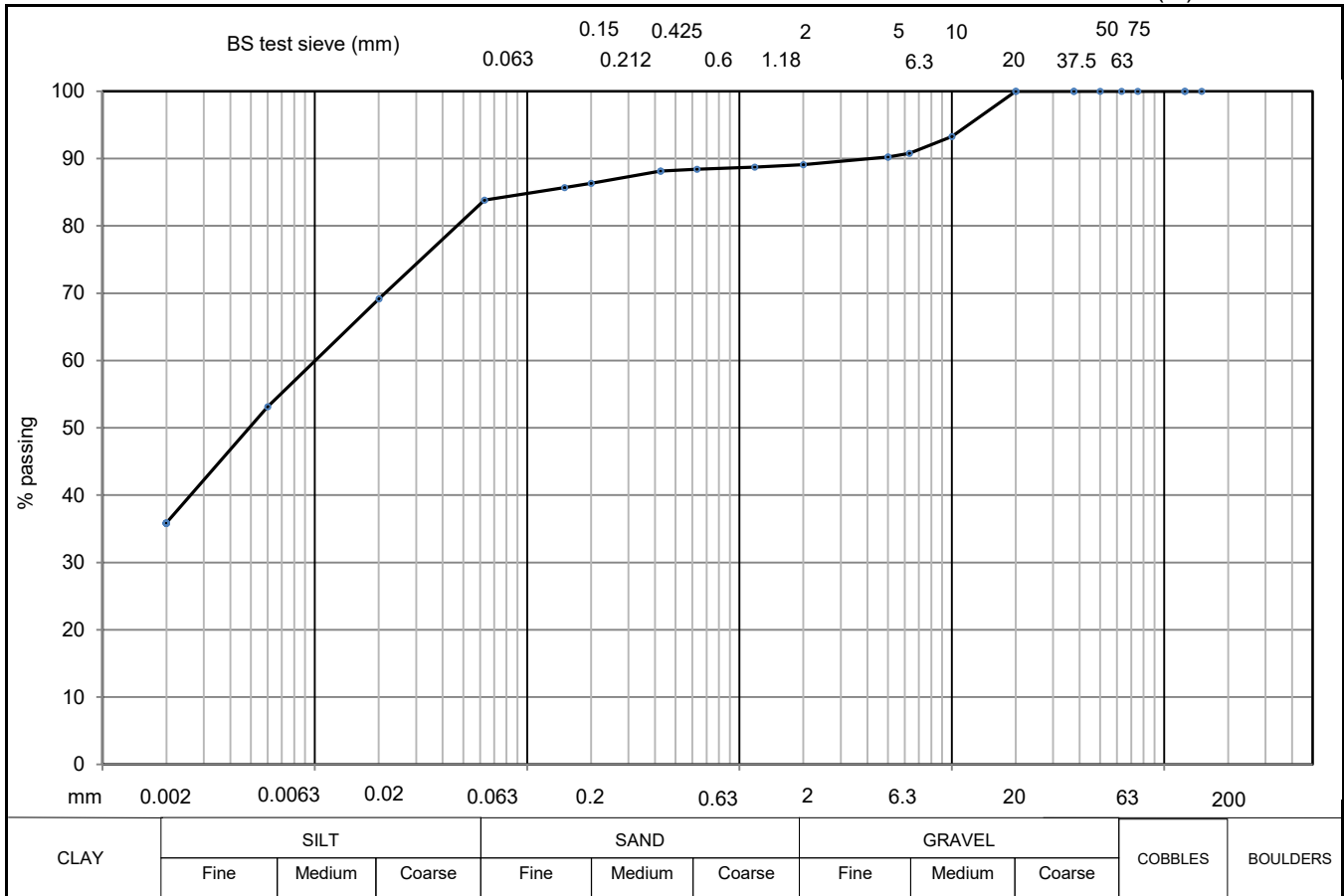
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150	100	5	25	20	
SILT & CLAY	8						
SAND	13	75	94	2	21	6	
GRAVEL	68						
COBBLE & BOULDER	12	63	88	1.18	19	2	
test method(s)	5.2#	50	81	0.63	17		
test method		37.5	57	0.425	16		
5.2 - sieving		20	37	0.2	13		
5.3 - sedimentation by hydrometer		10	30	0.15	11		
5.4 - sedimentation by pipette		6.3	27	0.063	8		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH03
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	8D
DESCRIPTION	Brown and grey slightly sandy slightly gravelly silty CLAY	SAMPLE DEPTH (m)	3.70
		SPECIMEN TOP (m)	3.70
		SPECIMEN BASE (m)	3.80



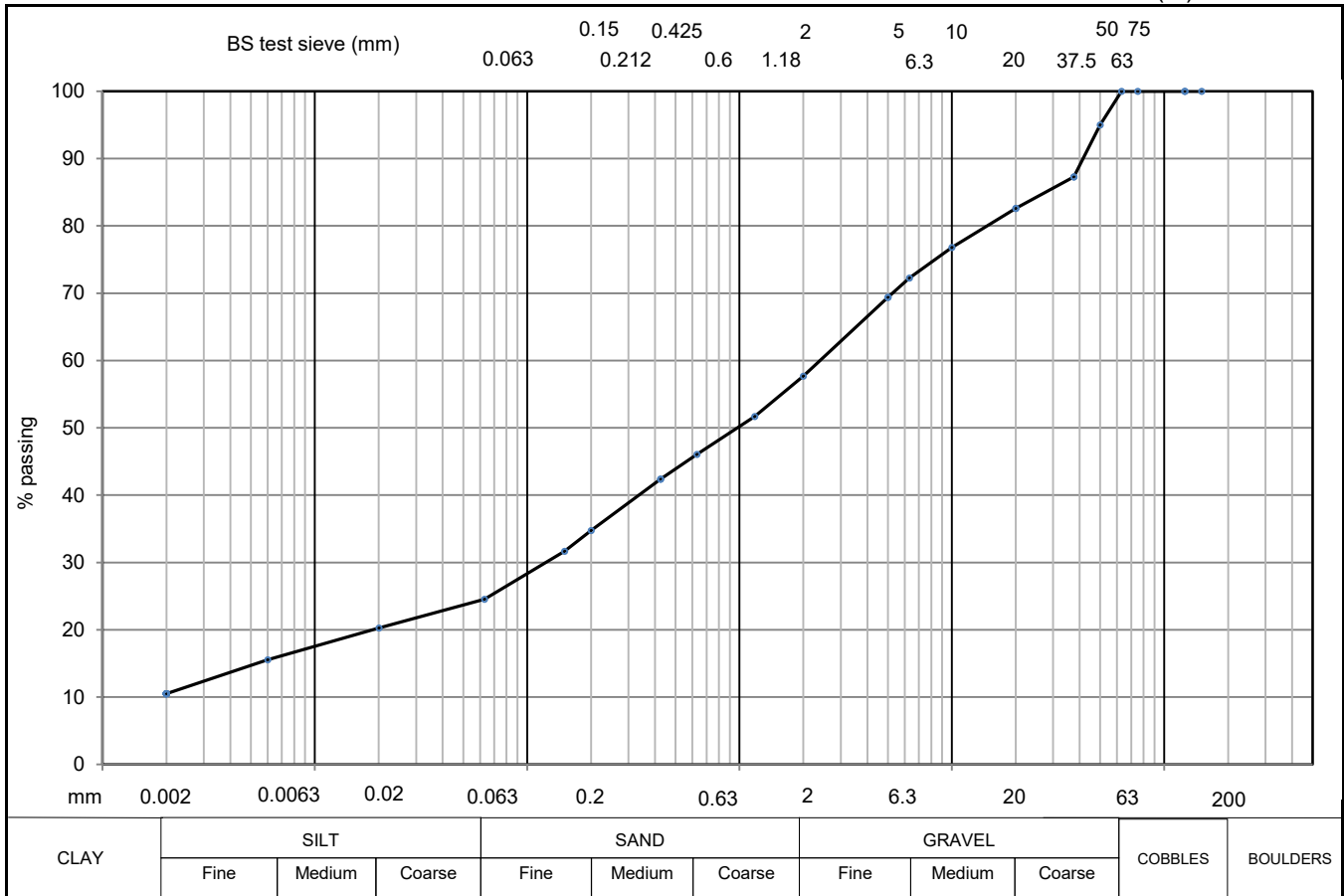
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	36						
SILT	48	150		5	90	20	69
SILT & CLAY	84						
SAND	5	75		2	89	6	53
GRAVEL	11						
COBBLE & BOULDER	0	63		1.18	89	2	36
test method(s)	5.2 & 5.4	50		0.63	88		
test method		37.5		0.425	88		
5.2 - sieving		20	100	0.2	86		
5.3 - sedimentation by hydrometer		10	93	0.15	86		
5.4 - sedimentation by pipette		6.3	91	0.063	84		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH04
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Dark brown very clayey very sandy GRAVEL	SAMPLE DEPTH (m)	1.00
		SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



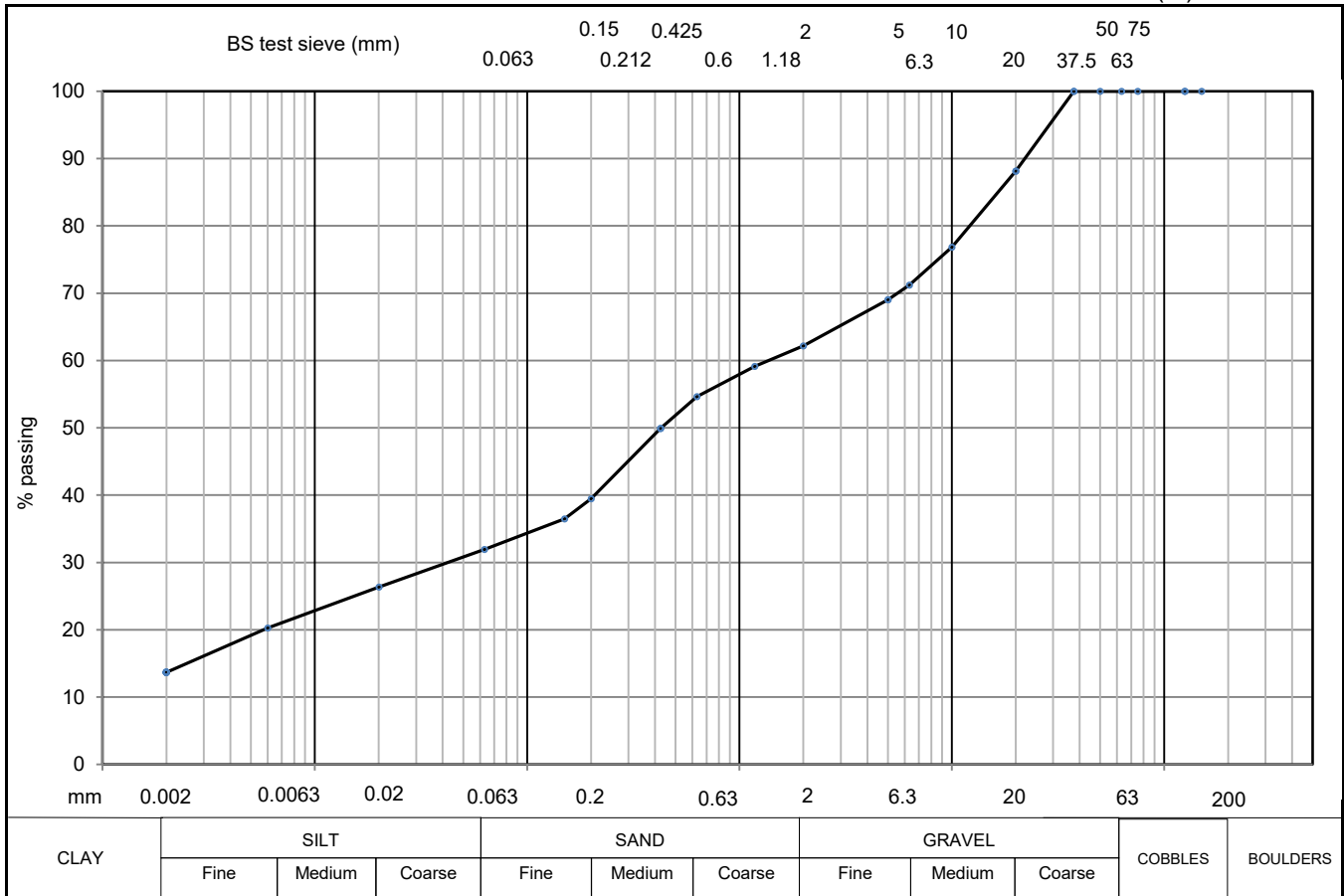
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	11						
SILT	14	150		5	69	20	20
SILT & CLAY	25						
SAND	33	75		2	58	6	16
GRAVEL	42						
COBBLE & BOULDER	0	63	100	1.18	52	2	10
test method(s)	5.2# & 5.4	50	95	0.63	46		
test method		37.5	87	0.425	42		
5.2 - sieving		20	83	0.2	35		
5.3 - sedimentation by hydrometer		10	77	0.15	32		
5.4 - sedimentation by pipette		6.3	72	0.063	25		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH04
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	14D
DESCRIPTION	Brown and grey slightly sandy gravelly silty CLAY	SAMPLE DEPTH (m)	4.00
		SPECIMEN TOP (m)	4.00
		SPECIMEN BASE (m)	4.45



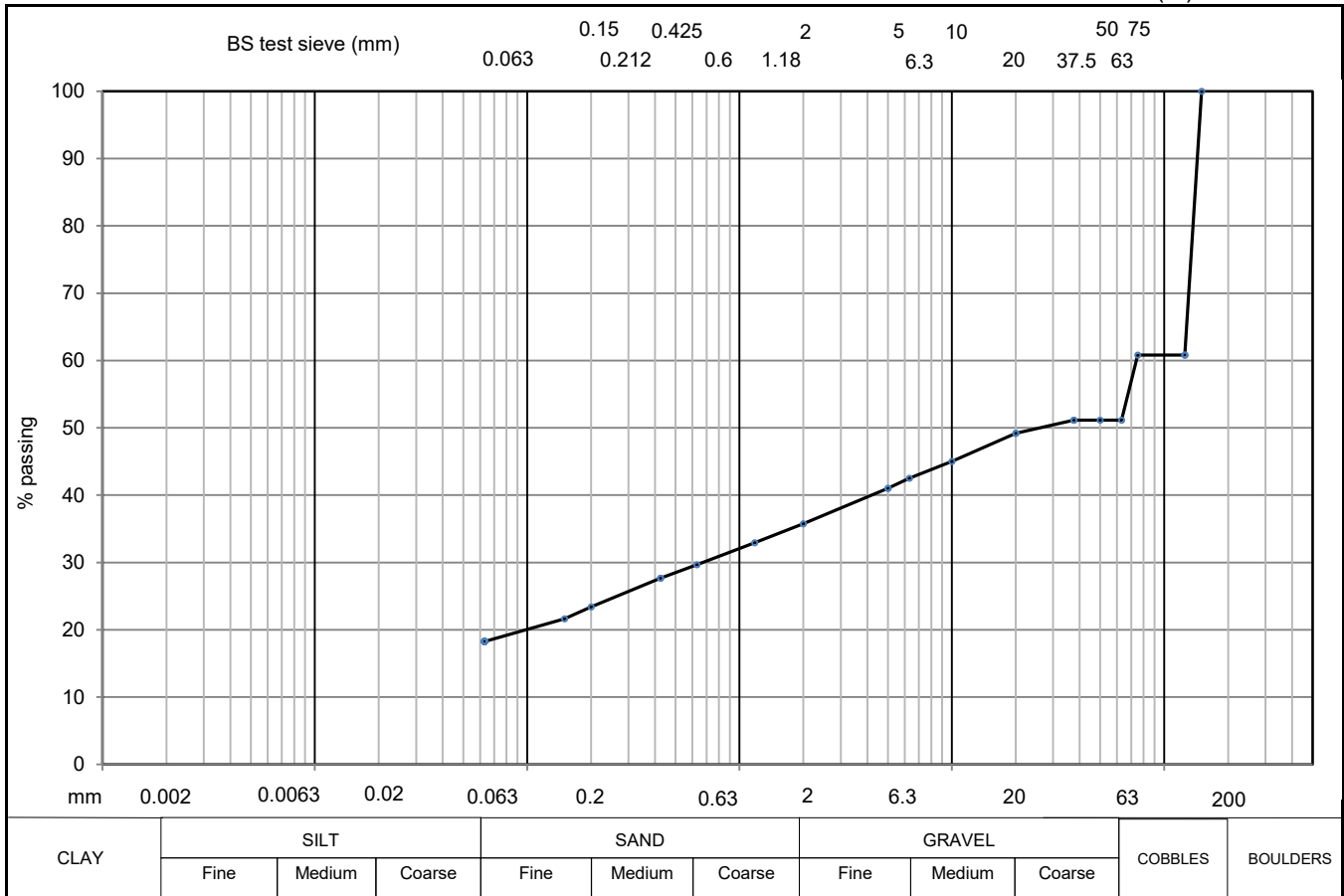
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	14						
SILT	18	150		5	69	20	26
SILT & CLAY	32						
SAND	30	75		2	62	6	20
GRAVEL	38						
COBBLE & BOULDER	0	63		1.18	59	2	14
test method(s)	5.2 & 5.4	50		0.63	55		
test method		37.5	100	0.425	50		
5.2 - sieving		20	88	0.2	39		
5.3 - sedimentation by hydrometer		10	77	0.15	36		
5.4 - sedimentation by pipette		6.3	71	0.063	32		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH05
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	2B
DESCRIPTION	Dark brown COBBLES with slightly gravelly slightly sandy clay	SAMPLE DEPTH (m)	0.80
		SPECIMEN TOP (m)	0.80
		SPECIMEN BASE (m)	1.00



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150	100	5	41	20	
SILT & CLAY	18						
SAND	18	75	61	2	36	6	
GRAVEL	15						
COBBLE & BOULDER	49	63	51	1.18	33	2	
test method(s)	5.2#	50	51	0.63	30		
test method		37.5	51	0.425	28		
5.2 - sieving		20	49	0.2	23		
5.3 - sedimentation by hydrometer		10	45	0.15	22		
5.4 - sedimentation by pipette		6.3	43	0.063	18		

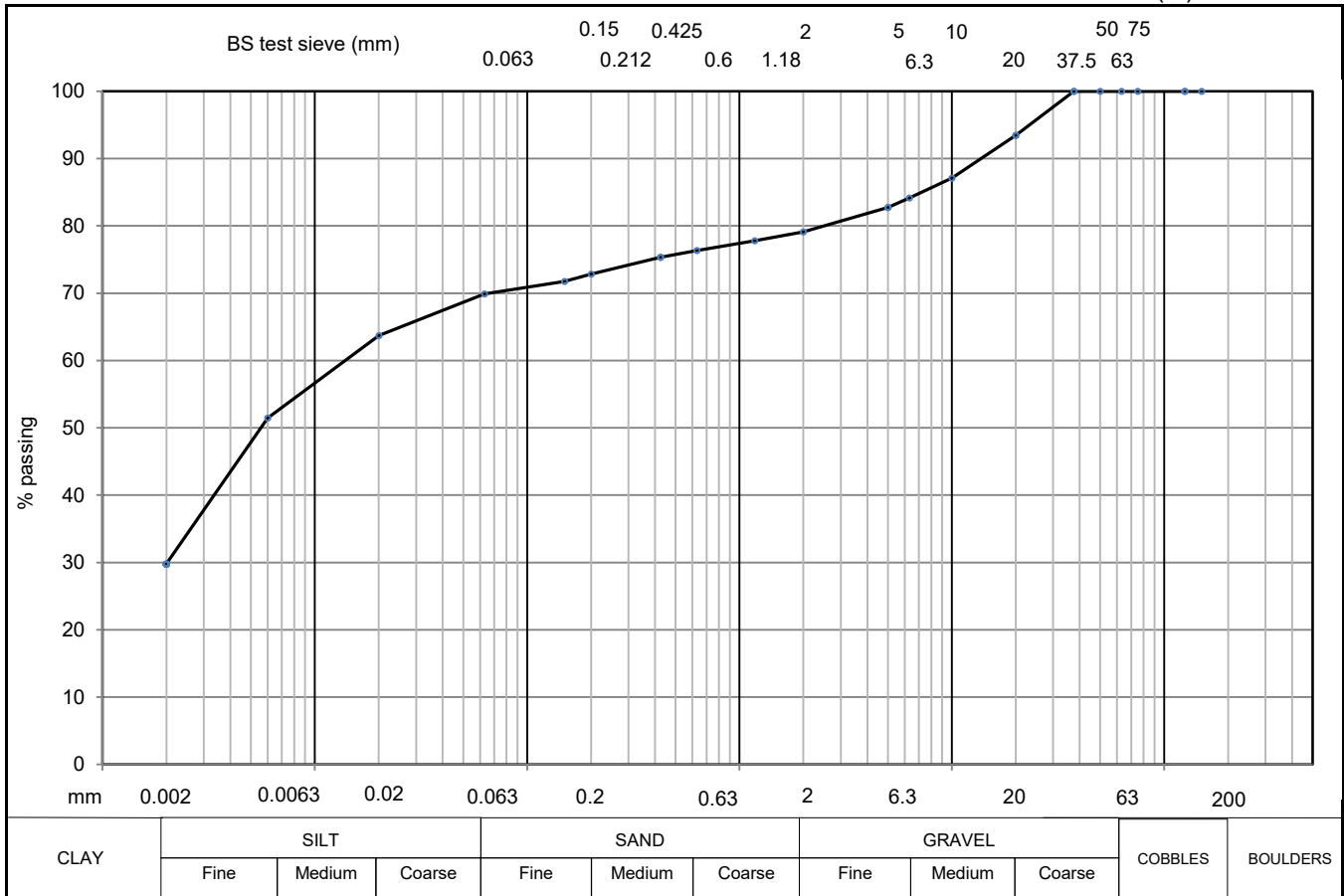
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m ³	CONTRACT 37707	CHECKED TB
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CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Brown slightly sandy slightly gravelly silty CLAY

BH/TP No. BH05
 SAMPLE No./TYPE 7L
 SAMPLE DEPTH (m) 2.00
 SPECIMEN TOP (m) 2.50
 SPECIMEN BASE (m) 3.00



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	30						
SILT	40	150		5	83	20	64
SILT & CLAY	70						
SAND	9	75		2	79	6	51
GRAVEL	21						
COBBLE & BOULDER	0	63		1.18	78	2	30
test method(s)	5.2# & 5.4	50		0.63	76		
test method		37.5	100	0.425	75		
5.2 - sieving		20	93	0.2	73		
5.3 - sedimentation by hydrometer		10	87	0.15	72		
5.4 - sedimentation by pipette		6.3	84	0.063	70		

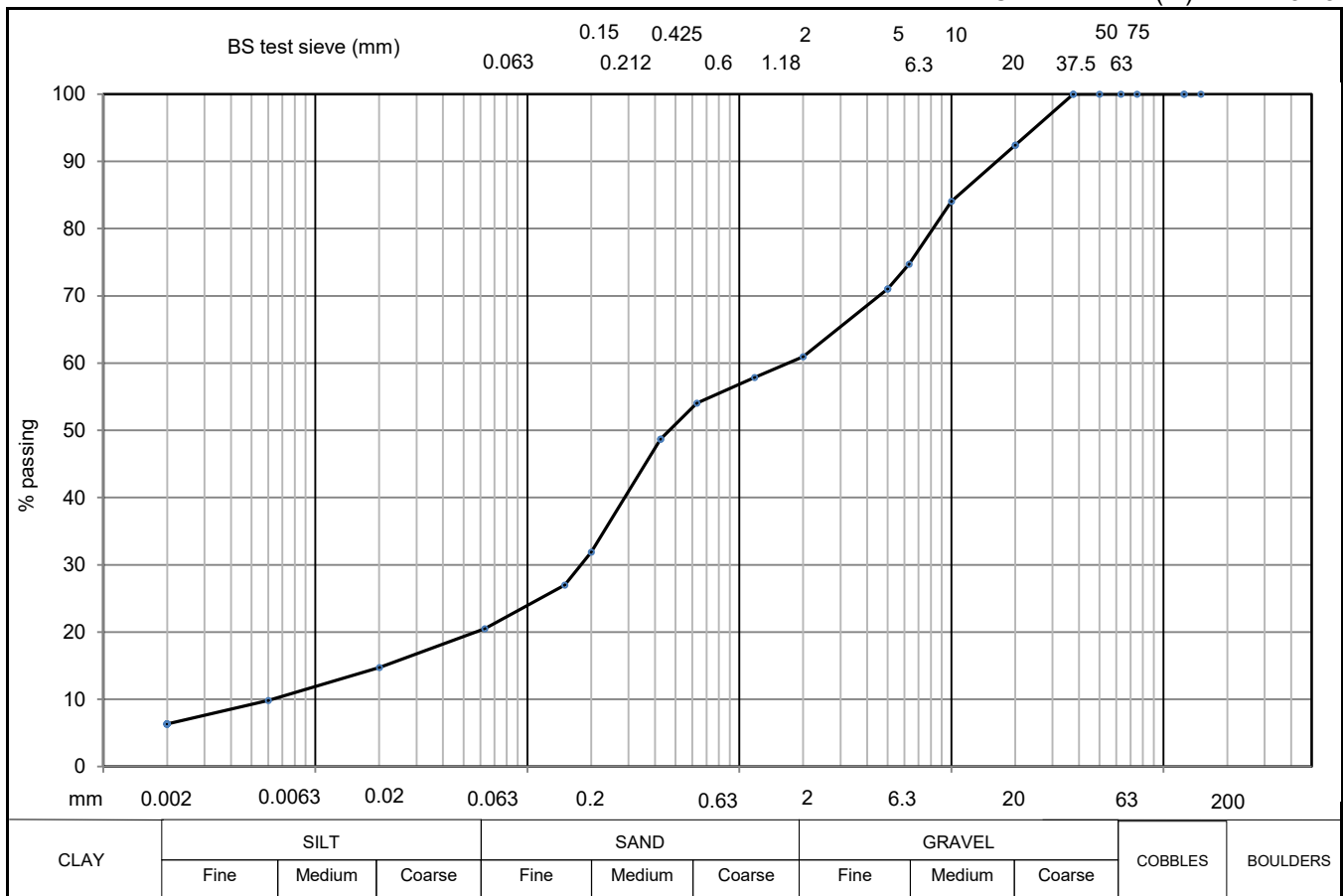
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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PARTICLE SIZE DISTRIBUTION
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CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Brown very clayey SAND and GRAVEL

BH/TP No. BH05
 SAMPLE No./TYPE 15D
 SAMPLE DEPTH (m) 5.00
 SPECIMEN TOP (m) 5.00
 SPECIMEN BASE (m) 5.45



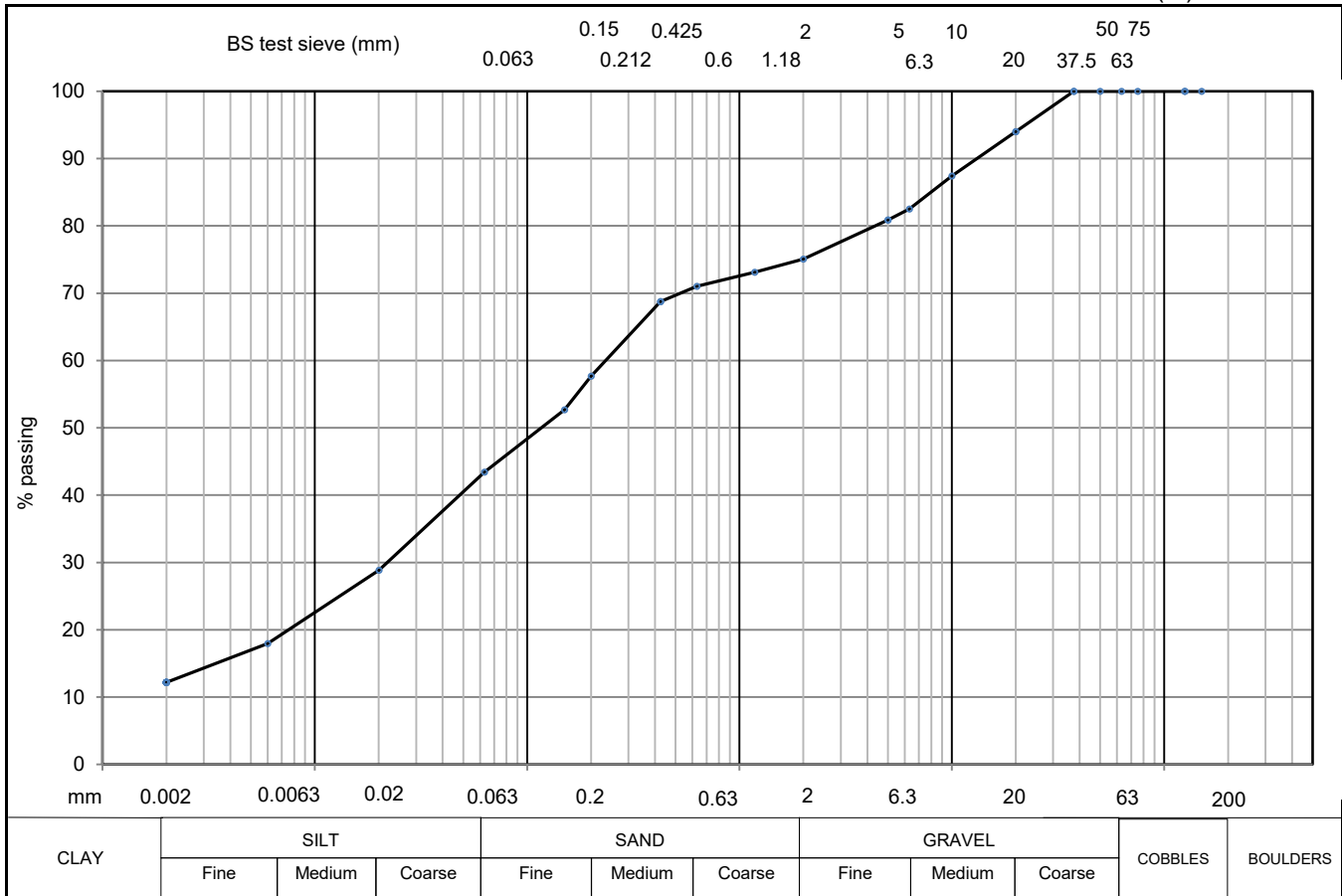
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	6						
SILT	14	150		5	71	20	15
SILT & CLAY	21						
SAND	40	75		2	61	6	10
GRAVEL	39						
COBBLE & BOULDER	0	63		1.18	58	2	6
test method(s)	5.2 & 5.4	50		0.63	54		
test method		37.5	100	0.425	49		
5.2 - sieving		20	92	0.2	32		
5.3 - sedimentation by hydrometer		10	84	0.15	27		
5.4 - sedimentation by pipette		6.3	75	0.063	21		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3 Combined with 14D	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH06
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	5L
DESCRIPTION	Brown slightly gravelly slightly sandy clayey SILT	SAMPLE DEPTH (m)	1.30
		SPECIMEN TOP (m)	1.40
		SPECIMEN BASE (m)	2.00



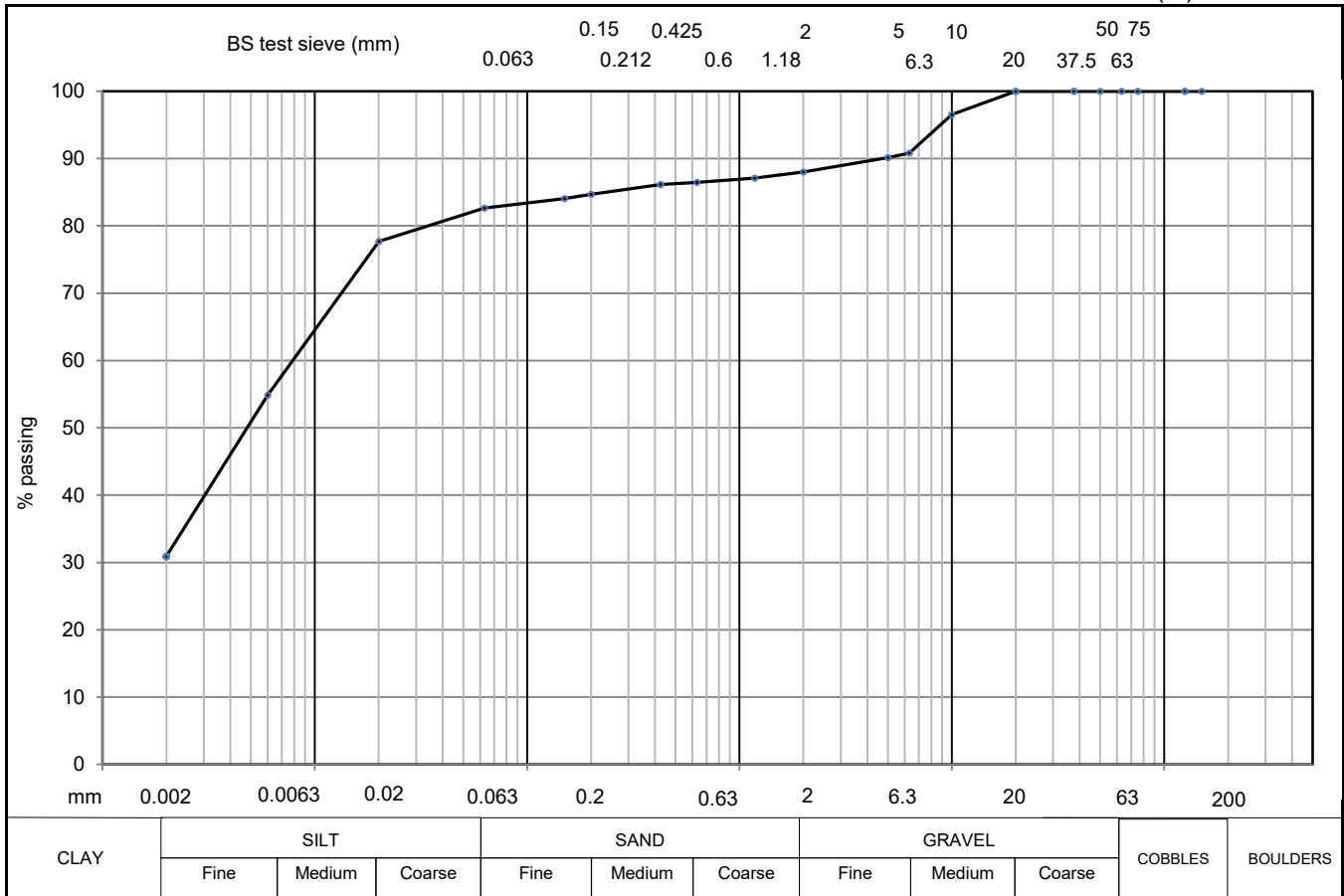
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	12			5	81	20	29
SILT	31	150		2	75	6	18
SILT & CLAY	43	75		1.18	73	2	12
SAND	32						
GRAVEL	25						
COBBLE & BOULDER	0						
test method(s)	5.2 & 5.4	63		0.63	71		
test method		50		0.425	69		
5.2 - sieving		37.5	100	0.2	58		
5.3 - sedimentation by hydrometer		20	94	0.15	53		
5.4 - sedimentation by pipette		10	87	0.063	43		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH06
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	9D
DESCRIPTION	Brown and grey slightly sandy slightly gravelly silty CLAY	SAMPLE DEPTH (m)	2.70
		SPECIMEN TOP (m)	2.70
		SPECIMEN BASE (m)	2.80



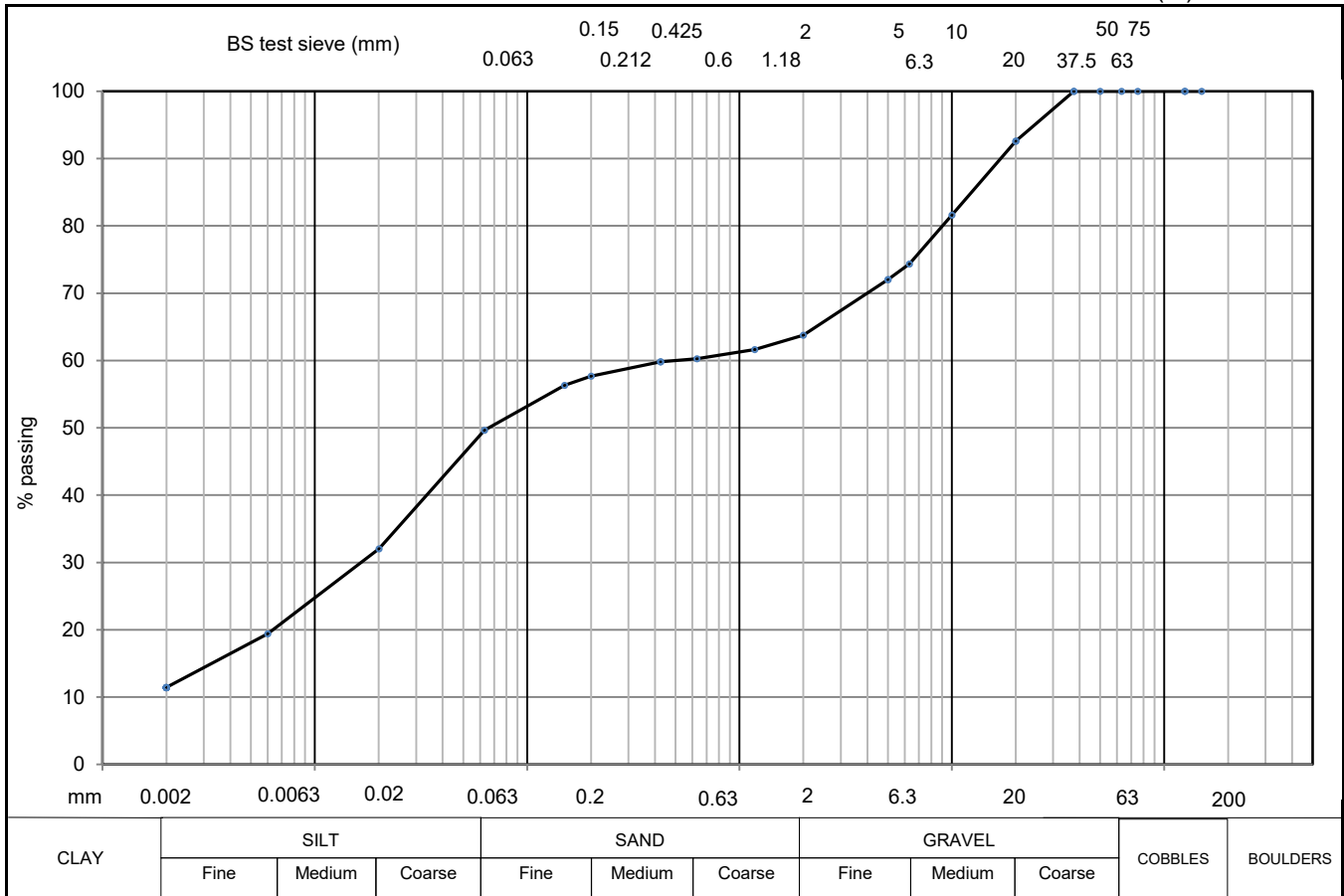
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	31						
SILT	52	150		5	90	20	78
SILT & CLAY	83						
SAND	5	75		2	88	6	55
GRAVEL	12						
COBBLE & BOULDER	0	63		1.18	87	2	31
test method(s)	5.2 & 5.4	50		0.63	86		
test method		37.5		0.425	86		
5.2 - sieving		20	100	0.2	85		
5.3 - sedimentation by hydrometer		10	97	0.15	84		
5.4 - sedimentation by pipette		6.3	91	0.063	83		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH06
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	21L
DESCRIPTION	Brown and grey slightly sandy gravelly clayey SILT	SAMPLE DEPTH (m)	6.00
		SPECIMEN TOP (m)	6.50
		SPECIMEN BASE (m)	7.00



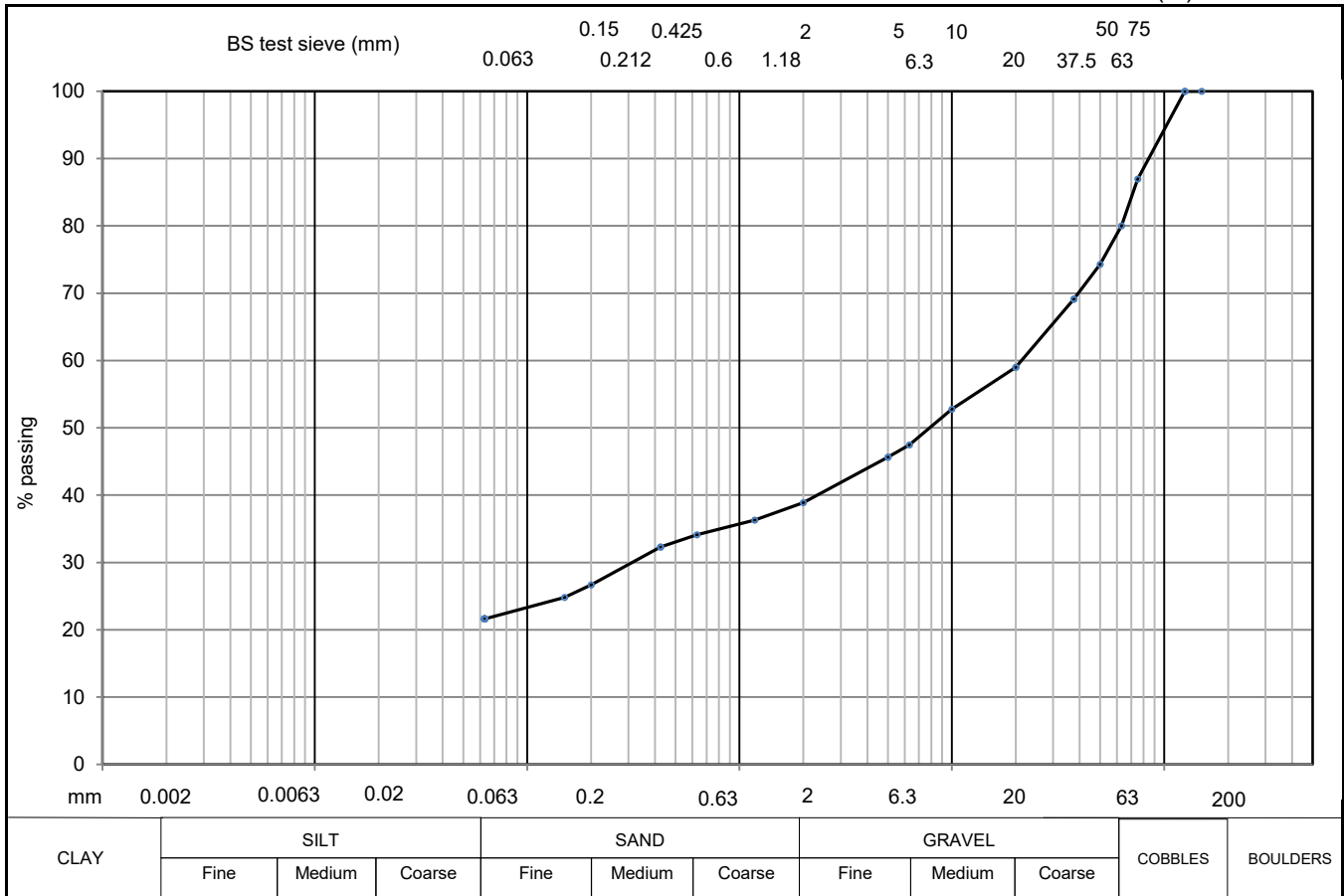
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	11			5	72	20	32
SILT	38	150		2	64	6	19
SILT & CLAY	50	75		1.18	62	2	11
SAND	14						
GRAVEL	36						
COBBLE & BOULDER	0						
test method(s)	5.2 & 5.4	63		0.63	60		
test method		50		0.425	60		
5.2 - sieving		37.5	100	0.2	58		
5.3 - sedimentation by hydrometer		20	93	0.15	56		
5.4 - sedimentation by pipette		10	82	0.063	50		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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PARTICLE SIZE DISTRIBUTION
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH07
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	2B
DESCRIPTION	Brown sandy very clayey GRAVEL with high cobble content	SAMPLE DEPTH (m)	0.50
		SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



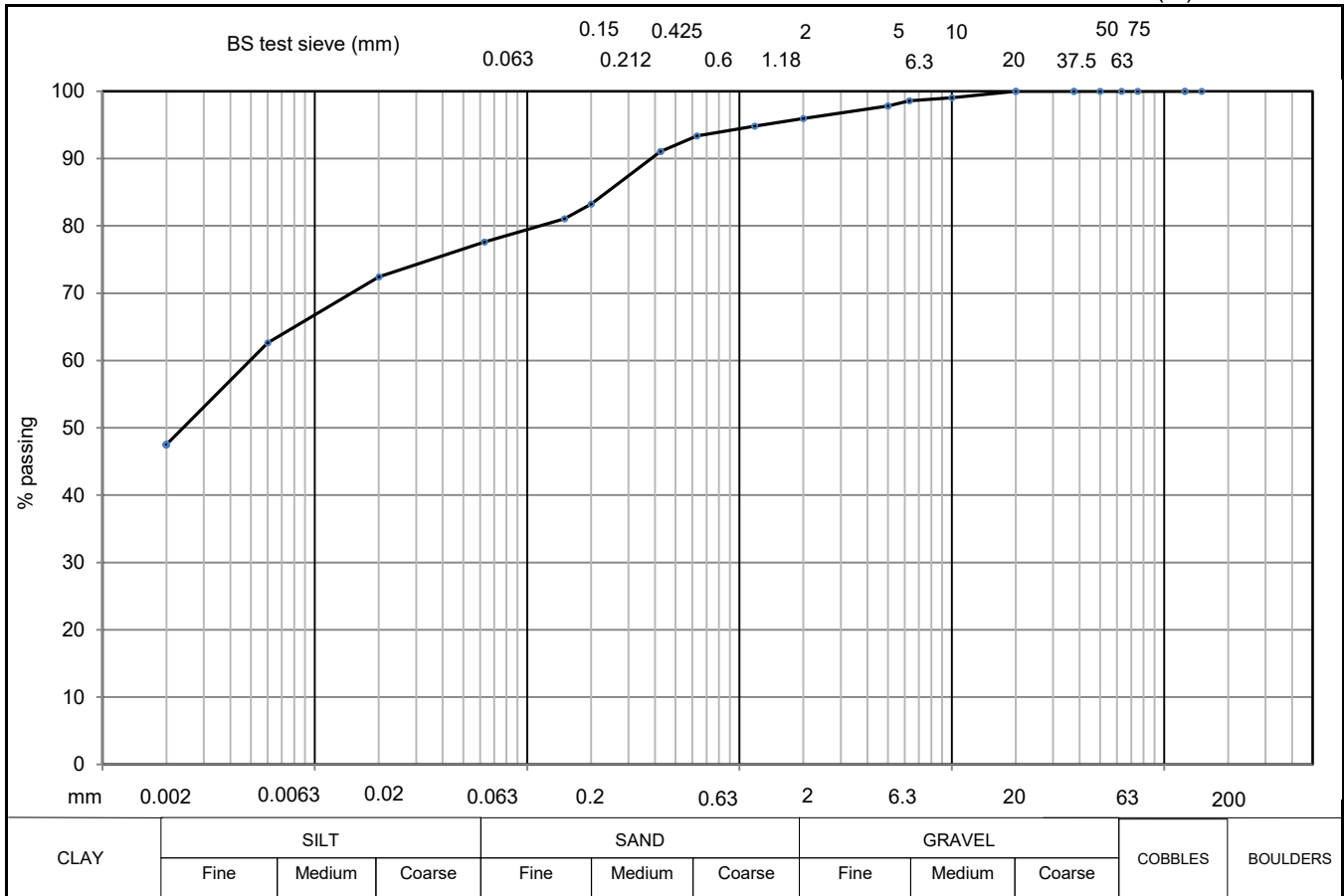
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150	100	5	46	20	
SILT & CLAY	22						
SAND	17	75	87	2	39	6	
GRAVEL	41						
COBBLE & BOULDER	20	63	80	1.18	36	2	
test method(s)	5.2	50	74	0.63	34		
test method		37.5	69	0.425	32		
5.2 - sieving		20	59	0.2	27		
5.3 - sedimentation by hydrometer		10	53	0.15	25		
5.4 - sedimentation by pipette		6.3	47	0.063	22		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m ³	CONTRACT 37707	CHECKED TB
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 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH07
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	4D
DESCRIPTION	Brown mottled orange and grey slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	1.20
		SPECIMEN TOP (m)	1.20
		SPECIMEN BASE (m)	1.65



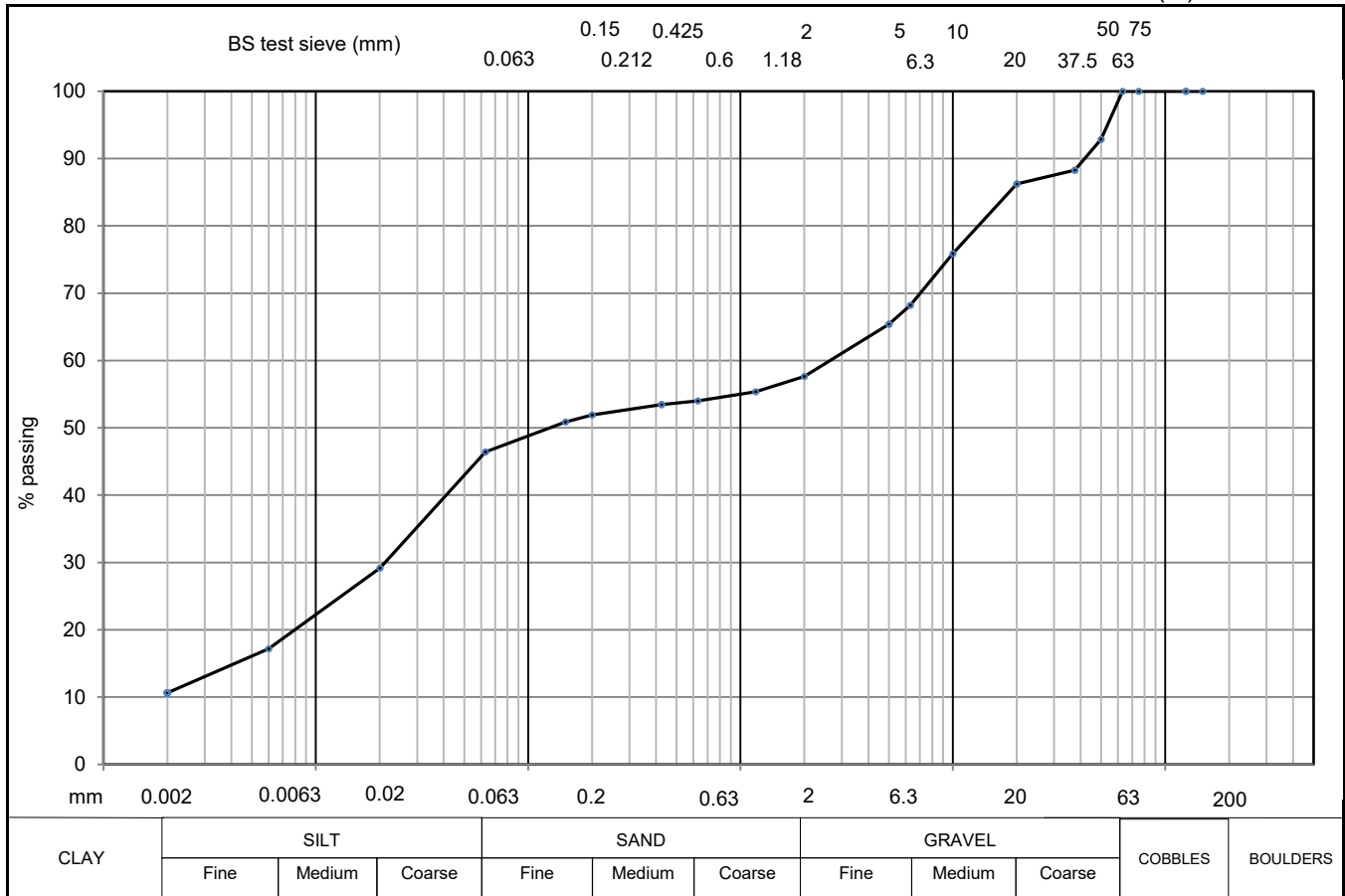
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	48						
SILT	30	150		5	98	20	72
SILT & CLAY	78						
SAND	18	75		2	96	6	63
GRAVEL	4						
COBBLE & BOULDER	0	63		1.18	95	2	47
test method(s)	5.2 & 5.4	50		0.63	93		
test method		37.5		0.425	91		
5.2 - sieving		20	100	0.2	83		
5.3 - sedimentation by hydrometer		10	99	0.15	81		
5.4 - sedimentation by pipette		6.3	99	0.063	78		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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PARTICLE SIZE DISTRIBUTION
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH07
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	19L
DESCRIPTION	Brown mottled orange and grey slightly sandy gravelly clayey SILT	SAMPLE DEPTH (m)	5.20
		SPECIMEN TOP (m)	5.70
		SPECIMEN BASE (m)	6.20



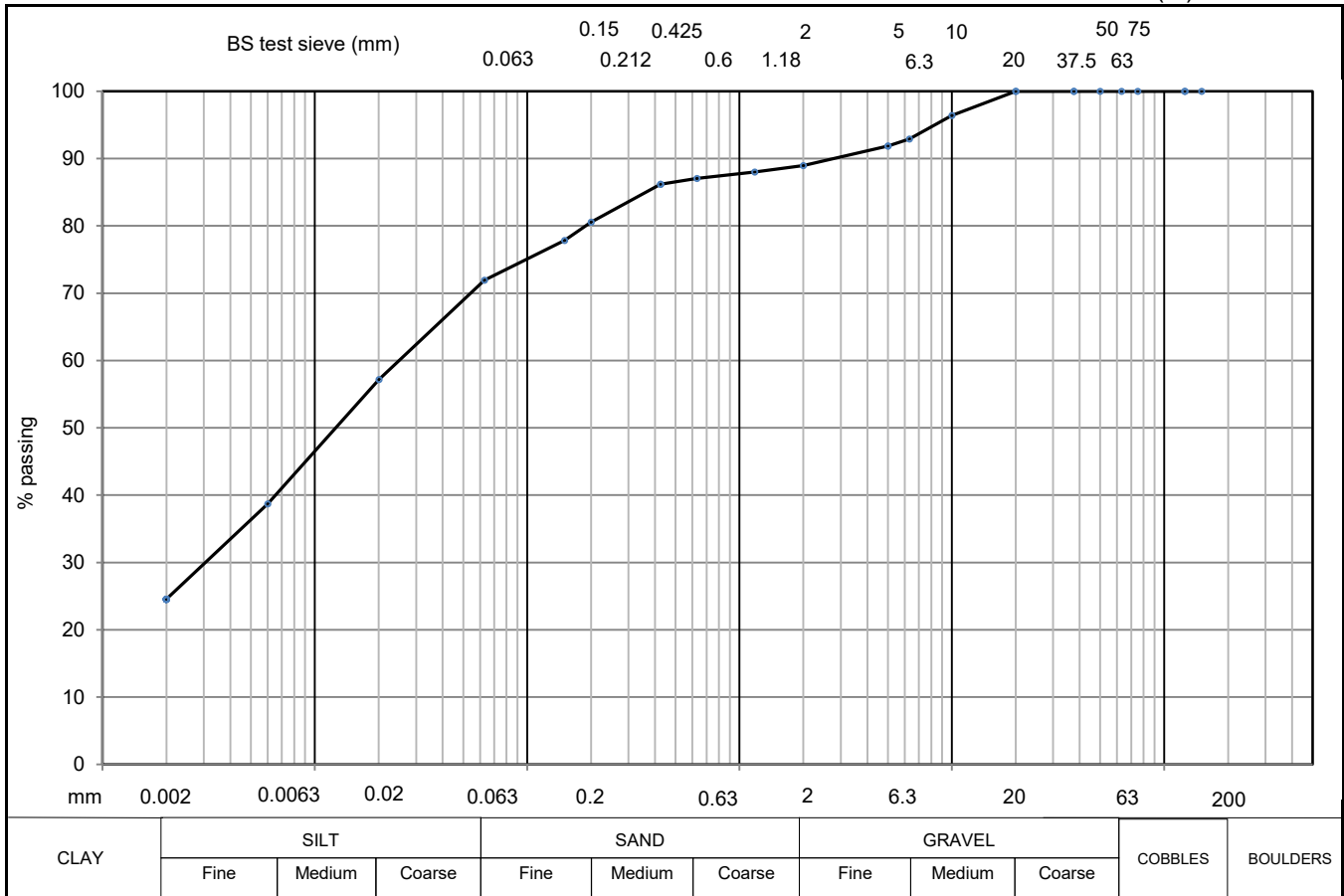
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	11						
SILT	36	150		5	65	20	29
SILT & CLAY	46						
SAND	11	75		2	58	6	17
GRAVEL	42						
COBBLE & BOULDER	0	63	100	1.18	55	2	11
test method(s)	5.2 & 5.4	50	93	0.63	54		
test method		37.5	88	0.425	53		
5.2 - sieving		20	86	0.2	52		
5.3 - sedimentation by hydrometer		10	76	0.15	51		
5.4 - sedimentation by pipette		6.3	68	0.063	46		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH08
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	9D
DESCRIPTION	Brown mottled grey slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	2.70
		SPECIMEN TOP (m)	2.70
		SPECIMEN BASE (m)	2.80



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	25						
SILT	47	150		5	92	20	57
SILT & CLAY	72						
SAND	17	75		2	89	6	39
GRAVEL	11						
COBBLE & BOULDER	0	63		1.18	88	2	25
test method(s)	5.2 & 5.4	50		0.63	87		
test method		37.5		0.425	86		
5.2 - sieving		20	100	0.2	81		
5.3 - sedimentation by hydrometer		10	96	0.15	78		
5.4 - sedimentation by pipette		6.3	93	0.063	72		

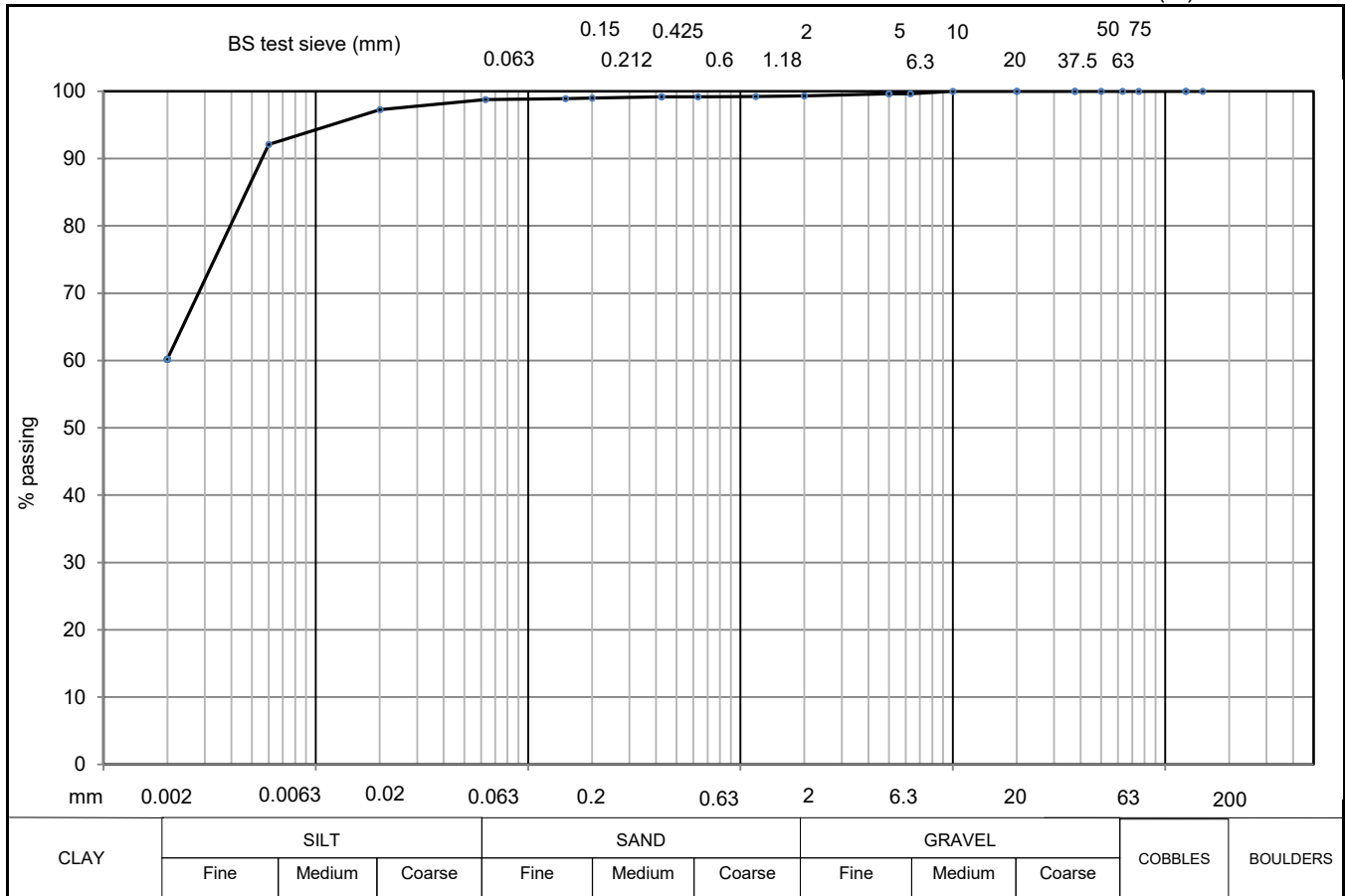
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Greyish brown silty CLAY

BH/TP No. BH09
 SAMPLE No./TYPE 6L
 SAMPLE DEPTH (m) 1.20
 SPECIMEN TOP (m) 1.70
 SPECIMEN BASE (m) 1.80



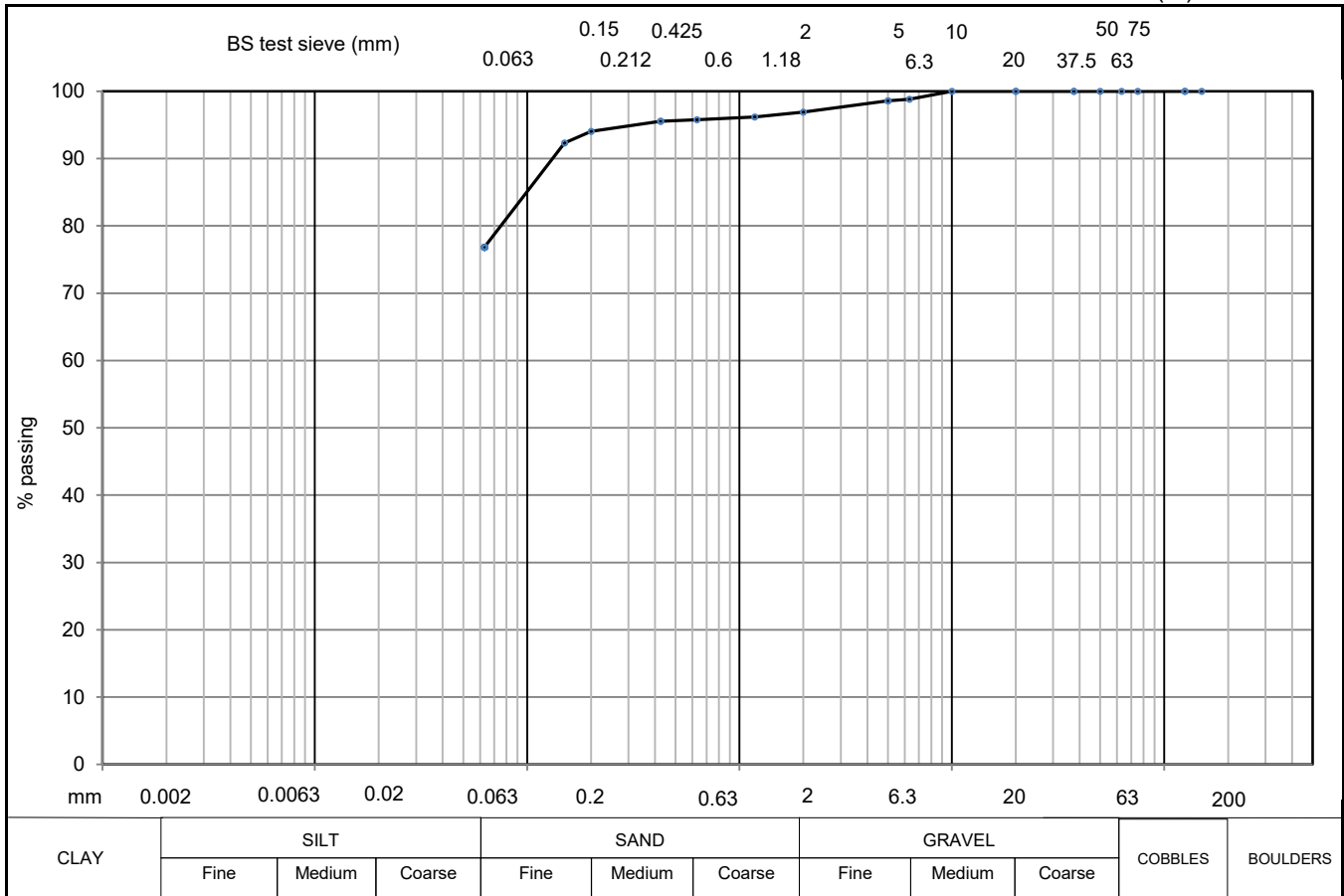
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	60						
SILT	39	150		5	100	20	97
SILT & CLAY	99						
SAND	1	75		2	99	6	92
GRAVEL	1						
COBBLE & BOULDER	0	63		1.18	99	2	60
test method(s)	5.2 & 5.4	50		0.63	99		
test method		37.5		0.425	99		
5.2 - sieving		20		0.2	99		
5.3 - sedimentation by hydrometer		10	100	0.15	99		
5.4 - sedimentation by pipette		6.3	100	0.063	99		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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PARTICLE SIZE DISTRIBUTION
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH09
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	13D
DESCRIPTION	Greyish brown slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	3.45
		SPECIMEN TOP (m)	3.45
		SPECIMEN BASE (m)	3.70



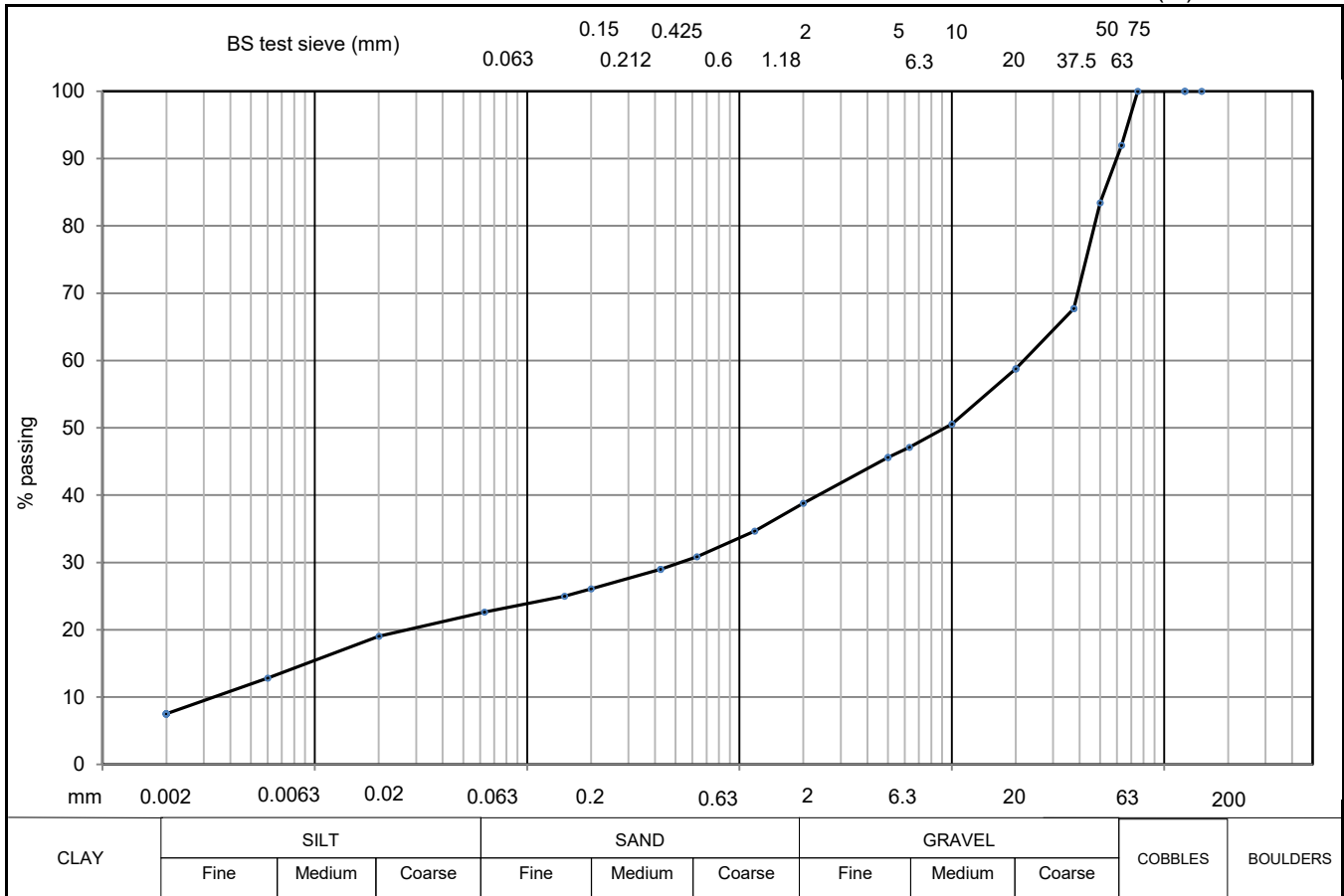
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY							
SILT		150		5	99	20	
SILT & CLAY	77						
SAND	20	75		2	97	6	
GRAVEL	3						
COBBLE & BOULDER	0	63		1.18	96	2	
test method(s)	5.2	50		0.63	96		
test method		37.5		0.425	96		
5.2 - sieving		20		0.2	94		
5.3 - sedimentation by hydrometer		10	100	0.15	92		
5.4 - sedimentation by pipette		6.3	99	0.063	77		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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PARTICLE SIZE DISTRIBUTION
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH11
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	2B
DESCRIPTION	Brown and black sandy very clayey GRAVEL with medium cobble content	SAMPLE DEPTH (m)	0.60
		SPECIMEN TOP (m)	0.60
		SPECIMEN BASE (m)	0.80



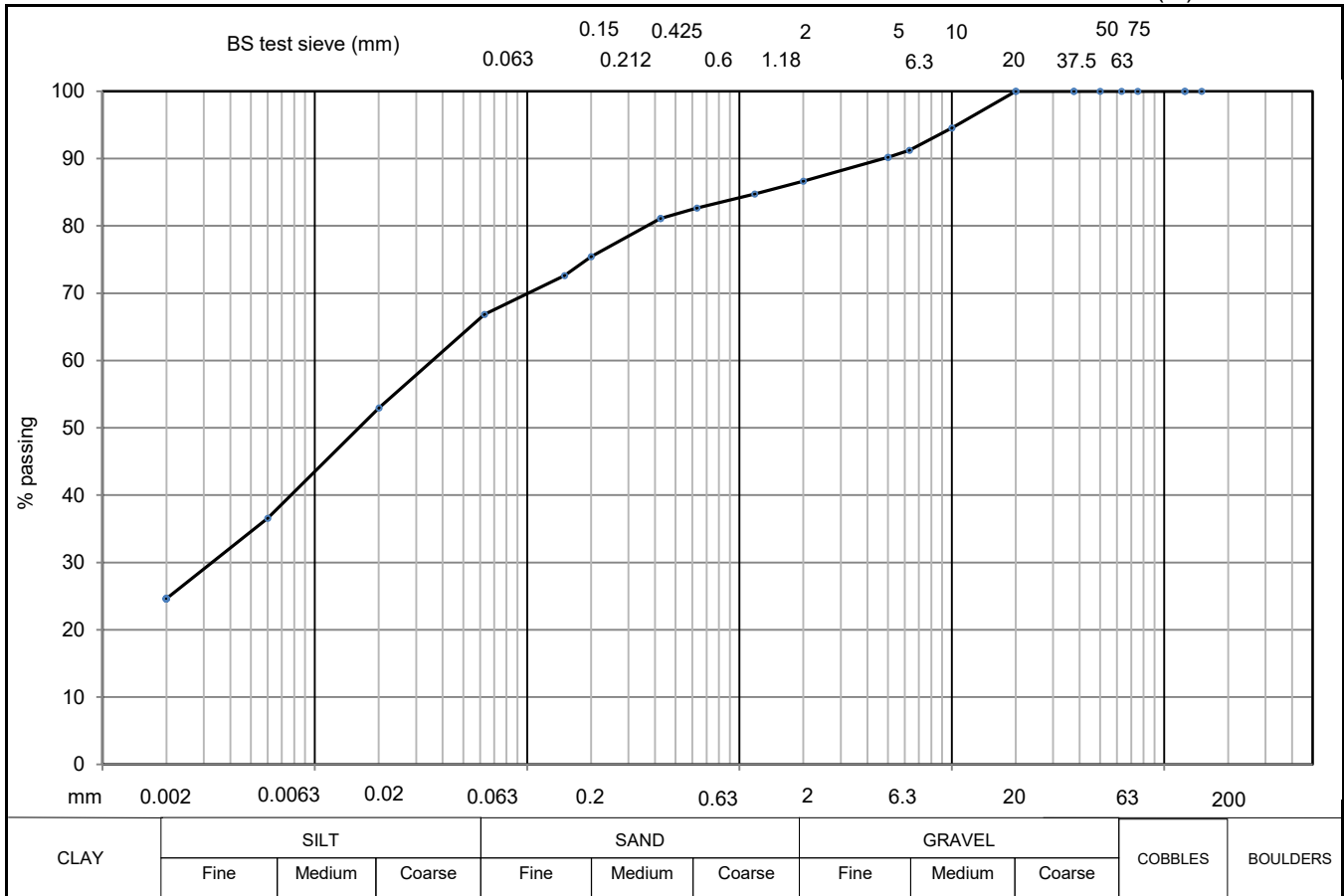
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	8						
SILT	15	150		5	46	20	19
SILT & CLAY	23						
SAND	16	75	100	2	39	6	13
GRAVEL	53						
COBBLE & BOULDER	8	63	92	1.18	35	2	8
test method(s)	5.2 & 5.4	50	83	0.63	31		
test method		37.5	68	0.425	29		
5.2 - sieving		20	59	0.2	26		
5.3 - sedimentation by hydrometer		10	51	0.15	25		
5.4 - sedimentation by pipette		6.3	47	0.063	23		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH11
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	13D
DESCRIPTION	Greyish brown slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	4.00
		SPECIMEN TOP (m)	4.00
		SPECIMEN BASE (m)	4.45



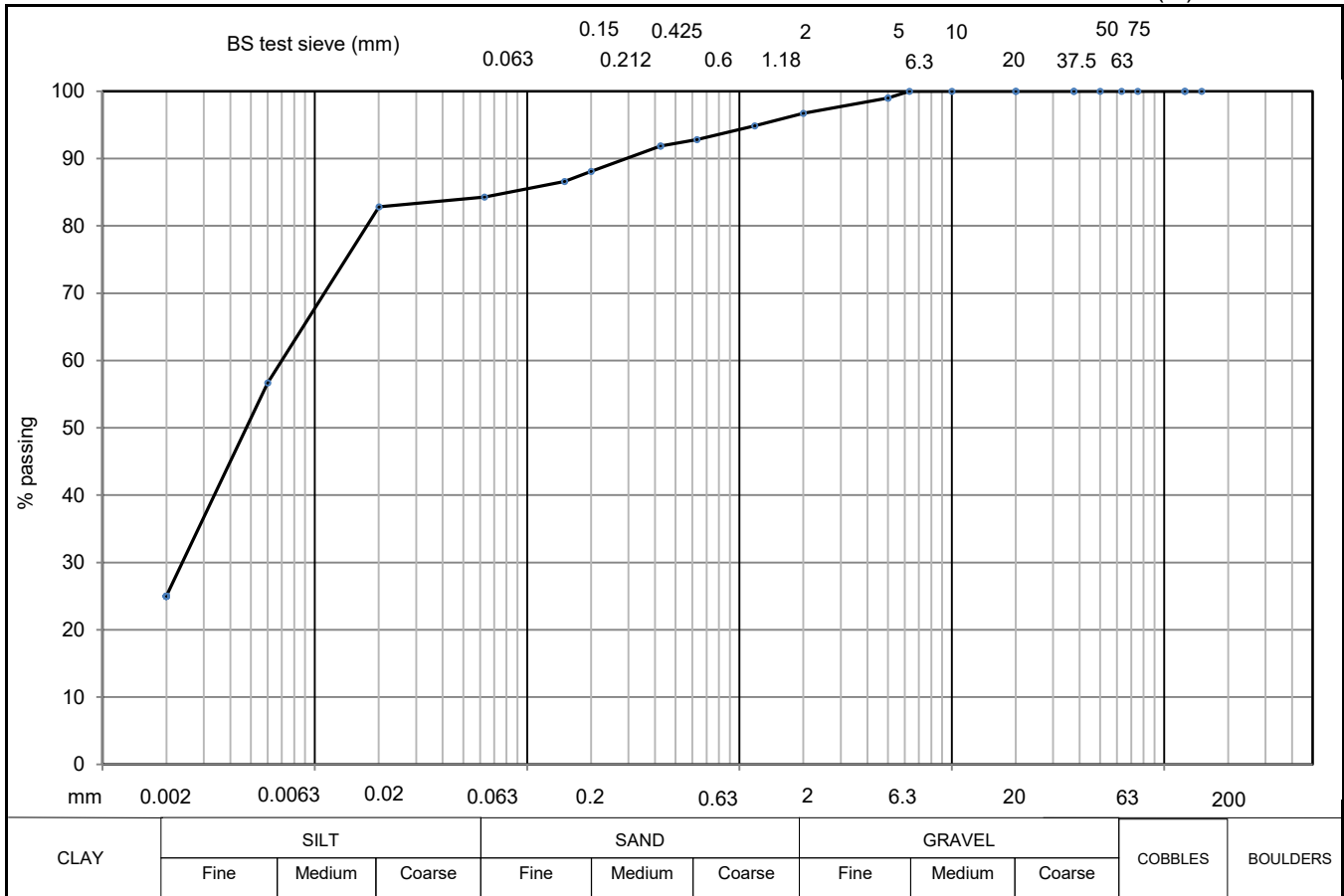
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	25						
SILT	42	150		5	90	20	53
SILT & CLAY	67						
SAND	20	75		2	87	6	37
GRAVEL	13						
COBBLE & BOULDER	0	63		1.18	85	2	25
test method(s)	5.2 & 5.4	50		0.63	83		
test method		37.5		0.425	81		
5.2 - sieving		20	100	0.2	75		
5.3 - sedimentation by hydrometer		10	95	0.15	73		
5.4 - sedimentation by pipette		6.3	91	0.063	67		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH11
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	23L
DESCRIPTION	Light grey slightly gravelly slightly sandy clayey SILT	SAMPLE DEPTH (m)	7.50
		SPECIMEN TOP (m)	7.60
		SPECIMEN BASE (m)	7.90



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	25						
SILT	59	150		5	99	20	83
SILT & CLAY	84						
SAND	12	75		2	97	6	57
GRAVEL	3						
COBBLE & BOULDER	0	63		1.18	95	2	25
test method(s)	5.2 & 5.4	50		0.63	93		
test method		37.5		0.425	92		
5.2 - sieving		20		0.2	88		
5.3 - sedimentation by hydrometer		10		0.15	87		
5.4 - sedimentation by pipette		6.3	100	0.063	84		

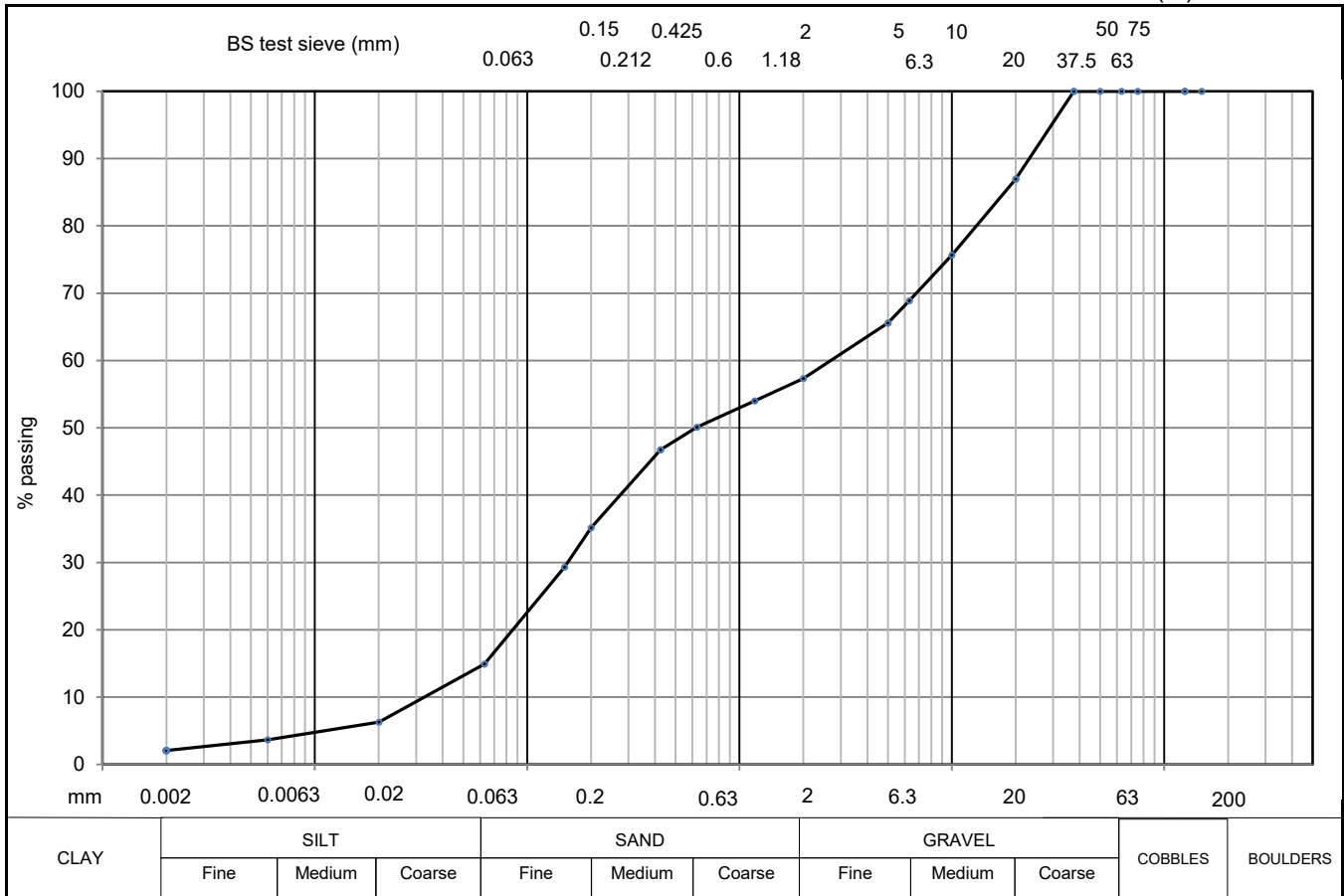
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Light grey silty SAND and GRAVEL

BH/TP No. BH11
 SAMPLE No./TYPE 25D
 SAMPLE DEPTH (m) 8.30
 SPECIMEN TOP (m) 8.30
 SPECIMEN BASE (m) 8.40



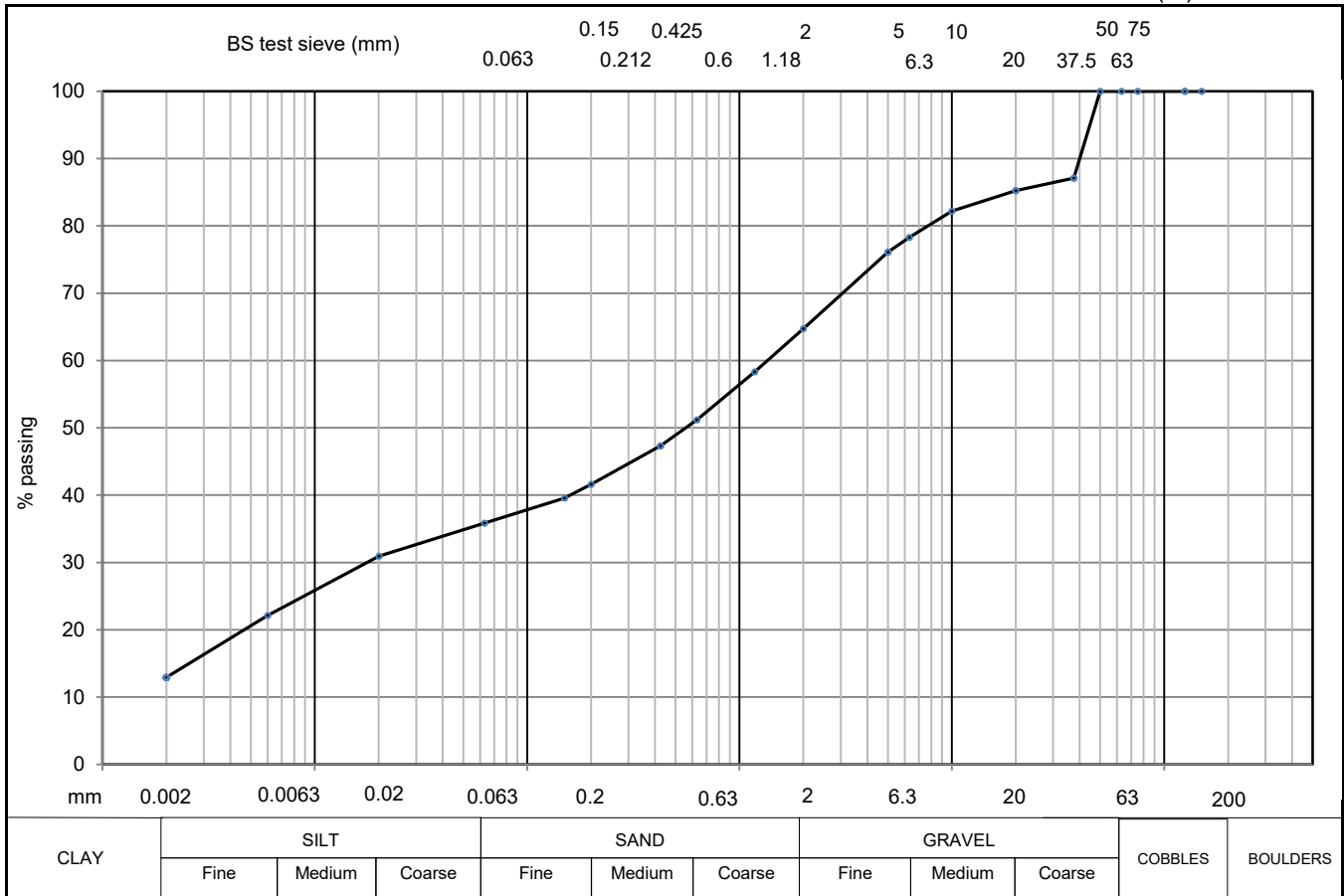
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
		CLAY	2				
SILT	13	150		5	66	20	6
SILT & CLAY	15						
SAND	42	75		2	57	6	4
GRAVEL	43						
COBBLE & BOULDER	0	63		1.18	54	2	2
test method(s)	5.2# & 5.4	50		0.63	50		
test method		37.5	100	0.425	47		
5.2 - sieving		20	87	0.2	35		
5.3 - sedimentation by hydrometer		10	76	0.15	29		
5.4 - sedimentation by pipette		6.3	69	0.063	15		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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PARTICLE SIZE DISTRIBUTION
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH12
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Dark brown very sandy very clayey GRAVEL	SAMPLE DEPTH (m)	1.00
		SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



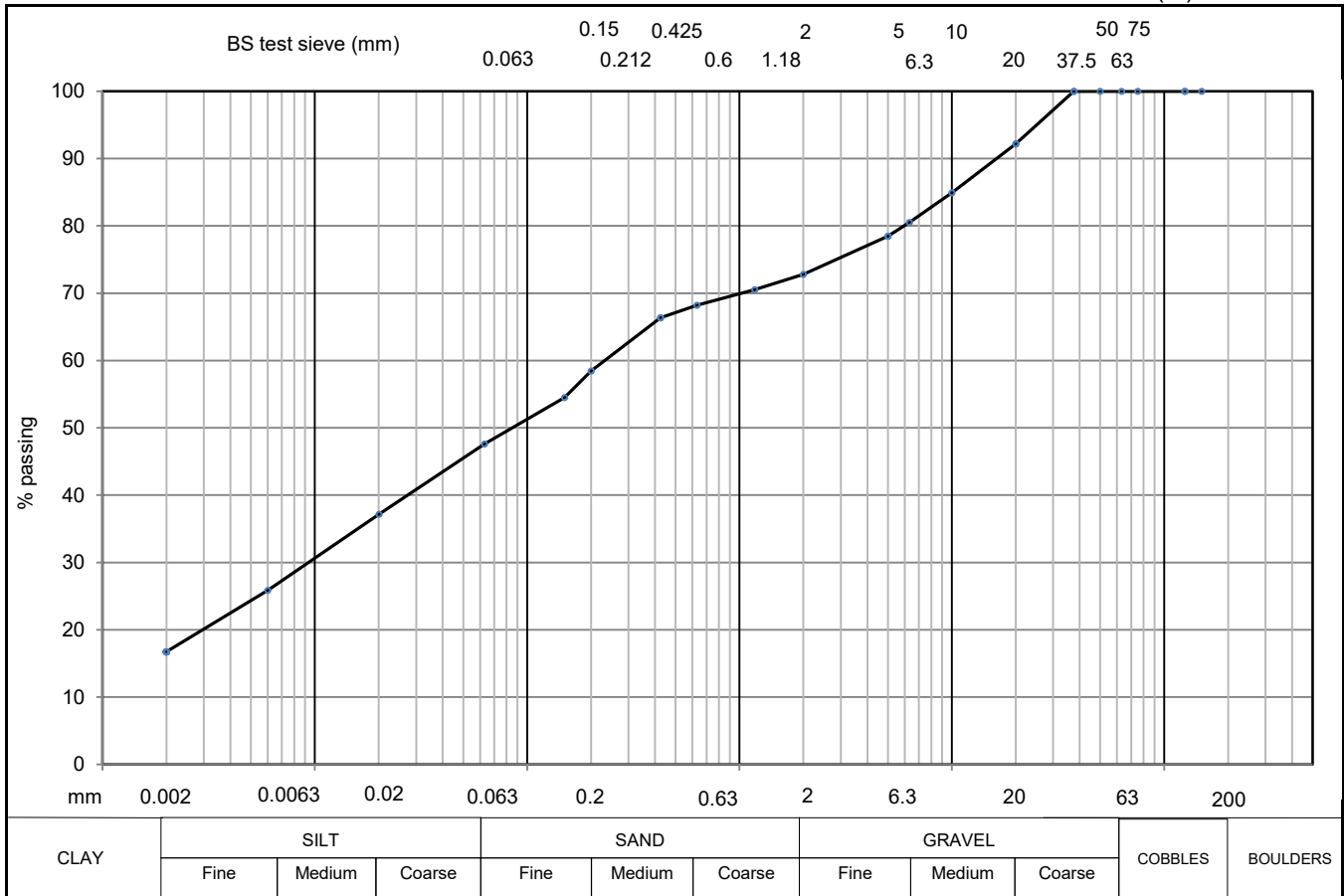
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	13						
SILT	23	150		5	76	20	31
SILT & CLAY	36						
SAND	29	75		2	65	6	22
GRAVEL	35						
COBBLE & BOULDER	0	63		1.18	58	2	13
test method(s)	5.2# & 5.4	50	100	0.63	51		
test method		37.5	87	0.425	47		
5.2 - sieving		20	85	0.2	42		
5.3 - sedimentation by hydrometer		10	82	0.15	40		
5.4 - sedimentation by pipette		6.3	78	0.063	36		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH12
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	13L
DESCRIPTION	Brown slightly sandy slightly gravelly silty CLAY	SAMPLE DEPTH (m)	5.00
		SPECIMEN TOP (m)	5.50
		SPECIMEN BASE (m)	6.00



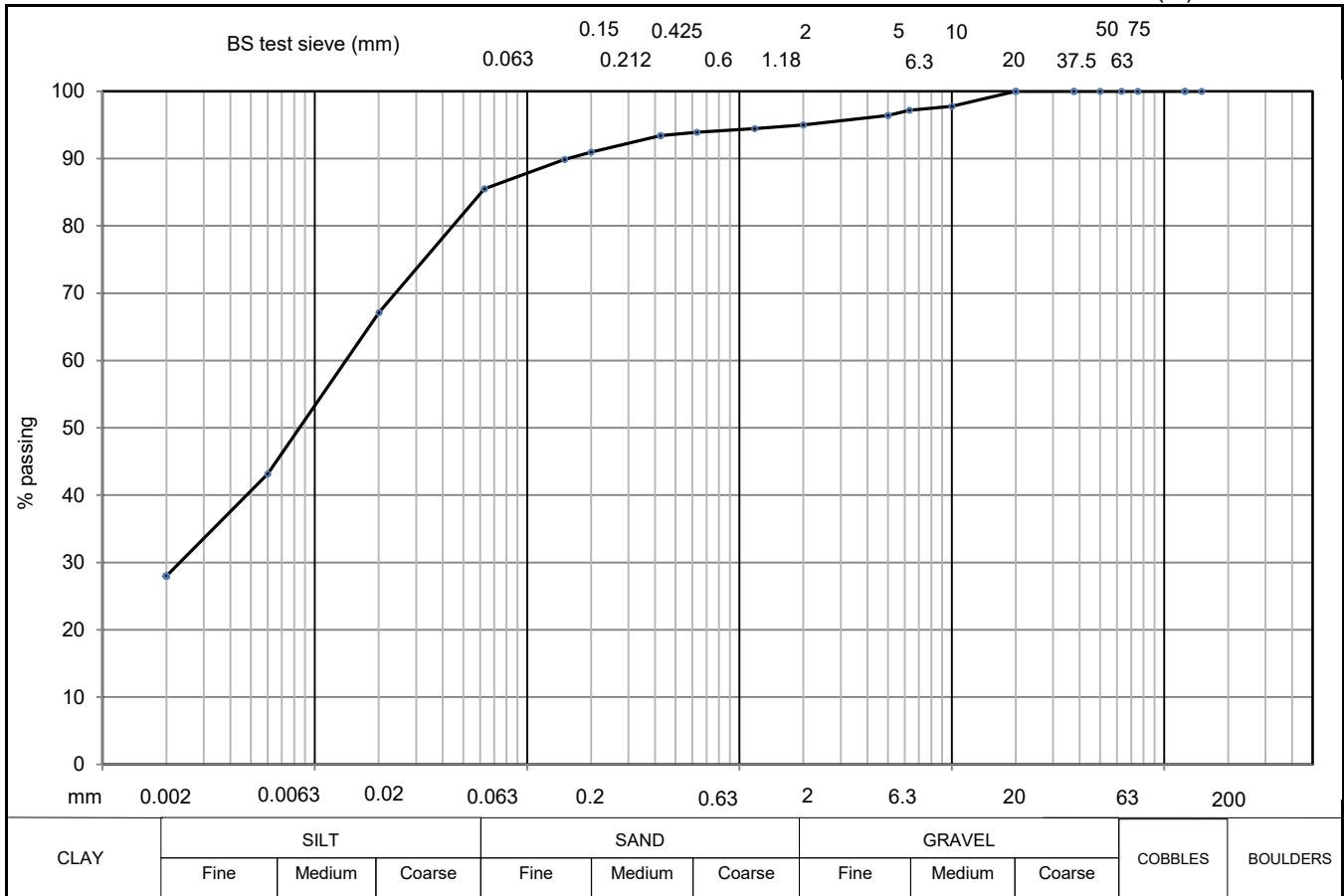
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	17						
SILT	31	150		5	78	20	37
SILT & CLAY	48						
SAND	25	75		2	73	6	26
GRAVEL	27						
COBBLE & BOULDER	0	63		1.18	71	2	17
test method(s)	5.2 & 5.4	50		0.63	68		
test method		37.5	100	0.425	66		
5.2 - sieving		20	92	0.2	58		
5.3 - sedimentation by hydrometer		10	85	0.15	55		
5.4 - sedimentation by pipette		6.3	81	0.063	48		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH14
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	7D
DESCRIPTION	Light brown mottled orange slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	1.20
		SPECIMEN TOP (m)	1.20
		SPECIMEN BASE (m)	1.65



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	28						
SILT	58	150		5	96	20	67
SILT & CLAY	86						
SAND	9	75		2	95	6	43
GRAVEL	5						
COBBLE & BOULDER	0	63		1.18	94	2	28
test method(s)	5.2 & 5.4	50		0.63	94		
test method		37.5		0.425	93		
5.2 - sieving		20	100	0.2	91		
5.3 - sedimentation by hydrometer		10	98	0.15	90		
5.4 - sedimentation by pipette		6.3	97	0.063	86		

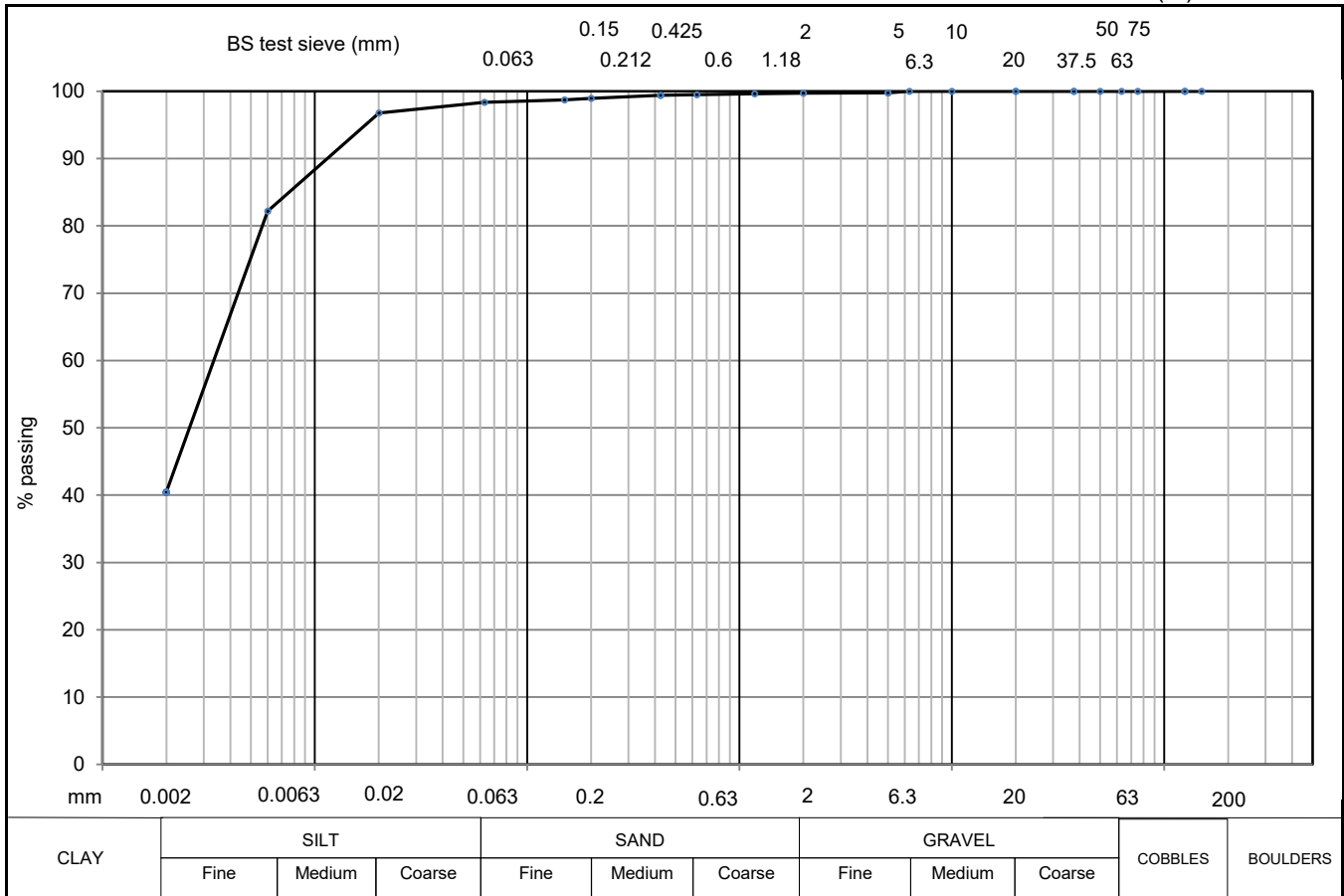
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Light grey slightly sandy silty CLAY

BH/TP No. BH14
 SAMPLE No./TYPE 14L
 SAMPLE DEPTH (m) 3.00
 SPECIMEN TOP (m) 3.60
 SPECIMEN BASE (m) 3.70



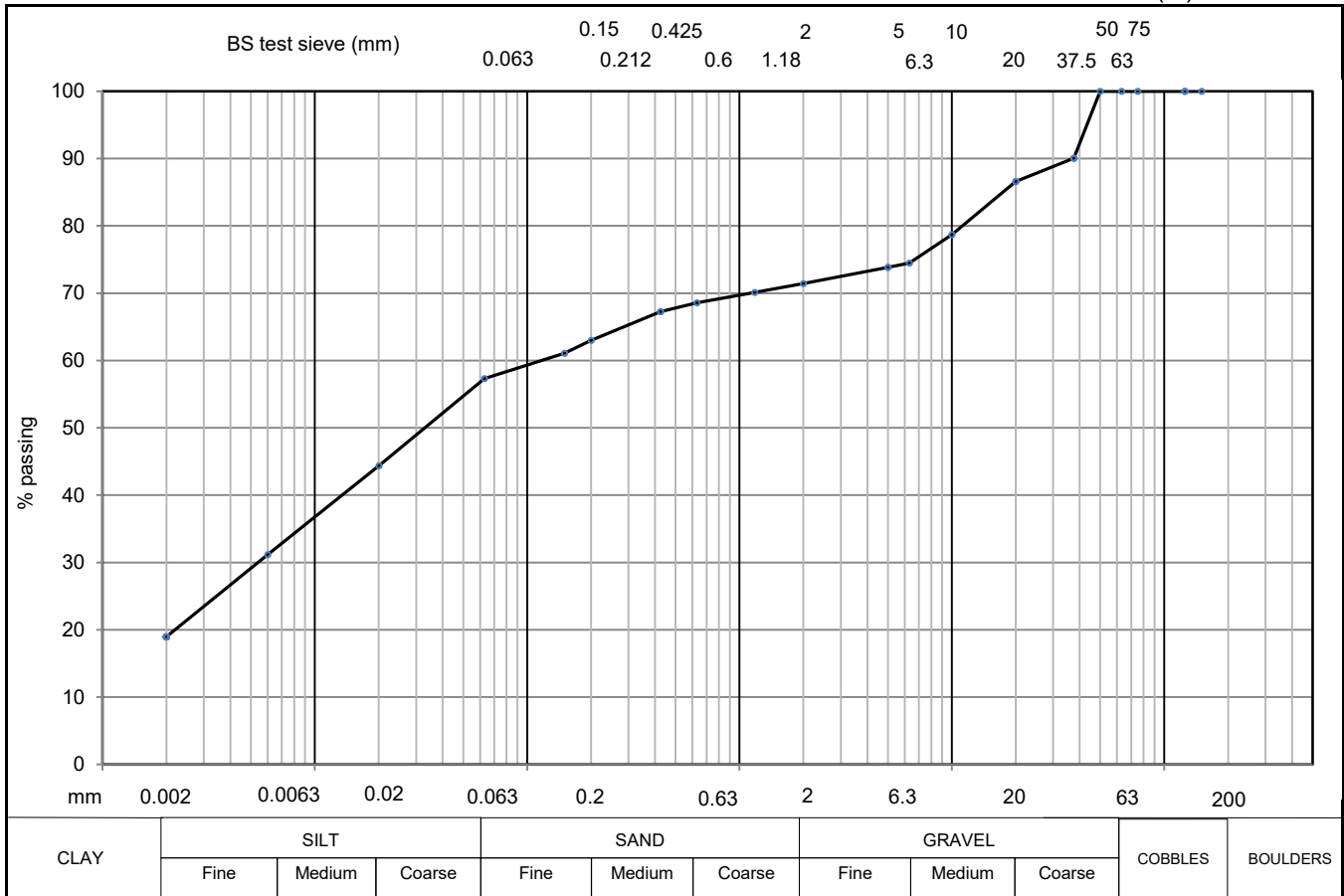
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	40						
SILT	58	150		5	100	20	97
SILT & CLAY	98						
SAND	1	75		2	100	6	82
GRAVEL	0						
COBBLE & BOULDER	0	63		1.18	100	2	40
test method(s)	5.2 & 5.4	50		0.63	100		
test method		37.5		0.425	99		
5.2 - sieving		20		0.2	99		
5.3 - sedimentation by hydrometer		10		0.15	99		
5.4 - sedimentation by pipette		6.3	100	0.063	98		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH15
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	5B
DESCRIPTION	Brown slightly sandy slightly gravelly clayey SILT	SAMPLE DEPTH (m)	0.90
		SPECIMEN TOP (m)	0.90
		SPECIMEN BASE (m)	1.20



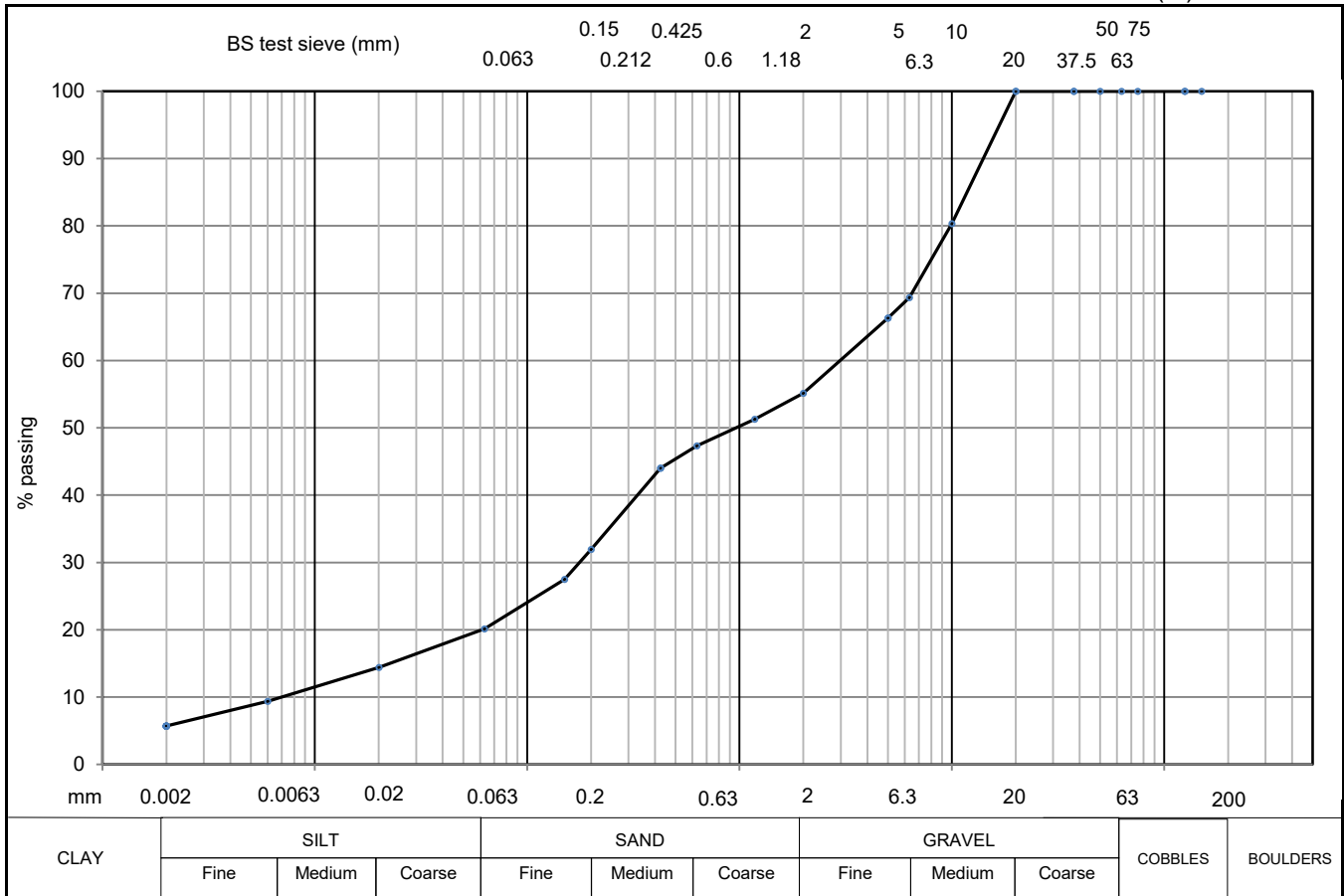
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	19						
SILT	38	150		5	74	20	44
SILT & CLAY	57						
SAND	14	75		2	71	6	31
GRAVEL	29						
COBBLE & BOULDER	0	63		1.18	70	2	19
test method(s)	5.2 & 5.4	50	100	0.63	69		
test method		37.5	90	0.425	67		
5.2 - sieving		20	87	0.2	63		
5.3 - sedimentation by hydrometer		10	79	0.15	61		
5.4 - sedimentation by pipette		6.3	74	0.063	57		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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CLIENT	FORESTRY ENGLAND	BH/TP No.	BH15
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	16D
DESCRIPTION	Brown very silty very sandy GRAVEL	SAMPLE DEPTH (m)	4.50
		SPECIMEN TOP (m)	4.50
		SPECIMEN BASE (m)	N/A



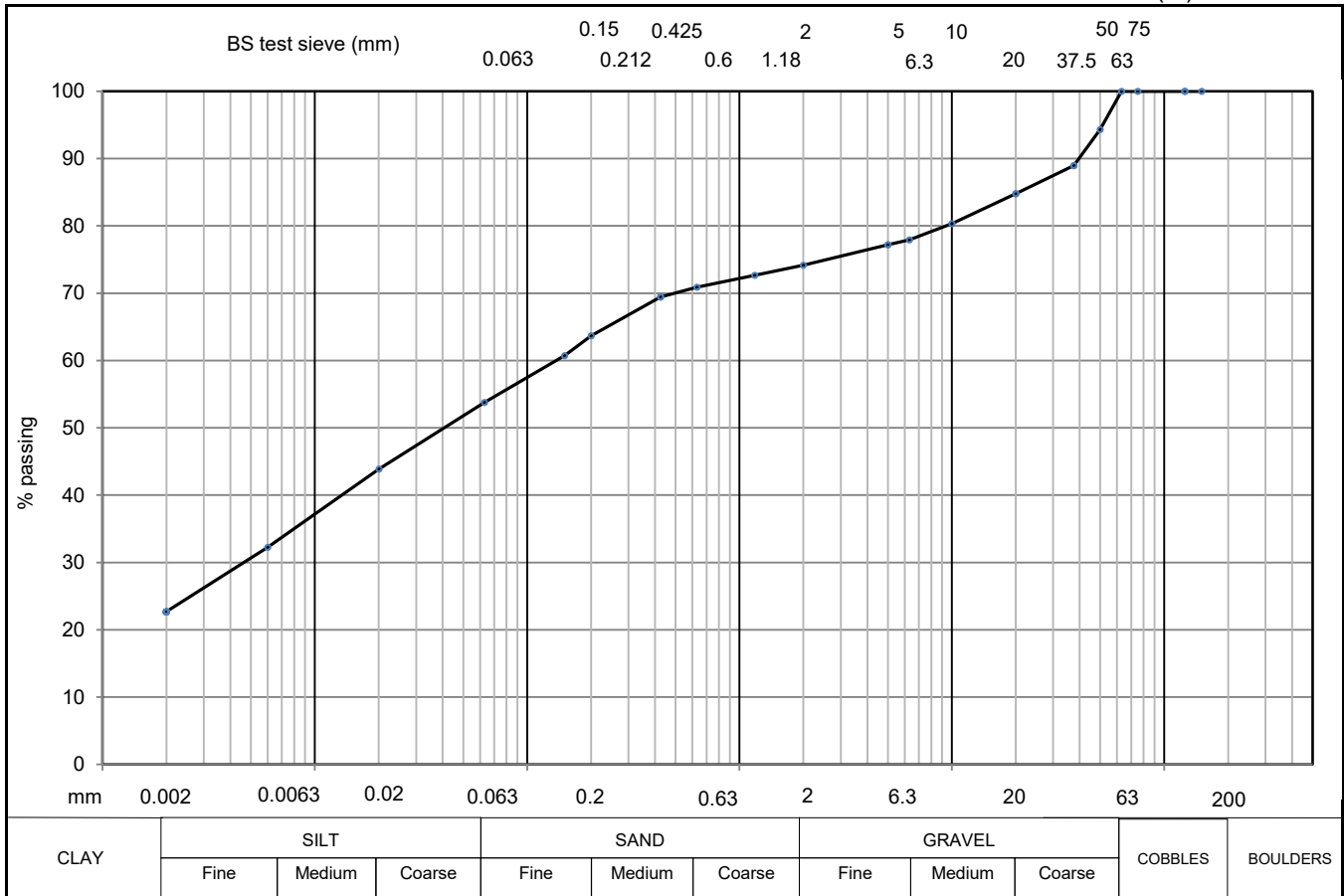
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	6						
SILT	14	150		5	66	20	14
SILT & CLAY	20						
SAND	35	75		2	55	6	9
GRAVEL	45						
COBBLE & BOULDER	0	63		1.18	51	2	6
test method(s)	5.2 & 5.4	50		0.63	47		
test method		37.5		0.425	44		
5.2 - sieving		20	100	0.2	32		
5.3 - sedimentation by hydrometer		10	80	0.15	27		
5.4 - sedimentation by pipette		6.3	69	0.063	20		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH16
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Brown slightly sandy slightly gravelly silty CLAY	SAMPLE DEPTH (m)	0.80
		SPECIMEN TOP (m)	0.80
		SPECIMEN BASE (m)	1.20



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	23						
SILT	31	150		5	77	20	44
SILT & CLAY	54						
SAND	20	75		2	74	6	32
GRAVEL	26						
COBBLE & BOULDER	0	63	100	1.18	73	2	23
test method(s)	5.2 & 5.4	50	94	0.63	71		
test method		37.5	89	0.425	69		
5.2 - sieving		20	85	0.2	64		
5.3 - sedimentation by hydrometer		10	80	0.15	61		
5.4 - sedimentation by pipette		6.3	78	0.063	54		

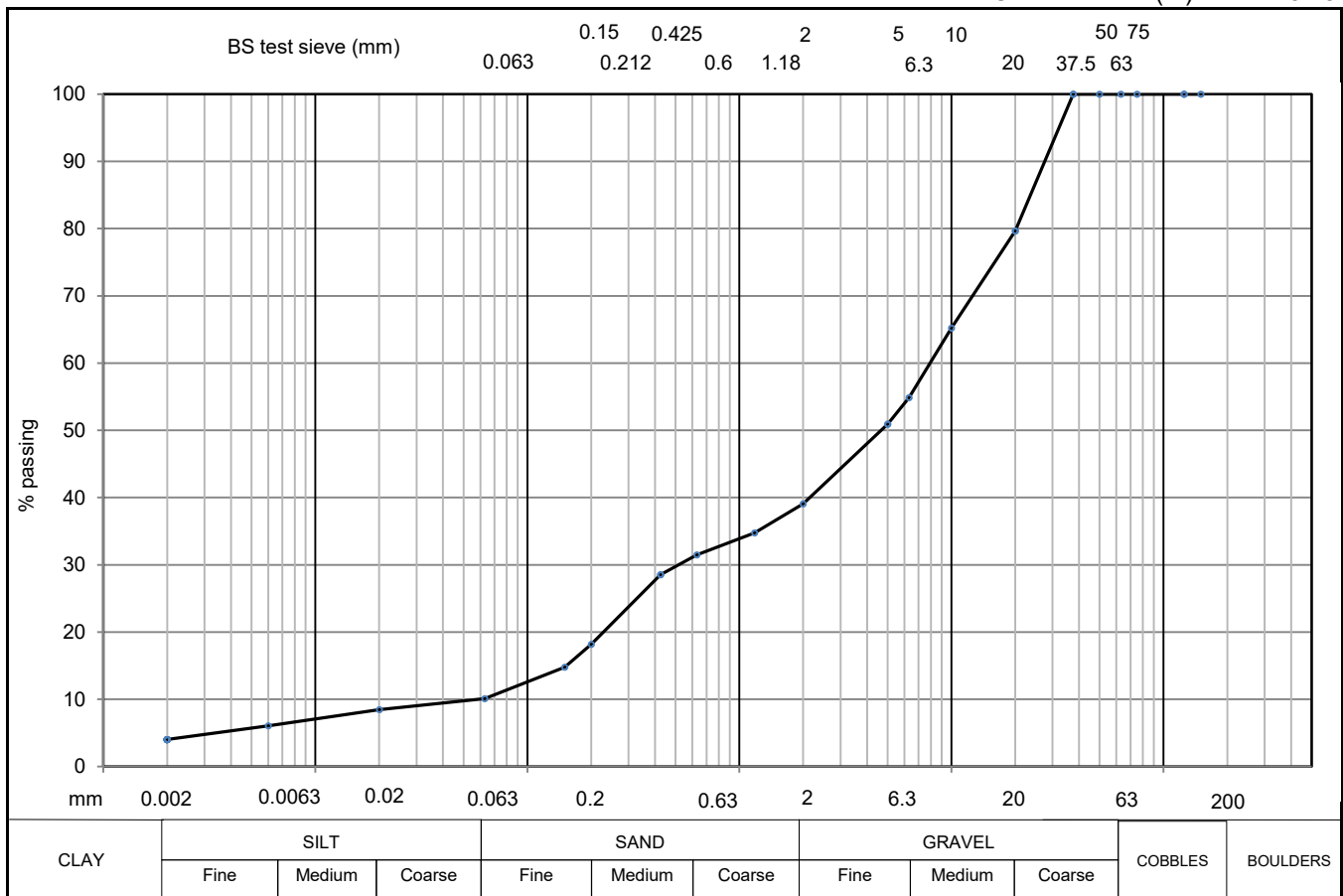
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Brown clayey very sandy GRAVEL

BH/TP No. BH16
 SAMPLE No./TYPE 10D
 SAMPLE DEPTH (m) 3.00
 SPECIMEN TOP (m) 3.00
 SPECIMEN BASE (m) 3.45



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	4						
SILT	6	150		5	51	20	8
SILT & CLAY	10						
SAND	29	75		2	39	6	6
GRAVEL	61						
COBBLE & BOULDER	0	63		1.18	35	2	4
test method(s)	5.2# & 5.4	50		0.63	31		
test method		37.5	100	0.425	29		
5.2 - sieving		20	80	0.2	18		
5.3 - sedimentation by hydrometer		10	65	0.15	15		
5.4 - sedimentation by pipette		6.3	55	0.063	10		

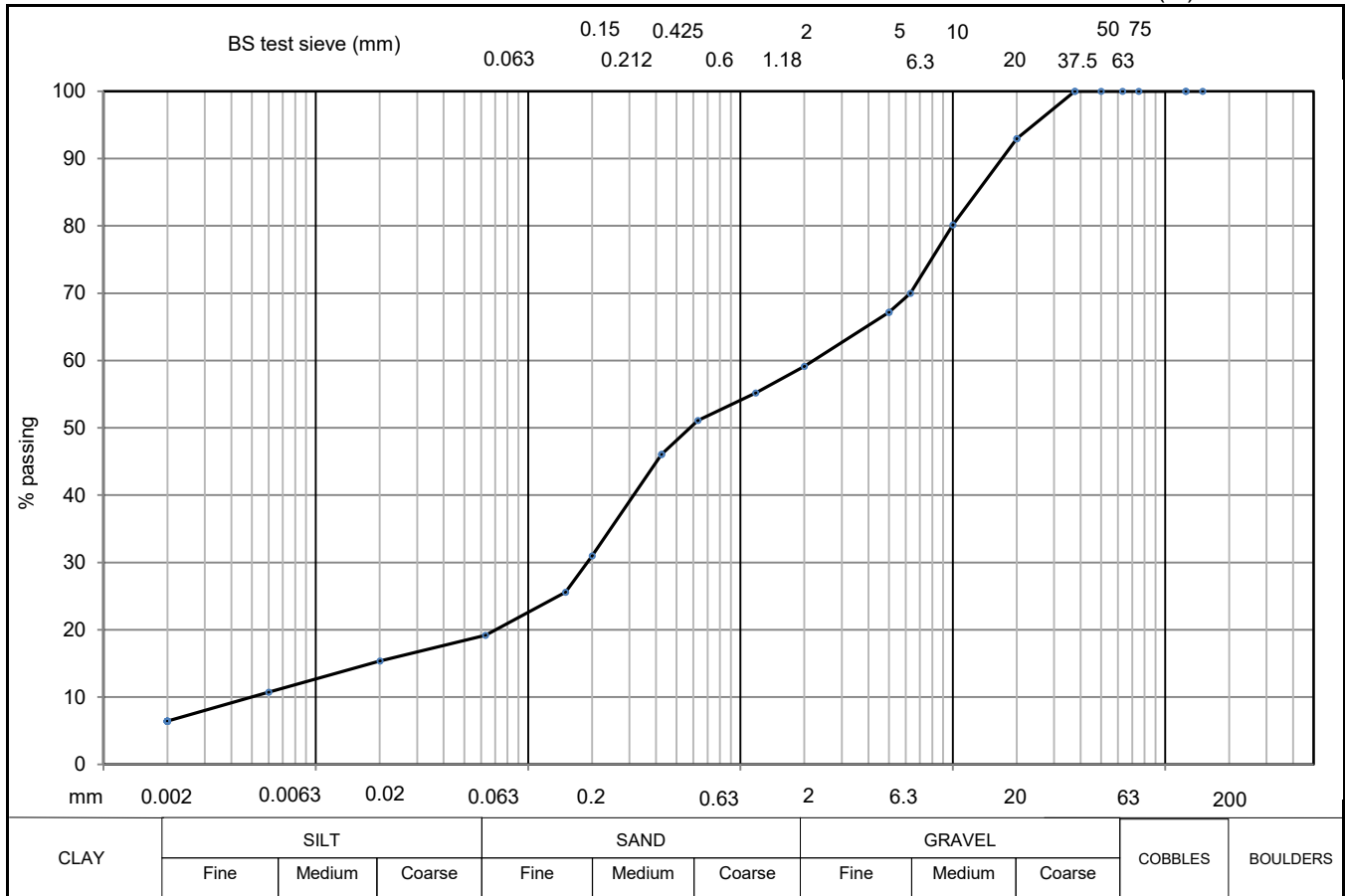
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m ³	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Brown slightly clayey sandy GRAVEL

BH/TP No. BH17
 SAMPLE No./TYPE 9D
 SAMPLE DEPTH (m) 3.00
 SPECIMEN TOP (m) 3.00
 SPECIMEN BASE (m) 3.45



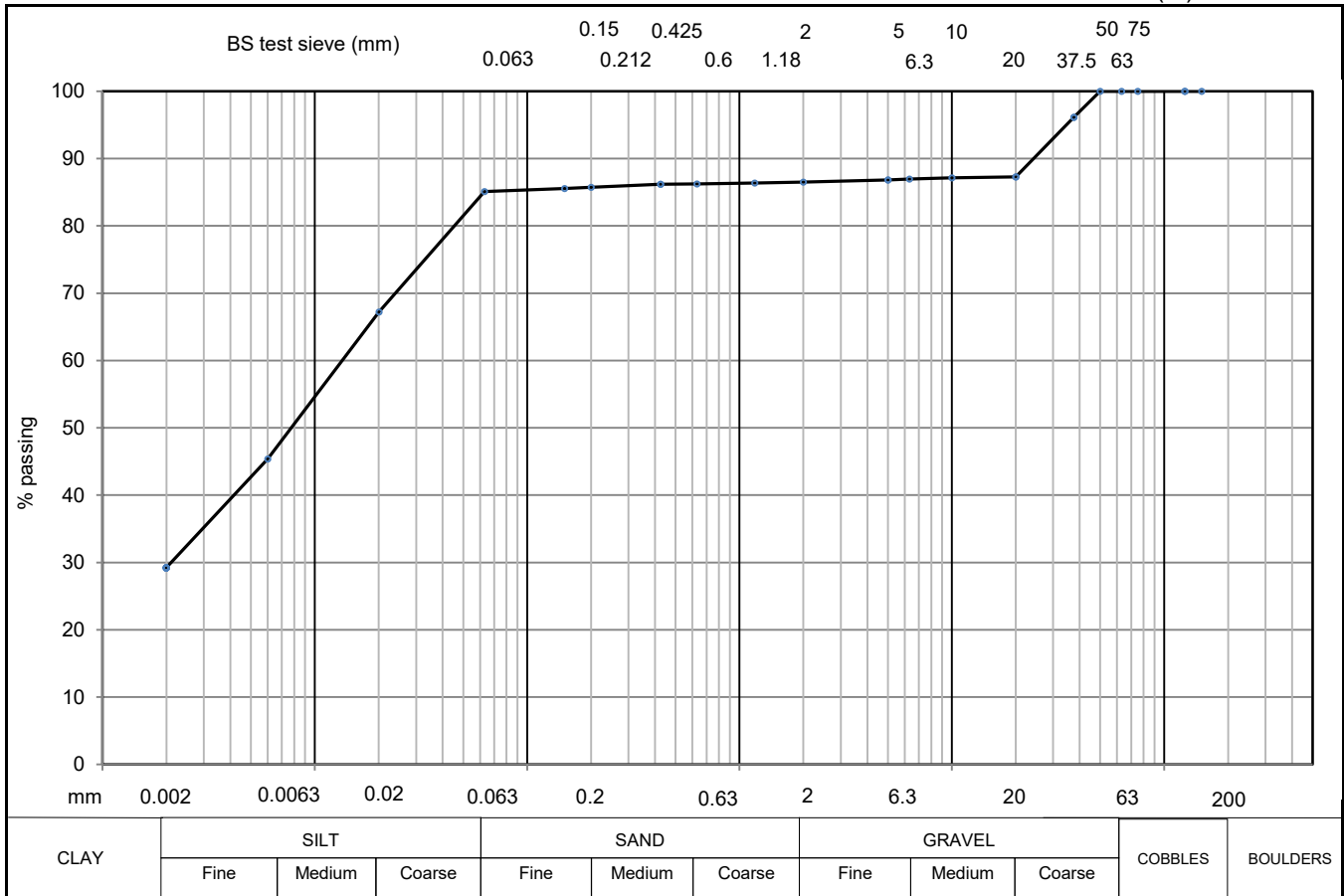
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	6						
SILT	13	150		5	67	20	15
SILT & CLAY	19						
SAND	40	75		2	59	6	11
GRAVEL	41						
COBBLE & BOULDER	0	63		1.18	55	2	6
test method(s)	5.2# & 5.4	50		0.63	51		
test method		37.5	100	0.425	46		
5.2 - sieving		20	93	0.2	31		
5.3 - sedimentation by hydrometer		10	80	0.15	26		
5.4 - sedimentation by pipette		6.3	70	0.063	19		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	HP01
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	5B
DESCRIPTION	Brown slightly sandy slightly gravelly silty CLAY	SAMPLE DEPTH (m)	1.00
		SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



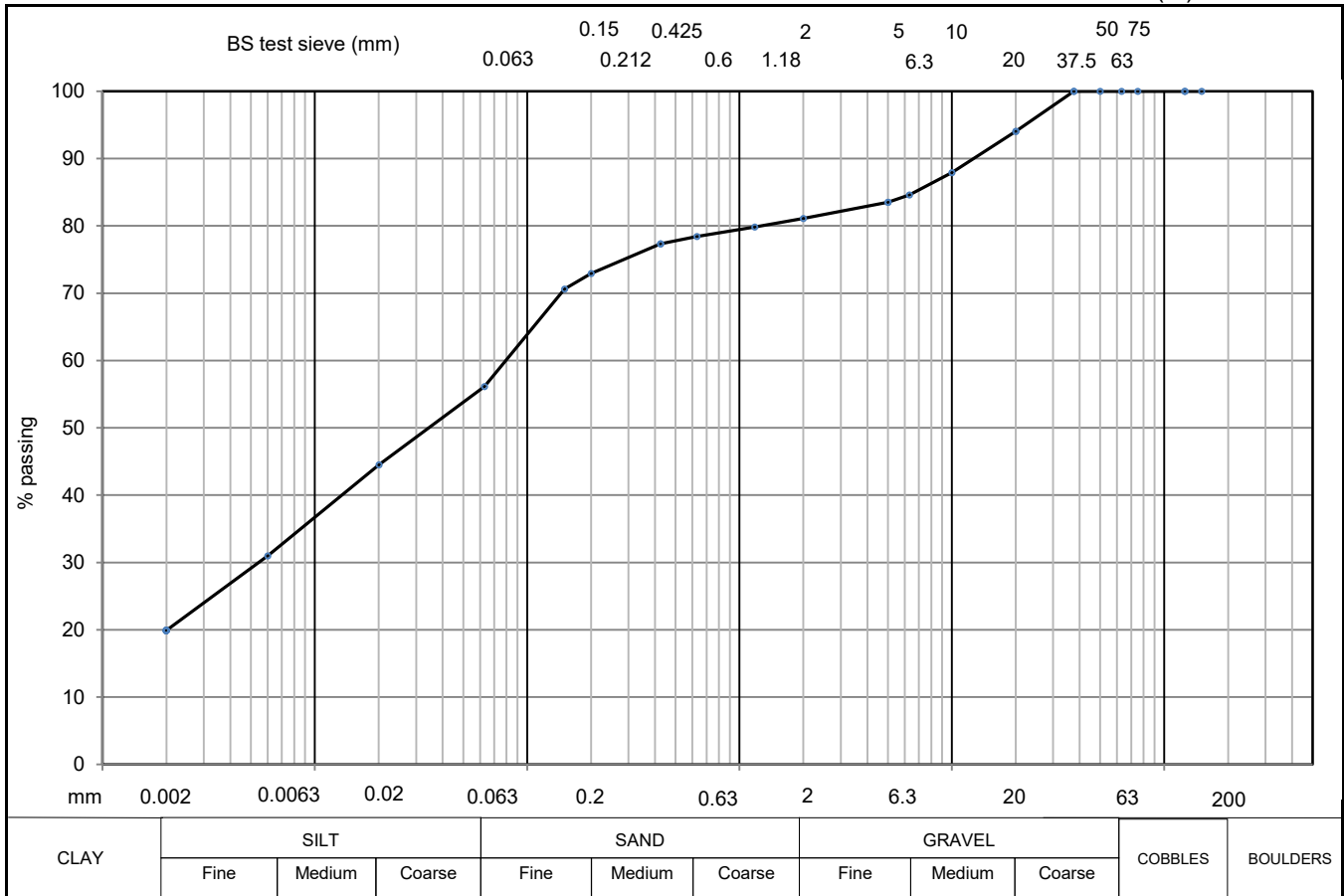
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	29						
SILT	56	150		5	87	20	67
SILT & CLAY	85						
SAND	1	75		2	86	6	45
GRAVEL	14						
COBBLE & BOULDER	0	63		1.18	86	2	29
test method(s)	5.2 & 5.4	50	100	0.63	86		
test method		37.5	96	0.425	86		
5.2 - sieving		20	87	0.2	86		
5.3 - sedimentation by hydrometer		10	87	0.15	86		
5.4 - sedimentation by pipette		6.3	87	0.063	85		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	HP02
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Brown slightly gravelly slightly sandy silty CLAY with rare roots	SAMPLE DEPTH (m)	0.40
		SPECIMEN TOP (m)	0.40
		SPECIMEN BASE (m)	0.60



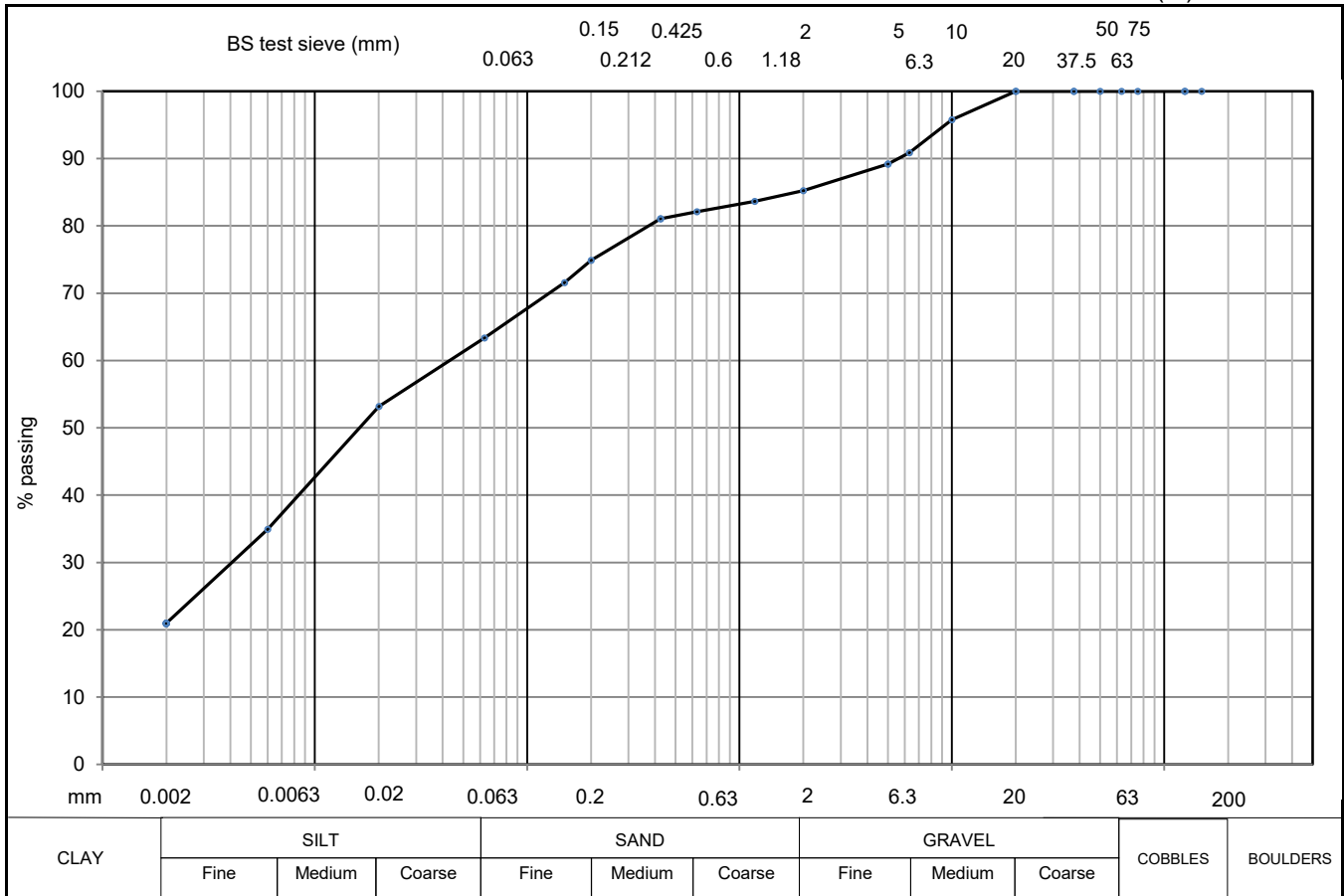
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	20						
SILT	36	150		5	84	20	45
SILT & CLAY	56						
SAND	25	75		2	81	6	31
GRAVEL	19						
COBBLE & BOULDER	0	63		1.18	80	2	20
test method(s)	5.2 & 5.4	50		0.63	78		
test method		37.5	100	0.425	77		
5.2 - sieving		20	94	0.2	73		
5.3 - sedimentation by hydrometer		10	88	0.15	71		
5.4 - sedimentation by pipette		6.3	85	0.063	56		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	HP04
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	3B
DESCRIPTION	Brown slightly gravelly slightly sandy silty CLAY with rare roots	SAMPLE DEPTH (m)	0.70
		SPECIMEN TOP (m)	0.70
		SPECIMEN BASE (m)	0.90



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	21						
SILT	42	150		5	89	20	53
SILT & CLAY	63						
SAND	22	75		2	85	6	35
GRAVEL	15						
COBBLE & BOULDER	0	63		1.18	84	2	21
test method(s)	5.2 & 5.4	50		0.63	82		
test method		37.5		0.425	81		
5.2 - sieving		20	100	0.2	75		
5.3 - sedimentation by hydrometer		10	96	0.15	72		
5.4 - sedimentation by pipette		6.3	91	0.063	63		

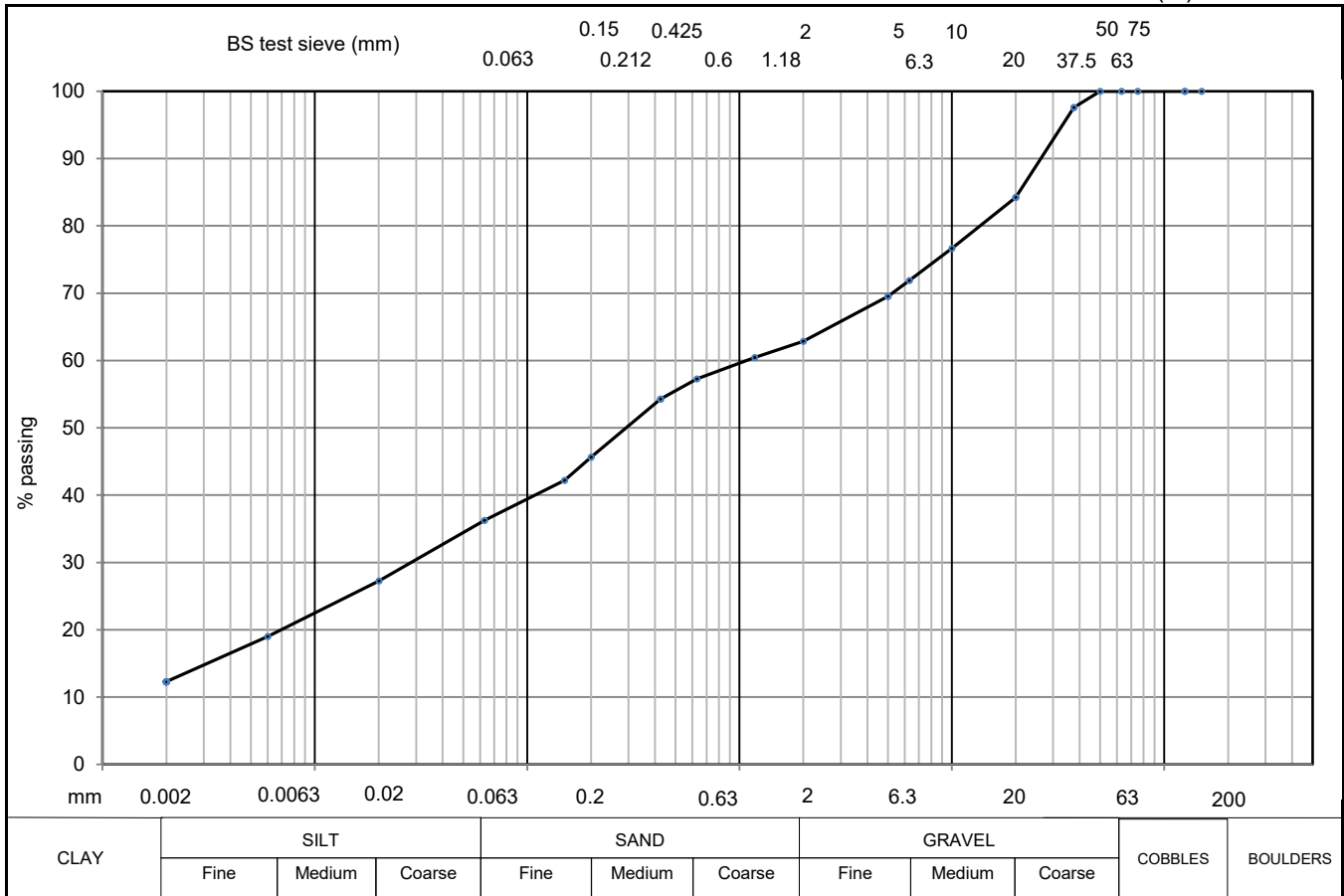
remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT FORESTRY ENGLAND
 SITE CANNOP PONDS INTRUSIVE GI
 DESCRIPTION Brown slightly sandy gravelly silty CLAY

BH/TP No. HP05
 SAMPLE No./TYPE 6B
 SAMPLE DEPTH (m) 1.00
 SPECIMEN TOP (m) 1.00
 SPECIMEN BASE (m) 1.20



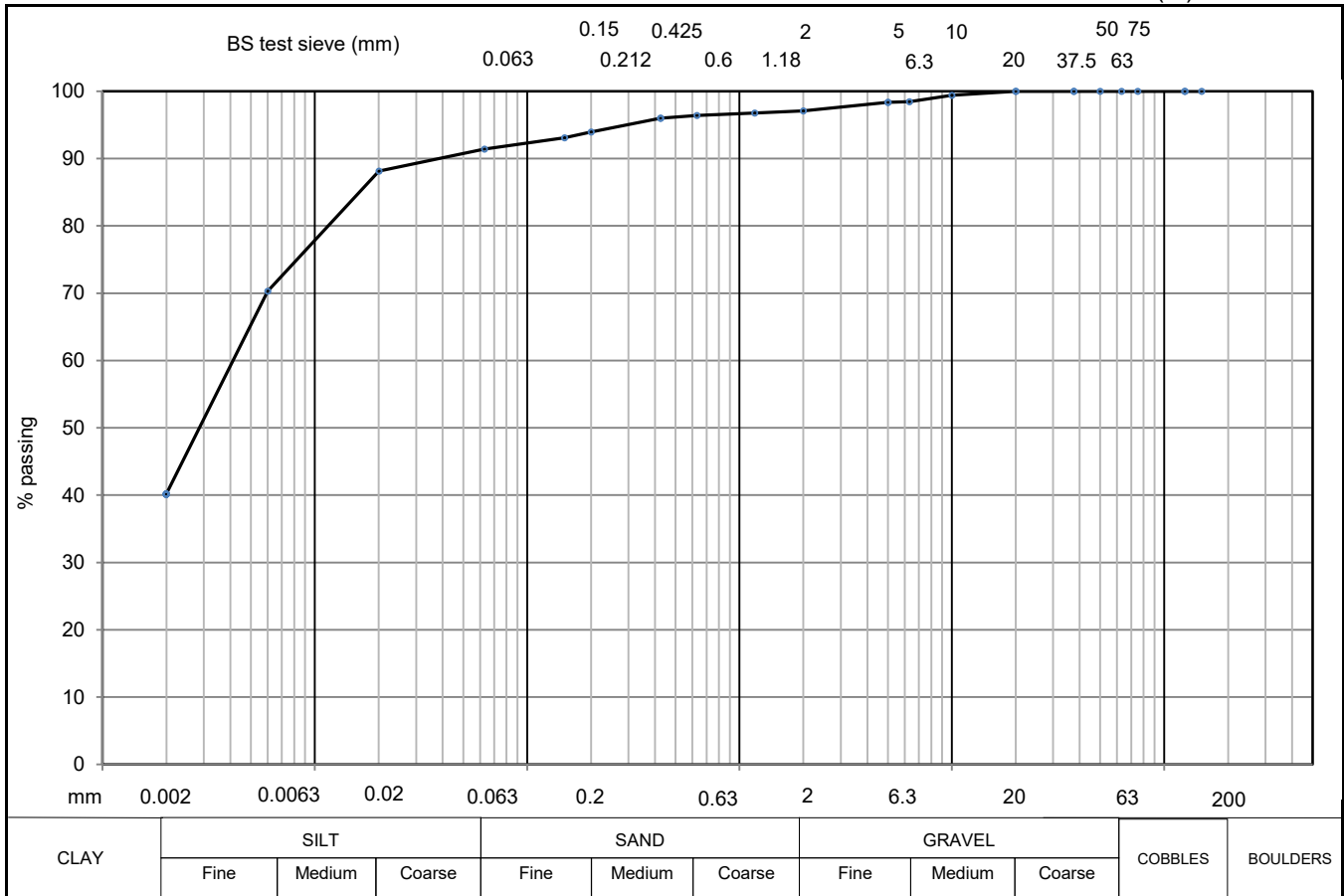
soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	12						
SILT	24	150		5	70	20	27
SILT & CLAY	36						
SAND	27	75		2	63	6	19
GRAVEL	37						
COBBLE & BOULDER	0	63		1.18	60	2	12
test method(s)	5.2 & 5.4	50	100	0.63	57		
test method		37.5	98	0.425	54		
5.2 - sieving		20	84	0.2	46		
5.3 - sedimentation by hydrometer		10	77	0.15	42		
5.4 - sedimentation by pipette		6.3	72	0.063	36		

remarks # denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	CONTRACT 37707	CHECKED TB
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Geotechnical Engineering Limited
PARTICLE SIZE DISTRIBUTION
 BS EN ISO 17892 - 4 : 2016 : 5



CLIENT	FORESTRY ENGLAND	BH/TP No.	HP06
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	5B
DESCRIPTION	Greyish brown slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	1.00
		SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction	BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
CLAY	40						
SILT	51	150		5	98	20	88
SILT & CLAY	91						
SAND	6	75		2	97	6	70
GRAVEL	3						
COBBLE & BOULDER	0	63		1.18	97	2	40
test method(s)	5.2 & 5.4	50		0.63	96		
test method		37.5		0.425	96		
5.2 - sieving		20	100	0.2	94		
5.3 - sedimentation by hydrometer		10	99	0.15	93		
5.4 - sedimentation by pipette		6.3	98	0.063	91		

remarks	CONTRACT	CHECKED
# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892 Particle density assigned an assumed value of 2.70 Mg/m3	37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP



BS. 1377 : Part 4 : 1990 : 3

CLIENT FORESTRY ENGLAND

BH/TP No.

BH02

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

8L

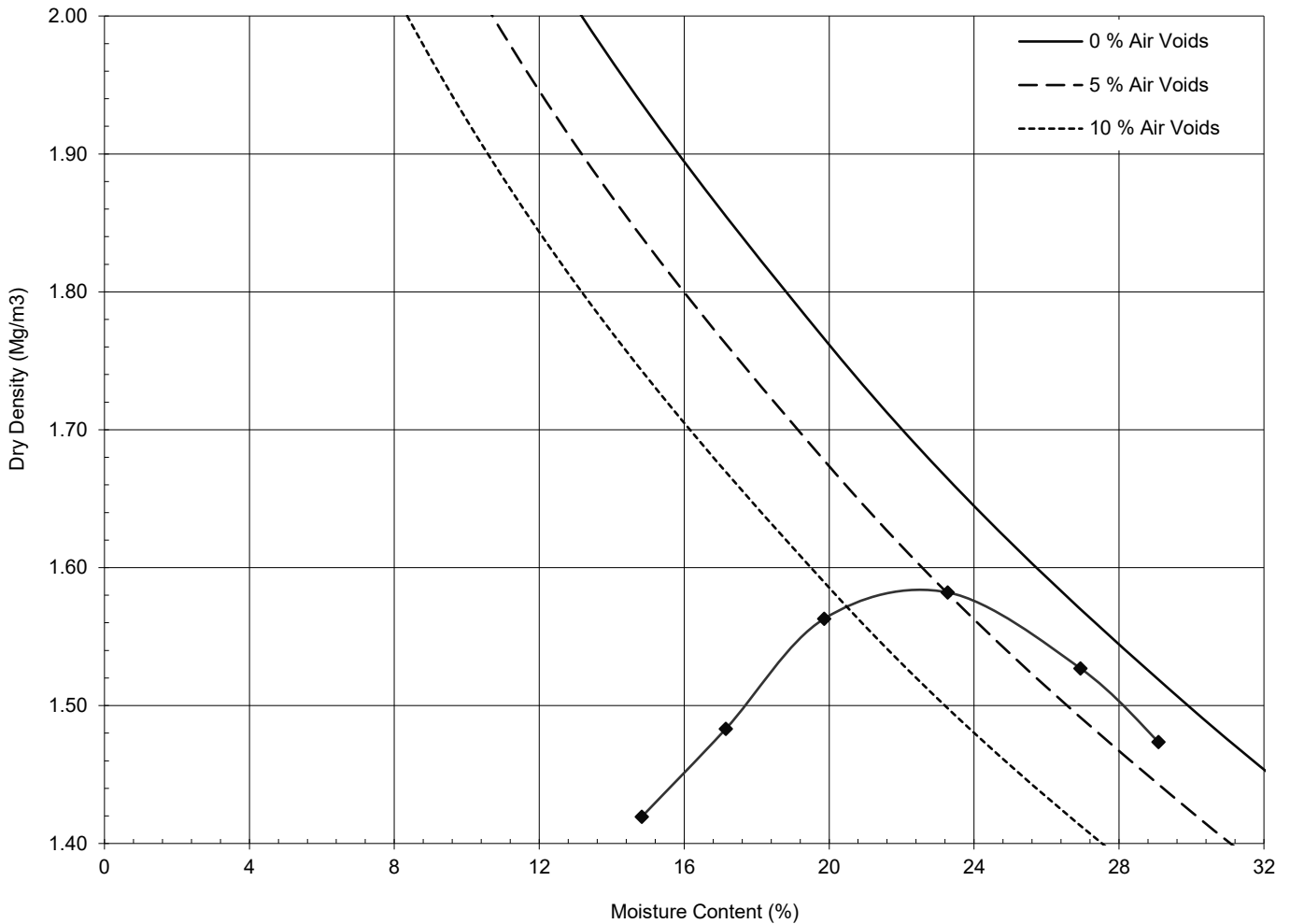
DESCRIPTION Greyish brown very gravelly very clayey SAND

SAMPLE DEPTH (m)

3.00

SPECIMEN DEPTH (m)

3.00



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	3.2.4.2 (grading zone 2)				
sample preparation	C				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	24
proportion retained on 20mm sieve	%	2	maximum dry density	(Mg/m ³)	1.59
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	22
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP



BS. 1377 : Part 4 : 1990 : 3

CLIENT FORESTRY ENGLAND

BH/TP No.

BH03

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

7L

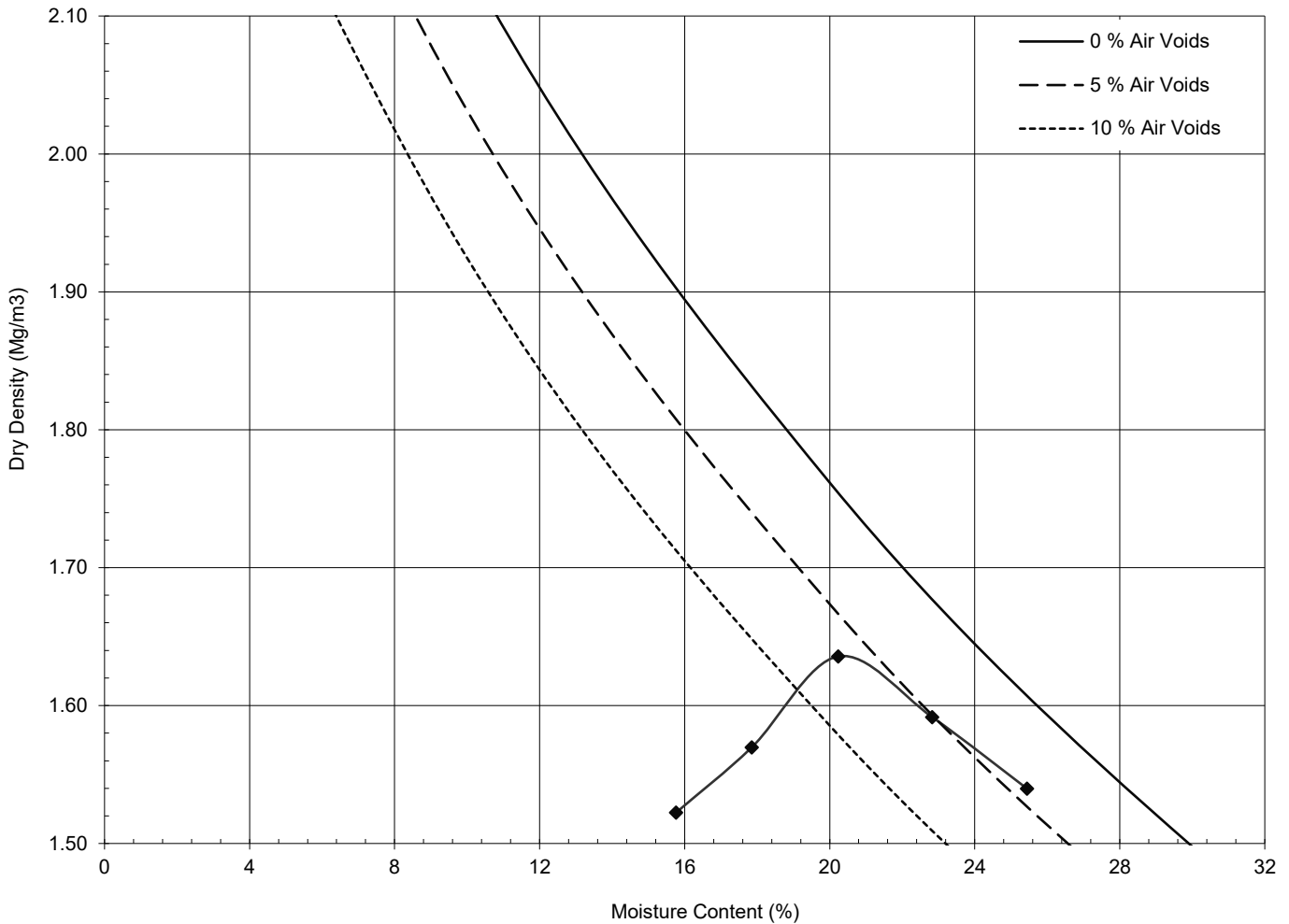
DESCRIPTION Greyish brown slightly sandy slightly gravelly CLAY

SAMPLE DEPTH (m)

3.00

SPECIMEN DEPTH (m)

3.00



test method	3.4.4.1 2.5kg dynamic compaction - CBR mould				
preparation procedure	3.2.5.2 (grading zone 4)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	5	initial moisture content	%	21
proportion retained on 20mm sieve	%	10	maximum dry density	(Mg/m ³)	1.64
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	20
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

BS. 1377 : Part 4 : 1990 : 3



CLIENT FORESTRY ENGLAND

BH/TP No.

BH04

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

15L

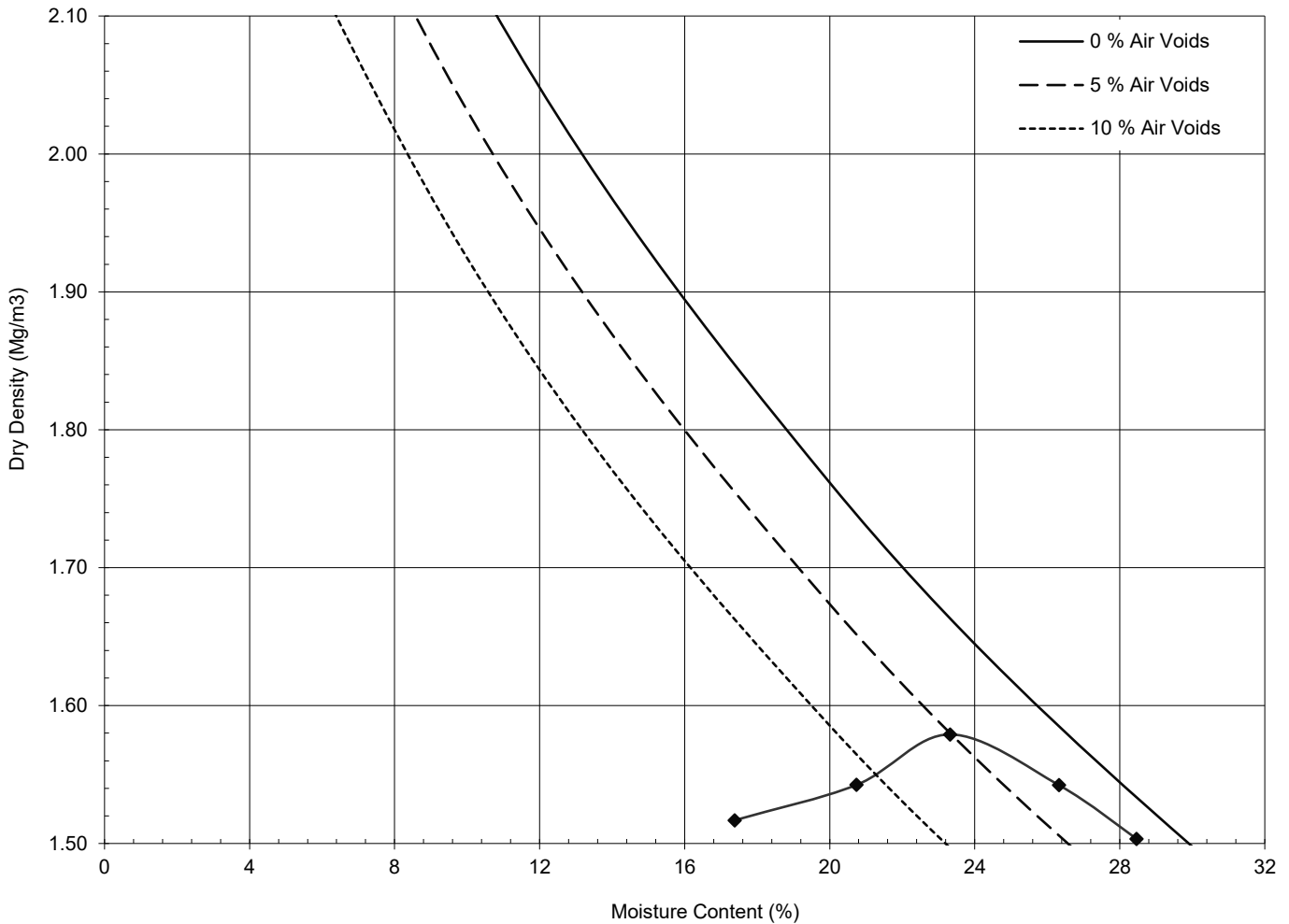
DESCRIPTION Grey and brown slightly sandy gravelly silty CLAY

SAMPLE DEPTH (m)

4.00

SPECIMEN DEPTH (m)

4.00



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	3.2.4.2 (grading zone 2)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	26
proportion retained on 20mm sieve	%	4	maximum dry density	(Mg/m ³)	1.58
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	23
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

BS. 1377 : Part 4 : 1990 : 3



CLIENT FORESTRY ENGLAND

BH/TP No.

BH05

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

16L

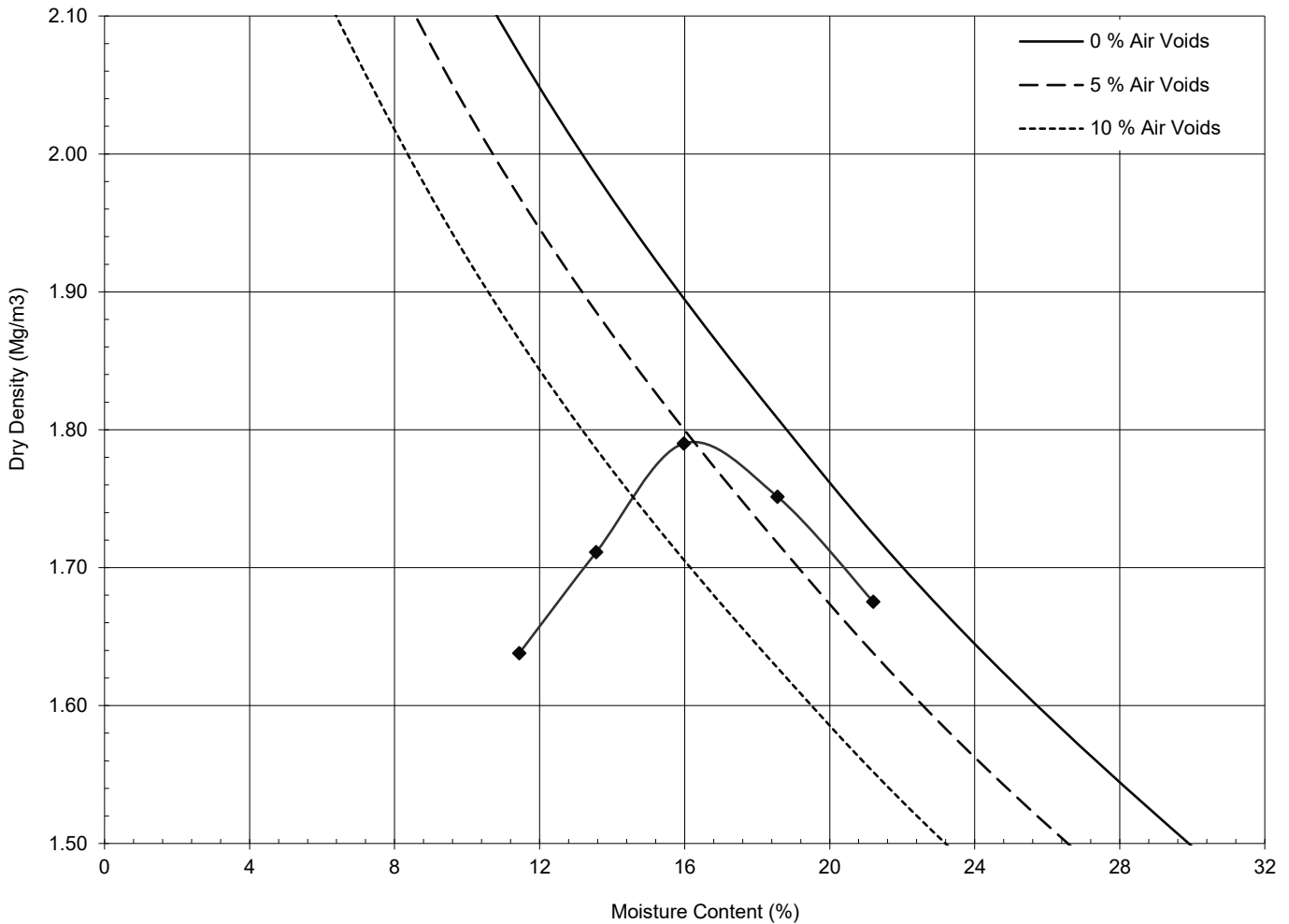
DESCRIPTION Greyish brown slightly sandy slightly gravelly CLAY

SAMPLE DEPTH (m)

5.00

SPECIMEN DEPTH (m)

5.00



test method	3.4.4.1 2.5kg dynamic compaction - CBR mould				
preparation procedure	3.2.5.1 (grading zone 3)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	20
proportion retained on 20mm sieve	%	7	maximum dry density	(Mg/m ³)	1.79
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	16
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP



BS. 1377 : Part 4 : 1990 : 3

CLIENT FORESTRY ENGLAND

BH/TP No.

BH06

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

11L

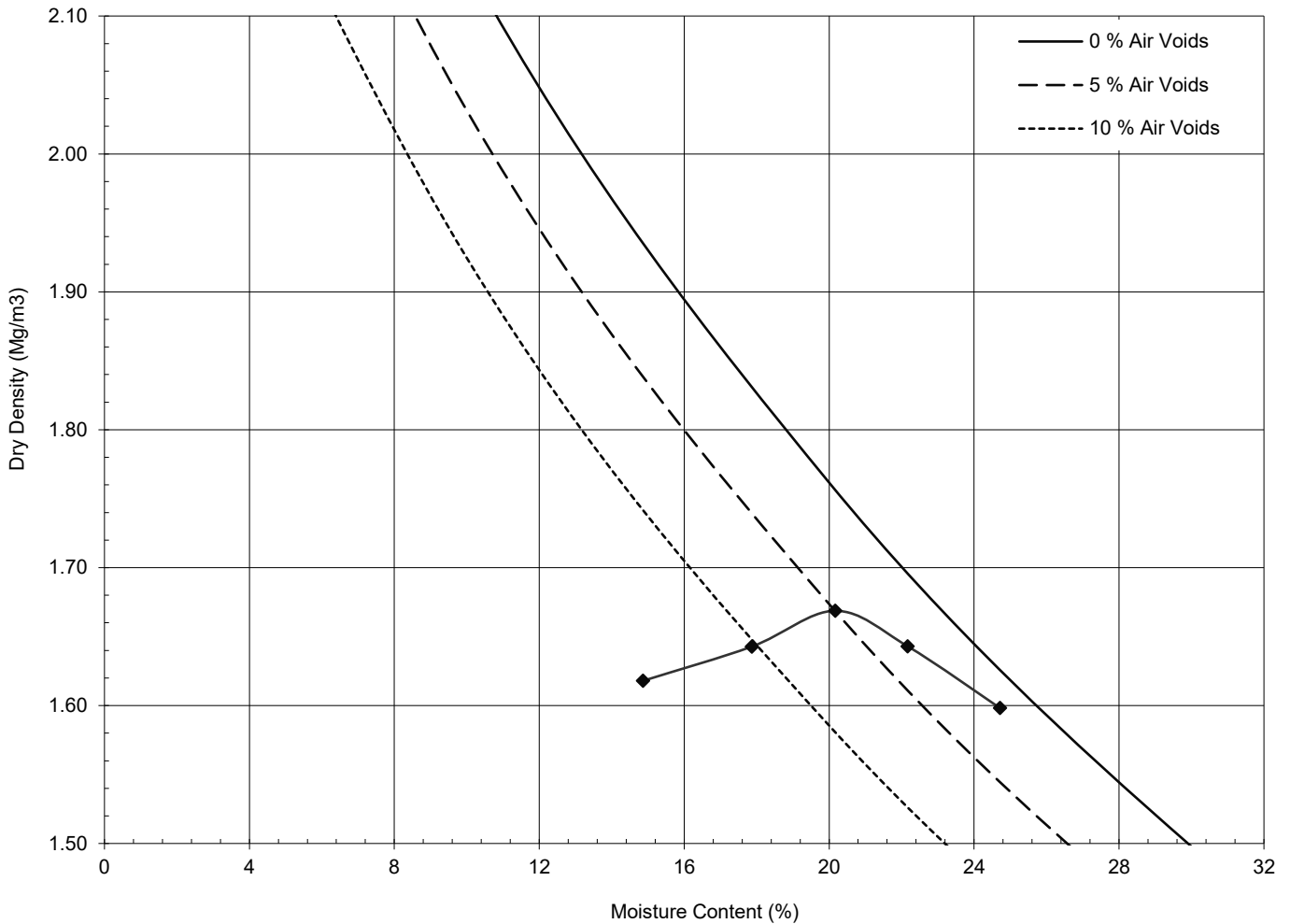
DESCRIPTION Greyish brown slightly sandy gravelly CLAY

SAMPLE DEPTH (m)

3.00

SPECIMEN DEPTH (m)

3.00



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	Grading zone X (Test not applicable)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	11	initial moisture content	%	23
proportion retained on 20mm sieve	%	2	maximum dry density	(Mg/m ³)	1.67
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	20
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
Non standard test carried out.			CONTRACT	CHECKED	
			37707	TB	

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP



BS. 1377 : Part 4 : 1990 : 3

CLIENT FORESTRY ENGLAND

BH/TP No.

BH07

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

8L

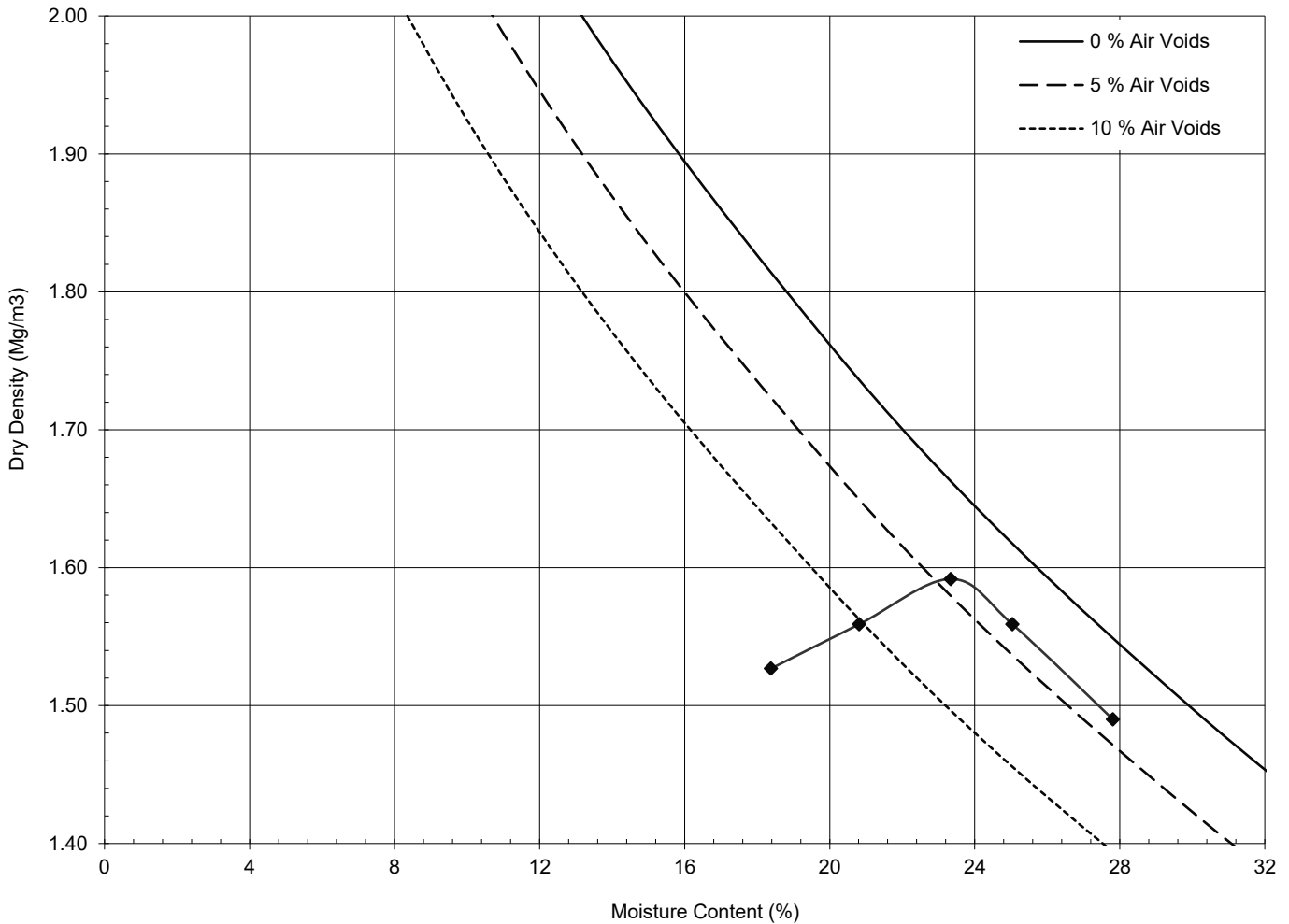
DESCRIPTION Grey and brown slightly sandy slightly gravelly CLAY

SAMPLE DEPTH (m)

2.20

SPECIMEN DEPTH (m)

2.20



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	3.2.4.1 (grading zone 1)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	23
proportion retained on 20mm sieve	%	0	maximum dry density	(Mg/m ³)	1.59
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	23
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP



BS. 1377 : Part 4 : 1990 : 3

CLIENT FORESTRY ENGLAND

BH/TP No.

BH08

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

11L

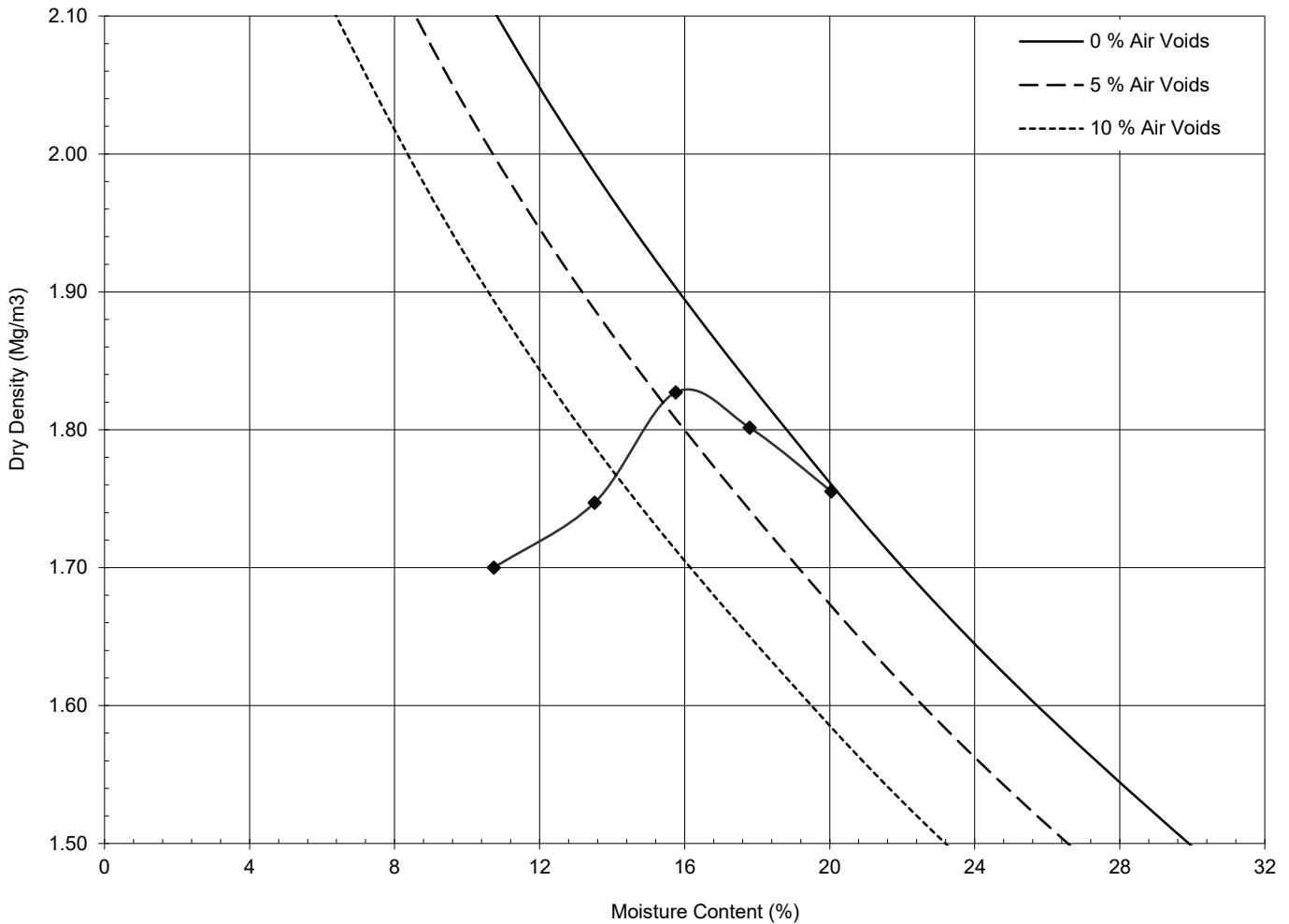
DESCRIPTION Brown slightly sandy slightly gravelly CLAY

SAMPLE DEPTH (m)

3.00

SPECIMEN DEPTH (m)

3.00



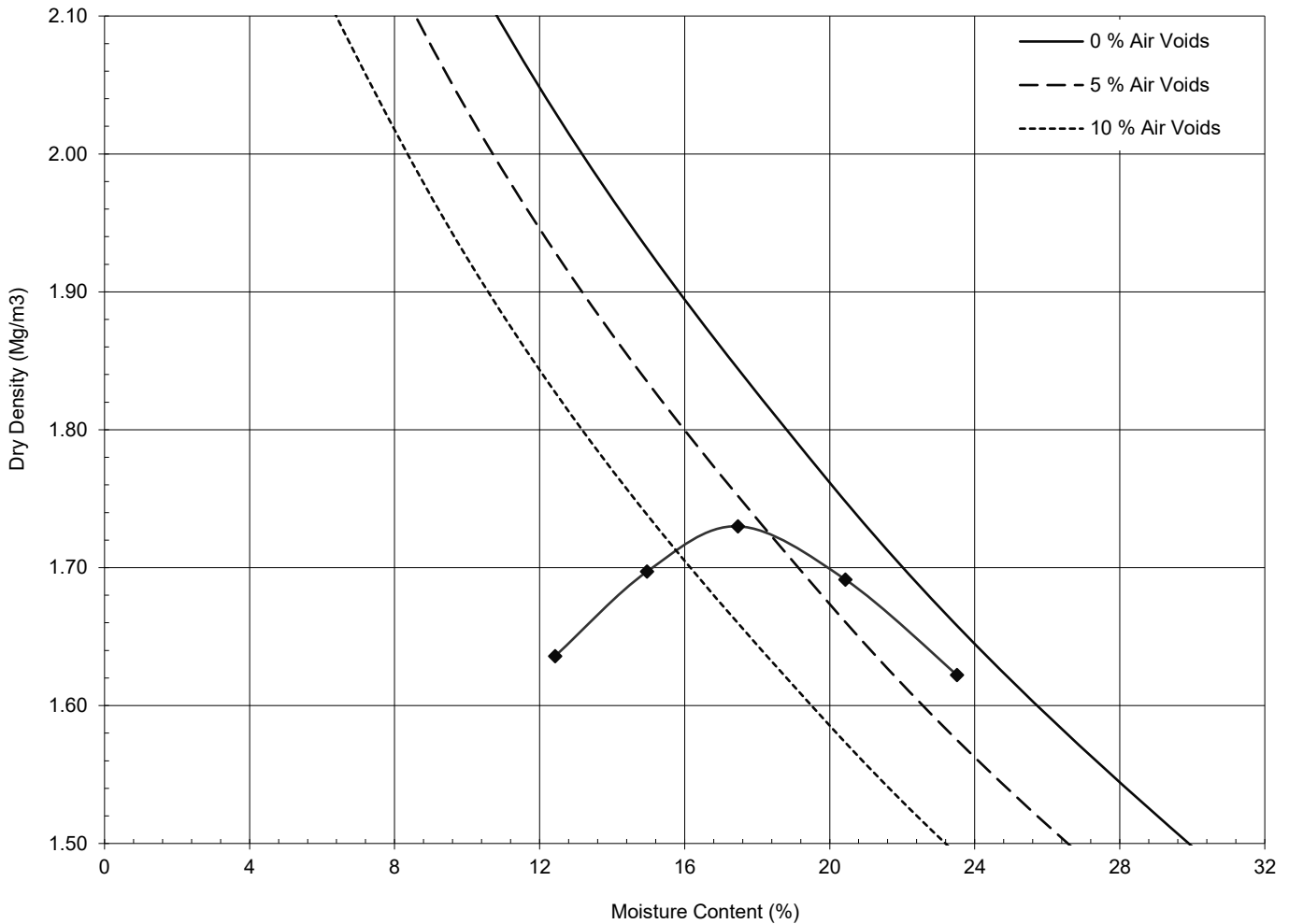
test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	3.2.4.2 (grading zone 2)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	21
proportion retained on 20mm sieve	%	5	maximum dry density	(Mg/m ³)	1.83
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	16
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP



BS. 1377 : Part 4 : 1990 : 3

CLIENT	FORESTRY ENGLAND	BH/TP No.	BH11
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	14L
DESCRIPTION	Greyish brown slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	4.00
		SPECIMEN DEPTH (m)	4.00



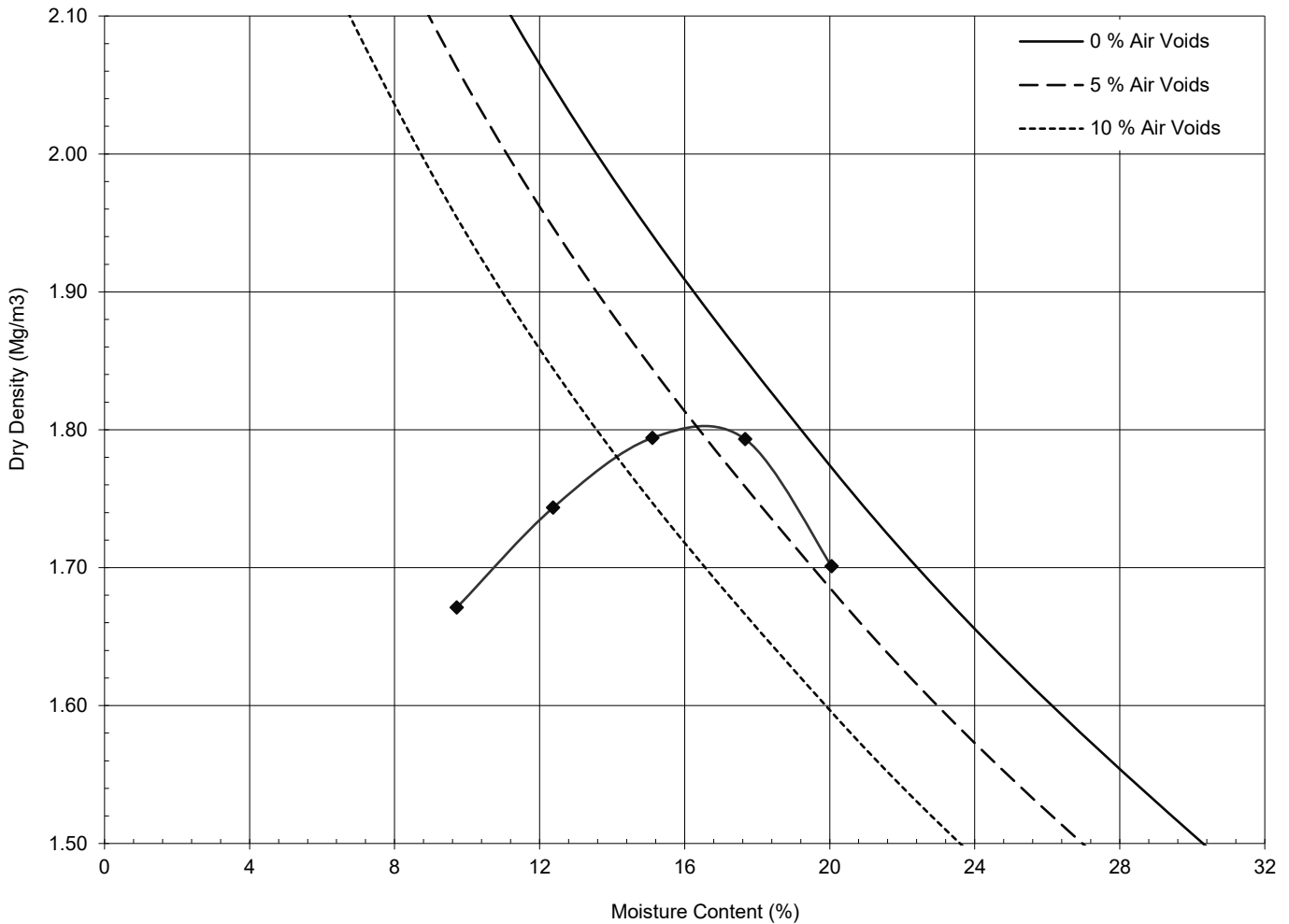
test method	3.4.4.1 2.5kg dynamic compaction - CBR mould				
preparation procedure	3.2.5.2 (grading zone 4)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	3	initial moisture content	%	26
proportion retained on 20mm sieve	%	4	maximum dry density	(Mg/m ³)	1.73
particle density	(Mg/m ³)	#2.72	optimum moisture content	%	17
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

BS. 1377 : Part 4 : 1990 : 3



CLIENT	FORESTRY ENGLAND	BH/TP No.	BH14
SITE	CANNOP PONDS INTRUSIVE GI	SAMPLE No./TYPE	8L
DESCRIPTION	Light greyish brown slightly gravelly slightly sandy silty CLAY	SAMPLE DEPTH (m)	1.20
		SPECIMEN DEPTH (m)	1.20



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	3.2.4.1 (grading zone 1)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	14
proportion retained on 20mm sieve	%	0	maximum dry density	(Mg/m ³)	1.80
particle density	(Mg/m ³)	#2.75	optimum moisture content	%	17
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
				CONTRACT	CHECKED
				37707	TB

DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

BS. 1377 : Part 4 : 1990 : 3



CLIENT FORESTRY ENGLAND

BH/TP No.

BH15

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

15L

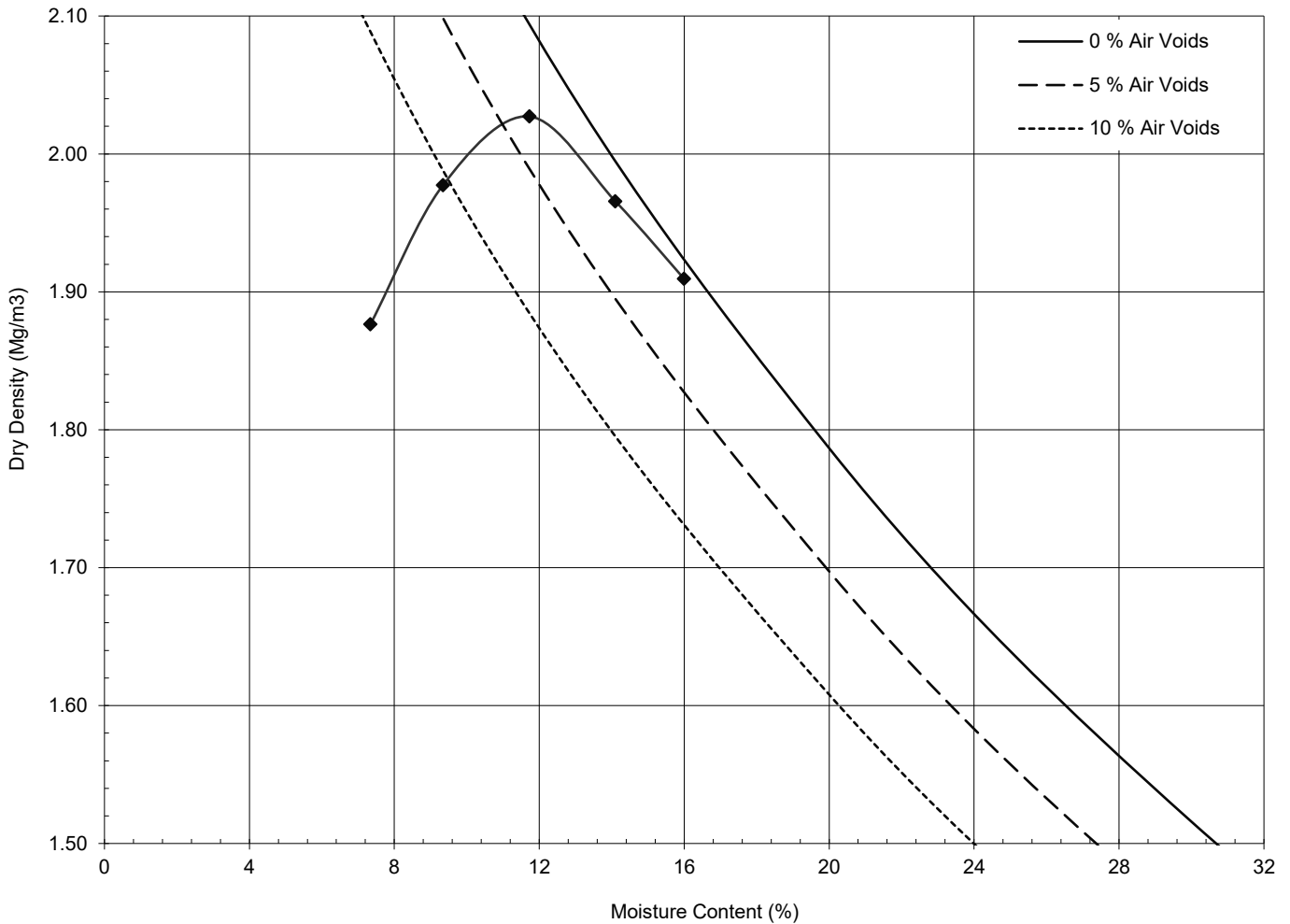
DESCRIPTION Yellowish brown very silty very gravelly SAND

SAMPLE DEPTH (m)

4.00

SPECIMEN DEPTH (m)

4.00



test method	3.3.4.1 2.5kg dynamic compaction - 1L mould				
preparation procedure	3.2.4.1 (grading zone 1)				
sample preparation	C R				
proportion retained on 37.5mm sieve	%	0	initial moisture content	%	9
proportion retained on 20mm sieve	%	0	maximum dry density	(Mg/m ³)	2.03
particle density	(Mg/m ³)	#2.78	optimum moisture content	%	12
remarks	# denotes particle density has been assigned an assumed value C denotes sample has been chopped to pass 20mm sieve S denotes sample has been shredded to pass 20mm sieve R denotes sample material has been recycled between/for points				
Combined with 13L.	CONTRACT		CHECKED		
	37707		TB		

SHEAR STRENGTH BY DIRECT SHEAR



BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No. BH15

SITE CANNOP PONDS INTRUSIVE GI

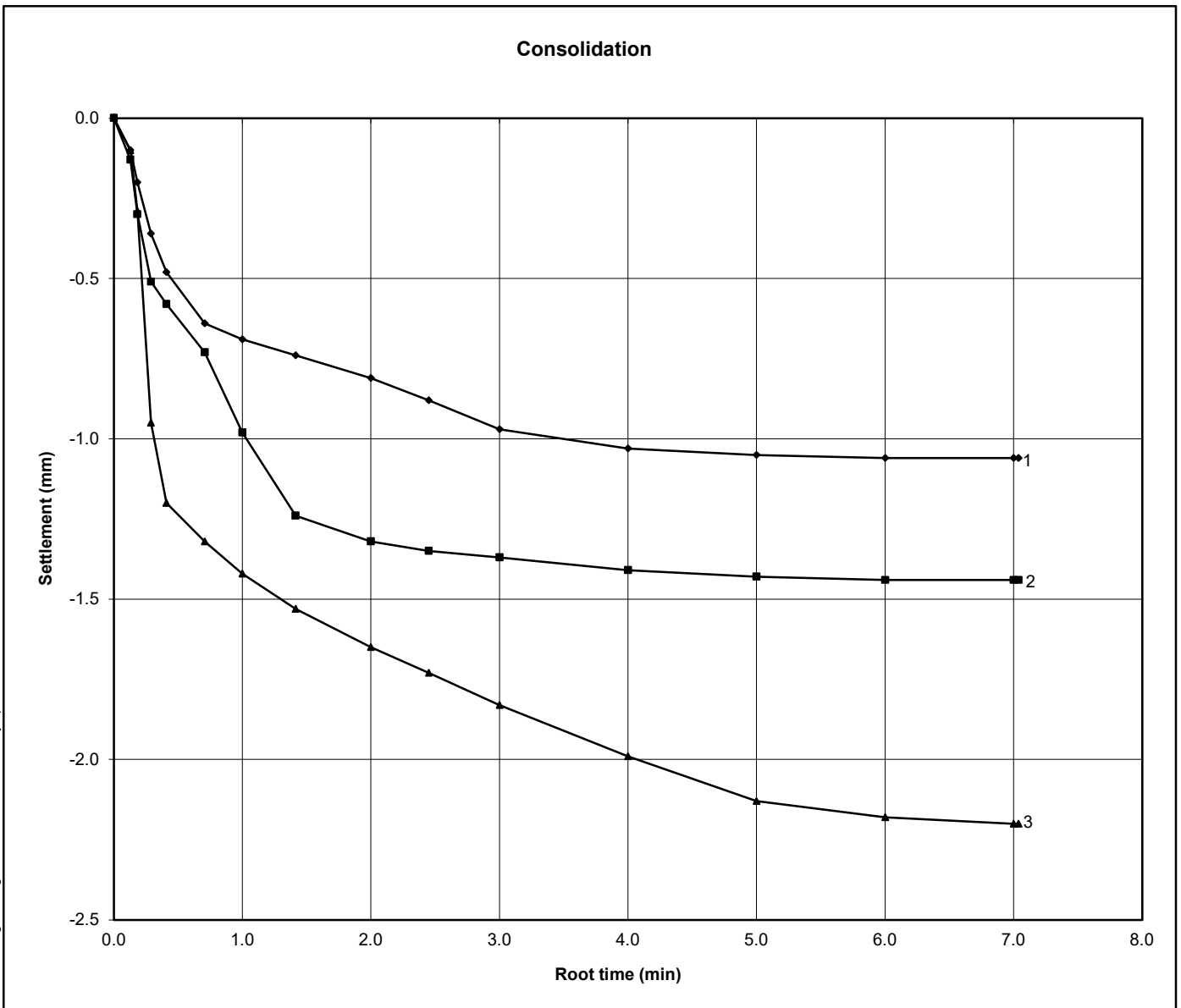
SAMPLE No./TYPE 15L

SAMPLE DEPTH (m) 4.00-5.00

SPECIMEN DEPTH (m) 4.00-5.00

DESCRIPTION Brown very silty very sandy GRAVEL

PREPARATION DETAILS	Remoulded using a tamping rod - 43% removed (retained on 2mm sieve).		
CONSOLIDATION STAGE RESULTS			
Specimen	1	2	3
t100 (min)	0.90	2.70	0.70
t _f (min)	11.43	34.29	8.89
Machine speed (mm/min)	0.0500	0.0500	0.0500
Normal Stress (kPa)	50	100	200
Initial height (mm)	19.91	19.91	19.91
Final height (mm)	18.85	18.47	17.71
Duration (days)	0.25	0.25	0.25



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remarks: Specimens are submerged throughout the test. Tested non standard after notification of gravel content.	CONTRACT	CHECKED
	37707	JH



SHEAR STRENGTH BY DIRECT SHEAR

BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No. BH15

SITE CANNOP PONDS INTRUSIVE GI

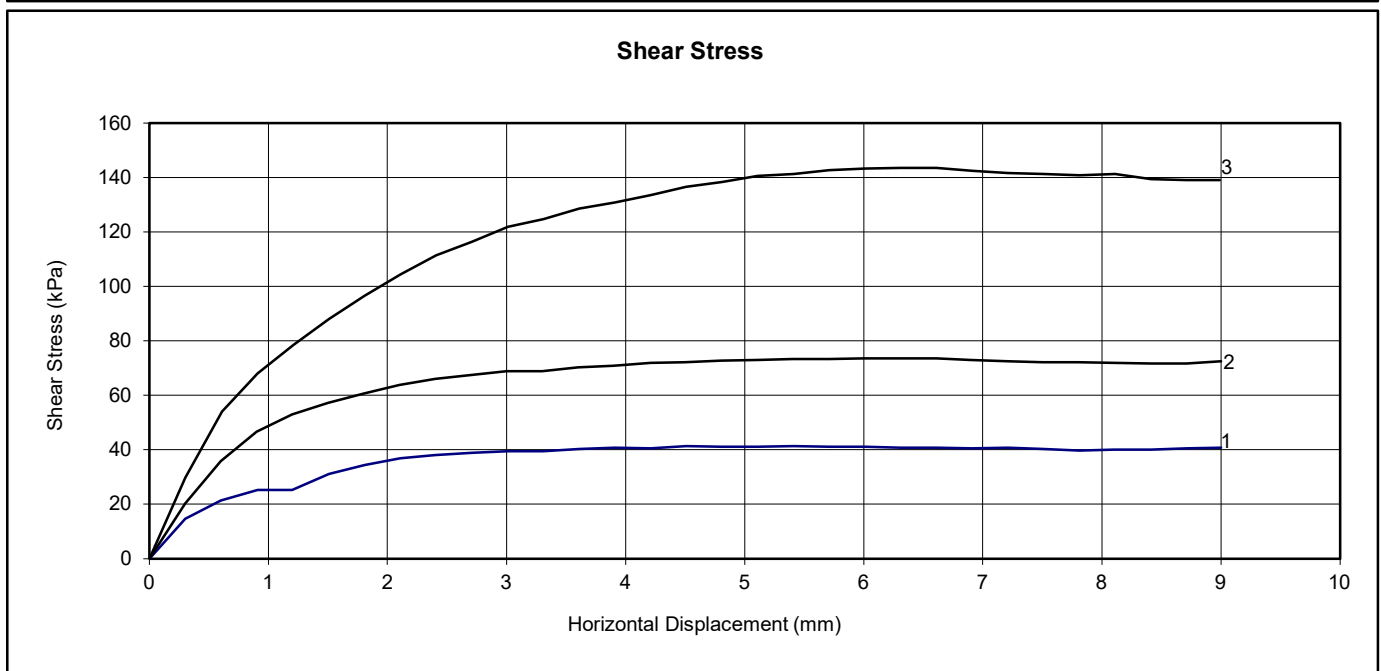
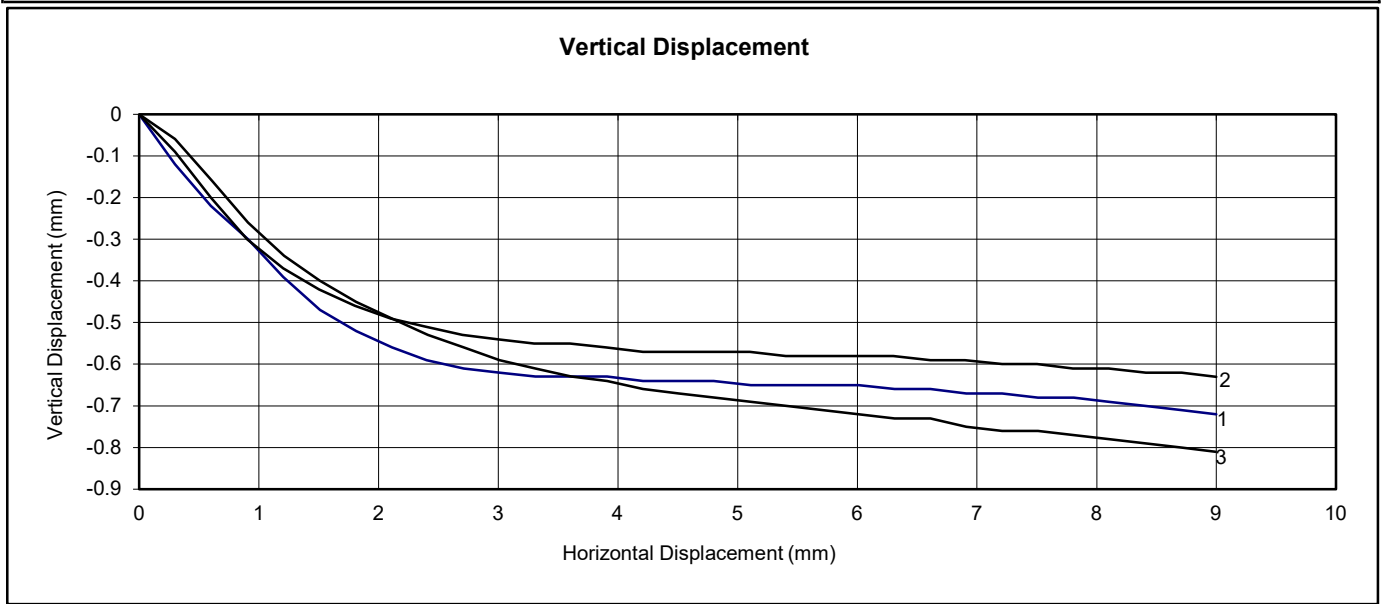
SAMPLE No./TYPE 15L

SAMPLE DEPTH (m) 4.00-5.00

SPECIMEN DEPTH (m) 4.00-5.00

DESCRIPTION Brown very silty very sandy GRAVEL

SHEAR STAGE RESULTS			
Specimen	1	2	3
Peak Shear Strength (kPa)	41.4	73.6	143.6
Residual Shear Strength (kPa)			
Cum. Vertical Displ. (mm)	-0.720	-0.630	-0.810
Cum. Forward Displ. (mm)	9.000	9.000	8.990
Normal Stress (kPa)	50	100	200
Duration (days)	0.25	0.25	0.25



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remarks:	CONTRACT	CHECKED
	37707	JH



SHEAR STRENGTH BY DIRECT SHEAR

BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No.

BH15

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

15L

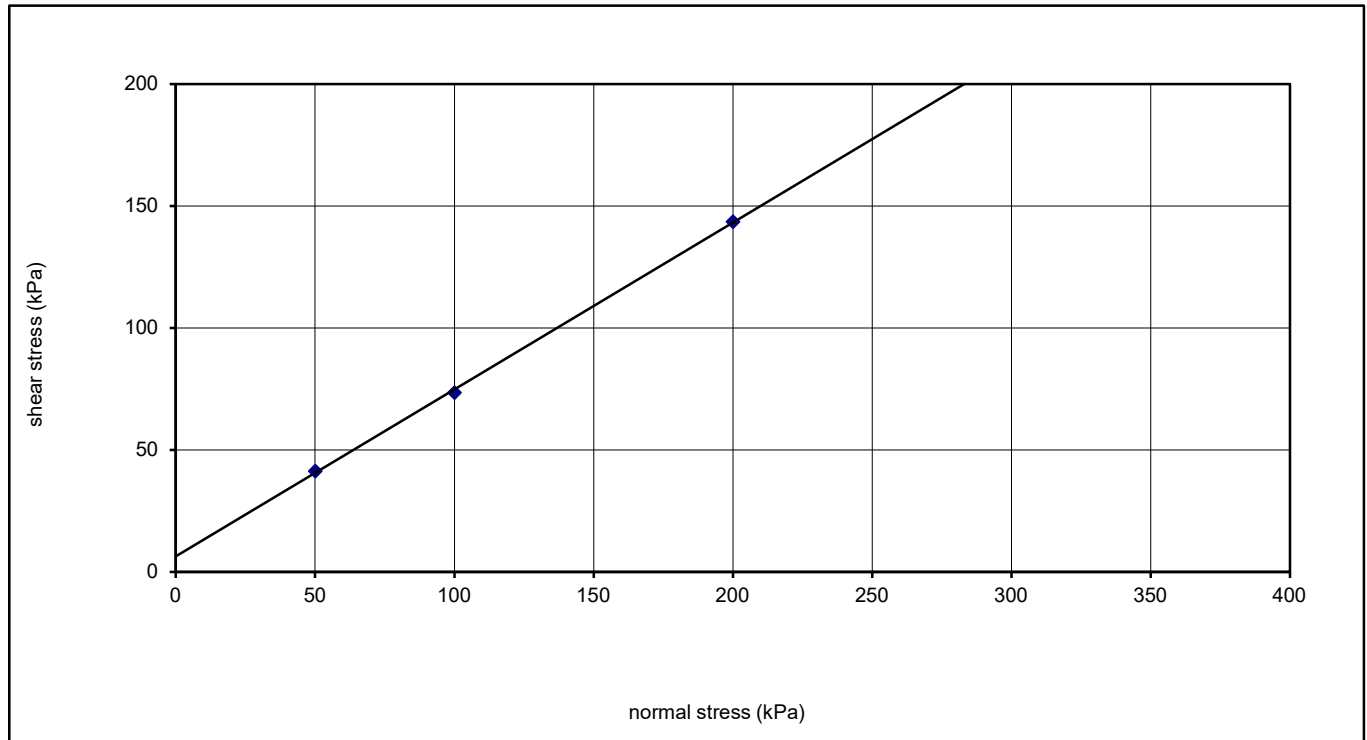
SAMPLE DEPTH (m)

4.00-5.00

SPECIMEN DEPTH (m)

4.00-5.00

DESCRIPTION Brown very silty very sandy GRAVEL



INITIAL CONDITIONS

			specimen 1	specimen 2	specimen 3
specimen size (mm)	60.03 Square	moisture content (%)	15	15	14
specimen height (mm)	19.91	bulk density Mg/m ³	2.01	2.01	2.01
particle density (Mg/m ³)	2.65 #	dry density Mg/m ³	1.75	1.75	1.76
		voids ratio	0.516	0.512	0.503
		degree of saturation (%)	78	76	74
		strain rate (mm/min)	0.05	0.05	0.05

SHEARING STAGES

specimen	normal stress (kPa)	peak shear stress (kPa)	horizontal displacement (mm)	residual shear stress (kPa)	traverses (No.)	total forward displacement (mm)
1	50	41.4	4.510		1	9.000
2	100	73.6	6.000		1	9.000
3	200	143.6	6.310		1	8.990

SHEAR STRENGTH PARAMETERS

peak angle of shearing resistance ϕ'	34.5	residual angle of shearing resistance ϕ'_r	
peak effective cohesion intercept, c' (kPa)	6.4	residual effective cohesion intercept, c'_r (kPa)	

remarks: # denotes particle density has been assigned an assumed value.

CONTRACT

CHECKED

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JH

◆ peak

SHEAR STRENGTH BY DIRECT SHEAR



BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No. BH16

SITE CANNOP PONDS INTRUSIVE GI

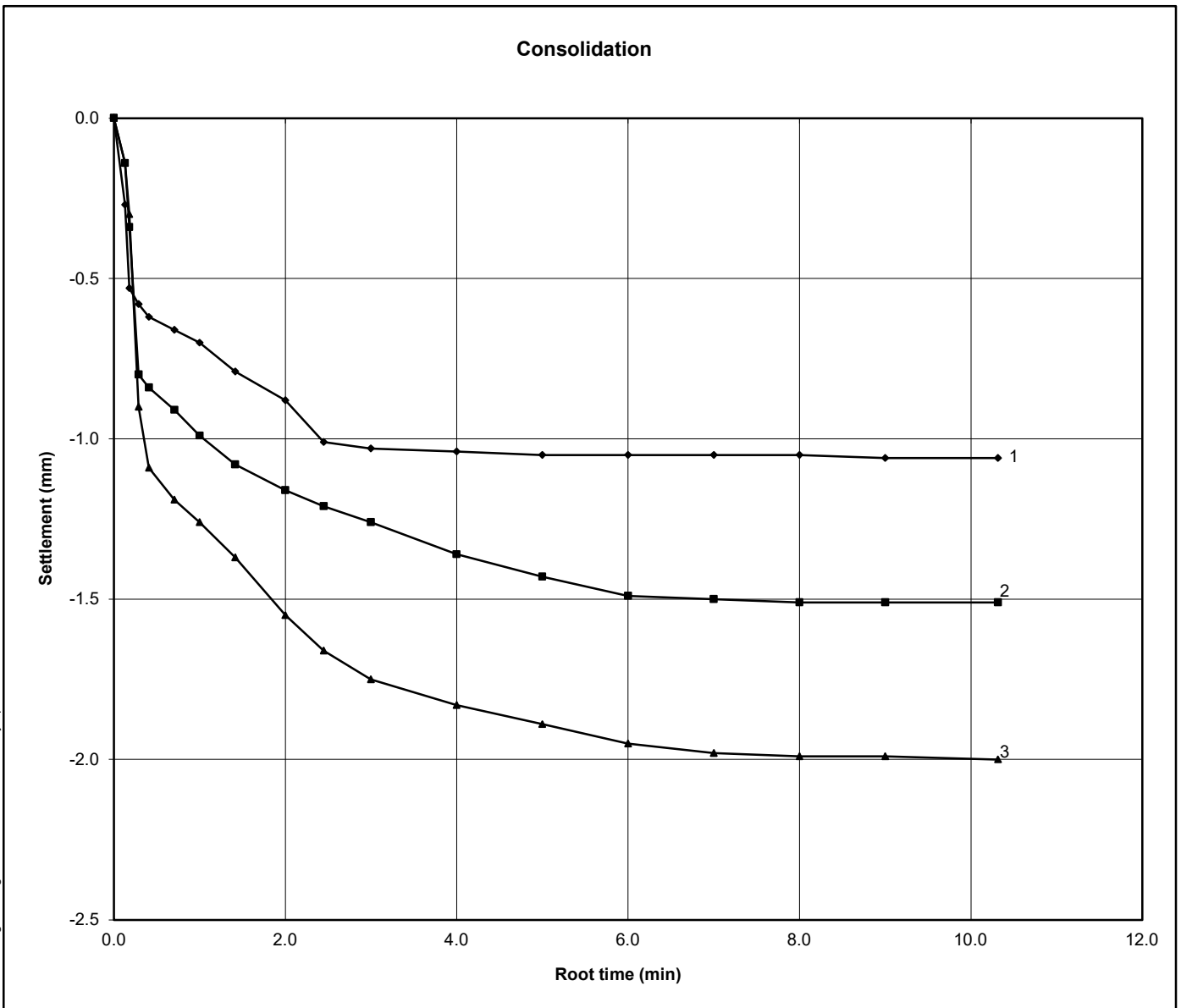
SAMPLE No./TYPE 11L

SAMPLE DEPTH (m) 3.00-4.00

SPECIMEN DEPTH (m) 3.00-4.00

DESCRIPTION Brown clayey very sandy GRAVEL

PREPARATION DETAILS	Remoulded using a tamping rod - 42% removed (retained on 2mm sieve).		
CONSOLIDATION STAGE RESULTS			
Specimen	1	2	3
t100 (min)	2.10	9.10	0.80
tf (min)	26.67	115.57	10.16
Machine speed (mm/min)	0.0430	0.0430	0.0430
Normal Stress (kPa)	50	100	200
Initial height (mm)	19.91	19.91	19.91
Final height (mm)	18.85	18.40	17.91
Duration (days)	0.25	0.25	0.25



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remarks: Specimens are submerged throughout the test. Tested non standard after notification of gravel content.	CONTRACT	CHECKED
	37707	JH



SHEAR STRENGTH BY DIRECT SHEAR

BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No.

BH16

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

11L

SAMPLE DEPTH (m)

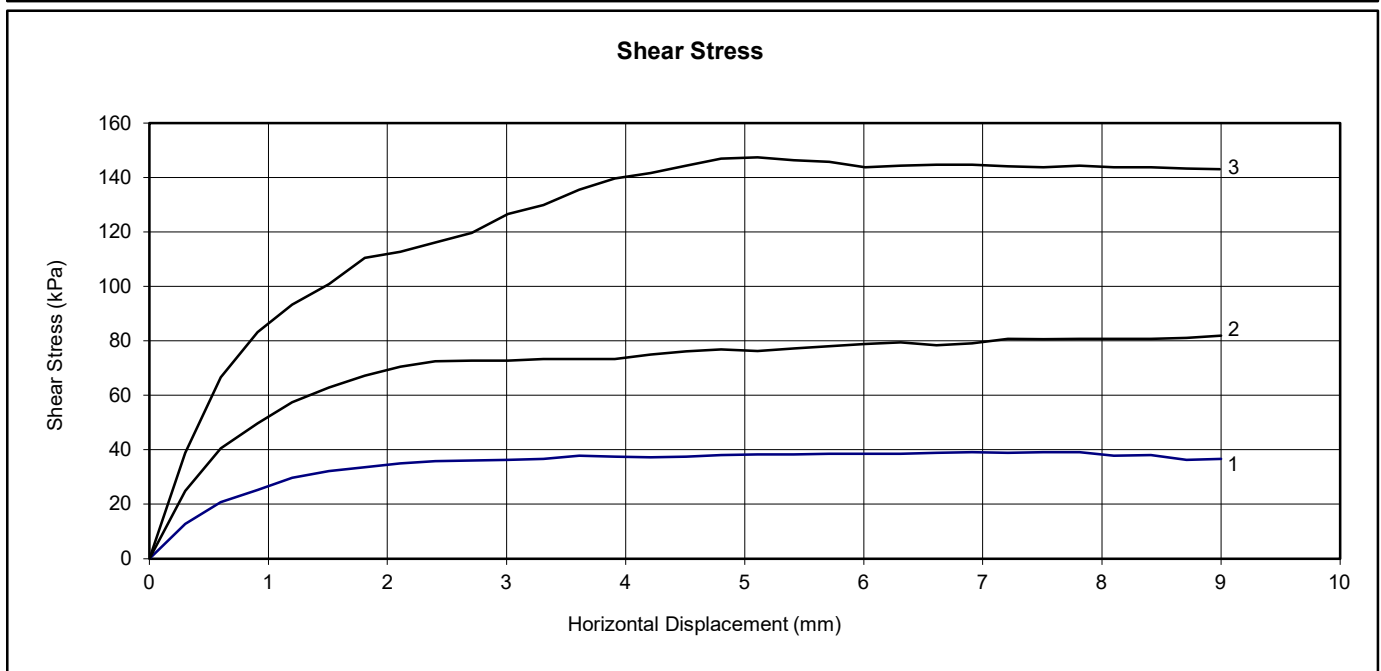
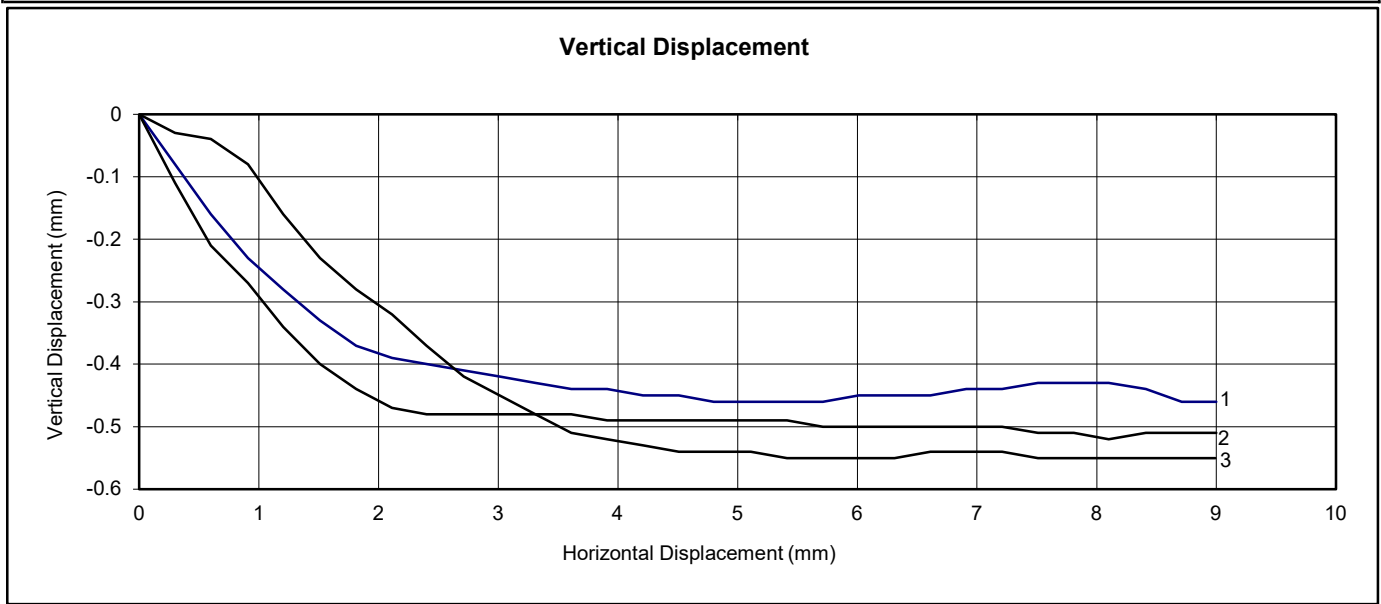
3.00-4.00

SPECIMEN DEPTH (m)

3.00-4.00

DESCRIPTION Brown clayey very sandy GRAVEL

SHEAR STAGE RESULTS			
Specimen	1	2	3
Peak Shear Strength (kPa)	39.2	81.9	147.5
Residual Shear Strength (kPa)			
Cum. Vertical Displ. (mm)	-0.460	-0.510	-0.550
Cum. Forward Displ. (mm)	9.000	9.000	8.990
Normal Stress (kPa)	50	100	200
Duration (days)	0.25	0.25	0.25



Geotechnical Engineering Ltd, Centurion House, Olympus Park, Gloucester, GL2 4NF, Tel: 01452 527743

remarks:

CONTRACT
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CHECKED
JH



SHEAR STRENGTH BY DIRECT SHEAR

BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No.

BH16

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

11L

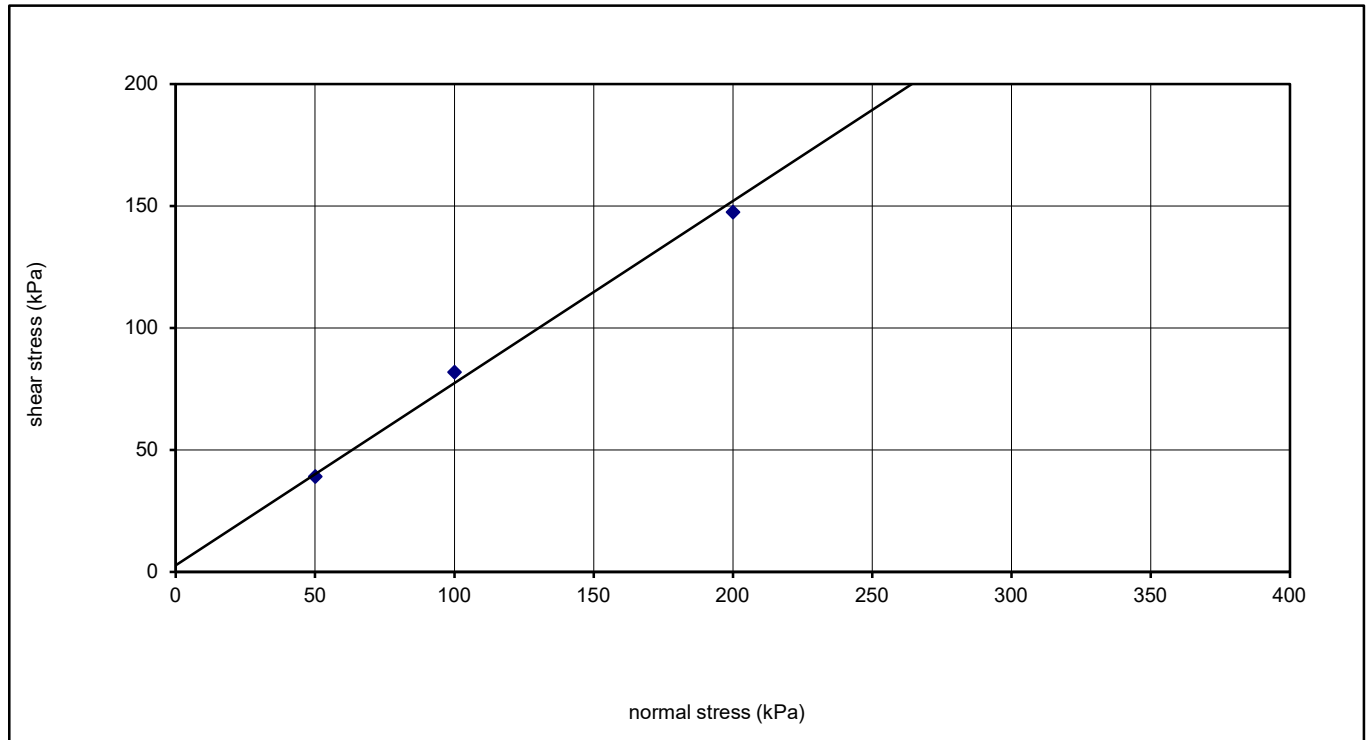
SAMPLE DEPTH (m)

3.00-4.00

SPECIMEN DEPTH (m)

3.00-4.00

DESCRIPTION Brown clayey very sandy GRAVEL



INITIAL CONDITIONS

		specimen 1	specimen 2	specimen 3
specimen size (mm)	60.03 Square	15	14	14
specimen height (mm)	19.91	2.05	2.06	2.06
particle density (Mg/m ³)	2.65 #	1.78	1.80	1.81
		0.490	0.471	0.465
		83	81	78
		0.043	0.043	0.043

SHEARING STAGES

specimen	normal stress (kPa)	peak shear stress (kPa)	horizontal displacement (mm)	residual shear stress (kPa)	traverses (No.)	total forward displacement (mm)
1	50	39.2	6.910		1	9.000
2	100	81.9	9.000		1	9.000
3	200	147.5	5.110		1	8.990

SHEAR STRENGTH PARAMETERS

peak angle of shearing resistance ϕ'	36.5	residual angle of shearing resistance ϕ'_r	
peak effective cohesion intercept, c' (kPa)	2.8	residual effective cohesion intercept, c'_r (kPa)	

remarks: # denotes particle density has been assigned an assumed value.

CONTRACT

CHECKED

37707

JH

◆ peak

SHEAR STRENGTH BY DIRECT SHEAR



BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

SITE CANNOP PONDS INTRUSIVE GI

DESCRIPTION Brown silty SAND and GRAVEL

BH/TP No.

SAMPLE No./TYPE

SAMPLE DEPTH (m)

SPECIMEN DEPTH (m)

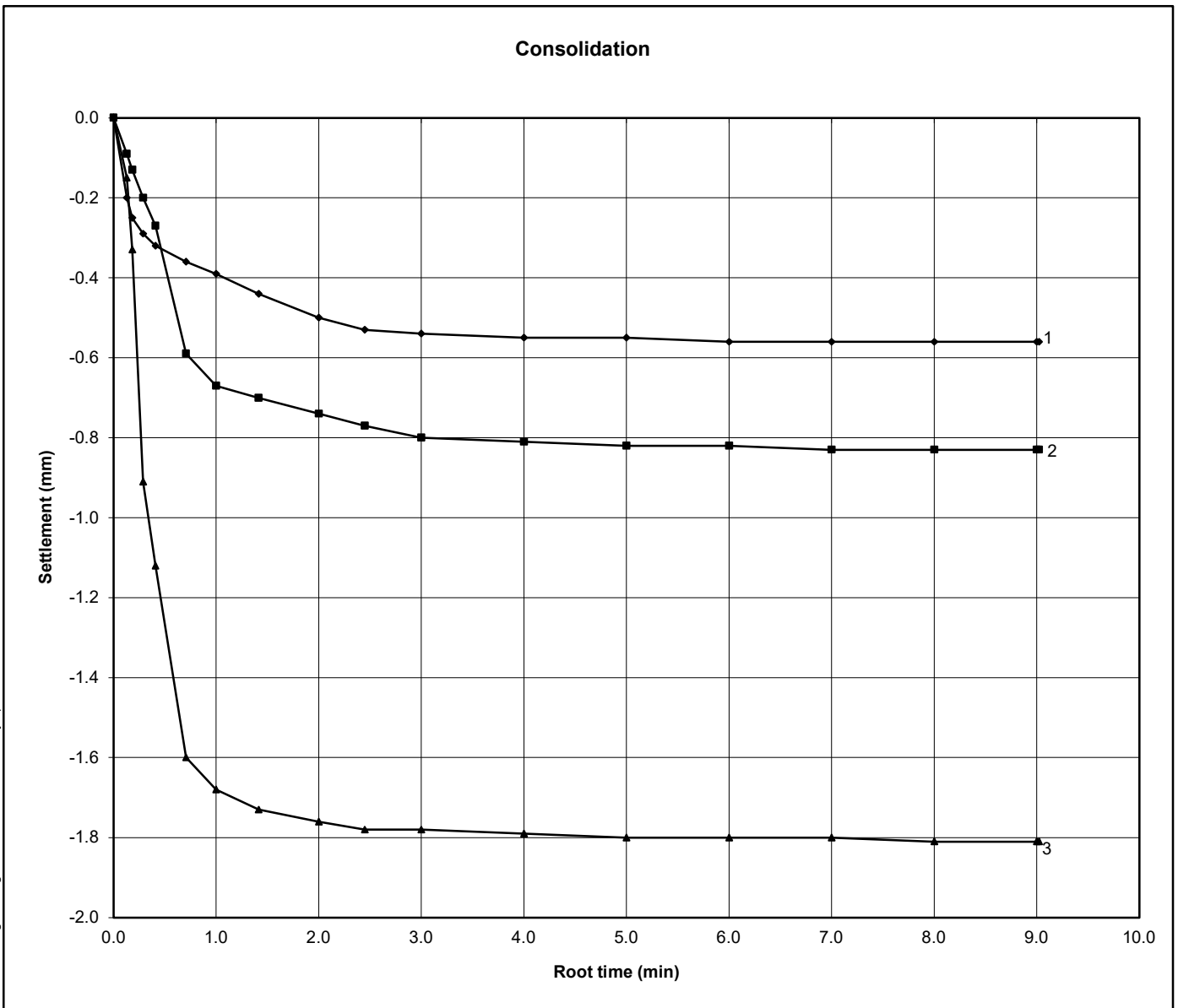
BH17

10L

3.00-4.00

3.00-4.00

PREPARATION DETAILS	Remoulded using a tamping rod - 52% removed (retained on 2mm sieve).		
CONSOLIDATION STAGE RESULTS			
Specimen	1	2	3
t100 (min)	6.00	0.80	0.70
t _f (min)	76.20	10.16	8.89
Machine speed (mm/min)	0.0500	0.0500	0.0500
Normal Stress (kPa)	50	100	200
Initial height (mm)	19.91	19.91	19.91
Final height (mm)	19.35	19.08	18.10
Duration (days)	0.25	0.25	0.25



Geotechnical Engineering Ltd, Centurion House, Olympus Park, Gloucester, GL2 4NF. Tel. 01452 527743

remarks: Specimens are submerged throughout the test. Tested non standard after notification of gravel content.	CONTRACT	CHECKED
	37707	JH



SHEAR STRENGTH BY DIRECT SHEAR

BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No.

BH17

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

10L

SAMPLE DEPTH (m)

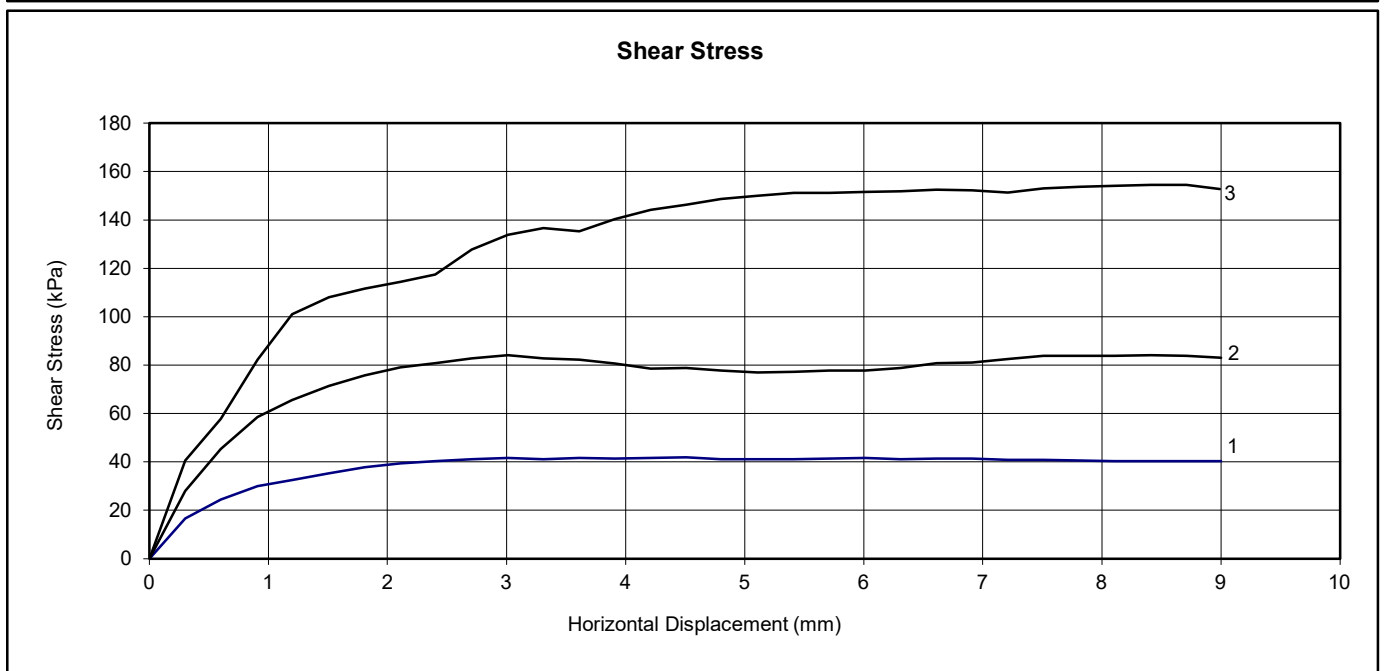
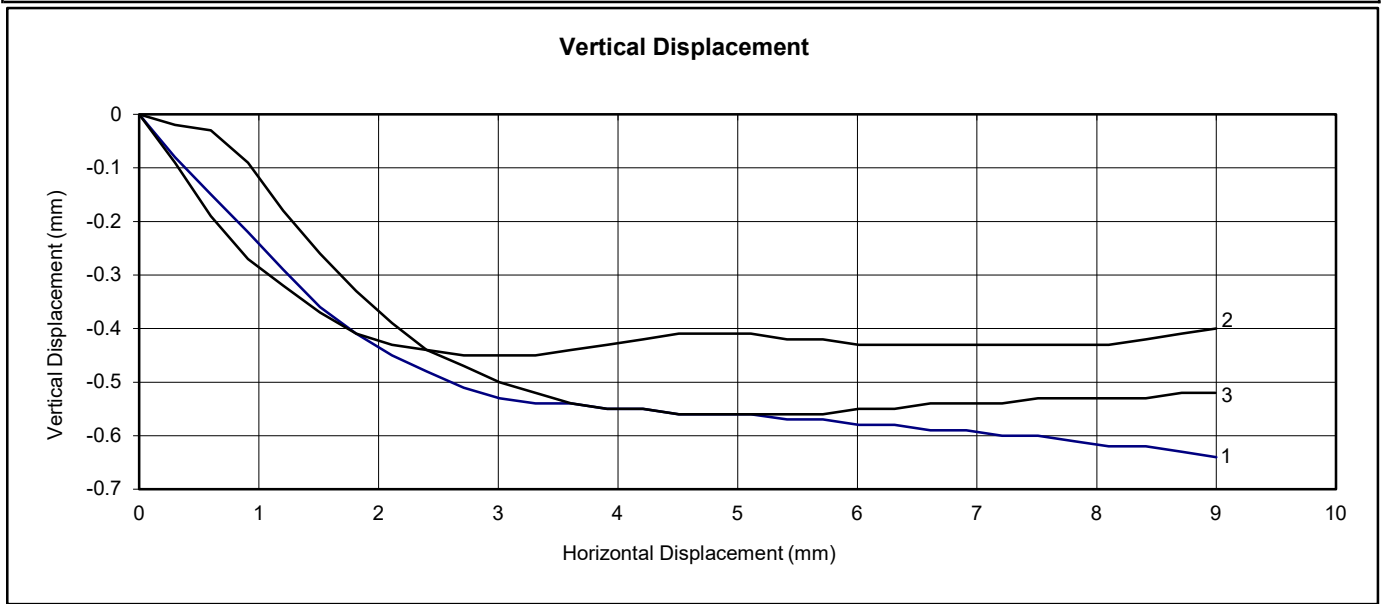
3.00-4.00

SPECIMEN DEPTH (m)

3.00-4.00

DESCRIPTION Brown silty SAND and GRAVEL

SHEAR STAGE RESULTS			
Specimen	1	2	3
Peak Shear Strength (kPa)	41.9	84.2	154.4
Residual Shear Strength (kPa)			
Cum. Vertical Displ. (mm)	-0.640	-0.400	-0.520
Cum. Forward Displ. (mm)	9.000	9.000	8.990
Normal Stress (kPa)	50	100	200
Duration (days)	0.25	0.25	0.25



Geotechnical Engineering Ltd, Centurion House, Olympus Park, Gloucester, GL2 4NF, Tel: 01452 527743

remarks:	CONTRACT	CHECKED
	37707	JH



SHEAR STRENGTH BY DIRECT SHEAR

BS EN ISO 17892-10:2018 (Small Shear Box)

CLIENT FORESTRY ENGLAND

BH/TP No.

BH17

SITE CANNOP PONDS INTRUSIVE GI

SAMPLE No./TYPE

10L

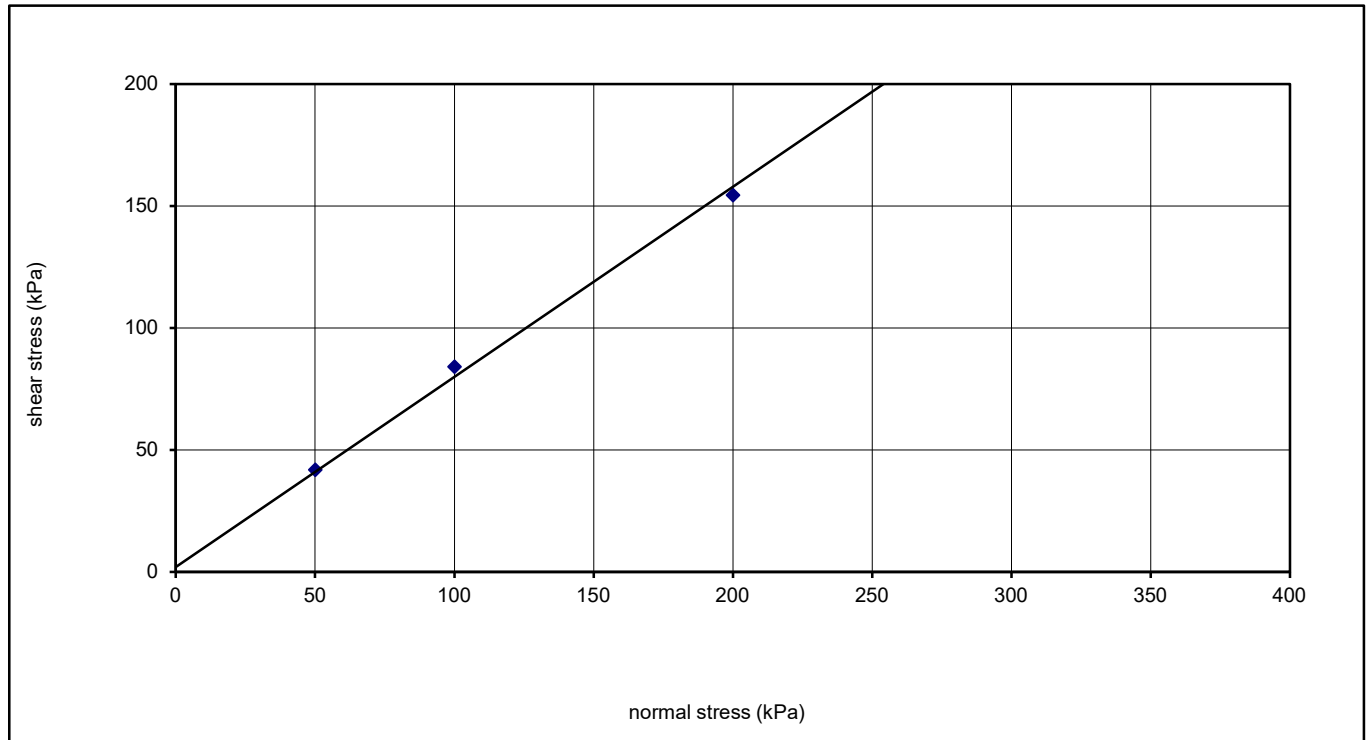
SAMPLE DEPTH (m)

3.00-4.00

SPECIMEN DEPTH (m)

3.00-4.00

DESCRIPTION Brown silty SAND and GRAVEL



INITIAL CONDITIONS

			specimen 1	specimen 2	specimen 3
specimen size (mm)	60.03 Square	moisture content (%)	16	15	14
specimen height (mm)	19.91	bulk density Mg/m ³	2.06	2.07	2.06
particle density (Mg/m ³)	2.65 #	dry density Mg/m ³	1.78	1.80	1.81
		voids ratio	0.491	0.468	0.465
		degree of saturation (%)	85	83	78
		strain rate (mm/min)	0.05	0.05	0.05

SHEARING STAGES

specimen	normal stress (kPa)	peak shear stress (kPa)	horizontal displacement (mm)	residual shear stress (kPa)	traverses (No.)	total forward displacement (mm)
1	50	41.9	4.510		1	9.000
2	100	84.2	3.010		1	9.000
3	200	154.4	8.410		1	8.990

SHEAR STRENGTH PARAMETERS

peak angle of shearing resistance ϕ'	38.0	residual angle of shearing resistance ϕ'_r	
peak effective cohesion intercept, c' (kPa)	2.0	residual effective cohesion intercept, c'_r (kPa)	

remarks: # denotes particle density has been assigned an assumed value.

CONTRACT

CHECKED

37707

JH

◆ peak



Final Report

Report No.: 23-27959-1

Initial Date of Issue: 24-Aug-2023

Re-Issue Details:

Client Geotechnical Engineering Ltd

Client Address: Centurion House, Olympus Park
Quedgeley
Gloucester
Gloucestershire
GL2 4NF

Contact(s): GEL
Tom Best

Project 37707 CANNOP PONDS INTRUSIVE
GI

Quotation No.: **Date Received:** 21-Aug-2023

Order No.: 7271 **Date Instructed:** 21-Aug-2023

No. of Samples: 10

Turnaround (Wkdays): 5 **Results Due:** 25-Aug-2023

Date Approved: 24-Aug-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: 37707 CANNOP PONDS INTRUSIVE GI

Client: Geotechnical Engineering Ltd	Chemtest Job No.:		23-27959	23-27959	23-27959	23-27959	23-27959	23-27959	23-27959	23-27959		
Quotation No.:	Chemtest Sample ID.:		1690985	1690986	1690987	1690988	1690989	1690990	1690991	1690992		
Order No.: 7271	Client Sample Ref.:		6	10	20	4	10	7	13	16		
	Sample Location:		BH05	BH06	BH06	BH07	BH08	BH14	BH14	BH15		
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
	Top Depth (m):		2.00	3.00	6.00	1.20	3.00	1.20	3.00	4.50		
	Bottom Depth (m):		2.45	3.45	6.45	1.65	3.45	1.65	3.45			
	Date Sampled:		15-Aug-2023	15-Aug-2023	15-Aug-2023	15-Aug-2023	15-Aug-2023	15-Aug-2023	15-Aug-2023	15-Aug-2023		
	Time Sampled:		7:30	7:30	7:30	7:30	7:30	7:30	7:30	7:30		
Determinand	Accred.	SOP	Units	LOD								
Moisture	N	2030	%	0.020	4.2	17	12	19	14	16	9.7	7.3
pH (2.5:1)	N	2010		4.0	6.3	6.9	6.9	6.9	6.9	6.7	7.8	7.7
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.11	0.012	0.022	0.040	< 0.010	< 0.010	< 0.010	< 0.010

Results - Soil

Project: 37707 CANNOP PONDS INTRUSIVE GI

Client: Geotechnical Engineering Ltd	Chemtest Job No.:		23-27959	23-27959		
Quotation No.:	Chemtest Sample ID.:		1690993	1690994		
Order No.: 7271	Client Sample Ref.:		10	9		
	Sample Location:		BH16	BH17		
	Sample Type:		SOIL	SOIL		
	Top Depth (m):		3.00	3.00		
	Bottom Depth (m):		3.45	3.45		
	Date Sampled:		15-Aug-2023	15-Aug-2023		
	Time Sampled:		7:30	7:30		
Determinand	Accred.	SOP	Units	LOD		
Moisture	N	2030	%	0.020	8.0	7.2
pH (2.5:1)	N	2010		4.0	8.0	7.8
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com



APPENDIX C

CHEMICAL ANALYSES



DETS

Certificate of Analysis

Certificate Number 23-16727

Issued: 28-Jul-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-16727

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds

Description 2 Soil samples, 2 Leachate samples.

Date Received 13-Jul-23

Date Started 13-Jul-23

Date Completed 28-Jul-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16727
 Client Ref 37707
 Contract Title Cannop Ponds

Lab No	2202169	2202170
Sample ID	BH01	BH01
Depth	1.00-1.20	2.80-2.90
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	03/07/2023	03/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Antimony	DETSC 2301*	1	mg/kg	< 1.0	< 1.0
Arsenic	DETSC 2301#	0.2	mg/kg	2.9	7.5
Beryllium	DETSC 2301#	0.2	mg/kg	< 0.2	0.3
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.9	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	18	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	5.9	9.9
Lead	DETSC 2301#	0.3	mg/kg	12	4.0
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	3.4	27
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	79	16
Zinc	DETSC 2301#	1	mg/kg	44	64
Inorganics					
pH	DETSC 2008#		pH	10.9	8.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	6.3	0.6
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	4.7	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	16	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	49	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	110	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	34	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	220	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	1.6	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	23	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	70	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	63	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	160	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	370	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16727

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2202169	2202170
Sample ID	BH01	BH01
Depth	1.00-1.20	2.80-2.90
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	03/07/2023	03/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.04	
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.03	
Pyrene	DETSC 3303#	0.03	mg/kg	0.04	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	
Chrysene	DETSC 3303	0.03	mg/kg	0.04	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.03	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.05	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.05	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.03	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.25	
PCBs					
PCB 77	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 81	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 105	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 114	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	
PCB 123	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 126	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 156	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 157	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 167	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 169	DETSC 3401*	0.01	mg/kg	< 0.01	
PCB 189	DETSC 3401*	0.01	mg/kg	< 0.01	
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-16727

Client Ref 37707

Contract Title Cannop Ponds

Sample Id BH01 1.00-1.20

Sample Numbers 2202169 2202171 2202172

Date Analysed 28/07/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	6.3	3	5	6
DETSC 2003# Loss On Ignition	%	0.56	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	10.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	2.1	0.89	0.004	0.011	0.5	2	25
DETSC 2306 Barium as Ba	14	5.4	0.03	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.75	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.2	0.56	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.027	0.012	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.2	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.52	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.48	0.11	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.23	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.5	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.2	11	0.006	0.097	4	50	200
DETSC 2055 Chloride as Cl	1700	690	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	5000	1300	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	56000	22000	112	278.1	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	3400	< 2000	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.6	6.7
DETSC 2009 Conductivity uS/cm	79.7	30.8
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.117

Stage 1	
Volume of Leachant L2*	0.221
Volume of Eluate VE1*	0.2

Stage 2	
Volume of Leachant L8*	0.937
Volume of Eluate VE2*	0.884

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-16727

Client Ref 37707

Contract Title Cannop Ponds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2202169	BH01 1.00-1.20	SOIL	NAD	none	Michael Kay
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-16727
 Client Ref 37707
 Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2202169	BH01 1.00-1.20 SOIL	03/07/23		GJ 250ml, GJ 60ml, PT 1L x2	pH + Conductivity (7 days)	
2202170	BH01 2.80-2.90 SOIL	03/07/23		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2202171	BH01 1.00-1.20 LEACHATE	03/07/23		GJ 250ml, GJ 60ml, PT 1L x2		
2202172	BH01 1.00-1.20 LEACHATE	03/07/23		GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-16729

Issued: 31-Jul-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-16729

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds

Description 3 Soil samples.

Date Received 13-Jul-23

Date Started 13-Jul-23

Date Completed 31-Jul-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16729
 Client Ref 37707
 Contract Title Cannop Ponds

Lab No	2202177
Sample ID	BH03
Depth	0.50-0.70
Other ID	
Sample Type	SOIL
Sampling Date	04/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	1.1
Arsenic	DETSC 2301#	0.2	mg/kg	12
Beryllium	DETSC 2301#	0.2	mg/kg	0.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22
Lead	DETSC 2301#	0.3	mg/kg	14
Mercury	DETSC 2325#	0.05	mg/kg	0.14
Nickel	DETSC 2301#	1	mg/kg	20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	19
Zinc	DETSC 2301#	1	mg/kg	86
Inorganics				
pH	DETSC 2008#		pH	8.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	2.0
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	3.5
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	1.5
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-16729

Client Ref 37707

Contract Title Cannop Ponds

Sample Id BH03 0.50-0.70

Sample Numbers 2202177 2202171 2202172

Date Analysed 31/07/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.0	3	5	6
DETSC 2003# Loss On Ignition	%	3.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	10.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	2.1	0.89	0.004	0.011	0.5	2	25
DETSC 2306 Barium as Ba	14	5.4	0.03	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.75	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.2	0.56	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.027	0.012	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.2	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.52	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.48	0.11	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.23	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.5	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.2	11	0.006	0.097	4	50	200
DETSC 2055 Chloride as Cl	1700	690	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	5000	1300	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	56000	22000	112	278.1	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	3400	< 2000	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.6	6.7
DETSC 2009 Conductivity uS/cm	79.7	30.8
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.117

Stage 1	
Volume of Leachant L2*	0.221
Volume of Eluate VE1*	0.2

Stage 2	
Volume of Leachant L8*	0.937
Volume of Eluate VE2*	0.884

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-16729

Client Ref 37707

Contract Title Cannop Ponds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2202177	BH03 0.50-0.70	SOIL	NAD	none	Pierce Booth
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-16729
 Client Ref 37707
 Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Holding time exceeded for tests	Inappropriate container for tests
		Sampled	Containers Received		
2202177	BH03 0.50-0.70 SOIL	04/07/23	GJ 250ml, GJ 60ml, PT 1L x2	pH + Conductivity (7 days)	
2202178	BH03 0.50-0.70 SOIL	04/07/23	GJ 250ml, GJ 60ml, PT 1L x2	pH/Cond/TDS (1 days)	
2202179	BH03 0.50-0.70 SOIL	04/07/23	GJ 250ml, GJ 60ml, PT 1L x2	pH/Cond/TDS (1 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-16738

Issued: 01-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-16738

Client Reference 37707/RH

Order No 37707/RH

Contract Title Cannop Ponds

Description 1 Soil sample, 3 Leachate samples.

Date Received 13-Jul-23

Date Started 13-Jul-23

Date Completed 01-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16738
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2202379
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	1.7
Arsenic	DETSC 2301#	0.2	mg/kg	24
Beryllium	DETSC 2301#	0.2	mg/kg	0.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	1.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.3
Chromium	DETSC 2301#	0.15	mg/kg	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	26
Lead	DETSC 2301#	0.3	mg/kg	30
Mercury	DETSC 2325#	0.05	mg/kg	0.08
Nickel	DETSC 2301#	1	mg/kg	32
Selenium	DETSC 2301#	0.5	mg/kg	0.9
Vanadium	DETSC 2301#	0.8	mg/kg	31
Zinc	DETSC 2301#	1	mg/kg	89
Inorganics				
pH	DETSC 2008#		pH	7.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2
Total Organic Carbon	DETSC 2084#	0.5	%	19
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	4.8
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETSC 3321*	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16738
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2202379
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
C10-C24 Diesel Range Organics (DRO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10
EPH (C8-C40): HS_1D_Total	DETSC 3311*	10	mg/kg	< 10
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10
PCBs				
PCB 77	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 81	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 105	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 114	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 123	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 126	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 156	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 157	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 167	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 169	DETSC 3401*	0.01	mg/kg	< 0.01
PCB 189	DETSC 3401*	0.01	mg/kg	< 0.01
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.9

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16738
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2202379
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16738
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2202379
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01
SVOCs				
Phenol	DETSC 3433	0.1	mg/kg	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-16738
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2202379
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-16738
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2202380
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	1.2
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.9
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	12
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.53
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.2
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.37
Manganese, Dissolved	DETSC 2306	0.22	ug/l	3.3
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.7
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.36
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	1.0
Zinc, Dissolved	DETSC 2306	1.3	ug/l	14
Inorganics				
pH	DETSC 2008		pH	6.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.095
Chloride	DETSC 2055	0.1	mg/l	6.2
Petroleum Hydrocarbons				
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.02
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.02
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.01
Pyrene	DETSC 3304	0.01	ug/l	0.02
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-16738

Client Ref 37707/RH

Contract Title Cannop Ponds

Lab No	2202380
Sample ID	BH07
Depth	1.00-1.20
Other ID	3
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-16738

Client Ref 37707/RH

Contract Title Cannop Ponds

Sample Id BH07 3 1.00-1.20

Sample Numbers 2202379 2202381 2202382

Date Analysed 01/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	19.0	3	5	6
DETSC 2003# Loss On Ignition	%	26.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	7.6	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	2.9	0.84	0.006	0.012	0.5	2
DETSC 2306 Barium as Ba	23	4.9	0.05	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.6	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.4	1.2	0.005	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.015	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	5.5	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.96	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.4	0.38	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	2.6	0.69	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.61	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	4.4	7.5	0.009	0.07	4	50	200
DETSC 2055 Chloride as Cl	8300	1200	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	300	< 100	0.6	0.5	10	150	500
DETSC 2055 Sulphate as SO4	18000	3200	36	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	150000	29000	300	490.3	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	6400	3100	12.8	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	6.9	7.1
DETSC 2009 Conductivity uS/cm	210.0	41.8
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.118

Stage 1	
Volume of Leachant L2*	0.215
Volume of Eluate VE1*	0.196

Stage 2	
Volume of Leachant L8*	0.947
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-16738

Client Ref 37707/RH

Contract Title Cannop Ponds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2202379	BH07 3 1.00-1.20	SOIL	NAD	none	Michael Kay
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-16738

Client Ref 37707/RH

Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2202379	BH07 1.00-1.20 SOIL	05/07/23		GJ 250ml, GJ 60ml, PT 1L x2	pH + Conductivity (7 days), VOC (7 days)	
2202380	BH07 1.00-1.20 LEACHATE	05/07/23		GJ 250ml, GJ 60ml, PT 1L x2		
2202381	BH07 1.00-1.20 LEACHATE	05/07/23		GJ 250ml, GJ 60ml, PT 1L x2		
2202382	BH07 1.00-1.20 LEACHATE	05/07/23		GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
C5-C10 Gasoline Range Organics (GR)	HS_1D_Total
C10-C24 Diesel Range Organics (DRO)	EH_1D_Total
EPH (C8-C40)	HS_1D_Total
TPH (C10-C40)	EH_1D_Total
C24-C40 Lube Oil Range Organics (LO)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17118

Issued: 01-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17118

Client Reference 37707

Order No 37707/RH

Contract Title CANNOP PONDS

Description 3 Soil samples, 3 Leachate samples.

Date Received 18-Jul-23

Date Started 18-Jul-23

Date Completed 01-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2204660	2204661	2205141
Sample ID	BH06	UC01	UC02
Depth	0.50-0.70	0.00-0.30	0.80-1.10
Other ID	2	1	
Sample Type	ES	ES	SOIL
Sampling Date	11/07/2023	10/07/2023	10/07/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Antimony	DETSC 2301*	1	mg/kg	< 1.0	1.3	2.1
Arsenic	DETSC 2301#	0.2	mg/kg	14	13	35
Beryllium	DETSC 2301#	0.2	mg/kg	0.3	1.2	6.4
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.2	1.5	3.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.6	2.9
Chromium	DETSC 2301#	0.15	mg/kg	18	14	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	16	45	86
Lead	DETSC 2301#	0.3	mg/kg	16	56	57
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.08	0.27
Nickel	DETSC 2301#	1	mg/kg	31	31	140
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	1.7
Vanadium	DETSC 2301#	0.8	mg/kg	16	18	19
Zinc	DETSC 2301#	1	mg/kg	72	110	330
Inorganics						
pH	DETSC 2008#		pH	8.8	5.6	6.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.4	0.8
Total Organic Carbon	DETSC 2084#	0.5	%	0.7	9.0	20
Petroleum Hydrocarbons						
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	40
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	35
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	44
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	6.3
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10	120
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10	120
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01		



Summary of Chemical Analysis

Soil Samples

Our Ref 23-17118
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2204660	2204661	2205141
Sample ID	BH06	UC01	UC02
Depth	0.50-0.70	0.00-0.30	0.80-1.10
Other ID	2	1	
Sample Type	ES	ES	SOIL
Sampling Date	11/07/2023	10/07/2023	10/07/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01		
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03		
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03		
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03		
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03		
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03		
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.04		
Pyrene	DETSC 3303#	0.03	mg/kg	0.05		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.03		
Chrysene	DETSC 3303	0.03	mg/kg	0.04		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.08		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.06		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.03		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.33		
PCBs						
PCB 77	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 81	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 105	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 114	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 123	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 126	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 156	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 157	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 167	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 169	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
PCB 189	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	3.4	5.0

Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2204661	2205141
Sample ID	UC01	UC02
Depth	0.00-0.30	0.80-1.10
Other ID	1	
Sample Type	ES	SOIL
Sampling Date	10/07/2023	10/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2204661	2205141
Sample ID	UC01	UC02
Depth	0.00-0.30	0.80-1.10
Other ID	1	
Sample Type	ES	SOIL
Sampling Date	10/07/2023	10/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
SVOCs					
Phenol	DETSC 3433	0.1	mg/kg	0.4	0.4
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	0.2	0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	0.4	0.4
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	0.2
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	0.5	0.4
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	0.3	0.4
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	0.4	0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	0.7	0.4
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	0.4	0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	0.2	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2204661	2205141
Sample ID	UC01	UC02
Depth	0.00-0.30	0.80-1.10
Other ID	1	
Sample Type	ES	SOIL
Sampling Date	10/07/2023	10/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	0.2	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1	0.1
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	0.2
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1	0.2
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	0.2
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1	0.4
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	0.3
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	0.2	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC01 1 0.00-0.30

Sample Numbers 2204661 2204662 2204663

Date Analysed 01/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	9.0	3	5	6
DETSC 2003# Loss On Ignition	%	20.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	160.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	5.6	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	6.4	1.9	0.013	0.022	0.5	2	25
DETSC 2306 Barium as Ba	230	78	0.46	0.87	20	100	300
DETSC 2306 Cadmium as Cd	0.059	0.71	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	4.2	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	6.2	0.66	0.012	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.024	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.4	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	70	20	0.14	0.23	0.4	10	40
DETSC 2306 Lead as Pb	0.69	3.1	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.63	0.54	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.52	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	190	140	0.38	1.43	4	50	200
DETSC 2055 Chloride as Cl	21000	1600	42	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	240000	80000	480	895.9	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	130000	150000	260	1488	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2500	2100	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.4	7.2
DETSC 2009 Conductivity uS/cm	179.0	209.0
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.067

Stage 1	
Volume of Leachant L2*	0.06
Volume of Eluate VE1*	0.04

Stage 2	
Volume of Leachant L8*	0.534
Volume of Eluate VE2*	0.48

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC02 0.80-1.10

Sample Numbers 2205141 2205143

Date Analysed 01/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	20.0	3	5	6
DETSC 2003# Loss On Ignition	%	40.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	240.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	8.7	100	n/a	n/a
DETSC 2008# pH	pH Units	6.6	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	9.6	0.096	0.5	2	25
DETSC 2306 Barium as Ba	20	0.2	20	100	300
DETSC 2306 Cadmium as Cd	0.042	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.56	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.018	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.4	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.3	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.34	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.98	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.91	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	6.3	0.063	4	50	200
DETSC 2055 Chloride as Cl	2800	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	110	1.1	10	150	500
DETSC 2055 Sulphate as SO4	35000	350	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	77000	770	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4600	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.4
DETSC 2009 Conductivity uS/cm	110.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.067
Stage 1	
Volume of Leachant L2*	0.594
Volume of Eluate VE1*	0.48

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17118

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2204660	BH06 2 0.50-0.70	SOIL	NAD	none	Keith Wilson
2204661	UC01 1 0.00-0.30	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-17118
 Client Ref 37707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2204660	BH06 0.50-0.70 SOIL	11/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2204661	UC01 0.00-0.30 SOIL	10/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days), VOC (7 days)	
2204662	UC01 0.00-0.30 LEACHATE	10/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2		
2204663	UC01 0.00-0.30 LEACHATE	10/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2		
2205141	UC02 0.80-1.10 SOIL	10/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days), VOC (7 days)	
2205142	UC02 0.80-1.10 LEACHATE	10/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2		
2205143	UC02 0.80-1.10 LEACHATE	10/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17122

Issued: 31-Jul-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17122

Client Reference 37707

Order No 37707/RH

Contract Title CANNOP PONDS

Description 2 Soil samples, 2 Leachate samples.

Date Received 18-Jul-23

Date Started 18-Jul-23

Date Completed 31-Jul-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17122

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2204792	2204793
Sample ID	BH08	BH08
Depth	0.50-0.70	1.00-1.20
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	11/07/2023	11/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Antimony	DETSC 2301*	1	mg/kg	3.3	3.5
Arsenic	DETSC 2301#	0.2	mg/kg	44	47
Beryllium	DETSC 2301#	0.2	mg/kg	0.6	0.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	2.0	1.4
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	8.8	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	63	74
Lead	DETSC 2301#	0.3	mg/kg	42	42
Mercury	DETSC 2325#	0.05	mg/kg	0.18	0.26
Nickel	DETSC 2301#	1	mg/kg	5.2	9.3
Selenium	DETSC 2301#	0.5	mg/kg	1.6	1.6
Vanadium	DETSC 2301#	0.8	mg/kg	27	26
Zinc	DETSC 2301#	1	mg/kg	31	84
Inorganics					
pH	DETSC 2008#		pH	4.6	5.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	25	17
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17122
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2204792	2204793
Sample ID	BH08	BH08
Depth	0.50-0.70	1.00-1.20
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	11/07/2023	11/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg		0.04
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.09
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03
Chrysene	DETSC 3303	0.03	mg/kg		< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		0.13
PCBs					
PCB 77	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 81	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 105	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 114	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01
PCB 123	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 126	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 156	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 157	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 167	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 169	DETSC 3401*	0.01	mg/kg		< 0.01
PCB 189	DETSC 3401*	0.01	mg/kg		< 0.01
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.0	0.8

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17122

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id BH08 1.00-1.20

Sample Numbers 2204793 2204794 2204795

Date Analysed 31/07/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	17.0	3	5	6
DETSC 2003# Loss On Ignition	%	29.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	5.7	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	0.35	0.27	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	8.6	2.8	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.32	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	< 0.40	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.63	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.33	0.38	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	28	6.1	0.056	0.096	4	50	200
DETSC 2055 Chloride as Cl	1500	740	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	38000	7600	76	124.9	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	72000	19000	144	275.2	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2500	2000	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.8	6.8
DETSC 2009 Conductivity uS/cm	103.0	27.6
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.116

Stage 1	
Volume of Leachant L2*	0.209
Volume of Eluate VE1*	0.187

Stage 2	
Volume of Leachant L8*	0.931
Volume of Eluate VE2*	0.879

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17122

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2204792	BH08 0.50-0.70	SOIL	NAD	none	Keith Wilson
2204793	BH08 1.00-1.20	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-17122
 Client Ref 37707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2204792	BH08 0.50-0.70 SOIL	11/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2204793	BH08 1.00-1.20 SOIL	11/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2204794	BH08 1.00-1.20 LEACHATE	11/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2204795	BH08 1.00-1.20 LEACHATE	11/07/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17124

Issued: 02-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17124

Client Reference 37707

Order No 37707/RH

Contract Title CANNOP PONDS

Description One Soil sample.

Date Received 18-Jul-23

Date Started 18-Jul-23

Date Completed 02-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17124
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2204799
Sample ID	BH15
Depth	2.80-3.00
Other ID	
Sample Type	SOIL
Sampling Date	10/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	1.4
Arsenic	DETSC 2301#	0.2	mg/kg	13
Beryllium	DETSC 2301#	0.2	mg/kg	0.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	16
Lead	DETSC 2301#	0.3	mg/kg	11
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	25
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	17
Zinc	DETSC 2301#	1	mg/kg	61
Inorganics				
pH	DETSC 2008#		pH	8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	< 0.5
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17124
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2204799
Sample ID	BH15
Depth	2.80-3.00
Other ID	
Sample Type	SOIL
Sampling Date	10/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17124

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2204799	BH15 2.80-3.00	SOIL	NAD	none	Keith Wilson
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-17124
 Client Ref 37707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Holding time exceeded for tests	Inappropriate container for tests
		Sampled	Containers Received		
2204799	BH15 2.80-3.00 SOIL	10/07/23	GJ 250ml x2, GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub
 DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17126

Issued: 31-Jul-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17126

Client Reference 37707

Order No 37707/RH

Contract Title CANNOP PONDS

Description One Soil sample.

Date Received 18-Jul-23

Date Started 18-Jul-23

Date Completed 31-Jul-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17126
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2204802
Sample ID	BH08
Depth	2.80-3.00
Other ID	5
Sample Type	es
Sampling Date	12/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	1.2
Arsenic	DETSC 2301#	0.2	mg/kg	9.5
Beryllium	DETSC 2301#	0.2	mg/kg	0.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.1
Chromium	DETSC 2301#	0.15	mg/kg	12
Copper	DETSC 2301#	0.2	mg/kg	33
Lead	DETSC 2301#	0.3	mg/kg	12
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	28
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	16
Zinc	DETSC 2301#	1	mg/kg	87
Inorganics				
pH	DETSC 2008#		pH	6.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	1.2
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17126
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2204802
Sample ID	BH08
Depth	2.80-3.00
Other ID	5
Sample Type	es
Sampling Date	12/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

Information in Support of the Analytical Results

Our Ref 23-17126
 Client Ref 37707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2204802	BH08 2.80-3.00 SOIL	12/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
<p>Key: G-Glass P-Plastic J-Jar T-Tub</p> <p>DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.</p>					

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17228

Issued: 14-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17228

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds

Description 6 Soil samples, 19 Leachate samples, 1 Sludge sample.

Date Received 19-Jul-23

Date Started 19-Jul-23

Date Completed 14-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139



Summary of Chemical Analysis

Soil/Sludge Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205262	2205263	2205264	2205265	2205266	2205267	2205268
.Sample ID	LC01	LC02	LC02	LC03	LC03	LC04	LC05
Depth	2.45		3.00		3.00	3.00	1.80
Other ID	2	1	2	1	2	1	1
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	06/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Antimony	DETSC 2301*	1	mg/kg	4.5	1.4	1.2	1.9	1.2	3.9	1.3
Arsenic	DETSC 2301#	0.2	mg/kg	37	9.3	4.7	15	2.3	38	8.7
Barium	DETSC 2301#	1.5	mg/kg	91	87	50	84	41	96	66
Beryllium	DETSC 2301#	0.2	mg/kg	2.0	1.0	0.7	1.4	1.0	2.4	0.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	1.2	1.7	< 0.2	< 0.2	0.6	0.7	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.4	0.2	0.7	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	25	12	12	14	13	17	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	180	31	31	42	41	21	32
Lead	DETSC 2301#	0.3	mg/kg	330	24	18	72	8.8	12	12
Mercury	DETSC 2325#	0.05	mg/kg	0.07	< 0.05	< 0.05	0.12	< 0.05	0.07	0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	2.0	0.5	< 0.4	0.7	< 0.4	3.0	0.6
Nickel	DETSC 2301#	1	mg/kg	39	41	27	63	29	31	33
Selenium	DETSC 2301#	0.5	mg/kg	0.5	0.8	< 0.5	1.2	< 0.5	< 0.5	0.6
Vanadium	DETSC 2301#	0.8	mg/kg	22	17	16	23	16	31	18
Zinc	DETSC 2301#	1	mg/kg	200	130	100	150	49	95	58
Inorganics										
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	12	36	4.9	9.5	5.4	10	7.2
pH	DETSC 2008#		pH	7.1	6.9	7.4	7.0	7.3	6.8	7.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	0.3	< 0.1	0.2	< 0.1	0.1	0.2
Total Organic Carbon	DETSC 2084#	0.5	%	3.6	14	1.0	5.5	0.8	1.9	2.5
Chloride	DETSC 2055	1	mg/kg	93.8	161	24.2	42.8	29.9	64.3	23.8
Sulphide	DETSC 2024*	10	mg/kg	130	100	40	96	76	88	36
Sulphur (free)	DETSC 3049#	0.75	mg/kg	49	24	< 0.75	24	2.6	11	2.6
Petroleum Hydrocarbons										
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4



Summary of Chemical Analysis

Soil/Sludge Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205262	2205263	2205264	2205265	2205266	2205267	2205268
.Sample ID	LC01	LC02	LC02	LC03	LC03	LC04	LC05
Depth	2.45		3.00		3.00	3.00	1.80
Other ID	2	1	2	1	2	1	1
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	06/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
PCBs										
PCB 77	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 81	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 105	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 114	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 123	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 126	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 156	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 157	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 167	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 169	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 189	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.6	1.8	< 0.3	1.1	< 0.3	< 0.3	0.4



Summary of Chemical Analysis Soil/Sludge Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205262	2205263	2205264	2205265	2205266	2205267	2205268
.Sample ID	LC01	LC02	LC02	LC03	LC03	LC04	LC05
Depth	2.45		3.00		3.00	3.00	1.80
Other ID	2	1	2	1	2	1	1
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	06/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
VOCs											
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	



Summary of Chemical Analysis

Soil/Sludge Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205262	2205263	2205264	2205265	2205266	2205267	2205268
Sample ID	LC01	LC02	LC02	LC03	LC03	LC04	LC05
Depth	2.45		3.00		3.00	3.00	1.80
Other ID	2	1	2	1	2	1	1
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	06/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
SVOCs										
Phenol	DETSC 3433	0.1	mg/kg	0.2	0.3	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	0.2	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	0.2	0.3	< 0.1	0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	0.1	0.2	< 0.1	0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



Summary of Chemical Analysis Soil/Sludge Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205262	2205263	2205264	2205265	2205266	2205267	2205268
Sample ID	LC01	LC02	LC02	LC03	LC03	LC04	LC05
Depth	2.45		3.00		3.00	3.00	1.80
Other ID	2	1	2	1	2	1	1
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	06/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205269	2205270	2205271	2205272	2205273	2205274
Sample ID	LC01	LC01	LC02	LC02	LC03	LC03
Depth		2.45		3.00		3.00
Other ID	1	2	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Preparation									
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y	Y	Y	Y	Y	Y
Metals									
Antimony, Dissolved	DETSC 2306	0.17	ug/l	< 0.17	0.53	0.20	0.26	< 0.17	< 0.17
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.20	2.2	0.62	0.29	0.46	0.23
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.07	< 0.03	2.8	0.03	0.17	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	15	7.0	17	2.0	10	1.3
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	0.38	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4	2.5	0.8	< 0.4	0.7	< 0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	12	2.4	< 0.09	6.6	< 0.09
Manganese, Dissolved	DETSC 2306	0.22	ug/l	70	44	330	8.5	1200	11
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.2	0.9	0.6	0.7	0.6	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	0.31	< 0.25	0.56	< 0.25	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	0.9	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	9.5	16	14	6.9	46	6.9
Inorganics									
pH	DETSC 2008		pH	6.6	8.4	7.2	6.9	6.8	6.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Dissolved Organic Carbon	DETSC 2033*	2	mg/l	3.9	3.0	2.6	< 2.0	2.5	5.1
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	54.7	24.1	66.3	7.53	34.8	4.54
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.081	1.2	0.42	0.026	0.086	0.050
Chloride	DETSC 2055	0.1	mg/l	4.3	1.7	4.0	0.73	2.1	0.85
Petroleum Hydrocarbons									
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAHs									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	8.4	0.34	< 0.05	0.16	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	0.96	0.05	< 0.01	0.03	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	0.32	0.02	< 0.01	0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.52	0.04	< 0.01	0.03	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	0.07	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.24	0.03	< 0.01	0.02	0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.16	0.02	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17228
 Client Ref 37707
 Contract Title Cannop Ponds

Lab No	2205269	2205270	2205271	2205272	2205273	2205274
Sample ID	LC01	LC01	LC02	LC02	LC03	LC03
Depth		2.45		3.00		3.00
Other ID	1	2	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	11	0.51	< 0.20	0.24	< 0.20
Phenols									
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100	< 100

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205275
Sample ID	LC04
Depth	3.00
Other ID	1
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.19
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	2.1
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	5.8
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09
Manganese, Dissolved	DETSC 2306	0.22	ug/l	63
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	8.3
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.53
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	14
Inorganics				
pH	DETSC 2008		pH	6.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Dissolved Organic Carbon	DETSC 2033*	2	mg/l	3.8
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	23.4
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	1.1
Chloride	DETSC 2055	0.1	mg/l	7.9
Petroleum Hydrocarbons				
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2205275
Sample ID	LC04
Depth	3.00
Other ID	1
Sample Type	ES
Sampling Date	05/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC01 2 2.45

Sample Numbers 2205262 2205279 2205280

Date Analysed 02/08/2023

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	3.6
DETSC 2003# Loss On Ignition	%	12.0
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	55.0
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC 2008# pH	pH Units	7.1
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	8.5	2.9	0.017	0.042
DETSC 2306 Barium as Ba	160	31	0.32	0.61
DETSC 2306 Cadmium as Cd	2.7	< 0.030	0.005	< 0.02
DETSC 2306 Chromium as Cr	27	< 0.25	0.05	< 0.1
DETSC 2306 Copper as Cu	26	1.2	0.052	0.07
DETSC 2306 Mercury as Hg	0.13	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	7	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	29	0.56	0.06	< 0.1
DETSC 2306 Lead as Pb	25	1.1	0.05	0.067
DETSC 2306 Antimony as Sb	5.2	0.45	0.01	< 0.05
DETSC 2306 Selenium as Se	4.8	< 0.25	0.01	< 0.03
DETSC 2306 Zinc as Zn	44	6	0.088	0.149
DETSC 2055 Chloride as Cl	3300	1400	< 20	< 100
DETSC 2055* Fluoride as F	120	< 100	0.24	0.28
DETSC 2055 Sulphate as SO4	39000	23000	78	267.4
DETSC 2009* Total Dissolved Solids	39000	55000	78	512.6
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2033* Dissolved Organic Carbon	3800	4500	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.6	6.7
DETSC 2009 Conductivity uS/cm	55.6	79.2
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.064

Stage 1

Volume of Leachant L2*	0.053
Volume of Eluate VE1*	0.15

Stage 2

Volume of Leachant L8*	0.514
Volume of Eluate VE2*	0.46

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC02 1

Sample Numbers 2205263 2205281

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	14.0	3	5	6
DETSC 2003# Loss On Ignition	%	36.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	140.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	2.5	100	n/a	n/a
DETSC 2008# pH	pH Units	6.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1	0.01	0.5	2	25
DETSC 2306 Barium as Ba	21	0.21	20	100	300
DETSC 2306 Cadmium as Cd	0.068	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.58	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.69	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.01	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.5	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.59	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.37	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.94	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	6.5	0.065	4	50	200
DETSC 2055 Chloride as Cl	2700	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	26000	260	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	78000	780	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3600	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	111.0
* Temperature*	18.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.029
Stage 1	
Volume of Leachant L2*	0.184
Volume of Eluate VE1*	0.85

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC02 2 3.00

Sample Numbers 2205264 2205283 2205284

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.0	3	5	6
DETSC 2003# Loss On Ignition	%	4.9	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	7.4	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	0.3	0.36	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	7.4	2.8	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.41	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.56	2.1	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	0.17	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.25	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.74	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	5.5	2.9	0.011	0.033	4	50	200
DETSC 2055 Chloride as Cl	1300	670	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	350	120	0.7	1.57	10	150	500
DETSC 2055 Sulphate as SO4	4500	1800	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	23000	19000	46	196.4	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4300	2200	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.6	6.8
DETSC 2009 Conductivity uS/cm	32.9	26.9
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.119

Stage 1

Volume of Leachant L2*	0.217
Volume of Eluate VE1*	0.19

Stage 2

Volume of Leachant L8*	0.951
Volume of Eluate VE2*	0.9

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC03 1

Sample Numbers 2205265 2205285

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	5.5	3	5	6
DETSC 2003# Loss On Ignition	%	9.5	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	7.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.73	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	45	0.45	20	100	300
DETSC 2306 Cadmium as Cd	0.13	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.1	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.2	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	2.8	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.1	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.34	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.79	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	43	0.43	4	50	200
DETSC 2055 Chloride as Cl	3300	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	45000	450	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	98000	980	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3600	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.7
DETSC 2009 Conductivity uS/cm	139.0
* Temperature*	17.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.035
Stage 1	
Volume of Leachant L2*	0.249
Volume of Eluate VE1*	0.95

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC03 2 3.00

Sample Numbers 2205266 2205287 2205288

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	0.8	3	5	6
DETSC 2003# Loss On Ignition	%	5.4	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	7.3	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	0.38	0.26	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	17	2	0.03	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	0.28	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	4.5	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.2	< 0.40	0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.68	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.9	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.33	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.29	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	9.5	7.3	0.019	0.077	4	50	200
DETSC 2055 Chloride as Cl	1700	600	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	4100	1200	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	21000	13000	42	143.6	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	3600	3900	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.5	6.5
DETSC 2009 Conductivity uS/cm	30.1	18.2
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.117

Stage 1	
Volume of Leachant L2*	0.222
Volume of Eluate VE1*	0.2

Stage 2	
Volume of Leachant L8*	0.94
Volume of Eluate VE2*	0.88

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC04 1 3.00

Sample Numbers 2205267 2205289 2205290

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.9	3	5	6
DETSC 2003# Loss On Ignition	%	10.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	6.8	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	4.1	1.5	0.008	0.019	0.5	2	25
DETSC 2306 Barium as Ba	42	6.8	0.08	0.12	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.81	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.51	< 0.40	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	3.1	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	2	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.3	0.42	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	18	8.8	0.036	0.101	4	50	200
DETSC 2055 Chloride as Cl	10000	1100	20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	55000	9900	110	165.2	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	120000	26000	240	397.9	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	2900	5300	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.2	6.2
DETSC 2009 Conductivity uS/cm	178.0	36.6
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.109

Stage 1	
Volume of Leachant L2*	0.187
Volume of Eluate VE1*	0.16

Stage 2	
Volume of Leachant L8*	0.873
Volume of Eluate VE2*	0.82

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Sample Id LC05 1 1.80

Sample Numbers 2205268 2205291 2205292

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.5	3	5	6
DETSC 2003# Loss On Ignition	%	7.2	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	7.5	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	0.84	0.71	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	21	7.8	0.04	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.7	3.6	0.005	0.035	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.4	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.34	0.61	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.27	0.28	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.9	0.4	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.5	4.1	0.005	0.039	4	50	200
DETSC 2055 Chloride as Cl	5800	1100	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	300	170	0.6	1.9	10	150	500
DETSC 2055 Sulphate as SO4	20000	4900	40	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	60000	21000	120	269.3	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	4000	4500	< 10	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	7.2	7.2
DETSC 2009 Conductivity uS/cm	85.8	30.6
* Temperature*	18.0	16.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.112

Stage 1

Volume of Leachant L2*	0.195
Volume of Eluate VE1*	0.17

Stage 2

Volume of Leachant L8*	0.894
Volume of Eluate VE2*	0.84

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Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17228

Client Ref 37707

Contract Title Cannop Ponds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2205262	LC01 2 2.45	SOIL	NAD	none	Michael Kay
2205263	LC02 1	SOIL	NAD	none	Michael Kay
2205264	LC02 2 3.00	SOIL	NAD	none	Michael Kay
2205265	LC03 1	SLUDGE	NAD	none	Michael Kay
2205266	LC03 2 3.00	SOIL	NAD	none	Michael Kay
2205267	LC04 1 3.00	SOIL	NAD	none	Michael Kay
2205268	LC05 1 1.80	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-17228
 Client Ref 37707
 Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2205261	LC01 SOIL	05/07/23		GJ 60ml x2, PT 1L x2		
2205262	LC01 2.45 SOIL	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205263	LC02 SOIL	05/07/23		GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205264	LC02 3.00 SOIL	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205265	LC03 SLUDGE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205266	LC03 3.00 SOIL	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205267	LC04 3.00 SOIL	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205268	LC05 1.80 SOIL	06/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
2205269	LC01 LEACHATE	05/07/23		GJ 60ml x2, PT 1L x2		
2205270	LC01 2.45 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205271	LC02 LEACHATE	05/07/23		GJ 60ml x2, PT 1L x2		
2205272	LC02 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205273	LC03 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205274	LC03 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205275	LC04 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205276	LC05 1.80 LEACHATE	06/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205277	LC01 LEACHATE	05/07/23		GJ 60ml x2, PT 1L x2		
2205278	LC01 LEACHATE	05/07/23		GJ 60ml x2, PT 1L x2		
2205279	LC01 2.45 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205280	LC01 2.45 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205281	LC02 LEACHATE	05/07/23		GJ 60ml x2, PT 1L x2		
2205282	LC02 LEACHATE	05/07/23		GJ 60ml x2, PT 1L x2		
2205283	LC02 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205284	LC02 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205285	LC03 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205286	LC03 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205287	LC03 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205288	LC03 3.00 LEACHATE	05/07/23		GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Information in Support of the Analytical Results

Our Ref 23-17228
 Client Ref 37707
 Contract Cannop Ponds

Lab No	Sample ID	Date	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled			
2205289	LC04 3.00 LEACHATE	05/07/23	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205290	LC04 3.00 LEACHATE	05/07/23	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205291	LC05 1.80 LEACHATE	06/07/23	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
2205292	LC05 1.80 LEACHATE	06/07/23	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17230

Issued: 04-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17230

Client Reference 37707

Order No 37707/RH

Contract Title Cannop ponds

Description 2 Soil samples, 1 Leachate sample, 2 Water samples.

Date Received 19-Jul-23

Date Started 19-Jul-23

Date Completed 04-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17230
 Client Ref 37707
 Contract Title Cannop ponds

Lab No	2205310	2205311
Sample ID	BH07	BH05
Depth	4.00-4.20	4.80-5.00
Other ID	6	6
Sample Type	ES	ES
Sampling Date	06/07/2023	06/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Antimony	DETSC 2301*	1	mg/kg	1.2	1.7
Arsenic	DETSC 2301#	0.2	mg/kg	8.5	12
Beryllium	DETSC 2301#	0.2	mg/kg	0.7	0.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.8	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	14	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	17	19
Lead	DETSC 2301#	0.3	mg/kg	14	15
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	21	24
Selenium	DETSC 2301#	0.5	mg/kg	0.7	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	23	23
Zinc	DETSC 2301#	1	mg/kg	61	63
Inorganics					
pH	DETSC 2008#		pH	5.9	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.2
Total Organic Carbon	DETSC 2084#	0.5	%	3.1	0.9
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 23-17230
 Client Ref 37707
 Contract Title Cannop ponds

Lab No	2205310
Sample ID	BH07
Depth	4.00-4.20
Other ID	6
Sample Type	ES
Sampling Date	06/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 23-17230
 Client Ref 37707
 Contract Title Cannop ponds

Lab No	2205310
Sample ID	BH07
Depth	4.00-4.20
Other ID	6
Sample Type	ES
Sampling Date	06/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01
SVOCs				
Phenol	DETSC 3433	0.1	mg/kg	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 23-17230
 Client Ref 37707
 Contract Title Cannop ponds

Lab No	2205310
Sample ID	BH07
Depth	4.00-4.20
Other ID	6
Sample Type	ES
Sampling Date	06/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Water Samples

Our Ref 23-17230

Client Ref 37707

Contract Title Cannop ponds

Lab No	2205312	2205313
Sample ID	LCP SW	UCP SW
Depth		
Other ID	1	1
Sample Type	EW	EW
Sampling Date	06/07/2023	06/07/2023
Sampling Time	1618	1650

Test	Method	LOD	Units		
Metals					
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.24	0.19
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.97	0.85
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	45	45
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.5	0.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.25	< 0.09
Manganese, Dissolved	DETSC 2306	0.22	ug/l	36	27
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	2.8	2.7
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.3	0.76
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	1.9	1.3
Inorganics					
pH	DETSC 2008		pH	8.0	8.0
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Dissolved Organic Carbon	DETSC 2033*	2	mg/l	3.7	4.1
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	208	208
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.10	0.13
Chloride	DETSC 2055	0.1	mg/l	36	26
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	1	ug/l	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 23-17230

Client Ref 37707

Contract Title Cannop ponds

Lab No	2205312	2205313
Sample ID	LCP SW	UCP SW
Depth		
Other ID	1	1
Sample Type	EW	EW
Sampling Date	06/07/2023	06/07/2023
Sampling Time	1618	1650

Test	Method	LOD	Units		
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0
PAHs					
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20
PCBs					
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0
Phenols					
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17230

Client Ref 37707

Contract Title Cannop ponds

Lab No	2205314
Sample ID	BH07
Depth	4.00-4.20
Other ID	6
Sample Type	ES
Sampling Date	06/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.27
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.94
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	2.7
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.33
Copper, Dissolved	DETSC 2306	0.4	ug/l	3.9
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.98
Manganese, Dissolved	DETSC 2306	0.22	ug/l	15
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.52
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	0.8
Zinc, Dissolved	DETSC 2306	1.3	ug/l	8.5
Inorganics				
pH	DETSC 2008		pH	7.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Dissolved Organic Carbon	DETSC 2033*	2	mg/l	5.0
Total Hardness as CaCO ₃	DETSC 2303	0.1	mg/l	10.5
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	2.3
Chloride	DETSC 2055	0.1	mg/l	2.7
Petroleum Hydrocarbons				
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17230

Client Ref 37707

Contract Title Cannop ponds

Lab No	2205314
Sample ID	BH07
Depth	4.00-4.20
Other ID	6
Sample Type	ES
Sampling Date	06/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17230

Client Ref 37707

Contract Title Cannop ponds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2205310	BH07 6 4.00-4.20	SOIL	NAD	none	Darryl Fletcher
2205311	BH05 6 4.80-5.00	SOIL	NAD	none	Darryl Fletcher

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-17230
 Client Ref 37707
 Contract Cannop ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2205310	BH07 4.00-4.20 SOIL	06/07/23		GJ 250ml, GJ 60ml, PT 1L x2	pH + Conductivity (7 days), VOC (7 days)	
2205311	BH05 4.80-5.00 SOIL	06/07/23		GJ 250ml, GJ 60ml, PT 1L x2	pH + Conductivity (7 days)	
2205312	LCP SW WATER	06/07/23		GB to 500ml, GV, PB 1L x2	Aliphatics/Aromatics (4 days), Hardness (7 days), Kone (4 days), pH/Cond/TDS (1 days), Ammoniacal Nitrogen as N (10 days), PAH MS (4 days), PCB (7 days)	
2205313	UCP SW WATER	06/07/23		GB to 500ml, GV, PB 1L x2	Aliphatics/Aromatics (4 days), Hardness (7 days), Kone (4 days), pH/Cond/TDS (1 days), Ammoniacal Nitrogen as N (10 days), PAH MS (4 days), PCB (7 days)	
2205314	BH07 4.00-4.20 LEACHATE	06/07/23		GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17231

Issued: 02-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17231

Client Reference 37707

Order No 37707/RH

Contract Title CANNOP PONDS

Description 1 Soil sample, 3 Leachate samples.

Date Received 19-Jul-23

Date Started 19-Jul-23

Date Completed 02-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17231
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2205315
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	3.9
Arsenic	DETSC 2301#	0.2	mg/kg	27
Barium	DETSC 2301#	1.5	mg/kg	190
Beryllium	DETSC 2301#	0.2	mg/kg	1.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	1.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	82
Lead	DETSC 2301#	0.3	mg/kg	56
Mercury	DETSC 2325#	0.05	mg/kg	0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	5.2
Nickel	DETSC 2301#	1	mg/kg	33
Selenium	DETSC 2301#	0.5	mg/kg	0.7
Vanadium	DETSC 2301#	0.8	mg/kg	33
Zinc	DETSC 2301#	1	mg/kg	65
Inorganics				
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	23
pH	DETSC 2008#		pH	8.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	20
Chloride	DETSC 2055	1	mg/kg	47.4
Sulphide	DETSC 2024*	10	mg/kg	210
Sulphur (free)	DETSC 3049#	0.75	mg/kg	3.1
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17231
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2205315
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.7

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17231
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2205315
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17231
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2205315
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01
SVOCs				
Phenol	DETSC 3433	0.1	mg/kg	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17231
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2205315
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17231

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2205316
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	< 0.17
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.38
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	7.7
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.6
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.19
Manganese, Dissolved	DETSC 2306	0.22	ug/l	6.8
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.5
Inorganics				
pH	DETSC 2008		pH	7.1
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Dissolved Organic Carbon	DETSC 2033*	2	mg/l	4.1
Total Hardness as CaCO ₃	DETSC 2303	0.1	mg/l	24.1
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.096
Chloride	DETSC 2055	0.1	mg/l	3.1
Petroleum Hydrocarbons				
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17231

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2205316
Sample ID	BH04
Depth	0.50-0.70
Other ID	2
Sample Type	ES
Sampling Date	13/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17231

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id BH04 2 0.50-0.70

Sample Numbers 2205315 2205317 2205318

Date Analysed 02/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	20.0	3	5	6
DETSC 2003# Loss On Ignition	%	23.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	52.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	8.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	0.37	0.24	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	10	4.5	0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.29	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.71	0.52	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.21	0.15	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.31	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	1.4	1.8	0.003	0.017	4	50	200
DETSC 2055 Chloride as Cl	2500	790	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	160	< 100	0.32	0.28	10	150	500
DETSC 2055 Sulphate as SO4	26000	4500	52	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	66000	19000	132	271.9	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	6100	4400	12.2	< 50	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	7.1	7.3
DETSC 2009 Conductivity uS/cm	93.5	26.5
* Temperature*	18.0	17.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.118

Stage 1	
Volume of Leachant L2*	0.223
Volume of Eluate VE1*	0.205

Stage 2	
Volume of Leachant L8*	0.941
Volume of Eluate VE2*	0.895

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17231

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2205315	BH04 2 0.50-0.70	SOIL	NAD	none	Vicky Convery
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-17231
 Client Ref 37707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2205315	BH04 0.50-0.70 SOIL	13/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2205316	BH04 0.50-0.70 LEACHATE	13/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2205317	BH04 0.50-0.70 LEACHATE	13/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2205318	BH04 0.50-0.70 LEACHATE	13/07/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17394

Issued: 14-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17394

Client Reference 377707

Order No 37707/RH

Contract Title CANNOP PONDS

Description 1 Soil sample, 3 Leachate samples.

Date Received 20-Jul-23

Date Started 20-Jul-23

Date Completed 14-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17394

Client Ref 377707

Contract Title CANNOP PONDS

Lab No	2206318
Sample ID	BH12
Depth	0.30-0.50
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	1.5
Arsenic	DETSC 2301#	0.2	mg/kg	45
Barium	DETSC 2301#	1.5	mg/kg	73
Beryllium	DETSC 2301#	0.2	mg/kg	0.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.9
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	51
Lead	DETSC 2301#	0.3	mg/kg	28
Mercury	DETSC 2325#	0.05	mg/kg	0.23
Molybdenum	DETSC 2301#	0.4	mg/kg	1.9
Nickel	DETSC 2301#	1	mg/kg	17
Selenium	DETSC 2301#	0.5	mg/kg	1.4
Vanadium	DETSC 2301#	0.8	mg/kg	18
Zinc	DETSC 2301#	1	mg/kg	50
Inorganics				
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	47
pH	DETSC 2008#		pH	5.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	31
Chloride	DETSC 2055	1	mg/kg	7.0
Sulphide	DETSC 2024*	10	mg/kg	< 10
Sulphur (free)	DETSC 3049#	0.75	mg/kg	5.3
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17394
 Client Ref 377707
 Contract Title CANNOP PONDS

Lab No	2206318
Sample ID	BH12
Depth	0.30-0.50
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.9

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17394

Client Ref 377707

Contract Title CANNOP PONDS

Lab No	2206319
Sample ID	BH12
Depth	0.30-0.50
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.17
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.6
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	4.5
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.76
Manganese, Dissolved	DETSC 2306	0.22	ug/l	4.2
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.42
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	4.2
Inorganics				
pH	DETSC 2008		pH	6.9
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Dissolved Organic Carbon	DETSC 2033*	2	mg/l	6.0
Total Hardness as CaCO ₃	DETSC 2303	0.1	mg/l	19.8
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.076
Chloride	DETSC 2055	0.1	mg/l	0.99
Petroleum Hydrocarbons				
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-17394

Client Ref 377707

Contract Title CANNOP PONDS

Lab No	2206319
Sample ID	BH12
Depth	0.30-0.50
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-17394

Client Ref 377707

Contract Title CANNOP PONDS

Sample Id BH12 2 0.30-0.50

Sample Numbers 2206318 2206320 2206321

Date Analysed 14/08/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	31.0	3	5	6
DETSC 2003# Loss On Ignition	%	47.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	5.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	1.4	1.8	0.003	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	11	5.8	0.02	0.16	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.66	0.63	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.7	1.9	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	0.011	0.014	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.93	2.2	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.85	1.2	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.31	0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.98	0.42	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	4.2	27	0.008	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	2200	910	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	40000	3400	80	786.2	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	96000	19000	192	1772.6	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2033* Dissolved Organic Carbon	11000	5500	22	168	500	800	1000

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Additional Information		
DETSC 2008 pH	6.7	6.8
DETSC 2009 Conductivity uS/cm	137.0	27.6
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.122

Stage 1	
Volume of Leachant L2*	0.225
Volume of Eluate VE1*	2.5

Stage 2	
Volume of Leachant L8*	0.973
Volume of Eluate VE2*	0.92

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17394

Client Ref 377707

Contract Title CANNOP PONDS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2206318	BH12 2 0.30-0.50	SOIL	NAD	none	Darryl Fletcher
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-17394
 Client Ref 377707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2206318	BH12 0.30-0.50 SOIL	18/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2206319	BH12 0.30-0.50 LEACHATE	18/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2206320	BH12 0.30-0.50 LEACHATE	18/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
2206321	BH12 0.30-0.50 LEACHATE	18/07/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-17542

Issued: 09-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17542

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds Intrusive GI

Description One Soil sample.

Date Received 24-Jul-23

Date Started 24-Jul-23

Date Completed 09-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17542

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2207304
Sample ID	BH09
Depth	2.45-2.55
Other ID	5
Sample Type	SOIL
Sampling Date	19/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	< 1.0
Arsenic	DETSC 2301#	0.2	mg/kg	11
Beryllium	DETSC 2301#	0.2	mg/kg	1.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	12
Copper	DETSC 2301#	0.2	mg/kg	44
Lead	DETSC 2301#	0.3	mg/kg	5.5
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	120
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	20
Zinc	DETSC 2301#	1	mg/kg	120
Inorganics				
pH	DETSC 2008#		pH	7.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	< 0.5
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17542

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2207304
Sample ID	BH09
Depth	2.45-2.55
Other ID	5
Sample Type	SOIL
Sampling Date	19/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-17542

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2207304	BH09 5 2.45-2.55	SOIL	NAD	none	Michael Kay
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-17542
 Client Ref 37707
 Contract Cannop Ponds Intrusive GI

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2207304	BH09 2.45-2.55 SOIL	19/07/23	GJ 250ml, GJ 60ml, PT 1L x2		
<p>Key: G-Glass P-Plastic J-Jar T-Tub</p> <p>DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.</p>					

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



Certificate of Analysis

Certificate Number 23-17657

Issued: 10-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-17657

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds Intrusive GI

Description One Soil sample.

Date Received 25-Jul-23

Date Started 25-Jul-23

Date Completed 10-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Kirk Bridgewood'.

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17657

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2208055
Sample ID	HP05
Depth	1.00-1.20
Other ID	2
Sample Type	ES
Sampling Date	20/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	2.4
Arsenic	DETSC 2301#	0.2	mg/kg	18
Beryllium	DETSC 2301#	0.2	mg/kg	1.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.1
Chromium	DETSC 2301#	0.15	mg/kg	16
Copper	DETSC 2301#	0.2	mg/kg	26
Lead	DETSC 2301#	0.3	mg/kg	23
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	25
Zinc	DETSC 2301#	1	mg/kg	59
Inorganics				
pH	DETSC 2008#		pH	6.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2
Total Organic Carbon	DETSC 2084#	0.5	%	1.1
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-17657
 Client Ref 37707
 Contract Title Cannop Ponds Intrusive GI

Lab No	2208055
Sample ID	HP05
Depth	1.00-1.20
Other ID	2
Sample Type	ES
Sampling Date	20/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

Summary of Asbestos Analysis Soil Samples

Our Ref 23-17657

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2208055	HP05 2 1.00-1.20	SOIL	NAD	none	Darryl Fletcher
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-17657
 Client Ref 37707
 Contract Cannop Ponds Intrusive GI

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2208055	HP05 1.00-1.20 SOIL	20/07/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



Certificate of Analysis

Certificate Number 23-18899

Issued: 24-Aug-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-18899

Client Reference 37707/RH

Order No 37707/RH

Contract Title Cannop Ponds

Description 3 Water samples.

Date Received 08-Aug-23

Date Started 08-Aug-23

Date Completed 24-Aug-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Kirk Bridgewood'.

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Water Samples

Our Ref 23-18899
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2215728	2215729	2215730
Sample ID	BH03	BH07	BH12
Depth	5.02	4.60	3.60
Other ID	1	1	1
Sample Type	EW	EW	EW
Sampling Date	31/07/2023	31/07/2023	31/07/2023
Sampling Time	0730	0845	1000

Test	Method	LOD	Units			
Metals						
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.45	< 0.17	0.23
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.1	0.52	1.5
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	79	57	53
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.8	1.3	0.9
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09
Manganese, Dissolved	DETSC 2306	0.22	ug/l	3800	2800	2300
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	5.8	3.0	6.0
Selenium, Dissolved	DETSC 2306	0.25	ug/l	2.8	0.35	0.41
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	< 0.6	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	3.5	3.4	15
Inorganics						
pH	DETSC 2008		pH	7.1	7.2	6.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40
Dissolved Organic Carbon	DETSC 2085	2	mg/l	14	9.0	11
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	269	246	239
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	3.0	1.6	1.8
Chloride	DETSC 2055	0.1	mg/l	79	28	27
Petroleum Hydrocarbons						
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 23-18899
 Client Ref 37707/RH
 Contract Title Cannop Ponds

Lab No	2215728	2215729	2215730
Sample ID	BH03	BH07	BH12
Depth	5.02	4.60	3.60
Other ID	1	1	1
Sample Type	EW	EW	EW
Sampling Date	31/07/2023	31/07/2023	31/07/2023
Sampling Time	0730	0845	1000

Test	Method	LOD	Units			
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
PAHs						
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20
PCBs						
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0
Phenols						
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100

Information in Support of the Analytical Results

Our Ref 23-18899
 Client Ref 37707/RH
 Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2215728	BH03 5.02 WATER	31/07/23	GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Hardness (7 days), Kone (4 days), pH/Cond/TDS (1 days), PAH MS (4 days), PCB (7 days)	
2215729	BH07 4.60 WATER	31/07/23	GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Hardness (7 days), Kone (4 days), pH/Cond/TDS (1 days), PAH MS (4 days), PCB (7 days)	
2215730	BH12 3.60 WATER	31/07/23	GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Hardness (7 days), Kone (4 days), pH/Cond/TDS (1 days), PAH MS (4 days), PCB (7 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

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Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



Certificate of Analysis

Certificate Number 23-20310

Issued: 07-Sep-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-20310

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds Intrusive GI

Description 4 Water samples.

Date Received 24-Aug-23

Date Started 24-Aug-23

Date Completed 07-Sep-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Kirk Bridgewood'.

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Water Samples

Our Ref 23-20310

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2223699	2223700	2223701	2223702
Sample ID	BH03	BH12	LCP SW	UCP SW
Depth	5.00	3.80	0.00-0.20	0.00-0.20
Other ID	2	2	2	2
Sample Type	EW	EW	EW	EW
Sampling Date	21/08/2023	21/08/2023	21/08/2023	21/08/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Antimony, Dissolved	DETSC 2306	0.17	ug/l	< 0.17	0.54	0.20	< 0.17
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	37	1.4	0.69	0.79
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	0.04	< 0.03	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	48	65	46	45
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.46	0.25	7.1	7.3
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4	1.8	2.7	2.8
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09	< 0.09
Manganese, Dissolved	DETSC 2306	0.22	ug/l	2000	1600	7.7	3.0
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	5.7	5.8	1.7	2.6
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.34	2.5	< 0.25	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	91	76	30	42
Inorganics							
pH	DETSC 2008		pH	6.5	6.8	7.9	7.8
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40
Dissolved Organic Carbon	DETSC 2085	2	mg/l	11	8.4	3.6	3.7
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	222	217	205	204
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	1.5	2.0	0.30	0.14
Chloride	DETSC 2055	0.1	mg/l	27	72	28	26
Petroleum Hydrocarbons							
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	25	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	1.8	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	4.7	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	18	< 1.0	< 1.0	< 1.0
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	1	ug/l	25	< 1.0	< 1.0	< 1.0
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 23-20310

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2223699	2223700	2223701	2223702
Sample ID	BH03	BH12	LCP SW	UCP SW
Depth	5.00	3.80	0.00-0.20	0.00-0.20
Other ID	2	2	2	2
Sample Type	EW	EW	EW	EW
Sampling Date	21/08/2023	21/08/2023	21/08/2023	21/08/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
PAHs							
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.03	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.03	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.03	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20
PCBs							
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3		
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2		
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3		
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6		
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2		
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2		
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2		
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0		
Phenols							
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100

Information in Support of the Analytical Results

Our Ref 23-20310
 Client Ref 37707
 Contract Cannop Ponds Intrusive GI

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2223699	BH03 5.00 WATER	21/08/23	GB 1L x2, PB 1L x3	pH/Cond/TDS (1 days)	
2223700	BH12 3.80 WATER	21/08/23	GB 1L x3, PB 1L x3	pH/Cond/TDS (1 days)	
2223701	LCP SW 0.00-0.20 WATER	21/08/23	GB 1L x3, PB 1L x3	pH/Cond/TDS (1 days)	
2223702	UCP SW 0.00-0.20 WATER	21/08/23	GB 1L x2, GV x3, PB 1L x3	pH/Cond/TDS (1 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-20620

Issued: 18-Sep-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-20620

Client Reference 37707

Order No 37707/RH

Contract Title CANNOP PONDS

Description 7 Soil samples, 7 Leachate samples.

Date Received 30-Aug-23

Date Started 30-Aug-23

Date Completed 18-Sep-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139



Summary of Chemical Analysis

Soil Samples

Our Ref 23-20620
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2225542	2225543	2225544	2225545	2225546	2225547	2225548
.Sample ID	UC03	UC03	UC04	UC05	UC05	UC06	UC06
Depth		3.00	3.00		3.00		2.75
Other ID	1	2	1	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Antimony	DETSC 2301*	1	mg/kg	1.6	1.4	1.8	2.0	2.4	1.9	1.9
Arsenic	DETSC 2301#	0.2	mg/kg	17	20	20	27	27	16	18
Barium	DETSC 2301#	1.5	mg/kg	120	95	100	85	76	210	190
Beryllium	DETSC 2301#	0.2	mg/kg	3.8	1.5	3.7	2.8	3.3	2.7	3.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	6.1	2.9	2.0	1.5	1.6	1.8	2.1
Cadmium	DETSC 2301#	0.1	mg/kg	2.9	0.6	0.7	1.8	1.0	0.4	0.5
Chromium	DETSC 2301#	0.15	mg/kg	11	7.5	13	10	17	20	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	36	55	92	110	110	60	86
Lead	DETSC 2301#	0.3	mg/kg	55	61	36	46	49	81	89
Mercury	DETSC 2325#	0.05	mg/kg	0.07	0.14	0.36	0.23	0.55	0.07	0.10
Molybdenum	DETSC 2301#	0.4	mg/kg	2.0	1.4	1.2	1.1	1.4	1.2	1.5
Nickel	DETSC 2301#	1	mg/kg	78	78	95	130	130	55	90
Selenium	DETSC 2301#	0.5	mg/kg	1.0	0.8	0.9	2.0	1.6	< 0.5	0.6
Vanadium	DETSC 2301#	0.8	mg/kg	17	13	14	14	20	29	29
Zinc	DETSC 2301#	1	mg/kg	230	150	330	360	390	190	270
Inorganics										
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	30	39	13	20	16	5.5	6.1
pH	DETSC 2008#		pH	6.0	6.8	6.9	7.2	7.3	6.1	6.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.7	0.3	0.2	0.3	0.1	0.4	0.6
Total Organic Carbon	DETSC 2084#	0.5	%	16	30	7.3	14	10	6.1	2.3
Chloride	DETSC 2055	1	mg/kg	65.3	25.3	113	52.9	25.7	14.9	20.5
Sulphide	DETSC 2024*	10	mg/kg	170	150	190	200	160	150	120
Sulphur (free)	DETSC 3049#	0.75	mg/kg	28	6.6	3.3	24	12	7.6	3.7
Petroleum Hydrocarbons										
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	4.3	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	4.3	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	6.2	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	65	< 1.4	< 1.4



Summary of Chemical Analysis

Soil Samples

Our Ref 23-20620
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2225542	2225543	2225544	2225545	2225546	2225547	2225548
.Sample ID	UC03	UC03	UC04	UC05	UC05	UC06	UC06
Depth		3.00	3.00		3.00		2.75
Other ID	1	2	1	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	50	< 1.4	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	120	< 10	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	120	< 10	< 10
PCBs										
PCB 77	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 81	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 105	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 114	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 123	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 126	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 156	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 157	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 167	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 169	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PCB 189	DETSC 3401*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	5.8	4.4	2.4	3.2	3.2	1.2	1.1



Summary of Chemical Analysis

Soil Samples

Our Ref 23-20620
 Client Ref 37707
 Contract Title CANNOP PONDS

Lab No	2225542	2225543	2225544	2225545	2225546	2225547	2225548
Sample ID	UC03	UC03	UC04	UC05	UC05	UC06	UC06
Depth		3.00	3.00		3.00		2.75
Other ID	1	2	1	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
VOCs										
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	0.03	0.01	0.02	< 0.01	0.02	0.01	0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2225542	2225543	2225544	2225545	2225546	2225547	2225548
Sample ID	UC03	UC03	UC04	UC05	UC05	UC06	UC06
Depth		3.00	3.00		3.00		2.75
Other ID	1	2	1	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
SVOCs										
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	2225542	2225543	2225544	2225545	2225546	2225547	2225548
Sample ID	UC03	UC03	UC04	UC05	UC05	UC06	UC06
Depth		3.00	3.00		3.00		2.75
Other ID	1	2	1	1	2	1	2
Sample Type	ES	ES	ES	ES	ES	ES	ES
Sampling Date	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023	07/07/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1	0.1	0.3	0.2	0.2	0.1	< 0.1
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1	0.1	0.1	0.1	< 0.1	0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	0.1	< 0.1
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	0.1	< 0.1	0.2	0.2	0.2	< 0.1	< 0.1
Chrysene	DETSC 3433	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	0.2	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC03 1

Sample Numbers 2225542 2225549

Date Analysed 14/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	16.0	3	5	6
DETSC 2003# Loss On Ignition	%	30.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	470.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	2.6	100	n/a	n/a
DETSC 2008# pH	pH Units	6.0	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.2	0.012	0.5	2	25
DETSC 2306 Barium as Ba	18	0.18	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.68	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.77	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.24	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.2	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.67	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.3	0.023	4	50	200
DETSC 2055 Chloride as Cl	1400	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	41000	410	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	100000	1000	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.4
DETSC 2009 Conductivity uS/cm	148.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.095
Stage 1	
Volume of Leachant L2*	0.903
Volume of Eluate VE1*	0.78

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC03 2 3.00

Sample Numbers 2225543 2225550

Date Analysed 13/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	30.0	3	5	6
DETSC 2003# Loss On Ignition	%	39.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	6.8	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.2	0.012	0.5	2	25
DETSC 2306 Barium as Ba	37	0.37	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.81	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.99	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.45	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.3	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.8	0.028	4	50	200
DETSC 2055 Chloride as Cl	1100	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	54000	540	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	150000	1500	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2100	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	216.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.197
Stage 1	
Volume of Leachant L2*	2.03
Volume of Eluate VE1*	0.79

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC04 1 3.00

Sample Numbers 2225544 2225551

Date Analysed 13/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	7.3	3	5	6
DETSC 2003# Loss On Ignition	%	13.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	2.0	100	n/a	n/a
DETSC 2008# pH	pH Units	6.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1	0.01	0.5	2	25
DETSC 2306 Barium as Ba	34	0.34	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	2.5	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.23	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.26	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.68	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.2	0.022	4	50	200
DETSC 2055 Chloride as Cl	2200	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	46000	460	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	140000	1400	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.5
DETSC 2009 Conductivity uS/cm	201.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.118
Stage 1	
Volume of Leachant L2*	1.158
Volume of Eluate VE1*	0.79

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC05 1

Sample Numbers 2225545 2225552

Date Analysed 13/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	14.0	3	5	6
DETSC 2003# Loss On Ignition	%	20.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	250.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	3.8	100	n/a	n/a
DETSC 2008# pH	pH Units	7.2	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	1.8	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.5	0.015	0.5	2	25
DETSC 2306 Barium as Ba	32	0.32	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.57	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	2.2	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.17	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.25	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.71	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.5	0.025	4	50	200
DETSC 2055 Chloride as Cl	1400	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	61000	610	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	170000	1700	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.6
DETSC 2009 Conductivity uS/cm	241.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.102
Stage 1	
Volume of Leachant L2*	0.98
Volume of Eluate VE1*	0.79

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC05 2 3.00

Sample Numbers 2225546 2225553

Date Analysed 13/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	10.0	3	5	6
DETSC 2003# Loss On Ignition	%	16.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	320.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	7.3	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.88	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	28	0.28	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.47	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.76	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.11	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.32	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.71	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	1100	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	42000	420	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	130000	1300	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	185.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.095
Stage 1	
Volume of Leachant L2*	0.903
Volume of Eluate VE1*	0.79

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC06 1

Sample Numbers 2225547 2225554

Date Analysed 13/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	6.1	3	5	6
DETSC 2003# Loss On Ignition	%	5.5	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	6.1	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	2	0.02	0.5	2	25
DETSC 2306 Barium as Ba	23	0.23	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.2	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.92	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.5	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.33	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.94	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3	0.03	4	50	200
DETSC 2055 Chloride as Cl	1300	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	17000	170	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	62000	620	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	22000	220	500	800	1000

Additional Information	
DETSC 2008 pH	6.8
DETSC 2009 Conductivity uS/cm	89.2
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.091
Stage 1	
Volume of Leachant L2*	0.86
Volume of Eluate VE1*	0.8

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Sample Id UC06 2 2.75

Sample Numbers 2225548 2225555

Date Analysed 13/09/2023

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.3	3	5	6
DETSC 2003# Loss On Ignition	%	6.1	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC 2008# pH	pH Units	6.1	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate			WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg	Limit values for LS10 Leachate		
	10:1	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	1.1	0.011	0.5	2	25
DETSC 2306 Barium as Ba	38	0.38	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.77	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.4	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.51	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.22	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.1	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.6	0.026	4	50	200
DETSC 2055 Chloride as Cl	970	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	27000	270	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	92000	920	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	4300	< 50	500	800	1000

Additional Information	
DETSC 2008 pH	6.5
DETSC 2009 Conductivity uS/cm	131.0
* Temperature*	19.0
Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.088
Stage 1	
Volume of Leachant L2*	0.832
Volume of Eluate VE1*	0.78

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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Summary of Asbestos Analysis

Soil Samples

Our Ref 23-20620

Client Ref 37707

Contract Title CANNOP PONDS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2225542	UC03 1	SOIL	NAD	none	Josh Best
2225543	UC03 2 3.00	SOIL	NAD	none	Josh Best
2225544	UC04 1 3.00	SOIL	NAD	none	Josh Best
2225545	UC05 1	SOIL	NAD	none	Josh Best
2225546	UC05 2 3.00	SOIL	NAD	none	Josh Best
2225547	UC06 1	SOIL	NAD	none	Josh Best
2225548	UC06 2 2.75	SOIL	NAD	none	Josh Best

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-20620
 Client Ref 37707
 Contract CANNOP PONDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2225542	UC03 SOIL	07/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2225543	UC03 3.00 SOIL	07/07/23	GJ 250ml, GJ 60ml, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2225544	UC04 3.00 SOIL	07/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2225545	UC05 SOIL	07/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2225546	UC05 3.00 SOIL	07/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2225547	UC06 SOIL	07/07/23	GJ 250ml, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	

Information in Support of the Analytical Results

Our Ref 23-20620
 Client Ref 37707
 Contract CANNOP PONDS

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2225548	UC06 2.75 SOIL	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Sulphur (free) (7 days), Mercury (28 days), Anions (30 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH FID (14 days), PCB (30 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2225549	UC03 LEACHATE	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2		
2225550	UC03 3.00 LEACHATE	07/07/23		GJ 250ml, GJ 60ml, PT 1L x2		
2225551	UC04 3.00 LEACHATE	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2		
2225552	UC05 LEACHATE	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2		
2225553	UC05 3.00 LEACHATE	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2		
2225554	UC06 LEACHATE	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2		
2225555	UC06 2.75 LEACHATE	07/07/23		GJ 250ml, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total
TPH (C10-C40)	EH_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-20724

Issued: 22-Sep-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-20724

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds Intrusive GI

Description 1 Soil sample, 1 Leachate sample.

Date Received 31-Aug-23

Date Started 31-Aug-23

Date Completed 22-Sep-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-20724

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2226248
Sample ID	BH09
Depth	0.10-0.30
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Antimony	DETSC 2301*	1	mg/kg	< 1.0
Arsenic	DETSC 2301#	0.2	mg/kg	7.9
Beryllium	DETSC 2301#	0.2	mg/kg	0.3
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.1
Chromium	DETSC 2301#	0.15	mg/kg	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	7.8
Lead	DETSC 2301#	0.3	mg/kg	6.1
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	7.6
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	14
Zinc	DETSC 2301#	1	mg/kg	25
Inorganics				
pH	DETSC 2008#		pH	8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	6.9
Petroleum Hydrocarbons				
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	17
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	17
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	32
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	95
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	75
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	240
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	240

Summary of Chemical Analysis

Soil Samples

Our Ref 23-20724

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2226248
Sample ID	BH09
Depth	0.10-0.30
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.16
Pyrene	DETSC 3303#	0.03	mg/kg	0.15
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.09
Chrysene	DETSC 3303	0.03	mg/kg	0.21
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.30
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.09
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.20
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.11
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.13
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	1.5
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-20724

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2226249
Sample ID	BH09
Depth	0.10-0.30
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Preparation				
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	< 0.17
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.53
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	11
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.0
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09
Manganese, Dissolved	DETSC 2306	0.22	ug/l	2.3
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3
Inorganics				
pH	DETSC 2008		pH	7.2
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.044
Chloride	DETSC 2055	0.1	mg/l	3.2
Petroleum Hydrocarbons				
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-20724

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2226249
Sample ID	BH09
Depth	0.10-0.30
Other ID	2
Sample Type	ES
Sampling Date	18/07/2023
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.03
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.03
Pyrene	DETSC 3304	0.01	ug/l	0.03
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.01
Chrysene	DETSC 3304	0.01	ug/l	0.02
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.02
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.02
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.02
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.02
PAH Total	DETSC 3304	0.2	ug/l	0.21
Phenols				
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-20724

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2226248	BH09 2 0.10-0.30	SOIL	NAD	none	Lee Kerridge
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-20724

Client Ref 37707

Contract Cannop Ponds Intrusive GI

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2226248	BH09 0.10-0.30 SOIL	18/07/23		GJ 250ml, GJ 60ml, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2226249	BH09 0.10-0.30 LEACHATE	18/07/23		GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-20807

Issued: 22-Sep-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-20807

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds

Description 2 Soil samples.

Date Received 01-Sep-23

Date Started 01-Sep-23

Date Completed 22-Sep-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-20807

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2226648	2226649
Sample ID	BH04	BH16
Depth	1.00-1.20	2.80-3.00
Other ID	2	4
Sample Type	SOIL	SOIL
Sampling Date	13/07/2023	17/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Antimony	DETSC 2301*	1	mg/kg	7.3	2.6
Arsenic	DETSC 2301#	0.2	mg/kg	57	31
Beryllium	DETSC 2301#	0.2	mg/kg	6.1	1.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	4.4	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.2
Chromium	DETSC 2301#	0.15	mg/kg	21	17
Copper	DETSC 2301#	0.2	mg/kg	110	23
Lead	DETSC 2301#	0.3	mg/kg	27	16
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	150	39
Selenium	DETSC 2301#	0.5	mg/kg	1.9	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	68	34
Zinc	DETSC 2301#	1	mg/kg	44	78
Inorganics					
pH	DETSC 2008#		pH	7.6	8.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%	12	0.6
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	10	mg/kg	< 10	< 10
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-20807

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2226648	2226649
Sample ID	BH04	BH16
Depth	1.00-1.20	2.80-3.00
Other ID	2	4
Sample Type	SOIL	SOIL
Sampling Date	13/07/2023	17/07/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg		< 0.03
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03
Chrysene	DETSC 3303	0.03	mg/kg		< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		< 0.10
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-20807

Client Ref 37707

Contract Title Cannop Ponds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2226649	BH16 4 2.80-3.00	SOIL	NAD	none	Josh Best
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 23-20807
 Client Ref 37707
 Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2226648	BH04 1.00-1.20 SOIL	13/07/23	GJ 250ml, GJ 60ml, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Mercury (28 days), Organic Matter (Auto) (28 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2226649	BH16 2.80-3.00 SOIL	17/07/23	GJ 250ml, GJ 60ml, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX / C5-C10 (14 days), Mercury (28 days), Naphthalene (14 days), Organic Matter (Auto) (28 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	

Key: G-Glass P-Plastic J-Jar T-Tub
 DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-22609

Issued: 02-Oct-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-22609

Client Reference 37707

Order No 37707/RM

Contract Title Cannop Ponds

Description 5 Water samples.

Date Received 21-Sep-23

Date Started 21-Sep-23

Date Completed 02-Oct-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Water Samples

Our Ref 23-22609

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2237587	2237588	2237589	2237590	2237591
Sample ID	BH03	BH07	BH12	LCP SW	UCP SW
Depth	5.50	5.00	3.70		
Other ID	3	2	3	3	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
Sampling Time	1245	1115	1510	1210	1535

Test	Method	LOD	Units						
Metals									
Antimony, Dissolved	DETSC 2306	0.17	ug/l	< 0.17	0.26	< 0.17	< 0.17	< 0.17	< 0.17
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.1	0.81	2.7	0.81	0.84	
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	
Calcium, Dissolved	DETSC 2306	0.09	mg/l	59	51	49	42	52	
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	0.44	< 0.25	< 0.25	
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4	0.7	1.7	< 0.4	0.7	
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09	
Manganese, Dissolved	DETSC 2306	0.22	ug/l	7400	1400	2200	2.3	1.8	
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Nickel, Dissolved	DETSC 2306	0.5	ug/l	7.5	3.0	7.5	2.1	1.2	
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.65	0.27	0.35	< 0.25	< 0.25	
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	
Zinc, Dissolved	DETSC 2306	1.3	ug/l	1.6	< 1.3	7.5	< 1.3	< 1.3	
Inorganics									
pH	DETSC 2008		pH	7.0	7.4	6.6	7.6	7.7	
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	
Dissolved Organic Carbon	DETSC 2085	2	mg/l	14	8.8	14	3.7	2.6	
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	231	258	235	199	239	
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	2.5	1.1	1.9	0.067	0.18	
Chloride	DETSC 2055	0.1	mg/l	53	26	25	25	24	
Petroleum Hydrocarbons									
Aliphatic C5-C6: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aliphatic C6-C8: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aliphatic C8-C10: HS_1D_AL	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aliphatic C10-C12: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic C10-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	68	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic C12-C16: EH_CU_1D_AL	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic C16-C21: EH_CU_1D_AL	DETSC 3072*	1	ug/l	1.3	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic C21-C35: EH_CU_1D_AL	DETSC 3072*	1	ug/l	64	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic C35-C44: EH_CU_1D_AL	DETSC 3072*	1	ug/l	2.9	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C5-C7: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aromatic C7-C8: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aromatic C8-C10: HS_1D_AR	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aromatic C10-C12: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C12-C16: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C16-C21: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C21-C35: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C35-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C10-C44: EH_CU_1D_AR	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Ali/Aro C10-C44: EH_CU_1D_Total	DETSC 3072*	1	ug/l	68	< 1.0	< 1.0	< 1.0	< 1.0	



Summary of Chemical Analysis

Water Samples

Our Ref 23-22609

Client Ref 37707

Contract Title Cannop Ponds

Lab No	2237587	2237588	2237589	2237590	2237591
Sample ID	BH03	BH07	BH12	LCP SW	UCP SW
Depth	5.50	5.00	3.70		
Other ID	3	2	3	3	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023
Sampling Time	1245	1115	1510	1210	1535

Test	Method	LOD	Units					
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAHs								
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	0.12
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.10
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.04
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.25
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.21
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.10
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.11
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.10
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.04
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.08
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.06
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.05
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	1.3
PCBs								
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l		< 0.3			
PCB 52	DETSC 3402	0.2	ug/l		< 0.2			
PCB 101	DETSC 3402	0.3	ug/l		< 0.3			
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l		< 0.6			
PCB 138	DETSC 3402	0.2	ug/l		< 0.2			
PCB 153	DETSC 3402	0.2	ug/l		< 0.2			
PCB 180	DETSC 3402	0.2	ug/l		< 0.2			
PCB 7 Total	DETSC 3402	1	ug/l		< 1.0			
Phenols								
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100

Information in Support of the Analytical Results

Our Ref 23-22609
 Client Ref 37707
 Contract Cannop Ponds

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2237587	BH03 5.50 WATER	14/09/23		GB 1L x2, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Kone (4 days), pH/Cond (1 days), PAH MS (4 days)	
2237588	BH07 5.00 WATER	14/09/23		GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Kone (4 days), pH/Cond (1 days), PAH MS (4 days)	
2237589	BH12 3.70 WATER	14/09/23		GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Kone (4 days), pH/Cond (1 days), PAH MS (4 days)	
2237590	LCP SW WATER	14/09/23		GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Kone (4 days), pH/Cond (1 days), PAH MS (4 days)	
2237591	UCP SW WATER	14/09/23		GB 1L x3, GV x3, PB 1L x3	Aliphatics/Aromatics (4 days), Kone (4 days), pH/Cond (1 days), PAH MS (4 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C10-C44	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C35-C44	EH_CU_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR
Aromatic C21-C35	EH_CU_1D_AR
Aromatic C35-C44	EH_CU_1D_AR
Aromatic C10-C44	EH_CU_1D_AR
Ali/Aro C10-C44	EH_CU_1D_Total

End of Report



DETS

Certificate of Analysis

Certificate Number 23-24164-0

Issued: 25-Oct-23

Client Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

Our Reference 23-24164-0

Client Reference 37707

Order No 37707/RH

Contract Title Cannop Ponds Intrusive GI

Description 5 Leachate samples.

Date Received 11-Oct-23

Date Started 11-Oct-23

Date Completed 25-Oct-23

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 23-24164, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139



Summary of Chemical Analysis

Leachate Samples

Our Ref 23-24164-0

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2246433	2246434	2246435	2246436	2246437
Sample ID	UC02	UC02	UC01	UC01	UC06
Depth	0.00-0.50	0.50-1.10	0.00-0.90	0.90-1.50	1.75-2.75
Other ID	3ES	4ES	3ES	4ES	3ES
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/10/2023	09/10/2023	09/10/2023	09/10/2023	09/10/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Preparation								
Leachate 2:1 250g Non-WAC	DETS 1009*			Y	Y	Y	Y	Y
Metals								
Antimony, Dissolved	DETS 2306	0.17	ug/l	0.27	< 0.17	< 0.17	< 0.17	0.21
Arsenic, Dissolved	DETS 2306	0.16	ug/l	2.3	1.2	0.62	0.52	1.4
Beryllium, Dissolved	DETS 2306*	0.1	ug/l	0.1	< 0.1	1.3	0.4	< 0.1
Cadmium, Dissolved	DETS 2306	0.03	ug/l	0.13	0.05	1.5	0.30	0.21
Calcium, Dissolved	DETS 2306	0.09	mg/l	79	9.3	74	44	120
Chromium, Dissolved	DETS 2306	0.25	ug/l	0.51	< 0.25	< 0.25	1.6	< 0.25
Copper, Dissolved	DETS 2306	0.4	ug/l	1.0	0.4	1.3	3.3	1.4
Lead, Dissolved	DETS 2306	0.09	ug/l	4.6	0.40	23	7.4	1.8
Manganese, Dissolved	DETS 2306	0.22	ug/l	2600	510	5200	4200	7100
Mercury, Dissolved	DETS 2306	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETS 2306	0.5	ug/l	11	2.1	76	52	30
Selenium, Dissolved	DETS 2306	0.25	ug/l	2.1	0.64	0.56	0.40	0.46
Vanadium, Dissolved	DETS 2306	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Zinc, Dissolved	DETS 2306	1.3	ug/l	220	46	630	270	75
Inorganics								
pH	DETS 2008		pH	6.9	7.2	6.2	5.2	6.4
Cyanide, Total	DETS 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40
Dissolved Organic Carbon	DETS 2085	2	mg/l	2.4	< 2.0	3.2	2.7	3.3
Total Hardness as CaCO ₃	DETS 2303	0.1	mg/l	269	32.9	263	169	392
Ammoniacal Nitrogen as N	DETS 2207	0.015	mg/l	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
Chloride	DETS 2055	0.1	mg/l	9.6	4.2	3.0	5.8	4.7
Petroleum Hydrocarbons								
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAHs								
Naphthalene	DETS 3304	0.05	ug/l	0.07	0.07	0.07	0.11	0.08
Acenaphthylene	DETS 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	0.01
Acenaphthene	DETS 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.03	0.08
Fluorene	DETS 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.05	0.05
Phenanthrene	DETS 3304	0.01	ug/l	0.02	< 0.01	0.02	0.26	0.19
Anthracene	DETS 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.08	0.07
Fluoranthene	DETS 3304	0.01	ug/l	0.02	< 0.01	0.01	0.42	0.45
Pyrene	DETS 3304	0.01	ug/l	0.01	< 0.01	0.01	0.25	0.26
Benzo(a)anthracene	DETS 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.17	0.16
Chrysene	DETS 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.10	0.09
Benzo(b)fluoranthene	DETS 3304	0.01	ug/l	0.01	< 0.01	0.01	0.18	0.16
Benzo(k)fluoranthene	DETS 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.06	0.05

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-24164-0

Client Ref 37707

Contract Title Cannop Ponds Intrusive GI

Lab No	2246433	2246434	2246435	2246436	2246437
Sample ID	UC02	UC02	UC01	UC01	UC06
Depth	0.00-0.50	0.50-1.10	0.00-0.90	0.90-1.50	1.75-2.75
Other ID	3ES	4ES	3ES	4ES	3ES
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/10/2023	09/10/2023	09/10/2023	09/10/2023	09/10/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.09	0.12
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.08	0.08
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.02	0.02
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.06	0.06
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	2.0	1.9
PCBs								
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Phenols								
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100

Information in Support of the Analytical Results

Our Ref 23-24164-0

Client Ref 37707

Contract Cannop Ponds Intrusive GI

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2246433	UC02 0.00-0.50 LEACHATE	09/10/23	GJ 250ml, GJ 60ml, PT 1L		
2246434	UC02 0.50-1.10 LEACHATE	09/10/23	GJ 250ml, GJ 60ml, PT 1L		
2246435	UC01 0.00-0.90 LEACHATE	09/10/23	GJ 250ml, GJ 60ml, PT 1L		
2246436	UC01 0.90-1.50 LEACHATE	09/10/23	GJ 250ml, GJ 60ml, PT 1L		
2246437	UC06 1.75-2.75 LEACHATE	09/10/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

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Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report