

**ENVIRONMENT**

Hargreaves Land Limited  
Planning Application 1 at Lincolnshire  
Lakes (North)  
Scunthorpe

Phase 2 Geo-Environmental Assessment

**ENVIRONMENT**

Hargreaves Land Limited  
Planning Application 1 at Lincolnshire Lakes (North)  
Scunthorpe  
Phase 2 Geo-Environmental Assessment

**Birmingham**  
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB  
T: 0121 233 3322

**Leeds**  
Whitehall Waterfront, 2 Riverside Way, Leeds  
LS1 4EH  
T: 0113 233 8000

London  
11 Borough High Street  
London, SE1 9SE  
T: 0207 407 3879

Manchester  
11, Portland Street, Manchester M1 3HU  
T: 0161 233 4260

Nottingham  
Waterfront House, Station Street, Nottingham NG2 3DQ  
T: 0115 924 1100

January 2025

## DOCUMENT ISSUE RECORD

<b>Document Number:</b>	LLP1-BWB-XX-XX-T-G-0002_Ph2		
<b>BWB Reference:</b>	221638		
<b>Author:</b>	Zoe Tait BSc (Hons)	Geo-Environmental Consultant	[REDACTED]
<b>Reviewer:</b>	Catherine Riley CEng, CEnv, MCIWEM	Principal Geo- Environmental Consultant	[REDACTED]
<b>Approver:</b>	Luke Cross BSc (Hons)	Principal Geo- Environmental Consultant	[REDACTED]

## REVISION CONTROL

Revision	Date of Issue	Status	Update Notes:	Updated:	Approved:
P1	December 2024	S0	Initial Issue	-	-
P2	January 2025	S2	Updated with Client Comments	ZT	

### Notice

This document has been prepared for the sole use of the Client in accordance with the terms of the appointment under which it was produced. BWB Consulting Limited accepts no responsibility for any use of or reliance on the contents of this document by any third party. No part of this document shall be copied or reproduced in any form without the prior written permission of BWB.

## EXECUTIVE SUMMARY

EXECUTIVE SUMMARY	
Site Address	The Site is located immediately east of the M181/A1077(M), to the west of Scunthorpe, Lincolnshire.
Site Setting and Proposed Development	<p>The Site comprises two irregular shaped parcels of land, predominantly used for agricultural purposes.</p> <p>The Hybrid Planning Application includes:</p> <p>Full planning application for the construction of a new vehicular access off the M181/A1077(M) roundabout, a pedestrian and cycle link to Scotter Road, a foul pumping station, earthworks and 'off-plot' drainage, ecological and associated landscaping and infrastructure works.</p> <p>Outline planning application, with all matters reserved, for the development of up to 550 residential dwellings (Use Class C3), a local centre (Use Class E) and associated 'on-plot' landscaping, drainage and other infrastructure works."</p>
Published Ground Conditions	British Geological Survey (BGS) mapping for the Site indicates that the majority of the Site is directly underlain by Warp (clay and silt) superficial deposits. The Sutton Sand Formation superficial deposits are located in the eastern section of the northern parcel of land, as well as a small portion of the southern parcel of land. A small outcrop of Alluvium is noted in the southernmost part of the southern parcel of land. Superficial deposits on both the north and south parcels overlie the Mercia Mudstone Group bedrock.
Site Investigation	Intrusive ground investigation works were undertaken between 14 <sup>th</sup> and 25 <sup>th</sup> August 2023 and comprised the advancement of twelve boreholes by dynamic sampling methods to a maximum depth of 5.45m below ground level (bgl) with SPTs and the installation of gas and groundwater monitoring wells in selected locations. Thirty-three machine excavated trial pits were also undertaken to a maximum depth of 3.00m bgl.
Ground Conditions Encountered	<p>The ground conditions generally comprised varying depths of Topsoil overlying Warp deposits, in turn overlying the Sutton Sand Formation. Neither the Alluvium nor Mercia Mudstone bedrock was encountered within any intrusive locations.</p> <p>Made Ground was encountered in one location in the north of the Site and Peat deposits were encountered sporadically throughout boreholes across the Site.</p> <p>Groundwater strikes during the ground investigation were recorded between 1.50m and 2.70m bgl. During the subsequent monitoring, groundwater was present in all monitored boreholes, with groundwater levels ranging between 0.94m and 1.62m.</p>
Geotechnical Appraisal	<p>Earthworks will be necessary to create development plateaus, but no significant issues are evident from the ground investigation in undertaking such works with on-site soils. Soils on site are a mixture of granular (Class 1) and cohesive (Class 2) materials and may require reductions in moisture content to achieve adequate compaction.</p> <p>Ground Improvement by Surcharging the Site by subjecting compressible strata to a load greater than the Proposed Development is considered to be a feasible method.</p>
Environmental Appraisal	<p>Chemical soil analysis has not identified significant contamination, with all soil samples recording contaminant concentrations below the relevant screening criteria. Asbestos has not been identified at the Site.</p> <p>All pesticide and herbicide concentrations were recorded below the laboratories lowest level of detection.</p> <p>Marginal leachate exceedances of chromium III, copper, lead and zinc have been identified when compared to the Environmental Quality Standards (EQS) criteria. However, it is considered unlikely that the leachate concentrations from</p>

	<p>soil samples would migrate towards the underlying aquifers or surface water features at elevated concentrations. Furthermore, the test results relate to samples of natural ground; it is therefore considered that these concentrations are reflective of natural background concentrations in the local area and not a result of contaminative land uses.</p> <p>Exceedances of the Ammonia screening criteria within groundwater have been recorded in the south of the Site, adjacent to the historical Scotter Road Landfill site, previously identified as a contamination source. No exceedances have been identified from one groundwater sample within the residential / commercial development area.</p> <p>Based on the gas monitoring completed, the results indicate that the Site should be characterised as CS1. However, given that only one borehole was monitored as per the prescribed monitoring programme within the northern parcel of land, (where the residential and commercial development is proposed), and due to the organic rich nature of the peat found further north of the borehole location, the gas assessment is not considered to have captured the true gassing scenario to the north.</p>
Waste Assessment	<p>The waste assessment indicates that the soils analysed are likely to be classified as non-hazardous.</p>
Recommendations	<p>Further ground investigation should be carried out utilising cable percussion boring and cone penetration testing to inform the design of either a piled foundation solution, or ground improvement via surcharging. A surcharging strategy will need to be developed if this option is proposed for development.</p> <p>BWB recommends a detailed Geotechnical Assessment Report is carried out following the further ground investigation once the preferred foundation option solution(s) and design details are confirmed. A surcharging strategy will need to be developed if this option is proposed for development.</p> <p>Further groundwater and ground gas analysis may be required to further inform the risk to human health and controlled waters.</p>
<p>This summary should be read in conjunction with BWB's full report (ref. LLP1-BWB-XX-XX-T-G-0002_Ph2) and reflects an assessment of the Site based on information received by BWB at the time of production.</p>	

## CONTENTS

EXECUTIVE SUMMARY .....	iii
1. INTRODUCTION.....	1
Instruction .....	1
2. THE SITE .....	3
Site Location.....	3
Site Description .....	3
3. PUBLISHED GROUND CONDITIONS.....	4
Published Geology .....	4
Hydrogeology .....	4
Hydrology .....	4
4. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT .....	5
Introduction.....	5
5. PHASE II ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION .....	7
Chemical Sampling and Analytical Strategy.....	7
6. GROUND CONDITIONS ENCOUNTERED.....	10
Geological Summary .....	10
Geotechnical Parameters.....	12
Hydrology .....	14
Contamination Observations.....	14
7. GEOTECHNICAL ASSESSMENT .....	15
Earthworks.....	15
Floor Slabs .....	16
Surcharging .....	16
Roads and Pavements.....	17
Drainage.....	17
Excavations .....	17
Groundwater.....	18
Chemical Attack on Buried Concrete .....	18
8. GROUND GAS ASSESSMENT .....	19
Introduction .....	19
Methodology .....	19
Results.....	19
9. HUMAN HEALTH RISK ASSESSMENT.....	22
Pathways .....	22
10. CONTROLLED WATERS RISK ASSESSMENT.....	24

11.	ENVIRONMENTAL RISK ASSESSMENT .....	27
12.	ENVIRONMENT LIABILITY ASSESSMENT/DEVELOPMENT CONSTRAINTS .....	30
13.	WASTE MANAGEMENT .....	31
	Waste Classification .....	31
14.	CONCLUSION AND RECOMMENDATIONS .....	32
	Conclusions .....	32
	Recommendations.....	33
15.	REFERENCES .....	34

## **FIGURES**

- Figure 2:1: Site Location Plan
- Figure 6:1: Corrected SPT 'N' Value (N60) Versus Depth
- Figure 6:2: In Situ Hand Shear Vane Test Results
- Figure 10:1: Abstraction Licences

## **TABLES**

- Table 4:1: Preliminary Conceptual Site Model
- Table 6:1: Summary of Ground Conditions
- Table 6:2: Geotechnical Test Result Summary
- Table 6:3: PSD Results Summary
- Table 6:5: Water Strikes
- Table 8:1: Summary of Recorded Ground Gas Results
- Table 9:1: Residual Exposure Pathways
- Table 10:1: Controlled Water Exposure Pathways
- Table 10:2: Controlled Water Exposure Pathways
- Table 10:3: Controlled Water Exposure Pathways
- Table 11:1: Revised Conceptual Site Model

## **DRAWINGS**

- Drawing 1: Exploratory Hole Location Plan
- Drawing 2: Inferred Groundwater Flow

## **APPENDICES**

- Appendix 1: BWB Exploratory Hole Logs
- Appendix 2: SPT Calibration Certificate
- Appendix 3: Gas and Groundwater Monitoring Data
- Appendix 4: Soil Chemical and Leachate Results
- Appendix 5: Groundwater Chemical Analysis Results
- Appendix 6: Geotechnical Laboratory Testing Results

Appendix 7: CLEA Screening Sheet  
Appendix 8: Leachate Screening Sheets  
Appendix 9: Groundwater Screening Sheets  
Appendix 10: Waste Classification

## 1. INTRODUCTION

### Instruction

- 1.1 BWB Consulting (BWB) was instructed by Hargreaves Land Limited (the Client) to carry out a Phase 2 Geo-Environmental Assessment for the Planning Application 1 at Lincolnshire Lakes (North), Scunthorpe ('the Site').
- 1.2 The Proposed Development is anticipated to comprise a hybrid planning application as detailed below:
- Outline planning application, with all matters reserved, for the development of up to 550 residential dwellings (Use Class C3), a local centre (Use Class E) and associated 'on-plot' landscaping, drainage and other infrastructure works; and
  - Full planning application for the construction of a new vehicular access off the M181/A1077(M) roundabout, a pedestrian and cycle link to Scotter Road, a foul pumping station, earthworks and 'off-plot' drainage, ecological and associated landscaping and infrastructure works.

### Previous Reports

- 1.3 The following geo-environmental reports have previously been completed for the Site:
- '*Surcharging Technical Note*' by BWB Consulting Limited for Hargreaves Land Limited, reference LIN-BWB-ZZ-XX-TN-NO-0001\_SUR\_P01, dated October 2023; and
  - '*Phase 1 Geo-Environmental Assessment*' by BWB Consulting Limited for Hargreaves Land Limited, reference LLP1-BWB-XX-XX-T-G-0001\_Ph1, dated December 2024.

### Objectives

- 1.4 The objectives of the report are to assess:
- The prevailing ground and groundwater conditions across the Site;
  - The potential presence and extent of contamination in shallow soil and groundwater beneath the Site;
  - The significance and magnitude of the observed contamination through comparison of analytical data to appropriate published environmental screening criteria;
  - The strength properties of the soil beneath the Site to enable foundation design; and
  - The ground gas regime beneath the Site.
- 1.5 The above objectives will allow the preliminary Conceptual Site Model (CSM) presented in the Phase 1 report to be verified and updated. The report has been completed in accordance with BS10175:2011(+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice' and EA Guidance on Risk Management of Land Contamination <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.

- 1.6 This report presents the information obtained from a desk study and the supplementary ground investigation. The report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007.

### **Scope of Works**

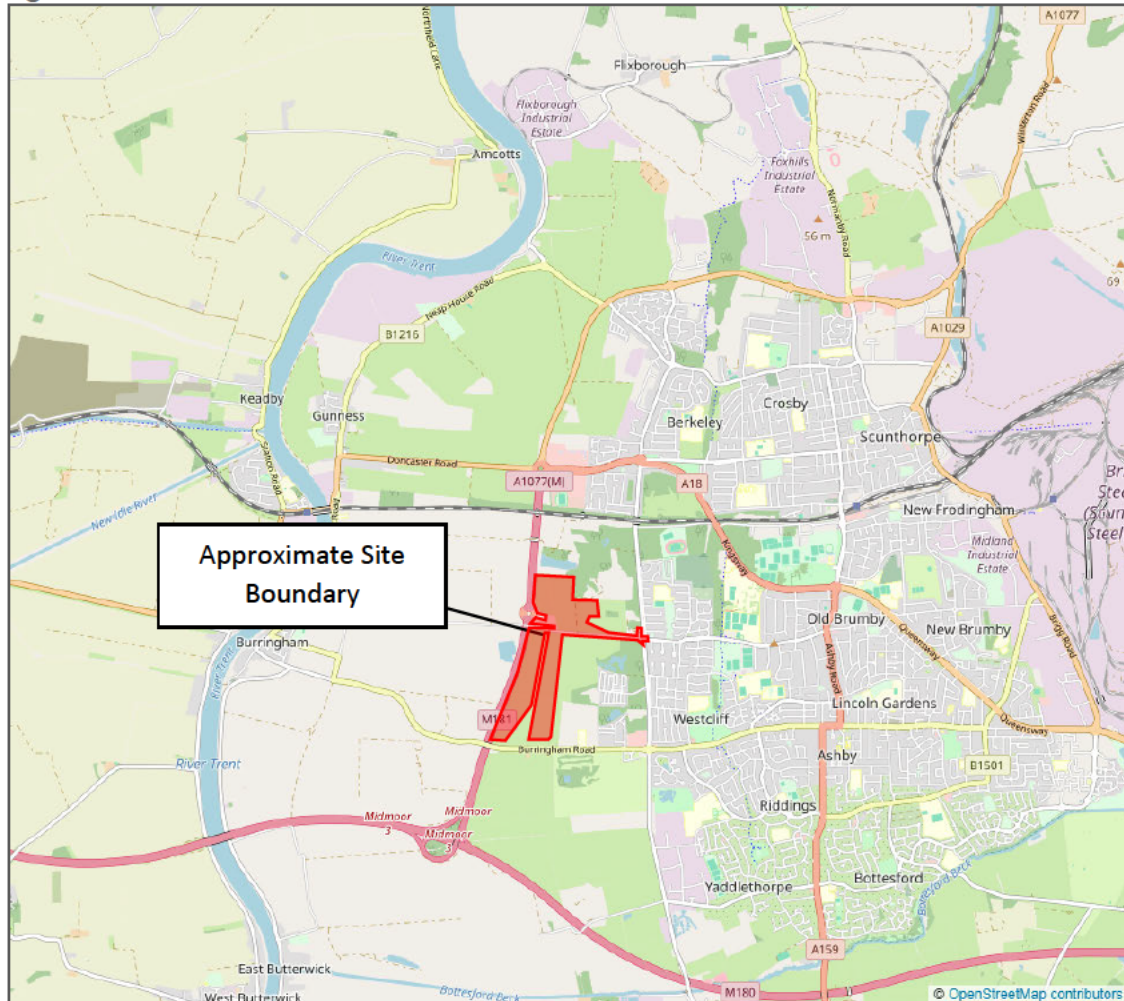
- 1.7 The ground investigation scope of works was completed in August 2023 and comprised the following:
- Non-intrusive survey of excavation locations for underground utilities;
  - Thirty-three machine excavated trial pits;
  - Twelve window sampler boreholes;
  - Chemical analysis of soils and groundwater;
  - Geotechnical testing of soil; and
  - Six gas and groundwater monitoring visits.
- 1.8 The laboratory analysis results include results from intrusive locations from a wider site area. Results from locations BH01, BH02, BH07, BH09 - BH11, BH15 - BH18, BH20, BH21, TP03, TP12 - TP16, TP29 - TP33, TP35 - TP37, TP43, TP45, TP48, TP49 and TP52 – TP56 do not form part of this assessment.

## 2. THE SITE

### Site Location

- 2.1 The Site is located immediately east of the M181/A1077(M), Scunthorpe, Lincolnshire, centred at approximate National Grid Reference 486593, 409493. The location of the Site is shown in **Figure 2.1**.

**Figure 2.1: Site Location Plan**



### Site Description

- 2.2 The Site comprises an irregular shaped parcel of land, immediately east of the M181/A1077(M) with Brumby Common Lane dissecting the Site into a northern and southern parcel.
- 2.3 The Site covers an area of approximately 56.51 hectares (ha). The elevation across the Site is relatively flat and consistent at around 3-5m Above Ordnance Datum (AOD). The Site is predominantly utilised for agricultural purposes.
- 2.4 A full site description is included within the Phase 1 Geo-Environmental Assessment.

### **3. PUBLISHED GROUND CONDITIONS**

#### **Published Geology**

- 3.1 British Geological Survey (BGS) mapping for the Site indicates that the majority of the Site is directly underlain by Warp (clay and silt) superficial deposits. The Sutton Sand Formation superficial deposits are located in the eastern section of the northern parcel of land, as well as a small portion of the southern parcel of land. A small outcrop of Alluvium is noted in the southernmost part of the southern parcel of land. Superficial deposits on both the north and south parcels overlie the Mercia Mudstone Group bedrock.
- 3.2 Artificial ground and Made Ground deposits are not mapped on-site. However, Made Ground deposits may be present along the M181/A1077(M), Brumby Common Lane and paths across the Site.
- 3.3 There are three accessible BGS borehole logs within the Site boundary (all in the northern parcel of land), recording varied superficial deposits. These include fine to medium dense sands, Warp Deposits, soft to stiff clays and one record of Peat, all overlying Mercia Mudstone bedrock.

#### **Hydrogeology**

- 3.4 The underlying ground conditions have been classified by the Environment Agency (EA) as follows:
  - Warp Deposits, Sutton Sand Formation and Alluvium: Secondary A Aquifers; and
  - Mercia Mudstone Group: Secondary B Aquifer.

#### **Hydrology**

- 3.5 Several unnamed surface water features are recorded on-site, as well as one named feature (Earl Beauchamp's Warping Drain). All are narrower than 5m and are land drainage features.
- 3.6 The EA classes the majority of the Site as being at a low risk of surface water flooding. This risk increases to medium along the far western Site boundary.
- 3.7 Two historical flood events were recorded on-site in 1947 with the entire Site indicated to have been affected by historical flood events.
- 3.8 The majority of the Site is within Flood Zone 2, with a thin section being classed as Flood Zone 3, associated with the Earl Beauchamp's Warping Drain, located in the northern Site area as well as a small area also classed as Flood Zone 3 in the far south west of the Site.

## **4. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT**

### **Introduction**

- 4.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.
- 4.2 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.
- 4.3 Three impact potentials exist for any given site; these are:
- The Site impacting upon itself;
  - The Site impacting on its surroundings; and
  - The surroundings impacting on the Site.
- 4.4 All three impacts need to be considered in a risk assessment.
- 4.5 A Source, Pathway, Receptor analysis has been undertaken for the Site based on the information provided in the preceding sections.
- 4.6 **Sources (S):** These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).
- 4.7 **Pathways (P):** A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.
- 4.8 **Receptors (R):** Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).
- 4.9 Under the Construction Design Management (CDM) Regulations 2015, construction and maintenance contractors must undertake their own risk assessments and mitigation to protect their staff, other human receptors and the environment from potential contamination. By law potential risks to human health and the environment from construction activities must appropriately identified and all necessary steps taken to eliminate/manage that risk. Therefore, construction / maintenance workers are excluded as a receptor in the CSM.

**Table 4:1: Preliminary Conceptual Site Model**

Source	Pathway	Receptor	Con	Prob	Risk
On-site sources: Localised Made Ground Agricultural works and practices Waste exemptions Alluvium and peat	Dermal contact with, and incidental ingestion of soil and / or dust. Inhalation of dust and / or fibres.	Future site users (residential / commercial / recreational)	Md	UI	L
	Ingestion of contaminated vegetables and / or soil attached to vegetables.	Future site users (residential / commercial / recreational)	Md	UI	L
	Inhalation of vapours.	Future site users (residential / commercial / recreational)	Md	UI	L
		Neighbouring public	Md	UI	L
	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future site users (residential / commercial / recreational)	Md	Li	M
	Leaching and permeation through soil profile.	Groundwater: Underlying Secondary A, B and Undifferentiated Aquifers	Md	UI	L
	Vertical and lateral migration of contaminants.		Md	UI	L
	Surface run-off.	Many Unnamed watercourses / features on-site	Md	UI	L
	Direct contact.	Water utility pipes	Md	UI	L
		Buried structures / foundations.	Mi	Li	M/L
Off-site sources: Historical Landfill Made Ground (associated with infilled ponds)	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane).	Future site users (residential / commercial / recreational)	Sv	L	M
	Lateral migration of contaminated groundwater.	Groundwater: Underlying Secondary A, B and Undifferentiated Aquifers	Md	UI	L

## 5. PHASE II ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION

- 5.1 Intrusive ground investigation works were undertaken between 14<sup>th</sup> August and 25<sup>th</sup> August 2023 and comprised the following works:
- Clearance of investigation locations by a specialist buried services tracing company;
  - Collection of coordinates and elevations of exploratory hole locations;
  - Advancement of twelve boreholes by dynamic sampling drilling techniques, to a maximum depth of 5.45m bgl with completion of SPTs and installations of gas and groundwater monitoring wells;
  - The advancement of thirty-three machine excavated trial pits to a maximum depth of 3.00m bgl;
  - Collection of environmental soil and groundwater water samples for chemical analysis at a UKAS and MCERTS accredited laboratory;
  - Collection of bulk and disturbed soil samples for geotechnical analysis at a UKAS accredited laboratory; and
  - Six post investigation ground gas and groundwater level monitoring visits.
- 5.2 An exploratory hole location plan is presented as **Drawing 1**. BWB exploratory hole records are presented as **Appendix 1**, the SPT calibration certificate is presented in **Appendix 2**, and the post investigation gas and groundwater monitoring data is presented as **Appendix 3**.
- 5.3 The site investigation works were carried out in general accordance with BS5930:2015 'Code of Practice for Site Investigations' and BS10175:2011 'Investigation of Potentially Contaminated Sites'.

### Chemical Sampling and Analytical Strategy

#### Soil Strategy

- 5.4 Limited potential sources of contamination have been identified through the Phase 1 Geo-Environmental assessment, therefore locations were positioned to provide spatial coverage.
- 5.5 Selected soil samples collected from exploratory hole locations were sent to i2 Analytical Ltd (UKAS and MCERTS accredited) for chemical analysis. The following chemical analytical testing was undertaken:
- Twenty-seven soil samples tested for a soil suite (BWB Standard Suite) comprising arsenic, barium, beryllium, water soluble boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), total phenols, total cyanide, free cyanide, complex cyanide, fraction of organic carbon, pH, Polycyclic Aromatic Hydrocarbons (PAHs) (United States Environment Protection Agency priority 16 compounds) and Total Petroleum Hydrocarbons (TPH) C6-C40;

- Nine soil samples for asbestos screening;
- Six soil samples for pesticides and herbicides; and
- Eight soil samples tested for a suite of common leachable contaminants, namely arsenic, barium, beryllium, water soluble boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), sulphate, total cyanide and pH.

5.6 The results of the soil chemical testing are presented as **Appendix 4**.

#### Groundwater Strategy

5.7 Groundwater samples were obtained using a bailer, following the removal of 3 times the well volume of water or the well bailed dry and was allowed to recharge. The groundwater samples were sent to i2 Analytical Ltd (UKAS and MCERTS accredited) for the following suite of groundwater chemical testing:

- Three water samples tested for arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, conductivity, soluble sulphate, ammoniacal nitrogen, total phenols, total cyanide, pH, total organic carbon, PAHs (US EPA priority 16 compounds);
- Three water samples for a natural attenuation suite; and
- Three water samples tested for a pesticide suite.

5.8 The results of the water chemical testing are presented as **Appendix 5**.

#### **Geotechnical Strategy**

5.9 The half of the dynamic sampling borehole locations were positioned beneath the Proposed Development area to the north, to assess underlying ground conditions for geotechnical purposes. The other half of the boreholes and all trial pit locations were positioned to assess ground conditions, strength properties and characteristics across the wider Site.

5.10 In-situ soil strength testing comprising SPTs were undertaken with the cable percussive. SPT 'N' values are included on the exploratory hole logs presented as **Appendix 1**.

5.11 Selected disturbed and bulk samples were collected from the investigation locations and sent to the geotechnical project laboratory (Professional Soils Laboratories Ltd), which is UKAS accredited. The following geotechnical testing was undertaken;

- Twenty-eight samples tested for moisture content;
- Twelve samples tested for Atterberg (liquid and plastic) limits;
- Eight samples tested for particle size distribution by pipette;
- Nine samples tested for particle size distribution by wet sieve;
- Eight samples tested for a BRE Suite comprising aqueous sulphate and pH;
- Four 2.5kg compaction tests;
- Five 4.5kg compaction tests; and

- Nine particle density tests.

5.12 The results of the geotechnical testing are included as **Appendix 6**.

### **Limitations and Uncertainty**

5.13 The targeted termination depth was not met in several borehole locations due to possible blowing sand deposits, causing challenging ground conditions for drilling.

5.14 Several trial pits were terminated before reaching target depth due to instability of the side walls.

5.15 During the subsequent gas and groundwater monitoring visits, it was noted that borehole locations BH12, BH13 and BH22, were obscured or had been damaged by farming practices. BH22 was monitored on one visit, with BH12 and BH13 not monitored on any of the six visits.

## 6. GROUND CONDITIONS ENCOUNTERED

### Geological Summary

- 6.1 The ground conditions recorded confirmed the published geology discussed in the Phase 1 report, comprising varying depths of Topsoil overlying Warp Deposits, in turn overlying the Sutton Sand Formation. Neither the Alluvium nor Mercia Mudstone bedrock was encountered within any intrusive locations.
- 6.2 Made Ground was encountered in one location in the north of the Site.
- 6.3 Peat deposits were encountered in seven trial pit locations across the Site and sporadically throughout the boreholes.
- 6.4 The recorded ground conditions are summarised in **Table 6:1** below.

**Table 6:1: Summary of Ground Conditions**

Stratum	Top Depth (m)		Base Depth (m)		Thickness (m)		SPT N Value	
	Min	Max	Min	Max	Min	Max	Min	Max
Topsoil	Ground Level		0.10	0.60	0.10	0.60	-	-
Made Ground	0.80		1.00		0.20		-	
Warp Deposits	Ground Level	0.60	0.80	1.80	0.30	1.50	5	
Peat Deposits	0.60	4.40	1.00	4.60	0.05	0.70	10	11
Sutton Sand Formation	Ground Level	4.60	Not Proven		Not Proven		3	37

### Geological Descriptions

#### Topsoil

- 6.5 Topsoil was encountered consistently across the Site at thicknesses of between 0.30m and 0.60m. The composition also displayed consistency, typically comprising a dark brown slightly clayey silty sand, or a firm brown slightly sandy clay. Moderate rootlet content was recorded within the borehole locations.
- 6.6 The depth of topsoil over the Site may vary from that encountered at the locations investigated within the scope of this investigation which may result in inaccurate estimations of topsoil quantities on the Site.

#### Made Ground

- 6.7 Made Ground was encountered at BH14 beneath Topsoil, at a depth from 0.80m to 1.00m bgl. It was recorded as a brown, slightly gravelly fine to coarse sand. Gravel inclusions were recorded as subangular to subrounded fine to coarse brick.
- 6.8 No SPTs were completed in the Made Ground given the limited depth and single location encountered.

### Warp Deposits

- 6.9 Warp Deposits were encountered within the majority of intrusive locations. The base of the Warp Deposits was proven in all locations in which it was recorded.
- 6.10 Deposits varied in composition and were typically encountered as a soft to firm, brown slightly sandy clay, a brown clayey sandy silt or an orangish brown, clayey, occasionally silty, fine to medium sand.

### Peat Deposits

- 6.11 Peat deposits were encountered sporadically across the Site, within the boreholes and within some trial pit locations. Deposits were described as either a spongy black fibrous peat, a plastic dark brown fibrous peat or a plastic black amorphous peat.

### Sutton Sand Formation

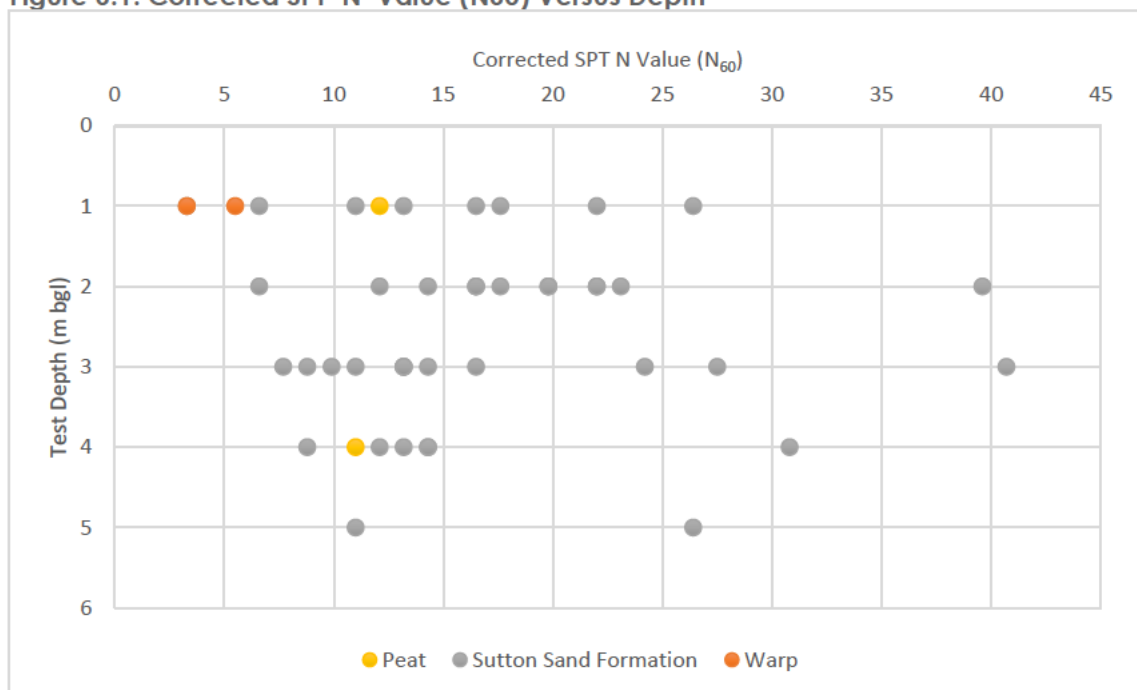
- 6.12 The Sutton Sand Formation was encountered within all intrusive locations across the Site, with deposits varying in colour and typically described as a fine to medium sand.

## **In Situ Testing**

### Standard Penetration Testing

- 6.13 SPTs were undertaken at regular depth intervals in the boreholes. A plot of corrected SPT 'N' Values versus depth is summarised in **Figure 6:1** below.

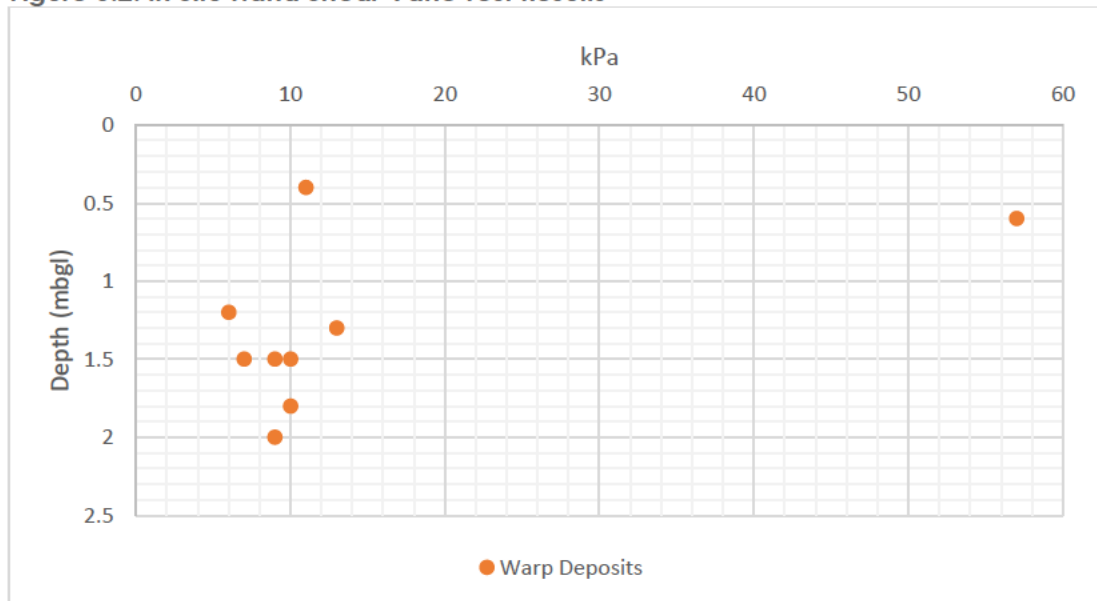
**Figure 6:1: Corrected SPT 'N' Value (N<sub>60</sub>) Versus Depth**



### Hand Shear Vane Testing

6.14 Where suitable cohesive deposits were encountered hand shear vane (HSV) tests were undertaken. The tests comprised three tests with the average taken as the peak results and presented as a graph below as **Figure 6:2**. The HSV results obtained at trial pits are presented on the exploratory hole records presented in **Appendix 1**.

**Figure 6:2: In Situ Hand Shear Vane Test Results**



### **Geotechnical Parameters**

#### Site Wide Conditions

6.15 The geotechnical properties of the soils encountered at the Site as determined through laboratory geotechnical testing are presented below in **Table 6:2** and **Table 6:3**.

**Table 6:2: Geotechnical Test Result Summary**

Parameter	Test Result				
	Topsoil	Made Ground	Peat	Warp Deposits	Suffon Sand Formation
Moisture Content (%)	15	-	74 - 419	18 – 126	12 – 60
Plasticity Index (%)	-	-	NP* - 226	34 – 43	37 and 47
Optimum Moisture Content (%) (2.5kg)	-	-	-	-	12 – 25
Maximum Dry Density (Mg/m <sup>3</sup> ) (2.5kg)	-	-	-	-	1.51 – 1.81
Optimum Moisture Content (%) (4.5kg)	-	-	-	21 – 26	-

Parameter	Test Result				
	Topsoil	Made Ground	Peat	Warp Deposits	Sutton Sand Formation
Maximum Dry Density (Mg/m <sup>3</sup> ) (4.5kg)	-	-	-	1.55 – 1.67	-
Particle Density (Mg/m <sup>3</sup> )	-	-	-	2.63 – 2.69	2.41 – 2.66
Total Organic Carbon (%)	0.7 – 3.1	0.8 – 1.9	1.1	0.3 – 1.7	0.4 – 4.3
*NP = Non-Plastic					

**Table 6:3: PSD Results Summary**

Stratum	Location	Depth (m bgl)	Cobble Content (%)	Gravel Content (%)	Sand Content (%)	Clay/ Silt Content (%)	Earthworks Classification
Warp	TP06	0.50 – 1.00	0	0	13	87	2A/2B
Warp	TP08	0.70 – 1.20	0	0	17	83	2A/2B
Warp	TP17	0.40 – 0.90	0	0	13	87	2A/2B
Sutton	TP18	0.50 – 1.00	0	0	46	54	2B/2C
Warp	TP19	1.10 – 1.30	0	0	19	81	2A/2B
Sutton	TP20	0.70 – 1.20	0	1	12	87	2A/2B
Sutton	TP22	1.50 – 2.00	0	0	93	7	1B
Sutton	TP25	1.00 – 1.50	0	0	97	3	1B
Sutton	TP28	1.00 – 1.35	0	7	83	10	1B
Sutton	TP40	1.00 – 1.50	0	0	98	2	1B
Sutton	TP42	1.40 – 1.80	0	0	16	84	2A/2B
Sutton	TP42	2.00 – 2.50	0	0	96	4	1B
Sutton	TP44	1.00 – 1.50	0	0	98	2	1B
Sutton	TP46	1.70 – 2.20	0	0	95	5	1B
Sutton	TP47	0.50 – 1.00	0	0	2	98	2A/2B
Warp	TP50	1.20 – 1.50	0	0	9	91	2A/2B
Warp	TP51	0.40 – 0.80	0	0	6	94	2A/2B

6.16 Atterberg charts for the samples tested are included within the geotechnical results presented as **Appendix 6**.

## Hydrogeology

- 6.17 Water strikes and seepages were recorded during the ground investigation. Details of which are summarised below in **Table 6:4**.

**Table 6:4: Water Strikes**

Location	Depth (m bgl)	Stratum
BH05	1.50	Sutton Sand Formation
BH14	2.00	Sutton Sand Formation
BH23	2.30	Sutton Sand Formation
BH24	1.60	Sutton Sand Formation
TP04	2.50	Sutton Sand Formation
TP05	2.10	Sutton Sand Formation
TP06	2.10	Sutton Sand Formation
TP08	2.70	Sutton Sand Formation
TP09	2.00	Sutton Sand Formation
TP10	2.00	Sutton Sand Formation
TP11	2.20	Sutton Sand Formation
TP17	2.10	Sutton Sand Formation
TP18	2.10	Sutton Sand Formation
TP38	2.00	Sutton Sand Formation
TP39	1.60	Sutton Sand Formation
TP42	2.60	Sutton Sand Formation

- 6.18 During the subsequent monitoring, groundwater was present in all boreholes monitored, with groundwater levels ranging between 0.94m and 1.62m.
- 6.19 An inferred groundwater flow direction has been derived based on the groundwater monitoring data (**Drawing 2**). Groundwater flow is broadly indicated to be in a westerly direction.

## Hydrology

- 6.20 A hydrological assessment did not form part of this investigation.

## Contamination Observations

- 6.21 Organic odours were noted in several borehole locations as recorded on the exploratory hole logs.
- 6.22 No visual contamination observations were noted during the intrusive works, groundwater sampling visits or subsequent gas and groundwater monitoring visits.

## **7. GEOTECHNICAL ASSESSMENT**

### **Introduction**

- 7.1 The Proposed Development is anticipated to comprise a residential development with a commercial 'local centre' and associated infrastructure in the northern parcel of land.
- 7.2 No detailed structural loading requirements were available at the time of writing this report.
- 7.3 The ground conditions recorded confirmed the published geology discussed in the Phase 1 report, comprising varying depths of Topsoil overlying Warp Deposits, in turn overlying the Sutton Sand Formation. Neither the Alluvium nor Mercia Mudstone bedrock was encountered within any intrusive locations.
- 7.4 Peat deposits were encountered sporadically across the Site.
- 7.5 During the subsequent monitoring, groundwater was present in all boreholes monitored, with groundwater levels ranging between 0.94m and 1.62m.

### **Earthworks**

- 7.6 It is understood that levels will need to be raised across the Site for flood mitigation purposes as well as to form suitable platforms for construction.
- 7.7 Earthworks will need to be undertaken in accordance with a suitable specification document, which will need to be prepared to assess the materials and their requirements including placement and acceptability limits.
- 7.8 It is not currently anticipated that contaminated soils will be encountered within site earthworks, but this will need to be monitored during construction.
- 7.9 The suitability of cut soils for possible reuse of earthworks materials has been assessed on the basis of the testing carried out as part of this investigation, however it should be noted that levels across the whole Site are likely to be raised. From the available data, near-surface soils are indicated to be predominantly cohesive and have been initially assessed as Class 2 (2A/2B, locally 2C) General Cohesive Fill materials with some Class 1B Uniformly Graded Granular material in accordance with the Specification for Highways Works. The Warp Deposits are generally classified as Class 2 whilst the Sutton Sands are typically Class 1.
- 7.10 High moisture content results from samples of peat, are recorded between 74% and 419%. Peat is classified as unsuitable material for earthworks and should not be used to form the development platform.
- 7.11 The materials encountered on-site during earthworks may vary from those sampled and presented herein; furthermore, inclement weather or winter working may result in materials being unsuitable for incorporation within the works without modification by lime, cement or other methods. In particular, cohesive soils are very susceptible to 'wet

weather working' and it is recommended that consideration be given to lime and / or cement stabilisation of these materials if any earthworks are undertaken during inclement weather or the winter period. Sulphate levels have been recorded as elevated within site soils which may have an impact on soils stabilisation measures and acceptable techniques.

- 7.12 Stockpiled materials often deteriorate due to water infiltration and they may become unsuitable for incorporation within works; further testing and re-assessment should be undertaken prior to the finalisation and implementation of the earthworks design.

## **Foundation Solutions**

### Simple Foundations Strip or Pads

- 7.13 The soft and organic soils encountered during the investigation (Peat, Warp), together with shallow groundwater levels beneath the Site indicate that shallow strip or pad foundations are unlikely to be suitable for the Proposed Development.
- 7.14 The highly compressible nature of these deposits results in a risk of excessive and unpredictable total and differential settlements.
- 7.15 If shallow foundations are adopted ground improvement is likely to be required.

### Piled Foundations

- 7.16 A piled foundation solution could be adopted for the Proposed Development but consideration should also be given to limiting settlements in the surrounding areas of infrastructure. A specialist piling contractor should be consulted to further assess the most economical and suitable piling solution.

## **Floor Slabs**

- 7.17 The nature of the soft deposits means that load bearing slabs are unlikely to be viable and suspended slabs or reinforcement will be required. It is likely that warranty providers will require enhanced foundations even where a surcharging strategy is adopted, and so slabs could form part of a semi raft or similar foundation design.

## **Surcharging**

- 7.18 Surcharging the Site by subjecting compressible strata to a load greater than the Proposed Development is considered to be a feasible method of improving the ground. This could enable shallow foundations to be adopted for the Proposed Development, though it is likely that enhanced foundations will be required and simple lightly reinforced strip foundations are unlikely to be accepted by a warranty provider. The surcharging would be in addition to raising of the site levels as a requirement to mitigate against flood risk.

- 7.19 It is unlikely that a RI/CMC solution would be viable, due to the depth and presence of organic soils, and would have potential implications on the ground gas regime and any gas protection requirements.
- 7.20 Should a surcharging solution be adopted, further ground investigation would be required, to determine the full thickness of the superficial deposits as well as its characteristics to enable detailed design.

### **Roads and Pavements**

- 7.21 Minimum design CBR values for pavement foundations will need to be confirmed by further testing but modification of these formation soils (e.g. by lime or cement) or the use of geogrids is likely to be required to achieve the minimum design CBR value. An improved CBR of minimum 5% may be possible in modified formation soils.
- 7.22 Some form of treatment is likely to be required for infrastructure works, whether that be surcharging or alternatives to promote settlement and mitigate against long term deformations.
- 7.23 The design of chemical modification to provide a suitable thickness of subgrade should take account of potentially elevated organic matter content and high-water contents in the underlying soils. Ground improvement techniques and thickness of improved in situ ground should be designed to limit settlement under pavements after the accommodation of the sub-base, base and surface courses. This should be subject to detailed design.
- 7.24 It is recommended that in-situ CBR tests at formation level should be carried out to confirm the state of the subgrade and finalise the required pavement construction thickness.

### **Drainage**

- 7.25 Due to shallow groundwater levels beneath the Site, soakaway drainage is unlikely to be a suitable option at the Site.
- 7.26 There are no significant contamination considerations in relation to the drainage works utilising on site soils.

### **Excavations**

#### Ease of Excavation

- 7.27 Machine excavations utilising a conventional backhoe machine are anticipated to be suitable for the ground conditions and on-site materials that are likely to be encountered during the earthworks and the construction process.

#### Stability of Excavation

- 7.28 Excavations displayed generally poor stability during the site investigation, in addition excavations may become unstable if left open for any significant periods. Where

personnel entry is required for inspection; excavations should be sufficiently enlarged and an assessment of safe temporary angles should be made. Alternatively, temporary shoring should be provided.

#### Legislation on Personnel Entry to Excavations

- 7.29 It is recommended that no excavations should be entered without appropriate support and a full risk assessment should be completed prior to entry. Mitigation measures to protect from accumulating ground gases should be implemented.

#### **Groundwater**

- 7.30 Groundwater strikes during the ground investigation were recorded between 1.50m and 2.70m bgl. During the subsequent monitoring, groundwater was present in all monitored boreholes, with groundwater levels ranging between 0.94m and 1.62m.
- 7.31 Groundwater is likely to collect in any excavations made across the site and will need to be managed. It is anticipated that standard sump and pumping operations should be sufficient to control water entries to allow temporary works to be completed.

#### **Chemical Attack on Buried Concrete**

- 7.32 Water-soluble sulphate concentrations in soils varied from 10mg/l to 1700mg/l with soil pH values ranging from 5.7 to 8.4.
- 7.33 Total sulphur concentrations ranged from 0.01% to 0.28% and acid soluble sulphate concentrations ranged between 0.01% and 0.28%.
- 7.34 From the testing carried out in this investigation, most soils were found to have a design sulphate class of DS-1, with an ACEC of AC-1 in accordance with the BRE Digest SD1 (2005) and assuming 'mobile' groundwater conditions.
- 7.35 Two samples from BH12 and TP06 were found to have a design sulphate class of DS3, with an ACEC of AC-2, due to high water-soluble sulphate concentrations. This should be considered when assessing the most appropriate type of buried concrete to be used at the site in regard to resisting chemical attack from elevated sulphates.

## 8. GROUND GAS ASSESSMENT

### Introduction

- 8.1 Ground gas assessment has been undertaken to assess the risks associated with ground gases and volatile vapours to new buildings and their occupants. The results obtained have been assessed in line with relevant guidance (notably CIRIA C665).
- 8.2 Based on the desk study and the ground investigation undertaken, the following potential sources of hazardous ground gas have been identified:
- Made Ground;
  - Off-site landfill to the south-east; and
  - Peat and organic rich deposits across the Site.
- 8.3 Based on the potential sources identified, CIRIA C665 guidance indicates that for a site with low-moderate gas generation potential and a high sensitivity development (the proposed residential land use), a typical monitoring programme may comprise 6 visits over a period of 3 months.
- 8.4 BWB have completed the prescribed monitoring programme as set out in CIRIA C665.

### Methodology

- 8.5 The assessment of potential ground gas generation is based on the observation of trends and changes in gas evolution by the direct measurement of ground gases from gas wells. The works included measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and barometric pressure. A PID survey was undertaken to measure volatile organic compounds within the borehole response zones.

### Results

- 8.6 The minimum and maximum steady state concentrations recorded for borehole flow, oxygen, carbon dioxide and methane are summarised below in **Table 8:1**. The full Ground gas monitoring results are presented in **Appendix 3**.

**Table 8:1: Summary of Recorded Ground Gas Results**

Borehole ID	Targeted Geology	Steady Flow (l/hr)		Carbon Dioxide (%v/v)		Methane (%v/v)	
		min.	max.	min.	max.	min.	max.
BH04	Warp/Peat	<0.1	<0.1	3.0	3.5	<0.1	<0.1
BH05	Sutton	<0.1	<0.1	3.1	3.6	<0.1	<0.1
BH06	Sutton	<0.1	<0.1	0.3	0.8	<0.1	<0.1
BH22*	Sutton	<0.1	<0.1	0.8	0.8	<0.1	<0.1
BH23	Sutton	<0.1	<0.1	3.4	3.8	<0.1	<0.1

\*Only monitored on one visit

8.7 The atmospheric pressures were recorded as follows:

- Round 1 – 1014mB during the site visit with regional atmospheric pressures rising from 1010mB over the preceding 12 hours;
- Round 2 – 1014mB during the site visit with regional atmospheric pressures rising from 1013mB over the preceding 12 hours;
- Round 3 – 1017mB during the site visit with regional atmospheric pressures rising from 1011mB over the preceding 12 hours;
- Round 4 – 1023mB during the site visit with regional atmospheric pressures falling from 1025mB over the preceding 12 hours;
- Round 5 – 995mB during the site visit with regional atmospheric pressures falling from 1001mB over the preceding 12 hours;
- Round 6 – 991mB during the site visit with regional atmospheric pressures rising from 990mB over the preceding 12 hours;

8.8 Hydrogen sulphide concentrations were not recorded above the limit of detection of the equipment during the monitoring visits.

8.9 Carbon Monoxide concentrations were recorded at concentrations of up to 21ppm in borehole location BH23 on two visits (24/08/2023 and 12/09/2023).

8.10 PID concentrations were recorded between <0.1ppm (the limit of detection of the equipment) and a maximum of 2.4ppm in borehole location BH23 on 24/08/23.

8.11 Depleted oxygen concentrations were noted within locations BH05 and BH23.

### **Risk Assessment**

8.12 CIRIA Report 665 “Assessing Risks Posed by Hazardous Ground Gases to Buildings” presents current best practice on the assessment of ground gases for commercial and residential buildings (with the exception of low-rise traditional housing). The report presents a risk-based approach based on gas screening values which depend on both the concentration and emission rate of gas from the ground. Gas screening values are calculated as follows:

$$\text{Gas screening value (l/hr)} = \frac{\text{gas concentration (\%)} \times \text{measured borehole flow rate (l/h)}}{100}$$

8.13 Maximum gas screening values of 0.0038 were recorded giving a classification of CS1, which indicates that no gas protection measures are required.

8.14 However, given that only one borehole was monitored as per the prescribed monitoring programme within the northern parcel of land, (where the residential and commercial development is proposed), and due to the organic rich nature of the peat found further north of the borehole location, the gas assessment is not considered to have captured the true gassing scenario to the north.

8.15 Furthermore, it is understood that the Site is likely to be surcharged due to the poor ground conditions and the need to raise site levels out of flood risk zones. The gas regime

---

will need to be re-assessed following surcharging once final development levels are established, with boreholes specifically targeting the proposed area of development.

## 9. HUMAN HEALTH RISK ASSESSMENT

- 9.1 Contamination data have been compared to Land Quality Management Suitable for Use Levels (LQM S4UL) residential end use with homegrown produce. Although a small portion of the development will be classed as commercial use, it is considered appropriate to adopt the more stringent residential screening criteria. The soil chemical laboratory results are presented as **Appendix 4**, with the CLEA screening sheets presented as **Appendix 7**.
- 9.2 The criteria include reference to the LQM CIEH S4ULs for Human Health Risk Assessment Copyright Land Quality Management Limited reproduced with permission; publication number S4UL3271.
- 9.3 The screening criteria have been developed with the following assumptions which have been changed from CLEA default parameter set. Soil type is a sandy loam, with an organic matter content of 2.5%.

### Pathways

- 9.4 The Site is to be developed for residential end use therefore the key receptor is considered to be a female child in the first six years of life. Exposure pathways considered in this assessment are presented in **Table 9:1**.

**Table 9:1: Residual Exposure Pathways**

Source:	Shallow Soils			Deep Soils
Pathway	Residential housing with private gardens	Residential housing with communal landscaped areas	Residential housing with hard standing areas	Residential housing
Ingestion of Soil	✓	✓	✗	✗
Ingestion of site derived household dust	✓	✓	✗	✗
Ingestion of contaminated vegetables	✓	✗	✗	✗
Ingestion of soil attached to vegetables	✓	✗	✗	✗
Dermal contact with Soil	✓	✓	✗	✗
Dermal contact with site derived household dust	✓	✓	✗	✗
Inhalation of fugitive soil dust	✓	✓	✗	✗
Inhalation of fugitive site derived household dust	✓	✓	✗	✗
Inhalation of vapours outside	✓	✓	✓	✓
Inhalation of vapours inside	✓	✓	✓	✓

---

## Sources

- 9.5 There were no exceedances of the screening criteria of any contaminants tested within any of the samples tested.
- 9.6 All pesticide and herbicide concentrations were recorded below the laboratories lowest level of detection.
- 9.7 No asbestos was identified within any soil samples screened.

## 10. CONTROLLED WATERS RISK ASSESSMENT

- 10.1 The results of soil leachate analysis and groundwater sampling are presented as **Appendix 4** and **Appendix 5** respectively.
- 10.2 An error in sample labelling has been noted on the laboratory groundwater results. The sample labelled BH03, should be labelled BH02, which lies outside the red line boundary. No water samples were taken from borehole location BH03.
- 10.3 The controlled waters assessment considers the potential impact of on-site contamination to pertinent controlled waters receptors identified at the Site, including several surface water drainage features on site and Secondary A and B Aquifers on site.
- 10.4 The closest active groundwater abstraction licence is located 698m south of the Site.

### Pathways

- 10.5 Controlled water risk assessment has been undertaken through assessment of leachable concentrations of contaminants in soil referring to exposure pathways considered and referencing **Table 10:1**.

**Table 10:1: Controlled Water Exposure Pathways**

Controlled Waters Exposure Pathway	Receptor
Leaching of soil contamination into recharge infiltration	✓
Vertical migration of impacted pore water through unsaturated zone into underlying aquifer	✓
Horizontal migration of groundwater through aquifer to off site receptors	✓

- 10.6 It is considered appropriate to adopt Environmental Quality Standards (EQS) for freshwater when assessing the risk to the surface water receptors, and the UK Drinking Water Standards (DWS) for assessing the risk to the underlying Aquifers. Where EQS are not available, World Health Organisation Standards (WHO) and UK DWS have been adopted as the relevant screening criteria.

### Soil Leachability

- 10.7 Eight soil samples were analysed for a variety of leachable contaminants. A summary of the soil leachate concentrations and adopted guideline concentrations are presented as **Appendix 8**.
- 10.8 When compared to the UK DWS, one marginal exceedance of Chromium III was recorded at 5.80µg/l against a screening criterion of 4.7µg/l.
- 10.9 When compared to the EQS criteria, marginal exceedances of four heavy metals were identified, summarised in **Table 10:2** below.

**Table 10:2: Controlled Water Exposure Pathways**

Contaminant	Range of Concentrations (µg/l)	Guideline Concentration (µg/l)	Number of Exceedances	Locations
Chromium III	0.60 – 5.80	4.7	1	TP01
Copper	17.00 – 41.00	1	8	All locations tested
Lead	<0.1 – 9.60	1.2	7	BH22, BH23, TP01, TP17, TP22, TP25 and TP50
Zinc	13.00 – 22.00	10.9	8	All locations tested

## Groundwater

- 10.10 Three groundwater samples were retrieved from the monitoring wells installed across the Site. A summary of groundwater concentrations and adopted guideline concentrations are presented within **Appendix 9**.
- 10.11 When compared to the UK DWS, no exceedances were reported.
- 10.12 When compared to the EQS marginal exceedances of Copper, Nickel and Ammonia (NH<sub>3</sub> as N), were identified, summarised in **Table 10:3** below.

**Table 10:3: Controlled Water Exposure Pathways**

Contaminant	Range of Concentrations (µg/l)	Guideline Concentration (µg/l)	Number of Exceedances	Locations
Copper	1.80 – 7.60	1	3	BH04, BH05 and BH23
Nickel	5.90 – 12.00	4	3	BH04, BH05 and BH23
Ammonia (NH <sub>3</sub> as N)	0.06 – 0.62	0.015	2	BH04 and BH05

## Risk Assessment

- 10.13 BWB consider the leachate exceedances to be marginal in relation to the screening criteria. It is considered unlikely that the leachate concentrations from soil samples would migrate towards the underlying aquifers or surface water features at elevated concentrations. Furthermore, the test results relate to samples of natural ground; it is therefore considered that these concentrations are reflective of natural background concentrations in the local area and not a result of contaminative land uses.

- 
- 10.14 Groundwater concentration exceedances of Copper and Nickel are marginal and not considered significant.
- 10.15 Exceedances of the Ammonia screening criteria within groundwater have been recorded in the south of the Site only, within the field adjacent to the historical Scotter Road Landfill site, previously identified as a potential contamination source. The inferred groundwater flow direction has indicated the flow to be in a westerly direction, supporting the theory that the historical landfill may be leaching contaminants into groundwater, then laterally migrating onto site.
- 10.16 No exceedances were found in BH23, located to the north of the off-site landfill.
- 10.17 Further groundwater analysis may be required to further inform the risk to controlled waters within proposed areas of cut soils if surcharging is to be considered.

## **11. ENVIRONMENTAL RISK ASSESSMENT**

### **Introduction**

- 11.1 The preliminary conceptual site model presented as **Table 4:1** has been updated based on the findings of the ground investigation and is presented as **Table 11:1**.

**Table 11:1: Revised Conceptual Site Model**

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
Potential hazardous ground gases	Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane)	Future site users	Sv	Lw	M/L	<p>Ground gas monitoring has given a classification of CS1, which indicates that no gas protection measures are required.</p> <p>However, given that only one borehole was monitored as per the prescribed monitoring programme within the northern parcel of land and due to the organic rich nature of the peat found further north of the borehole location, the gas assessment is not considered to have captured the true gassing scenario to the north.</p> <p>The gas regime will need to be re-assessed following surcharging once final development levels are established, with boreholes specifically targeting the proposed area of development.</p>
Elevated water-soluble sulphate concentrations	Direct Contact	Water Utility Pipes	Mi	Lw	L	<p>Sulphates and low pH in the ground could accelerate the degradation of buried concrete structures (e.g. foundations). The conditions of the soils at the site were found that the majority of soils are classified as to have a design sulphate class of DS-1, with an ACEC of AC-1 in accordance with the BRE Digest SD1. Two samples classified the soils as design sulphate class of DS-3, with an ACEC of AC-2.</p> <p>Further testing is recommended on a plot-by-plot basis to delineate and confirm the most appropriate concrete classification required on site.</p>
		Buried structures/foundations				
Elevated Ammonia in groundwater	Lateral migration of contaminated groundwater	Underlying Aquifers	Mi	Li	M/L	<p>Elevated concentrations of Ammonia have been recorded within groundwater to the south of the site. An off-site historical landfill to the southeast of the site has been identified as a potential source. Further groundwater sampling and analysis may be required in order to further inform the risk to controlled waters, with groundwater monitoring wells targeting the southern boundary of proposed area of development and areas earmarked for surcharging.</p>
<p style="text-align: center;"> <span style="background-color: #ff0000; color: white; padding: 2px;">VH = Very High</span>,  <span style="background-color: #ff6600; color: white; padding: 2px;">H = High</span>,  <span style="background-color: #ff9900; color: white; padding: 2px;">M = Moderate</span>,  <span style="background-color: #ffff00; color: black; padding: 2px;">M/L = Moderate/Low</span>,  <span style="background-color: #008000; color: white; padding: 2px;">L = Low</span>,  <span style="background-color: #90ee90; color: black; padding: 2px;">VL = Very Low</span> </p> <p style="text-align: center;">KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely</p>						

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
<b>Pollutant Linkage Assessment Summary</b> When considered in the context of the conceptual site model and the limited historical activities that have taken place, the Proposed Development is considered to pose a MODERATE/LOW risk to human health and controlled waters.						

## **12. ENVIRONMENT LIABILITY ASSESSMENT / DEVELOPMENT CONSTRAINTS**

### **Statutory Liability**

- 12.1 Based on the information available regarding the Site, the potential for Statutory Authority action based on "*pollution of controlled water*" or "*significant harm*" as defined by Part IIA of the Environmental Protection Act 1990 is considered to be **LOW** based on the lack of contamination identified at the site.

### **Third Party Liability**

- 12.2 The potential for legal action by surrounding landowners based on the potential for contamination to migrate off-site is considered to be low when considering the surrounding commercial land use.

### **Public Relations**

- 12.3 The likelihood of public relations being tarnished due to contamination issues at the Site are considered to be low.

### **Development Implications**

- 12.4 It is recommended that the requirement for earthworks and potential for re-use of or disposal of waste is established at an early stage in the project.
- 12.5 Further ground investigation should be carried out utilising cable percussion boring and cone penetration testing to inform the design of either a piled foundation solution, or ground improvement via surcharging.
- 12.6 The gas regime will need to be re-assessed following surcharging once final development levels are established, with boreholes specifically targeting the proposed area of development, to allow for gas protection measures to be included during the design phase if necessary.

## 13. WASTE MANAGEMENT

### Waste Classification

- 13.1 Soil samples have been characterised against hazardous waste criteria using Hazwasteonline. The results of the waste classification are presented in **Appendix 10**. The assessment indicates that the soils analysed are likely to be classified as non-hazardous. The waste classification assessment only applies to those soils that have been tested. If other soils are to be disposed of off-site then further analysis may be required.
- 13.2 Asbestos has not been found at the Site. The presence of visible asbestos containing materials in waste or at concentrations exceeding 0.1% by weight will classify the waste as mixed and require disposal as hazardous waste irrespective of the chemical properties of the waste.
- 13.3 Should any soils require disposal off-site an assessment of waste classification of the soils for disposal should be made by a competent person. Further chemical analysis may be required to fully characterise waste soils for disposal to landfill or re-use off-site. WAC analysis may be required for disposal of soils as inert or hazardous.

## 14. CONCLUSION AND RECOMMENDATIONS

### Conclusions

- 14.1 The ground conditions comprised varying depths of Topsoil overlying Warp Deposits, in turn overlying the Sutton Sand Formation. Made Ground was encountered in one location in the north of the Site and Peat deposits were encountered in trial pit locations across the Site and sporadically throughout the boreholes.
- 14.2 Neither the Alluvium nor Mercia Mudstone bedrock was encountered within any intrusive locations.
- 14.3 Groundwater strikes during the ground investigation were recorded between 1.50m and 2.70m bgl. During the subsequent monitoring, groundwater was present in all monitored boreholes, with groundwater levels ranging between 0.94m and 1.62m.

### Environmental

- 14.4 Chemical soil analysis has not identified significant contamination, with all soil samples recording contaminant concentrations below the relevant screening criteria. Asbestos has not been identified at the Site.
- 14.5 All pesticide and herbicide concentrations were recorded below the laboratories lowest level of detection.
- 14.6 Marginal leachate exceedances of Chromium III, copper, lead and zinc have been identified. However, it is considered unlikely that the leachate concentrations from soil samples would migrate towards the underlying aquifers or surface water features at elevated concentrations. Furthermore, the test results relate to samples of natural ground; it is therefore considered that these concentrations are reflective of natural background concentrations in the local area and not a result of contaminative land uses.
- 14.7 Groundwater concentration exceedances of Copper and Nickel are marginal and not considered significant.
- 14.8 Exceedances of the Ammonia screening criteria within groundwater have been recorded in the south of the Site, adjacent to the historical Scotter Road Landfill site, previously identified as a contamination source. No exceedances have been identified from one groundwater sample retrieved from the northern area of the Site.
- 14.9 Based on the limited monitoring completed, the results indicate that the Site should be characterised as CS1. However, given that only one borehole was monitored as per the prescribed monitoring programme within the northern parcel of land, (where the residential and commercial development is proposed), and due to the organic rich nature of the peat found further north of the borehole location, the gas assessment is not considered to have captured the true gassing scenario to the north.

### Geotechnical

- 14.10 Earthworks will be necessary to create development plateaus, but no significant issues are evident from the ground investigation in undertaking such works with on-site soils. Soils on-site are a mixture of granular (Class 1) and cohesive (Class 2) materials and may require reductions in moisture content to achieve adequate compaction.
- 14.11 Ground Improvement by Surcharging the Site by subjecting compressible strata to a load greater than the Proposed Development is considered to be a feasible method.
- 14.12 Peat lenses were identified throughout the superficial strata on-site. These are considered unsuitable for use in earthworks.
- 14.13 From the testing carried out in this investigation, most soils were found to have a design sulphate class of DS-1, with an ACEC of AC-1 in accordance with the BRE Digest SD1 (2005) and assuming 'mobile' groundwater conditions. Two samples from BH12 and TP06 were found to have a design sulphate class of DS3, with an ACEC of AC-2, due to high water-soluble sulphate concentrations. This should be considered when assessing the most appropriate type of buried concrete to be used at the site in regard to resisting chemical attack from elevated sulphates.

### **Recommendations**

#### Environmental

- 14.14 Further groundwater analysis may be required to further inform the risk to controlled waters within proposed areas of cut soils if surcharging is to be considered.
- 14.15 The gas regime will need to be re-assessed following surcharging once final development levels are established, with boreholes specifically targeting the proposed area of development, to allow for gas protection measures to be included during the design phase if necessary.

#### Geotechnical

- 14.16 Further ground investigation should be carried out utilising cable percussion boring and cone penetration testing to inform the design of either a piled foundation solution, or ground improvement via surcharging.
- 14.17 A surcharging strategy will need to be developed if this option is proposed for development.
- 14.18 BWB recommends a detailed Geotechnical Assessment Report is carried out following the further ground investigation once the preferred foundation option solution(s) and design details are confirmed.

## 15. REFERENCES

1. British Standards Institution, (BSI), BS 8485:2015+A1:2019, Code of Practice for the characterization and remediation from ground gas in affected developments
2. British Standards Institution, (BSI), BS 8576:2013, Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)
3. British Standards Institution, (BSI), BS 10175:2011+A2:2017, Investigation of Contaminated Sites – Code of Practice
4. British Standards Institution, (BSI), BS5930:2015+A1:2020 Code of practice for ground investigations
5. British Standards Institution, (BSI), BS EN 1997-1:2004+A1:2013, Incorporating corrigendum February 2009, Eurocode 7 – Geotechnical Design – Part 1: General rules.
6. British Standards Institution, (BSI), BS EN 1997-2:2007 Incorporating corrigendum June 2010, Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and testing.
7. Building Research Establishment Special Digest 1 *Third Edition*. Concrete in Aggressive Ground (2005)
8. Building Research Establishment (BRE) BR211, Radon; Guidance on Protective Measures for New Buildings (2015)
9. Construction Industry Research and Information Association (CIRIA), Report 132, A Guide to Safe working on Contaminated Sites (1996).
10. Construction Industry Research and Information Association (CIRIA). 2001, C522 Contaminated land risk assessment, A guide to good practice.
11. Construction Industry Research and Information Association (CIRIA). 2007, Report C665, Assessing Risk Posed by on Hazardous Ground Gases to Buildings
12. Department for Communities and Local Government (DCLG), 2012, National Planning Policy Framework.
13. Department for Environment Food and Rural Affairs (DEFRA), 2012, Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.
14. Environment Agency report Land Contamination Risk Management, 2020.
15. Environment Agency 2008, Updated technical background to the CLEA model Science Report – SC050021/SR3
16. Environment Agency 2008, Human health toxicological assessment of contaminants in soil Science Report – SC050021/SR2
17. Environment Agency 2009, CLEA Software (Version 1.05) Handbook Better Regulation Science Programme Science report: SC050021/SR4
18. Environment Agency 2008, A review of body weight and height data used within the Contaminated Land Exposure Assessment model (CLEA) Project SC050021/ Technical Review 1

19. Environment Agency, 2006, Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination
20. Health and Safety Executive (HSE) 'Protection of workers and the general public during the Development of Contaminated Land (1991).
21. NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66: 2008.

***DRAWINGS***

---

**Drawing 1: Exploratory Hole Location Plan**

---



- Notes**
1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
  2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  4. Any discrepancies noted on site are to be reported to the engineer immediately.

**Key Plan**

- Legend**
- Site Boundary
  - TP\*\* Denotes Location of Trial Pit
  - BH\*\* Denotes Location of Borehole

Rev	Date	Details of issue / revision	Drw	Rev
P02	10.12.24	Revised to Final	RT	ZT
P01	04.12.24	First Issue	RT	ZT

**Issues & Revisions**

**BWB** Birmingham | 0121 233 3322  
Leeds | 0113 233 8000  
London | 020 7234 9122  
Manchester | 0161 233 4280  
Nottingham | 0115 924 1100  
www.bwbconsulting.com

Client  
**Hargreaves Land Ltd**

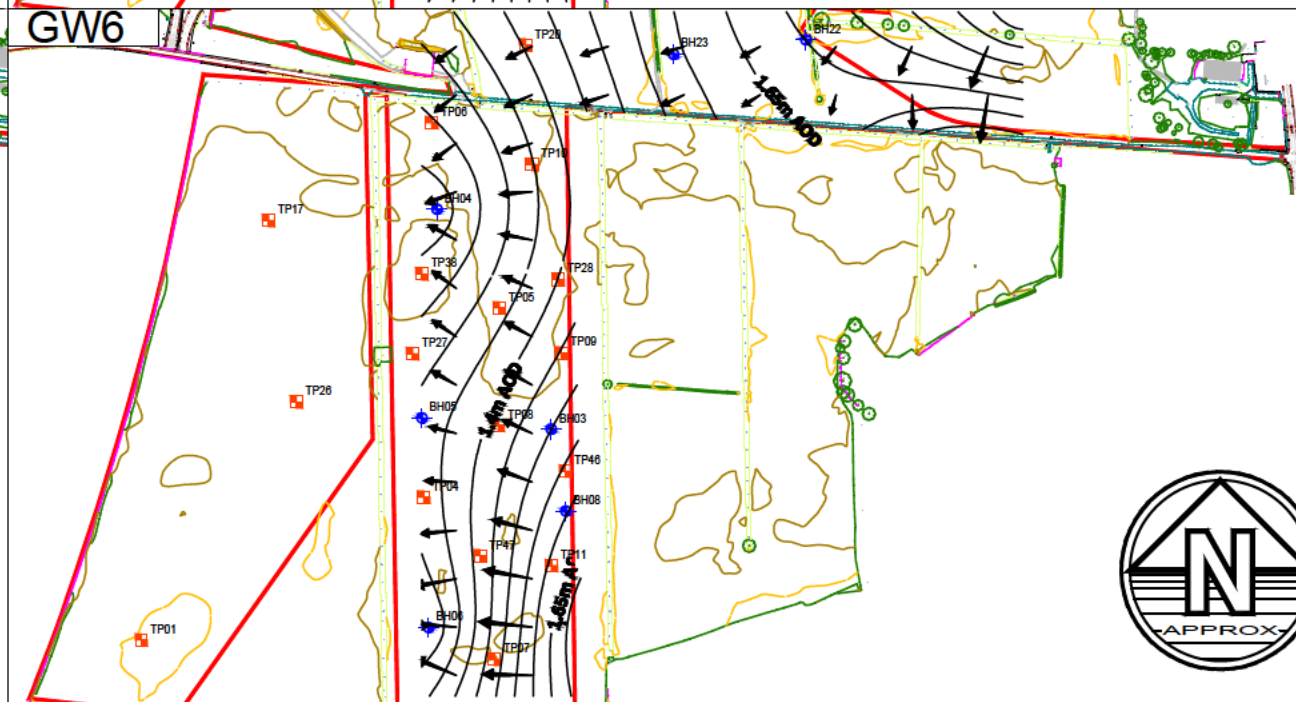
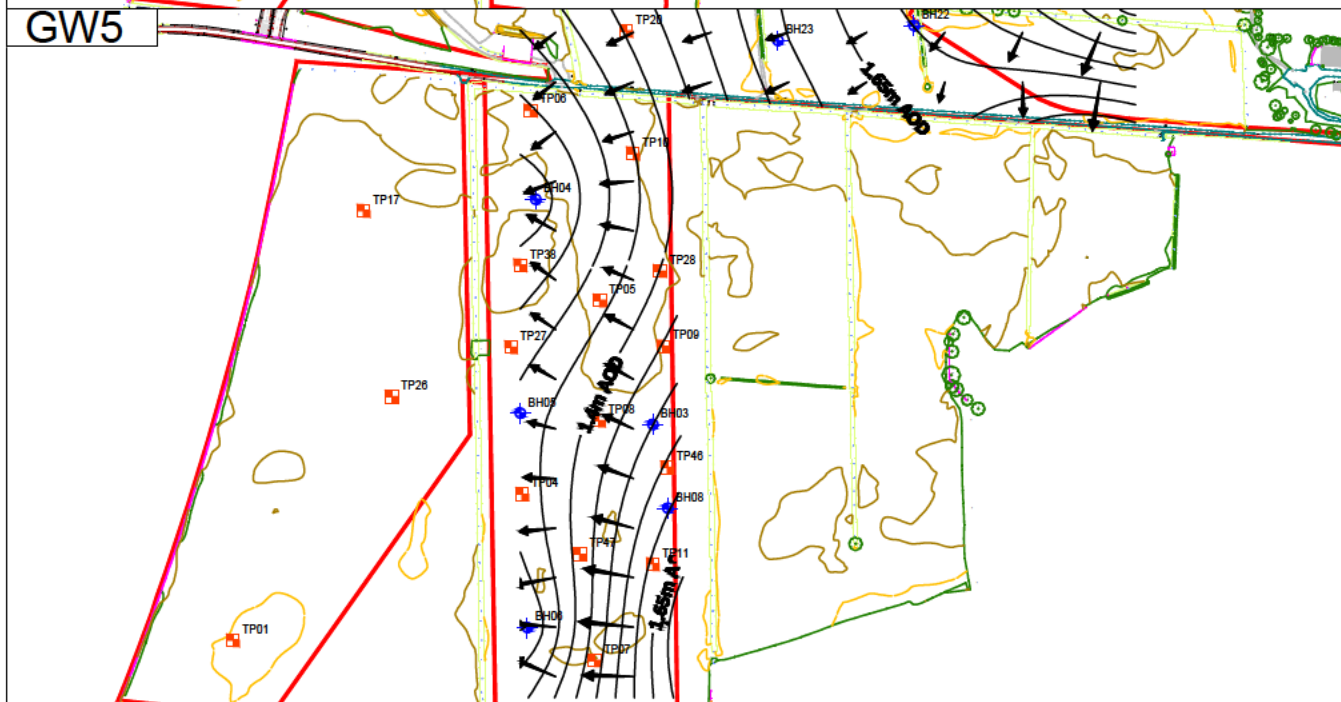
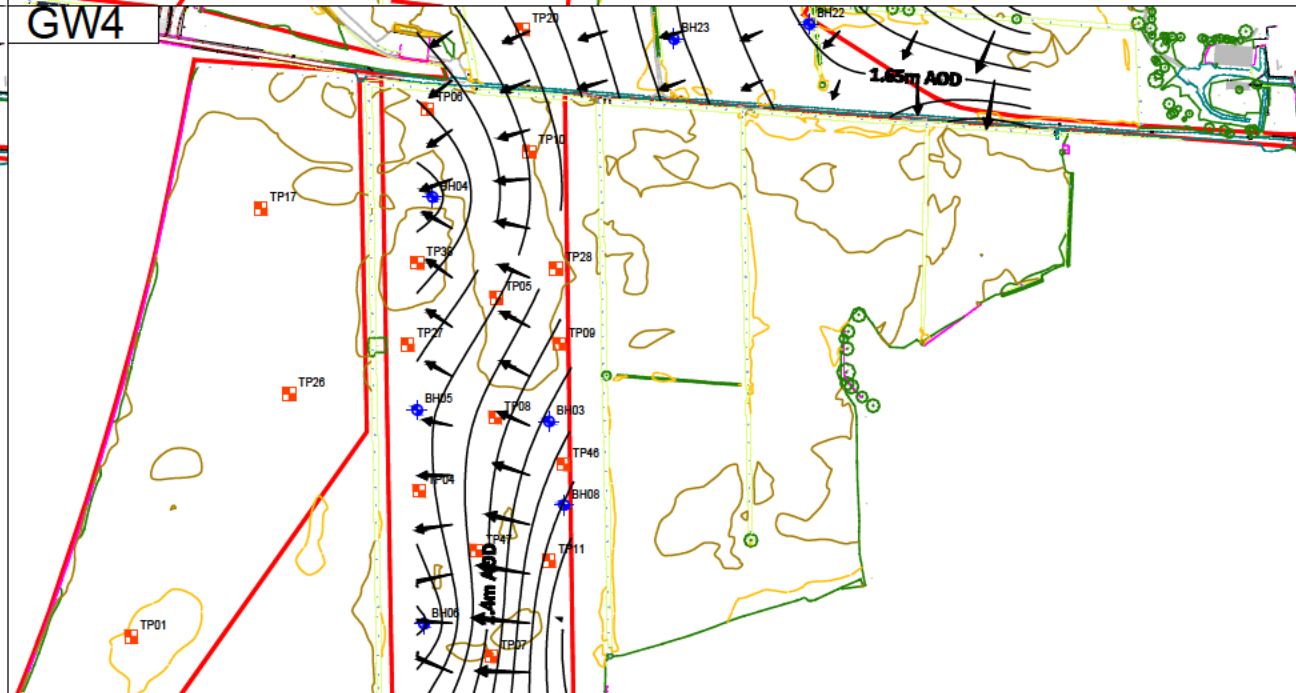
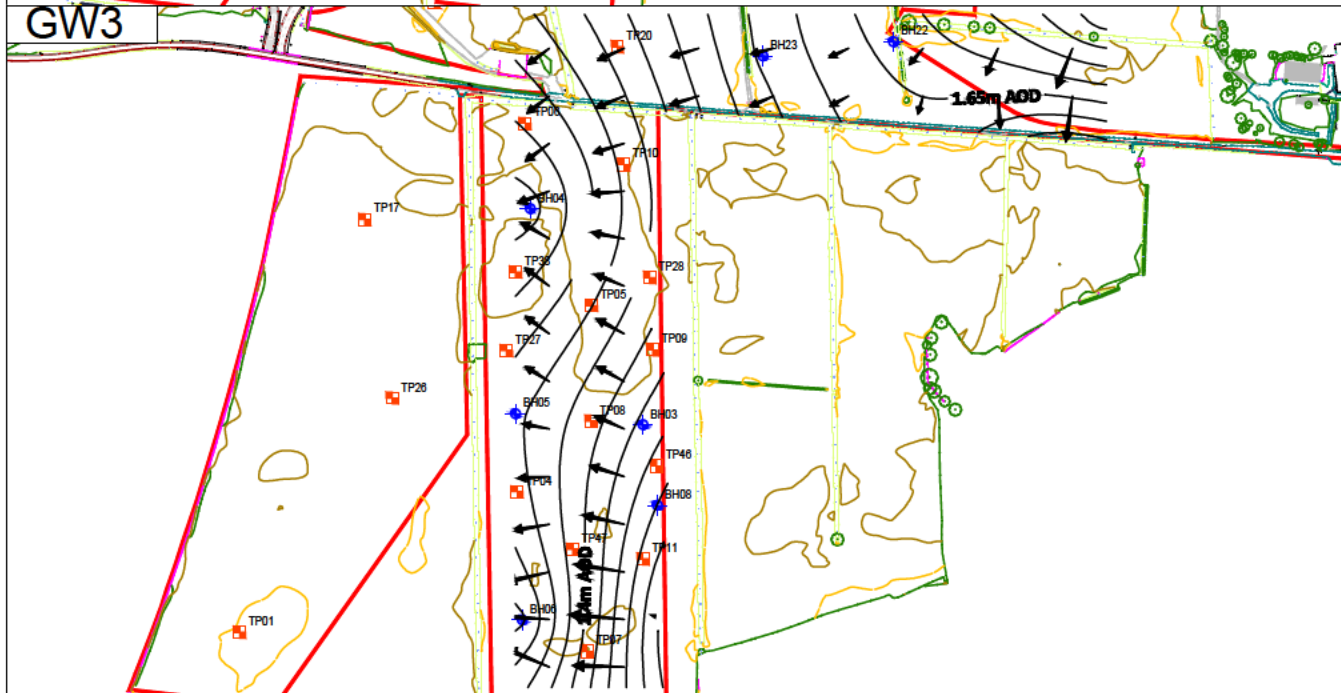
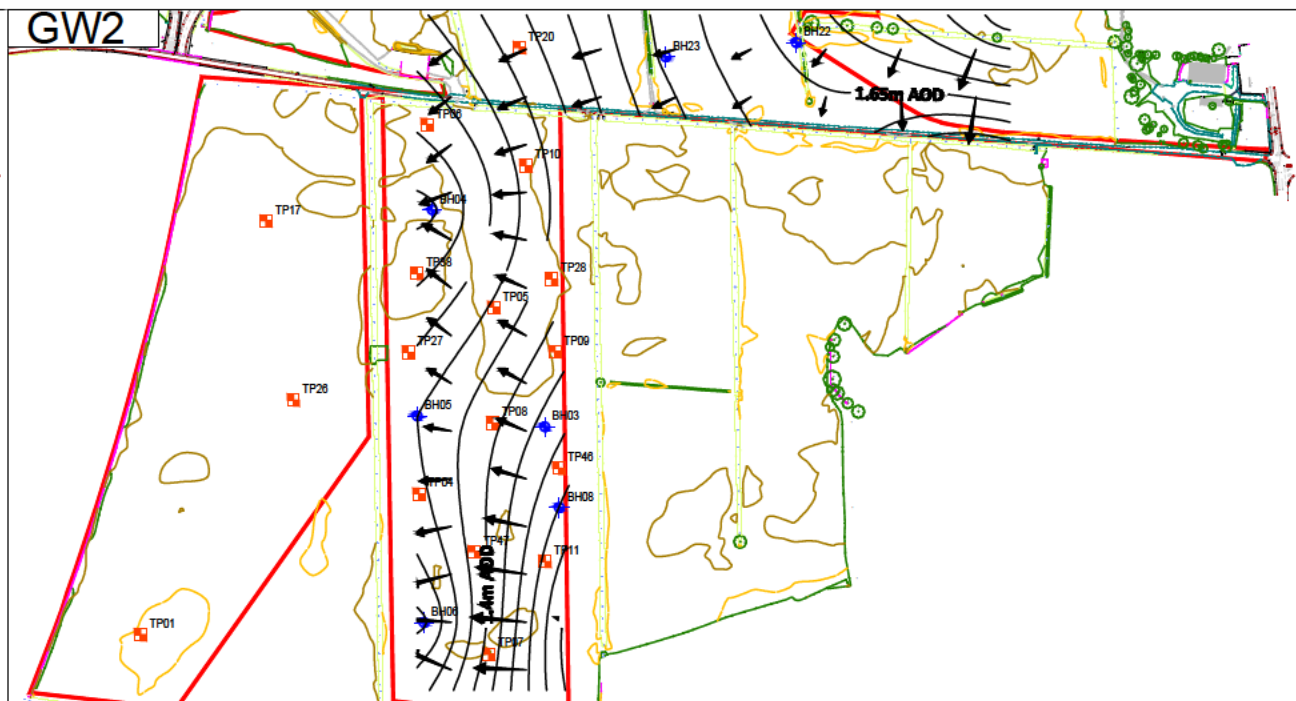
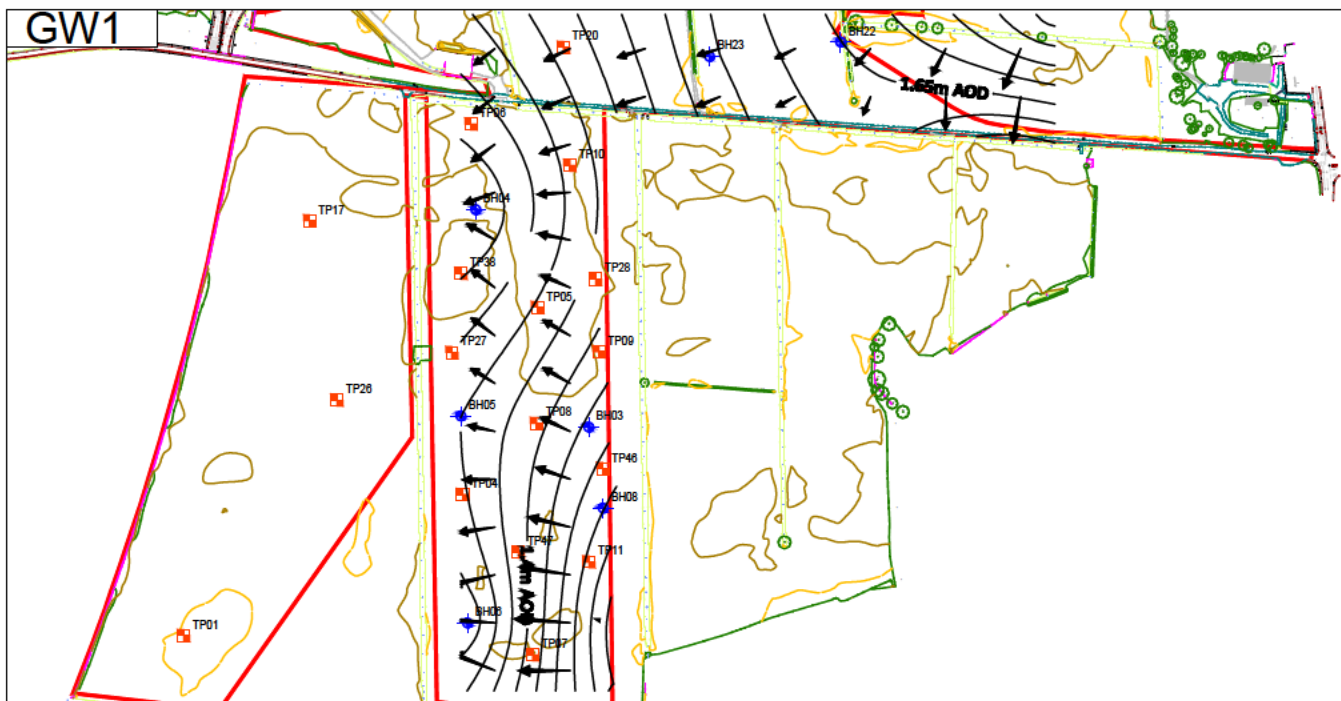
Project Title  
**Lincolnshire Lakes**

Drawing Title  
**Exploratory Hole Location Plan**

Drawn: R. Theobalds	Reviewed: Z. Tait
BWB Ref: 221638	Date: 04.12.24
Scale: A3	NTS
<b>Drawing Status</b>	
<b>FINAL</b>	
Project - Originator - Zone - Level - Type - Role - Number	Status Rev
221638-BWB-XX-XX-DR-GI-0001	S2 P02

**Drawing 2: Inferred Groundwater Flow**

---



- Notes**
1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
  2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  4. Any discrepancies noted on site are to be reported to the engineer immediately.

**Key Plan**

**Legend**

- Site Boundary
- TP\*\* Denotes Location of Trial Pit
- ⊕ BH\*\* Denotes Location of Borehole

Rev	Date	Details of Issue / revision	Drw	Rev
P02	10.12.24	EHLP Revised to show Ground Water levels	RT	ZT
P01	04.12.24	First Issue	RT	ZT

**Issues & Revisions**

- Birmingham | 0121 233 3322
- Leeds | 0113 233 8000
- London | 020 7234 9122
- Manchester | 0161 233 4280
- Nottingham | 0115 924 1100
- [www.bwbconsulting.com](http://www.bwbconsulting.com)

Client  
**Hargreaves Land Ltd**

Project Title  
**Lincolnshire Lakes**

Drawing Title  
**Exploratory Hole Location Plan**

Drawn:	R. Theobalds	Reviewed:	Z. Tait
BWB Ref:	221638	Date:	04.12.24
Scale:	A3: NTS		

Drawing Status  
**FINAL**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
221638-BWB-XX-XX-DR-GI-0002	S2	P02



**APPENDICES**

---

**Appendix 1: BWB Exploratory Hole Logs**

---


# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH03</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.69		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486531.50		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409171.30		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 23/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)	
		0.30 [0.30]	Crops over firm dark brown sandy CLAY with moderate rootlet content. (Topsoil)		0.30	ES	0.40						
		2.39 [0.70]	Light brown thinly laminated sandy SILT. (Warp)		1.00	ES	0.90						
		1.69 [0.50]	Soft brown slightly sandy CLAY (Warp)		1.50	D	1.20						
		1.19 [1.95]	Grey fine to coarse SAND. (Sutton Sand Formation)		1.50				SPT	2.00	N=18 (3,3/3,5,5,5)	2.00m (NR)	
										3.00	N=7 (1,0/1,0,3,3)	3.00m (NR)	
		-0.76	Hole Terminated at 3.45m bgl.										

<table border="1"> <tr> <th colspan="3">Chiselling</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Time (hh:mm)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Chiselling			From (m bgl)	To (m bgl)	Time (hh:mm)				<b>Remarks</b>  <b>Reason for Termination:</b> Terminated due to blowing sands.  <b>Groundwater Remarks:</b> No groundwater encountered.  <b>Other Remarks:</b> Location cleared of buried services. Backfilled with arisings upon completion
Chiselling												
From (m bgl)	To (m bgl)	Time (hh:mm)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										
												

# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH04</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.47		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486413.61		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409397.81		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 24/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata			Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (Below)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.20 2.27 [1.10]	Crops over firm brown sandy CLAY with moderate rootlet content. (Topsoil)		0.20	ES	0.50					
		1.17 [0.60]	Light brown thinly laminated sandy SILT. (Warp)		1.30				SPT	1.00	N=5 (1,2/1,2,1,1)	1.00m (NR)
		0.57 [1.55]	Plastic dark brown fibrous PEAT. (Peat)		1.90	ES	1.50					
			Grey fine to coarse SAND. (Sutton Sand Formation)		1.90				SPT	2.00	N=15 (2,3/3,4,4,4)	2.00m (NR)
										3.00	N=25 (2,2/3,6,8,8)	3.00m (NR)
		-0.98	Hole Terminated at 3.45m bgl.		3.45							

<table border="1"> <tr> <th colspan="3">Chiseling</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Time (hh:mm)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Chiseling			From (m bgl)	To (m bgl)	Time (hh:mm)				<b>Remarks</b>  <b>Reason for Termination:</b> Terminated due to blowing sands.  <b>Groundwater Remarks:</b> No groundwater encountered.  <b>Other Remarks:</b> Location cleared of buried services. Installed with monitoring standpipe upon completion.
Chiseling												
From (m bgl)	To (m bgl)	Time (hh:mm)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH05</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.62
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486398.14
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409182.78
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 23/08/2023
		<b>Engineer:</b> TF
		<b>Checker:</b> MH

Boring		Strata			Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (Below)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.10 [0.50] 2.52 [0.70]	Firm brown sandy CLAY (Topsoil)		0.10	ES	0.20					
		2.12 [0.90]	Crops over firm brown sandy CLAY with moderate rootlet content. (Topsoil)		0.50							
		1.82 [0.20]	Light grey slightly clayey fine to coarse SAND. (Sutton Sand Formation)		0.80				SPT	1.00	N=3 (1,0/0,1,1,1)	1.00m (NR)
		1.62 [2.00]	Light brown thinly laminated sandy SILT. (Warp)		1.00							
		1.22 [0.10] 1.12 [1.98]	Brown fine to medium SAND. (Sutton Sand Formation)		1.40							
			Light brown fine to coarse SAND. (Sutton Sand Formation)		1.50	ES	2.00		SPT	2.00	N=6 (1,1/1,2,1,2)	2.00m (NR)
			Moderate plant material content and organic odour.									
			Plastic black amorphous PEAT. (Peat)									
			Grey fine to coarse SAND. (Sutton Sand Formation)						SPT	3.00	N=15 (2,3/3,4,4,4)	3.00m (NR)
			Moderate plant material content and organic odour.									
		-0.38										
		-0.63	Hole Terminated at 3.45m bgl.		3.45							

Chiseling			Remarks
From (m bgl)	To (m bgl)	Time (hh:mm)	
			<b>Reason for Termination:</b> Terminated due to blowing sands.
<b>Water Added</b>			<b>Groundwater Remarks:</b> Groundwater at 1.5m.
From (m bgl)	To (m bgl)	Volume (l)	<b>Other Remarks:</b> Location cleared of buried services. Installed with monitoring standpipe upon completion.



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH06</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.81		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486405.08		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 408967.00		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 25/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples			In-Situ Tests			
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (Below)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.60	Grass over dark brown clayey SAND with moderate rootlet content. (Topsoil)		0.60							
		2.21 (0.30)	Firm brown sandy CLAY. (Warp)		0.90							
		1.51 (0.30)	Plastic black amorphous PEAT. (Peat)		1.20				SPT	1.00	N=11 (1,2/1,3,3,4)	1.00m (NR)
		1.61 (1.50)	Brown fine to coarse SAND. (Sutton Sand Formation)		2.70							
		0.11 (0.30) (1.75)	Grey fine to coarse SAND. (Sutton Sand Formation)		3.00				SPT	2.00	N=36 (4,5/8,8,10,10)	2.00m (NR)
		-0.19	Grey fine to coarse SAND. (Sutton Sand Formation)		3.00				SPT	3.00	N=37 (3,5/8,9,10,10)	3.00m (NR)
					4.00				SPT	4.00	N=28 (1,2/5,5,8,10)	4.00m (NR)
		-1.64	Hole Terminated at 4.45m bgl.		4.45							

Chiseling			Remarks
From (m bgl)	To (m bgl)	Time (hh:mm)	
			<b>Reason for Termination:</b> Terminated due to blowing sands.
<b>Water Added</b>			<b>Groundwater Remarks:</b> No groundwater encountered.
From (m bgl)	To (m bgl)	Volume (l)	<b>Other Remarks:</b> Location cleared of buried services. Installed with monitoring standpipe upon completion.




# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH08</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.64		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486472.41		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409086.93		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 25/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)	
		0.10 2.54 0.70	Firm brown sandy CLAY. (Topsoil)		0.10								
			Light grey slighty clayey SAND. (Sutton Sand Formation)			ES	0.40						
		1.84 0.20	Brown fine to medium SAND. (Sutton Sand Formation)		0.80	ES	0.90						
		1.64 2.45	Light brown fine to coarse SAND. (Sutton Sand Formation)		1.00				SPT	1.00	N=24 (2,2/5,6,6,7)	1.00m (NR)	
										SPT	2.00	N=20 (3,4/3,5,6,6)	2.00m (NR)
										SPT	3.00	N=8 (1,2/1,2,2,3)	3.00m (NR)
		-0.81	Hole Terminated at 3.45m bgl.										

<table border="1"> <tr> <th colspan="3">Chiseling</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Time (hh:mm)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Chiseling			From (m bgl)	To (m bgl)	Time (hh:mm)				<p><b>Remarks</b></p> <p><b>Reason for Termination:</b> Terminated due to blowing sands.</p> <p><b>Groundwater Remarks:</b> No groundwater encountered.</p> <p><b>Other Remarks:</b> Location cleared of buried services. Backfilled with arisings upon completion</p>
Chiseling												
From (m bgl)	To (m bgl)	Time (hh:mm)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										
												

# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH12</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.73		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486518.09		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409752.74		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 14/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata			Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blow)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		1.10	Grass over orangish brown clayey fine to medium SAND (Warp)			ES	0.80					
		1.63 (0.05) 1.58 (1.45)	Soft dark brown PEAT (Peat)		1.10 1.15	D	1.10					
			Grey fine to coarse SAND. (Sutton Sand Formation)						SPT	2.00	N=11 (2,2/2,3,3,3)	2.00m (NR)
		-0.07 (0.20) -0.27 (1.45)	Spongy black fibrous PEAT. (Peat)		2.80 3.00	ES	2.90		SPT	3.00	N=12 (1,2/3,3,3,3)	3.00m (NR)
			Grey fine to coarse SAND. (Sutton Sand Formation)						SPT	4.00	N=13 (2,2/2,4,3,4)	4.00m (NR)
		-1.72	Hole Terminated at 4.45m bgl.		4.45							

Chiseling			Remarks
From (m bgl)	To (m bgl)	Time (hh:mm)	
			<b>Reason for Termination:</b> Terminated due to blowing sands.
<b>Water Added</b>			<b>Groundwater Remarks:</b> No groundwater encountered.
From (m bgl)	To (m bgl)	Volume (l)	<b>Other Remarks:</b> Location cleared of buried services. Backfilled with arisings upon completion



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH13</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.76		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486454.28		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 410031.62		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 15/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata			Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (Below)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.20 2.56 [0.70]	Crops over dark brown slightly clayey fine to coarse SAND with moderate rootlet content. (Topsoil)		0.20							
		1.85 [0.10] 1.76 [3.45]	Brown slightly clayey SAND. (Sutton Sand Formation)		0.90	ES	0.50					
			Spongy black amorphous PEAT. (Peat)		1.00				SPT	1.00	N=15 (1,2/3,3,4,5)	1.00m (NR)
			Brown to grey fine to coarse SAND. (Sutton Sand Formation)						SPT	2.00	N=15 (1,2/3,3,4,5)	2.00m (NR)
									SPT	3.00	N=10 (2,2/3,2,3)	3.00m (NR)
									SPT	4.00	N=11 (3,2/3,2,3,3)	4.00m (NR)
		-1.69	Hole Terminated at 4.45m bgl.		4.45							

<table border="1"> <tr> <th colspan="3">Chiseling</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Time (hh:mm)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Chiseling			From (m bgl)	To (m bgl)	Time (hh:mm)				<b>Remarks</b>  <b>Reason for Termination:</b> Terminated due to blowing sands.  <b>Groundwater Remarks:</b> No groundwater encountered.  <b>Other Remarks:</b> Location cleared of buried services. Installed with monitoring standpipe upon completion.
Chiseling												
From (m bgl)	To (m bgl)	Time (hh:mm)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH14</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.84		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486415.79		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409874.81		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 14/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)	
		0.80 (0.80)	Crops over dark brown slightly clayey fine to coarse SAND with moderate rootlet content in upper 0.50m. (Warp)										
		2.04 (0.20)	Brown slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of brick. (Made Ground)		0.80	ES	0.90						
		1.84 (0.50)		Soft grey sandy CLAY. (Sutton Sand Formation)		1.00	D	1.30	SPT	1.00	N=6 (1,1/1,2,1,2)	1.00m (NR)	
		1.34 (0.50)	Brown fine to coarse SAND. (Sutton Sand Formation)		1.50								
		0.84 (0.80)	Greyish brown fine to coarse SAND. (Sutton Sand Formation)		2.00				SPT	2.00	N=21 (2,3/4,6,6,5)	2.00m (NR)	
		0.04 (2.65)	Grey fine to coarse SAND. (Sutton Sand Formation)		2.80				SPT	3.00	N=9 (3,4/3,2,2,2)	3.00m (NR)	
									SPT	4.00	N=12 (3,2/5,3,2,2)	4.00m (NR)	
									SPT	5.00	N=10 (2,2/2,3,3,2)	5.00m (NR)	
		-2.61	Hole Terminated at 5.45m bgl.										

Chiseling			<b>Remarks</b>
From (m bgl)	To (m bgl)	Time (hh:mm)	
			<b>Reason for Termination:</b> Terminated due to blowing sands.
Water Added			<b>Groundwater Remarks:</b> Groundwater at 2.3m.
From (m bgl)	To (m bgl)	Volume (l)	<b>Other Remarks:</b> Location cleared of buried services. Backfilled with arisings upon completion



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH19</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.67		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486857.14		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409645.20		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 17/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples			In-Situ Tests			
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.80	Grass over dark brown and black slightly clayey fine to medium SAND with moderate rootlet content in upper 0.50m (Warp)									
		1.87 (2.20)	Light brown coarse SAND. (Sutton Sand Formation)		0.80				SPT	1.00	N=16 (2,2/4,4,4,4)	1.00m (NR)
									SPT	2.00	N=13 (2,3/2,3,4,4)	2.00m (NR)
		-0.33 (1.40)	Dark grey fine to coarse SAND. (Sutton Sand Formation)		3.00				SPT	3.00	N=22 (3,3/5,6,5,6)	3.00m (NR)
									SPT	4.00	N=13 (6,4/4,3,3,3)	4.00m (NR)
		-1.73 (0.20)	Firm back amorphous PEAT. (Peat)		4.40		ES	4.50				
		-1.93 (0.85)	Dark grey fine to coarse SAND. (Sutton Sand Formation)		4.60				SPT	5.00	N=24 (5,5/6,6,6,6)	5.00m (NR)
		-2.78	Hole Terminated at 5.45m bgl.		5.45							

Chiseling			<b>Remarks</b>
From (m bgl)	To (m bgl)	Time (hh:mm)	
<b>Reason for Termination:</b>			
Terminated due to blowing sands.			
<b>Groundwater Remarks:</b>			
No groundwater encountered.			
Water Added			<b>Other Remarks:</b>
From (m bgl)	To (m bgl)	Volume (l)	
Location cleared of buried services. Backfilled with arisings upon completion			



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH22</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.63		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486794.15		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409028.75		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 22/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata			Samples			In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blow)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.30	Crops over soft brown sandy CLAY with moderate rootlet content.		0.30							
		2.33 (0.40)	(Topsoil)			ES	0.50					
		1.93 (0.30)	Soft dark brown sandy CLAY with organic odour.		0.70							
		1.63 (0.45)	Brown clayey SAND.		1.00				SPT	1.00	N=12 (2,2/2,3,3,4)	1.00m (NR)
			(Sutton Sand Formation)									
			Greyish brown fine to coarse SAND.									
			(Sutton Sand Formation)						SPT	2.00	N=16 (2,2/2,4,5,5)	2.00m (NR)
									SPT	3.00	N=12 (3,3/3,3,3,3)	3.00m (NR)
			3.60m bgl: Band of plastic dark brown amorphous PEAT.									
		-1.82	Hole Terminated at 4.45m bgl.		4.45							

Chiseling			Remarks
From (m bgl)	To (m bgl)	Time (hh:mm)	
			<b>Reason for Termination:</b> Terminated due to blowing sands.
<b>Water Added</b>			<b>Groundwater Remarks:</b> No groundwater encountered.
From (m bgl)	To (m bgl)	Volume (l)	<b>Other Remarks:</b> Location cleared of buried services. Installed with monitoring standpipe upon completion.



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH23</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.64		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486657.36		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409557.63		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 15/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples			In-Situ Tests			
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blow)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.50	Firm dark brown slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of brick. (Made Ground)		0.50	ES	0.20					
		2.34 [0.40]	Dark brown fine SAND. (Sutton Sand Formation)		0.90				SPT	1.00	N=10 (1,2/1,3,3,3)	1.00m (NR)
		1.74 [2.00]	Brown fine to coarse SAND. (Sutton Sand Formation)		2.90				SPT	2.00	N=20 (3,3/5,5,5,5)	2.00m (NR)
		-0.26 [1.00]	Grey fine to coarse SAND. (Sutton Sand Formation)		3.90				SPT	3.00	N=13 (2,3/3,4,3,3)	3.00m (NR)
		-1.26 [0.05]	Spongy dark brown amorphous PEAT. (Peat)		3.95	D	4.00		SPT	4.00	N=8 (2,1/2,2,2,2)	4.00m (NR)
		-1.81 [0.50]	Grey fine to coarse SAND. (Sutton Sand Formation)		4.45							
			Hole Terminated at 4.45m bgl.									

Chiseling			Remarks
From (m bgl)	To (m bgl)	Time (hh:mm)	
			<b>Reason for Termination:</b> Terminated due to blowing sands.
<b>Water Added</b>			<b>Groundwater Remarks:</b> Groundwater at 2.3m.
From (m bgl)	To (m bgl)	Volume (l)	<b>Other Remarks:</b> Location cleared of buried services. Installed with monitoring standpipe upon completion.



# BOREHOLE LOG

Scale 1:50

Sheet 1 of 1

<b>LOCATION ID</b>  <b>BH24</b>	<b>Project Name:</b> Lincolnshire Lakes	<b>Ground Level (m AOD):</b> 2.59		
	<b>Project Number:</b> 221638	<b>Eastings:</b> 486534.66		
	<b>Client:</b> Hargreaves Land Limited	<b>Northings:</b> 409958.18		
<b>Hole Type:</b> WS	<b>Rig:</b> Premier 110	<b>Start &amp; End Date:</b> 15/08/2023	<b>Engineer:</b> TF	<b>Checker:</b> MH

Boring		Strata				Samples		In-Situ Tests				
Strike	Well	Level (m AOD) & Thickness (m)	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
		0.50	Grass over dark brown slightly clayey fine to coarse SAND with moderate rootlet content. (Topsoil)		0.50	ES	0.20					
		2.09 (1.50)	Brown fine to coarse SAND. (Sutton Sand Formation)						SPT	1.00	N=20 (2,3/4,5,6,5)	1.00m (NR)
		0.59 (1.80)	Grey fine to coarse SAND. (Sutton Sand Formation)		2.00				SPT	2.00	N=18 (2,2/3,5,5,5)	2.00m (NR)
									SPT	3.00	N=12 (2,3/3,3,3,3)	3.00m (NR)
		-1.21 (0.65)	Plastic brown fibrous PEAT. (Peat)		3.80	D	3.80		SPT	4.00	N=10 (3,2/3,2,3,2)	4.00m (NR)
		-1.86	Hole Terminated at 4.45m bgl.		4.45							

<table border="1"> <tr> <th colspan="3">Chiseling</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Time (hh:mm)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Chiseling			From (m bgl)	To (m bgl)	Time (hh:mm)				<b>Remarks</b>  <b>Reason for Termination:</b> Terminated due to blowing sands.  <b>Groundwater Remarks:</b> Groundwater at 1.6m.  <b>Other Remarks:</b> Location cleared of buried services. Backfilled with arisings upon completion
Chiseling												
From (m bgl)	To (m bgl)	Time (hh:mm)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										
<table border="1"> <tr> <th colspan="3">Water Added</th> </tr> <tr> <th>From (m bgl)</th> <th>To (m bgl)</th> <th>Volume (l)</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>			Water Added			From (m bgl)	To (m bgl)	Volume (l)				
Water Added												
From (m bgl)	To (m bgl)	Volume (l)										



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP01</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 23/08/2023	
<b>Ground Level (m AOD):</b> 1.89		<b>Eastings &amp; Northings:</b> 486109E 408954N	Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		0.30	ES	0.10	0.20			
		1.59	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)		0.30	D	0.50				
		0.50m	Spongy black fibrous PEAT. (Peat)		0.80						
		1.09									
		0.50m									
		0.59	Light grey fine to medium SAND. (Sutton Sand Formation)		1.30						
		1.40m									
		-0.81	Hole Terminated at 2.70m bgl.								

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP02</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.46	<b>Eastings &amp; Northings:</b> 486310E 409793N		<b>Engineer:</b> PM <b>Checker:</b> MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.45m	Soft to firm brown sandy CLAY. (Topsoil)		0.45						
		2.01	Brown fine to medium SAND. (Sutton Sand Formation)		1.45m						
		1.45m									
		0.56	Grey fine to medium SAND. (Sutton Sand Formation)		1.90						
		0.40m									
		0.16	Hole Terminated at 2.30m bgl.		2.30						

Remarks
<p><b>Reason for Termination:</b> Terminated due to sides collapsing.</p> <p><b>Groundwater Notes:</b> No groundwater encountered.</p> <p><b>Other Remarks:</b> Location cleared of buried services.</p>



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP04</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.55	<b>Eastings &amp; Northings:</b> 486400E 409101N		<b>Engineer:</b> PM <b>Checker:</b> MH



Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.60m	Dark brown fine to medium SAND. (Topsoil)		0.60	ES	0.10	0.20			
		1.94	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)		0.60	D	1.00				
		0.65m				D	1.00				
		1.30	Black fine SAND. (Warp)		1.25	D	1.30				
		0.10m			1.35	D	1.30				
		1.20	Light grey fine to medium SAND. (Sutton Sand Formation)			B	1.50	2.00			
		1.45m				B	1.50	2.00			
		-0.26	Hole Terminated at 2.80m bgl.		2.80						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Minor seepage from 2.50m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP05</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 21/08/2023	
<b>Ground Level (m AOD):</b> 2.09		<b>Eastings &amp; Northings:</b> 486478E 409296N	<b>Engineer:</b> PM <b>Checker:</b> MH



Strata				Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown fine to medium SAND. (Topsoil)						0.40	
		0.45m	Soft to firm brown sandy CLAY. (Topsoil)						0.45	
		1.69	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)						0.90	
		1.64	Brown fine to medium SAND. (Sutton Sand Formation)						1.40	
		0.50m	Brown and orangish brown fine to medium SAND. (Sutton Sand Formation)						1.90	
		1.19	Light grey fine to medium SAND. (Sutton Sand Formation)						2.30	
		0.50m	Grey fine to medium SAND. (Sutton Sand Formation)						2.80	
		1.45m								
		0.69								
		0.19								
		0.40m								
		1.40m								
		-0.21								
		-0.71	Hole Terminated at 2.80m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Steady seepage from 2.10m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP06</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 21/08/2023	
<b>Ground Level (m AOD):</b> 2.11	<b>Eastings &amp; Northings:</b> 486408E 409487N		<b>Engineer:</b> PM <b>Checker:</b> MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Soft dark brown silty CLAY. (Topsoil)		0.40	ES	0.10	0.20			
		1.71	Dark brown medium laminated slightly clayey silty SAND with lenses of clay. (Warp)		0.40	B	0.50	1.00			
		0.80m				B	0.50	1.00			
		0.91	Plastic dark brown fibrous PEAT. (Peat)		1.20						
		0.50m									
		0.41	Soft grey slightly clayey slightly sandy CLAY. (Warp)		1.70	D	1.80		HSV	1.80	(10)kPa
		0.30m				D	1.80				
		0.11	Grey fine to medium SAND. (Sutton Sand Formation)		2.00						
		1.00m									
		-0.89	Hole Terminated at 3.00m bgl.								

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Groundwater at 2.10m.

**Other Remarks:**  
Location cleared of buried services.



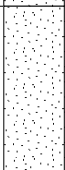

  


# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP07</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.51	<b>Eastings &amp; Northings:</b> 486473E 408934N		Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Shrub over fine to medium SAND (topsoil). (Topsoil)		ES	0.10	0.20			
		2.21	Light brown fine to medium SAND. (Sutton Sand Formation)							
		0.60m								
		1.61	Brown fine to medium SAND. (Sutton Sand Formation)		B	1.00	1.50			
		1.10m			B	1.00	1.50			
		0.51	Hole Terminated at 2.00m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP08</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.70		<b>Eastings &amp; Northings:</b> 486477E 409175N	<b>Engineer:</b> PM <b>Checker:</b> MH

Strata				Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.45m	Dark brown fine to medium SAND. (Topsoil)							
		2.25	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)							
		1.00m			B	0.70	1.20			
		1.25	Plastic dark brown fibrous PEAT. (Peat)							
		0.05m			B	0.70	1.20			
		1.20	Light grey fine to medium SAND. (Sutton Sand Formation)							
		1.40m								
		-0.20	Hole Terminated at 2.90m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Steady seepage from 2.70m.

**Other Remarks:**  
Location cleared of buried services.



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP09</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.59		<b>Eastings &amp; Northings:</b> 486542E 409250N	<b>Engineer:</b> PM <b>Checker:</b> MH



Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown slightly clayey fine to medium SAND. (Topsoil)						0.30	
		2.29	Grey fine to medium SAND. (Sutton Sand Formation)						0.70	
		0.40m	Black fine to medium SAND. (Sutton Sand Formation)						1.00	
		1.89	Brown fine to medium SAND. (Sutton Sand Formation)						1.55	
		0.30m	Light grey fine to medium SAND. (Sutton Sand Formation)						2.90	
		1.59	Brown fine to medium SAND. (Sutton Sand Formation)							
		0.55m	Light grey fine to medium SAND. (Sutton Sand Formation)							
		1.04	Hole Terminated at 2.90m bgl.							
		1.35m								
		-0.31								

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Steady seepage from 2.00m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP10</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 21/08/2023	
<b>Ground Level (m AOD):</b> 2.33	<b>Eastings &amp; Northings:</b> 486512E 409444N		<b>Engineer:</b> PM <b>Checker:</b> MH



Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Soft dark brown silty CLAY. (Topsoil)							
		2.03	Dark brown medium laminated slightly clayey silty SAND with lenses of clay. (Warp)							
		1.10m								
		0.93	Soft grey slightly clayey slightly sandy CLAY. (Warp)					HSV	1.50	(9)kPa
		0.30m								
		0.63	Grey fine to medium SAND. (Sutton Sand Formation)							
		1.20m								
		-0.57	Hole Terminated at 2.90m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Groundwater at 2.00m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP11</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.47	<b>Eastings &amp; Northings:</b> 486532E 409031N	<b>Engineer:</b> PM	<b>Checker:</b> MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Soft dark brown silty CLAY. (Topsoil)		0.40	ES	0.10	0.20			
		2.07	Light brown fine to medium SAND. (Sutton Sand Formation)		0.90						
		0.50m	Light grey fine to medium SAND. (Sutton Sand Formation)		1.40m						
		1.57									
		1.40m									
		0.17	Hole Terminated at 2.30m bgl.		2.30						

Remarks
<p><b>Reason for Termination:</b> Terminated due to sides collapsing.</p> <p><b>Groundwater Notes:</b> Groundwater at 2.20m.</p> <p><b>Other Remarks:</b> Location cleared of buried services.</p>



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP17</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 23/08/2023	
<b>Ground Level (m AOD):</b> 2.53	<b>Eastings &amp; Northings:</b> 486240E 409386N		Engineer: PM Checker: MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.35m	Soft dark brown silty CLAY. (Topsoil)		0.35	ES	0.10	0.20			
		2.18	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)		0.35	B	0.40	0.90			
		0.60m									
		1.58	Black fine SAND. (Warp)		0.95						
		0.10m									
		1.48	Brown fine to medium SAND. (Sutton Sand Formation)		1.05						
		0.75m									
		0.73	Grey fine to medium SAND. (Sutton Sand Formation)		1.80						
		0.70m									
		0.03	Hole Terminated at 2.50m bgl.		2.50						

### Remarks

**Reason for Termination:**

Terminated due to sides collapsing.

**Groundwater Notes:**

Minor seepage from 2.10m.

**Other Remarks:**

Location cleared of buried services.



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP18</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.86	<b>Eastings &amp; Northings:</b> 486459E 409753N		<b>Engineer:</b> PM <b>Checker:</b> MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		0.40	ES	0.10	0.20			
		2.46	Dark brown and orangish brown fine to medium silty SAND. (Sutton Sand Formation)		0.40	B	0.50	1.00			
		0.70m				B	0.50	1.00			
		1.76	Light brown fine to medium SAND. (Sutton Sand Formation)		1.10						
		1.36	Grey medium laminated clayey SILT. (Sutton Sand Formation)		1.50				HSV	1.50	(7)kPa
		0.40m									
		0.96	Grey fine to medium SAND. (Sutton Sand Formation)		1.90						
		1.00m									
		-0.04	Hole Terminated at 2.90m bgl.			2.90					

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Steady seepage from 2.10m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP19</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.85	<b>Eastings &amp; Northings:</b> 486436E 409842N	<b>Engineer:</b> PM	<b>Checker:</b> MH

Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.35m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		ES	0.10	0.20			
		2.50	Dark brown and orangish brown fine to medium silty SAND. (Warp)		ES	0.40	0.50			
		0.75m								
		1.74	Thinly laminated clayey sandy SILT. (Warp)		B	1.10	1.30	HSV	1.20	(6)kPa
		0.20m			B	1.10	1.30			
		1.54	Dark reddish brown fine to medium SAND. (Sutton Sand Formation)		D	1.20	1.20			
		0.10m	Dark brown fine to medium SAND. (Sutton Sand Formation)		D	1.20	1.20			
		1.44	Dark brown fine to medium SAND. (Sutton Sand Formation)							
		0.60m	Light grey fine to medium SAND. (Sutton Sand Formation)							
		0.84								
		0.80m								
		0.04	Hole Terminated at 2.80m bgl.							

### Remarks

**Reason for Termination:**

Terminated due to sides collapsing.

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services.



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP20</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.95		<b>Eastings &amp; Northings:</b> 486505E 409567N	<b>Engineer:</b> PM <b>Checker:</b> MH

Strata				Samples			In-Situ Tests					
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result	
		2.00m	Dark brown slightly clayey slightly silty fine to medium SAND. (Sutton Sand Formation)			ES	0.20	0.30				
							B	0.70	1.20			
							B	0.70	1.20			
		0.95	Grey slightly sandy clayey SILT. (Sutton Sand Formation)		2.00	D	2.00	2.10	HSV	2.00	(9)kPa	
		0.40m				D	2.00	2.10				
		0.55	Light grey fine to medium SAND. (Sutton Sand Formation)		2.40							
		0.50m										
		0.05	Hole Terminated at 2.90m bgl.		2.90							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.






# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP21</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 16/08/2023	
<b>Ground Level (m AOD):</b> 2.74		<b>Eastings &amp; Northings:</b> 486689E 409787N	<b>Engineer:</b> PM <b>Checker:</b> MH



Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown slightly clayey slightly silty fine to medium SAND. (Topsoil)		ES	0.10	0.20			
		2.34	Brown fine to medium SAND. (Sutton Sand Formation)							
		1.10m								
		1.24	Light grey fine to medium SAND. (Sutton Sand Formation)		B	1.70	2.20			
		0.80m			B	1.70	2.20			
		0.44	Hole Terminated at 2.30m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP22</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.97		<b>Eastings &amp; Northings:</b> 486533E 409710N	<b>Engineer:</b> PM <b>Checker:</b> MH



Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		0.30	ES	0.10	0.20			
		2.67	Brown fine to medium SAND. (Sutton Sand Formation)								
		1.00m									
		1.67	Dark brown fine to medium SAND. (Sutton Sand Formation)		1.30	B	1.50	2.00			
		0.10m	Light grey fine to medium SAND. (Sutton Sand Formation)		1.40	B	1.50	2.00			
		1.57									
		1.60m				D	2.00				
						D	2.00				
		-0.03	Hole Terminated at 3.00m bgl.		3.00						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.




  




# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP23</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.62		<b>Eastings &amp; Northings:</b> 486591E 409767N	<b>Engineer:</b> PM <b>Checker:</b> MH

Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.50m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		ES	0.10	0.20			
		2.12	Light grey and dark brown fine to medium SAND. (Sutton Sand Formation)					HSV	0.40	(11)kPa
		2.00m								
		0.12	Hole Terminated at 2.50m bgl.							

<b>Remarks</b>
<p><b>Reason for Termination:</b> Terminated due to sides collapsing.</p> <p><b>Groundwater Notes:</b> No groundwater encountered.</p> <p><b>Other Remarks:</b> Location cleared of buried services.</p>
 

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP24</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.54	<b>Eastings &amp; Northings:</b> 486576E 409841N		Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.60m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		D	0.30				
		1.94	Light brown fine to medium SAND. (Sutton Sand Formation)		D	0.30				
		0.20m								
		1.74	Orangish brown and brown fine to medium SAND. (Sutton Sand Formation)		B	0.80	1.00			
		0.20m								
		1.54	Light brown fine to medium SAND. (Sutton Sand Formation)		B	0.80	1.00			
		1.00m								
		0.54	Hole Terminated at 2.00m bgl.		D	1.50				
					D	1.50				

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP25</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.74		<b>Eastings &amp; Northings:</b> 486529E 410020N	<b>Engineer:</b> PM <b>Checker:</b> MH



Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		0.30	ES	0.10	0.20			
		2.44	Orangish brown and brown fine to medium SAND. (Warp)			ES	0.30	0.40			
		0.50m				D	0.50				
		1.94	Brown fine to medium SAND. (Sutton Sand Formation)		0.80	D	0.50				
		1.30m				B	1.00	1.50			
		0.64				B	1.00	1.50			
			Hole Terminated at 2.10m bgl.		2.10						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP26</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 23/08/2023	
<b>Ground Level (m AOD):</b> 2.06		<b>Eastings &amp; Northings:</b> 486269E 409199N	Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown slightly clayey fine to medium SAND. (Topsoil)		0.30	ES	0.10	0.20			
		1.76	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)		0.95						
		0.65m	Plastic black amorphous PEAT. (Peat)		1.30						
		1.11	Light grey fine to medium SAND. (Sutton Sand Formation)		2.00	D	2.00				
		0.35m				D					
		0.76									
		1.20m									
		-0.44	Hole Terminated at 2.50m bgl.		2.50						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP27</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.57		<b>Eastings &amp; Northings:</b> 486389E 409249N	Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.60m	Soft dark brown silty CLAY. (Topsoil)		0.60	ES	0.10	0.20			
		1.97	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)		0.60	D	1.00				
		0.70m				D	1.00				
		1.27	Black fine to medium SAND. (Sutton Sand Formation)		1.30						
		0.20m									
		1.07	Brown fine to medium SAND. (Sutton Sand Formation)		1.50	D	1.60				
		0.20m				D	1.60				
		0.87	Grey fine to medium SAND. (Sutton Sand Formation)		1.70						
		1.00m									
		-0.13	Hole Terminated at 2.70m bgl.		2.70						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP28</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 21/08/2023	
<b>Ground Level (m AOD):</b> 2.34		<b>Eastings &amp; Northings:</b> 486539E 409326N	Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Soft dark brown silty CLAY. (Topsoil)		ES	0.10	0.20			
		1.94	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)							
		0.60m								
		1.34	Brown and orangish brown fine to medium SAND. (Sutton Sand Formation)		B	1.00	1.35			
		0.35m			B	1.00	1.35			
		0.99	Grey fine to medium SAND. (Sutton Sand Formation)							
		1.25m								
		-0.26	Hole Terminated at 2.60m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP34</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 16/08/2023	
<b>Ground Level (m AOD):</b> 2.83	<b>Eastings &amp; Northings:</b> 486832E 409825N		Engineer: PM Checker: MH

Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown fine to medium SAND. (Topsoil)		0.40	ES	0.10	0.20			
		2.43	Light brown fine to medium SAND. (Sutton Sand Formation)		0.90	B	0.40	0.90			
		0.50m					0.40	0.90			
		1.93	Brown fine to medium SAND. (Sutton Sand Formation)		2.10						
		1.20m									
		0.73	Hole Terminated at 2.10m bgl.								

Remarks	
<b>Reason for Termination:</b>	Terminated due to sides collapsing.
<b>Groundwater Notes:</b>	No groundwater encountered.
<b>Other Remarks:</b>	Location cleared of buried services.



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP38</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 21/08/2023	
<b>Ground Level (m AOD):</b> 2.23		<b>Eastings &amp; Northings:</b> 486398E 409331N	Engineer: PM Checker: MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Soft dark brown silty CLAY. (Topsoil)		0.30	ES	0.10	0.20			
		1.93	Dark brown medium laminated slightly clayey silty SAND with lenses of clay. (Warp)		0.30	D	0.70				
		0.70m				D	0.70				
		1.23	Plastic dark brown fibrous PEAT. (Peat)		1.00						
		0.10m									
		1.13	Brown fine to medium SAND. (Sutton Sand Formation)		1.10						
		0.50m									
		0.63	Light grey fine to medium SAND. (Sutton Sand Formation)		1.60						
		0.60m				D	2.00				
		0.03	Plastic dark brown fibrous PEAT. (Peat)		2.20	D	2.00				
		0.40m									
		-0.37	Light grey fine to medium SAND. (Sutton Sand Formation)		2.60						
		0.40m									
		-0.77	Hole Terminated at 3.00m bgl.								

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Groundwater at 2.00m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP39</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 17/08/2023	
<b>Ground Level (m AOD):</b> 2.88	<b>Eastings &amp; Northings:</b> 486842E 409705N		Engineer: PM Checker: MH

Strata				Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown fine to medium SAND. (Topsoil)		ES	0.10	0.20			
		2.48	Brown fine to medium SAND. (Sutton Sand Formation)		D	1.00				
		1.40m			D	1.00				
		1.08	Hole Terminated at 1.80m bgl.							

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Steady seepage from 1.60m.

**Other Remarks:**  
Location cleared of buried services.



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP40</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 17/08/2023	
<b>Ground Level (m AOD):</b> 2.71	<b>Eastings &amp; Northings:</b> 486817E 409659N	<b>Engineer:</b> PM	<b>Checker:</b> MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown fine to medium SAND. (Topsoil)		0.40	ES	0.10	0.20			
		2.31 0.20m	Black fine SAND. (Warp)		0.60	D	0.40	0.50			
		2.11 0.20m	Brown fine to medium SAND. (Sutton Sand Formation)		0.80	D	0.50				
		1.91 1.60m	Light brown fine to medium SAND. (Sutton Sand Formation)			B	1.00	1.50			
		0.31	Hole Terminated at 2.40m bgl.		2.40	B	1.00	1.50			

Remarks
<p><b>Reason for Termination:</b> Terminated due to sides collapsing.</p> <p><b>Groundwater Notes:</b> No groundwater encountered.</p> <p><b>Other Remarks:</b> Location cleared of buried services.</p>



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP41</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	Scale: 1:50 Sheet 1 of 1 2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.86		<b>Eastings &amp; Northings:</b> 486414E 410043N	<b>Engineer:</b> PM <b>Checker:</b> MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown fine to medium SAND. (Topsoil)		0.30						
		2.56	Dark brown slightly clayey fine to medium SAND. (Sutton Sand Formation)								
		0.70m									
		1.86	Spongy black amorphous PEAT. (Peat)		1.00						
		0.70m									
		1.16	Light grey fine to medium SAND. (Sutton Sand Formation)		1.70						
		0.30m									
		0.86	Hole Terminated at 2.00m bgl.		2.00						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP42</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:	
		<b>Project Number:</b> 221638		
		<b>Client:</b> Hargreaves Land Limited		
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023		<b>Stability:</b> Unstable
<b>Ground Level (m AOD):</b> 2.93		<b>Eastings &amp; Northings:</b> 486409E 409929N	<b>Engineer:</b> PM	<b>Checker:</b> MH



Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.30m	Dark brown fine to medium SAND. (Topsoil)		0.30	ES	0.10	0.20			
		2.63	Brown clayey fine to medium SAND. (Warp)			D	0.50				
		1.10m				D	0.50				
		1.53	Grey very soft slightly clayey slightly sandy SILT. (Warp)		1.40	B	1.40	1.80	HSV	1.50	(10)kPa
		0.40m				B	1.40	1.80			
		1.13	Grey fine to medium SAND. (Sutton Sand Formation)		1.80	D	1.60				
		1.20m				D	1.60				
		1.20m				B	2.00	2.50			
						B	2.00	2.50			
		-0.07	Hole Terminated at 3.00m bgl.			3.00					

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
Steady seepage from 2.60m.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP44</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 16/08/2023	
<b>Ground Level (m AOD):</b> 2.83		<b>Eastings &amp; Northings:</b> 486756E 409690N	<b>Engineer:</b> PM <b>Checker:</b> MH



Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.45m	Dark brown fine to medium SAND. (Topsoil)		0.45	ES	0.10	0.20			
		2.38	Brown fine to medium SAND. (Sutton Sand Formation)		0.80	B	1.00	1.50			
		0.35m				B	1.00	1.50			
		2.03	Light brown fine to medium SAND. (Sutton Sand Formation)		2.00	D	1.75				
		1.20m				D	1.75				
		0.83	Hole Terminated at 2.00m bgl.								

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP46</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.69	<b>Eastings &amp; Northings:</b> 486546E 409128N		<b>Engineer:</b> PM <b>Checker:</b> MH



Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Dark brown fine to medium SAND. (Topsoil)		0.40						
		2.29	Dark brown and orangish brown clayey silty fine to medium SAND with lenses of clay. (Warp)		0.40						
		0.60m									
		1.69	Brown fine to medium SAND. (Sutton Sand Formation)		1.00	D	1.20				
		0.40m				D	1.20				
		1.29	Grey fine to medium SAND. (Sutton Sand Formation)		1.40	B	1.70	2.20			
		1.30m				B	1.70	2.20			
		-0.01	Hole Terminated at 2.70m bgl.		2.70						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP47</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 22/08/2023	
<b>Ground Level (m AOD):</b> 2.63	<b>Eastings &amp; Northings:</b> 486458E 409041N		Engineer: PM Checker: MH



Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.35m	Soft dark brown silty CLAY. (Topsoil)		0.35						
		2.28	Brown and orangish brown mottled slightly clayey silty fine to medium SAND with occasional pockets of clay. (Sutton Sand Formation)			B	0.50	1.00			
		0.70m				B	0.50	1.00			
		1.58	Brown fine to medium SAND. (Sutton Sand Formation)		1.05						
		0.95m									
		0.63	Grey fine to medium SAND. (Sutton Sand Formation)								
		0.40m									
		0.23	Hole Terminated at 2.40m bgl.		2.40						

**Remarks**

**Reason for Termination:**  
Terminated due to sides collapsing.

**Groundwater Notes:**  
No groundwater encountered.

**Other Remarks:**  
Location cleared of buried services.

# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP50</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 0.80 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 2.61	<b>Eastings &amp; Northings:</b> 486279E 410000N		<b>Engineer:</b> PM <b>Checker:</b> MH

Strata					Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result	
		0.50m	Dark brown fine to medium SAND. (Topsoil)		0.50	ES	0.10	0.20				
		2.11	Brown fine to medium SAND. (Warp)			B	0.50	1.00				
		0.70m				B	0.50	1.00				
		1.41				ES	0.60	0.70				
		1.41	Dark grey sandy SILT. (Warp)		1.20	B	1.20	1.50	HSV	1.30	(13)kPa	
		0.30m	Spongy black amorphous PEAT. (Peat)			B	1.20	1.50				
		1.11				D	1.40					
		0.40m		D	1.40							
		0.71		D	1.70							
		0.90m	Grey fine to medium SAND. (Sutton Sand Formation)		1.90	D	1.70					
		-0.19	Hole Terminated at 2.80m bgl.									

Remarks
<p><b>Reason for Termination:</b> Terminated due to sides collapsing.</p> <p><b>Groundwater Notes:</b> No groundwater encountered.</p> <p><b>Other Remarks:</b> Location cleared of buried services.</p>



# TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

<b>TP51</b>	<b>LOCATION ID:</b>	<b>Project Name:</b> Lincolnshire Lakes	2.00 Pit Dimensions (m) Orientation:
		<b>Project Number:</b> 221638	
		<b>Client:</b> Hargreaves Land Limited	
	<b>Plant:</b> 8 Tonne Excavator	<b>Start &amp; End Date:</b> 15/08/2023	
<b>Ground Level (m AOD):</b> 1.98		<b>Eastings &amp; Northings:</b> 486313E 409614N	<b>Engineer:</b> PM <b>Checker:</b> MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Firm dark brown silty CLAY. (Topsoil)		0.40	ES	0.10	0.20			
		1.58	Soft dark brown silty CLAY (Warp)		0.40	B	0.40	0.80	HSV	0.60	(57)kPa
		0.60m									
		0.98	Spongy black amorphous PEAT. (Peat)		1.00						
		0.30m									
		0.68	Brown fine to medium SAND. (Sutton Sand Formation)		1.30						
		0.70m									
		-0.02	Grey fine to medium SAND. (Sutton Sand Formation)		2.00						
		0.90m									
		-0.92	Hole Terminated at 2.90m bgl.		2.90						

### Remarks

**Reason for Termination:**

Terminated due to sides collapsing.

**Groundwater Notes:**

Steady seepage from 2.80m.

**Other Remarks:**

Location cleared of buried services.



**Appendix 2: SPT Calibration Certificate**

---

# SPT Calibration Report

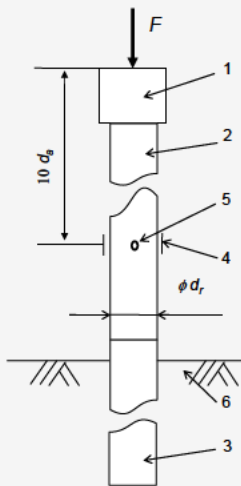
## Hammer Energy Measurement Report

Type of Hammer: PREMIER  
 Test No: EQU2022\_263  
 Client: Sherwood Drilling

Test Depth (m): 9.70  
 Mass of hammer:  $m = 63.5\text{kg}$   
 Falling height:  $h = 0.76\text{m}$   
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

### Characteristics of the instrumented rod

Diameter:  $d_r = 0.052\text{ m}$   
 Length of instrumented rod:  $0.558\text{ m}$   
 Area:  $A = 11.61\text{ cm}^2$   
 Modulus:  $E_s = 206843\text{ MPa}$



- Key**
- 1 Anvil
  - 2 Part of instrumented rod
  - 3 Drive Rod
  - 4 Strain Gauge
  - 5 Accelerometer
  - 6 Ground

$F$  Force  
 $d_r$  Diameter of rod

Fig. B.1 and B.2  
 BS EN ISO 22476-3 : 2005 + A1 : 2011

DATE OF TEST    VALID UNTIL    HAMMER ID

01/09/2022	01/09/2023	RP63
------------	------------	------

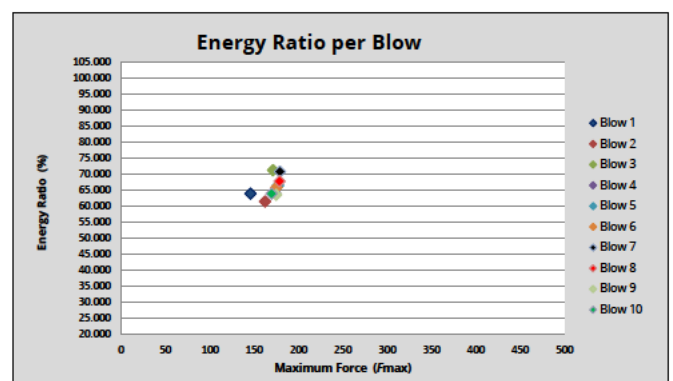
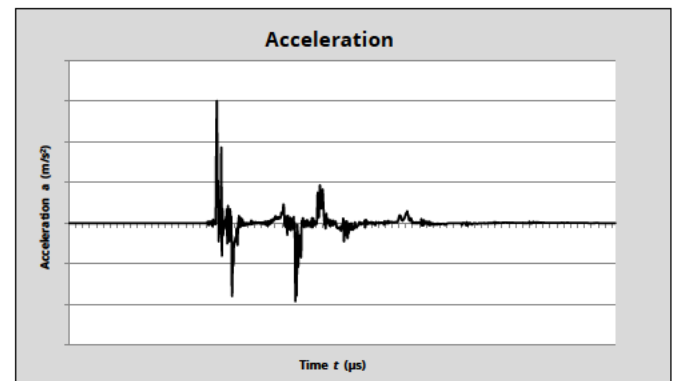
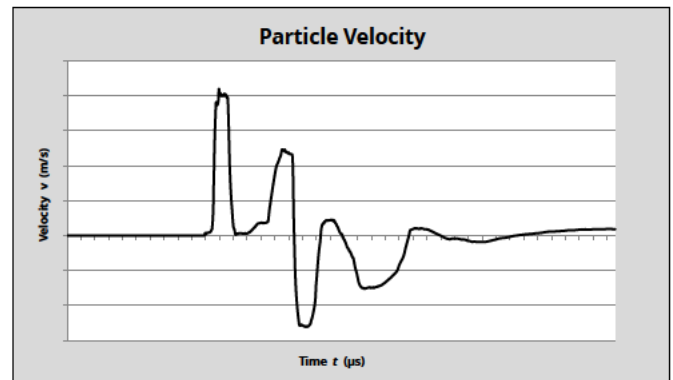
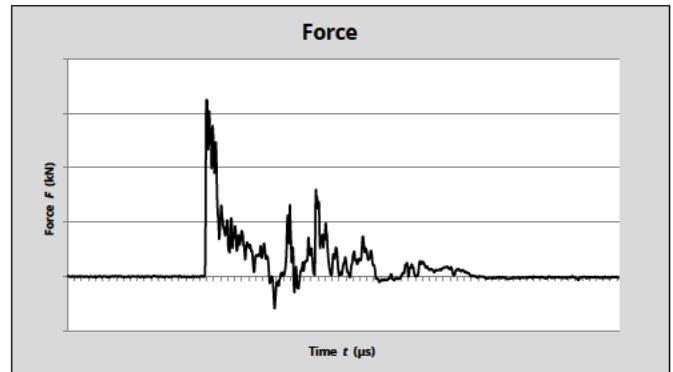
$E_{\text{meas}} = 0.312\text{ kN-m}$

$E_{\text{theor}} = 0.473\text{ kN-m}$

Comments

Energy Ratio (Er) =  $\frac{E_{\text{meas}}}{E_{\text{theor}}}$

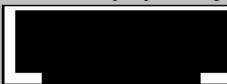
**65.94%**  
 © COPYRIGHT 2022



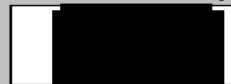
Equipe SPT Analyzer Operator

**KS**

Certificate prepared by



Certificate checked by



Certificate date

**06/09/2022**

**Appendix 3: Gas and Groundwater Monitoring Data**

---













**Appendix 4: Soil Chemical and Leachate Results**

---



**Thomas Flame**  
BWB Consulting Limited  
Westminster House  
11 Portland Street  
Manchester  
M1 3HU

i2 Analytical Ltd.  
7 Woodshots Meadow,  
Croxley Green  
Business Park,  
Watford,  
Herts,  
WD18 8YS

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

e: Thomas.Flame@bwbconsulting.com

## **Analytical Report Number : 23-53529**

<b>Project / Site name:</b>	Lincolnshire Lakes	<b>Samples received on:</b>	29/08/2023
<b>Your job number:</b>	221638	<b>Samples instructed on/ Analysis started on:</b>	29/08/2023
<b>Your order number:</b>		<b>Analysis completed by:</b>	07/09/2023
<b>Report Issue Number:</b>	1	<b>Report issued on:</b>	07/09/2023
<b>Samples Analysed:</b>	15 leachate samples - 61 soil samples		



**Signed:**

Nicola Jupp  
Senior Customer Service Advisor  
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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

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

Analytical Report Number: 23-53529  
Project / Site name: Lincolnshire Lakes

Lab Sample Number				2794732	2794733	2794734	2794735	2794736
Sample Reference				TP50	TP51	TP42	TP25	TP25
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.30-0.40
Date Sampled				15/08/2023	15/08/2023	15/08/2023	15/08/2023	15/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	18	15	13	6.2
Total mass of sample received	kg	0.001	NONE	0.8	0.9	0.8	0.3	1

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

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.1	8.1	8	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0079	0.0125	0.0113	0.0078	-
Total Sulphur	mg/kg	50	MCERTS	480	690	490	580	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.031	0.022	0.016	0.026	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.1	2.2	1.6	2.6	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

#### Total Phenols

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

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.12	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.15	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.2	0.17	1.1	0.13	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.3	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.39	0.26	1.2	0.2	-
Pyrene	mg/kg	0.05	MCERTS	0.32	0.23	0.89	0.19	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.2	0.16	0.52	0.12	-
Chrysene	mg/kg	0.05	MCERTS	0.22	0.21	0.54	0.15	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.25	0.24	0.5	0.17	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.09	0.07	0.2	0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.17	0.15	0.4	0.12	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.09	0.07	0.17	0.07	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.11	0.1	0.2	0.08	-

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.04	1.66	6.28	1.28	-
-----------------------------	-------	-----	-----------	------	------	------	------	---

Analytical Report Number: 23-53529  
Project / Site name: Lincolnshire Lakes

Lab Sample Number	2794732	2794733	2794734	2794735	2794736			
Sample Reference	TP50	TP51	TP42	TP25	TP25			
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Depth (m)	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.30-0.40			
Date Sampled	15/08/2023	15/08/2023	15/08/2023	15/08/2023	15/08/2023			
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

#### Heavy Metals / Metalloids

Analytical Parameter	Units	Limit of detection	Accreditation Status	2794732	2794733	2794734	2794735	2794736
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	29	19	20	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	220	430	300	250	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.7	1.2	0.72	0.77	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.2	0.9	0.5	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	59	36	39	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	44	30	32	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	81	160	92	100	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	34	21	21	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	51	32	33	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	180	140	140	-

#### Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	2794732	2794733	2794734	2794735	2794736
TPH C10 - C40 <sub>EH_CU_ID_TOTAL</sub>	mg/kg	10	MCERTS	< 10	< 10	11	< 10	-
TPH2 (C6 - C10) <sub>HS_ID_TOTAL</sub>	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	-

#### Pesticide and Herbicide Screen

Parameter	Units	Limit of detection	Accreditation Status	2794732	2794733	2794734	2794735	2794736
GCMS Pesticide Screen		N/A	NONE	None Detected	-	-	-	None Detected

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-53529  
Project / Site name: Lincolnshire Lakes

Lab Sample Number				2794737	2794738	2794739	2794740	2794741
Sample Reference				TP23	TP18	TP22	TP20	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.10-0.20	0.10-0.20	0.20-0.30	0.10-0.20
Date Sampled				15/08/2023	15/08/2023	15/08/2023	15/08/2023	16/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	18	-	17	14
Total mass of sample received	kg	0.001	NONE	1.6	0.3	-	0.8	0.8

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

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8	-	8.1	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0264	0.0093	-	0.0083	0.0079
Total Sulphur	mg/kg	50	MCERTS	410	500	-	500	470
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.016	0.017	-	0.02	0.02
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.5	1.7	-	2	2
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

#### Total Phenols

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

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.13	0.11	-	0.2	0.16
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.18	0.18	-	0.31	0.24
Pyrene	mg/kg	0.05	MCERTS	0.16	0.15	-	0.28	0.19
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	0.1	-	0.18	0.12
Chrysene	mg/kg	0.05	MCERTS	0.16	0.15	-	0.21	0.16
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.14	0.16	-	0.23	0.19
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.06	< 0.05	-	0.08	0.06
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.1	0.11	-	0.15	0.12
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.06	0.05	-	0.09	0.06
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.06	0.07	-	0.1	0.08

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.14	1.08	-	1.83	1.38
-----------------------------	-------	-----	-----------	------	------	---	------	------

Analytical Report Number: 23-53529  
Project / Site name: Lincolnshire Lakes

Lab Sample Number				2794737	2794738	2794739	2794740	2794741
Sample Reference				TP23	TP18	TP22	TP20	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.10-0.20	0.10-0.20	0.20-0.30	0.10-0.20
Date Sampled				15/08/2023	15/08/2023	15/08/2023	15/08/2023	16/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
<b>Heavy Metals / Metalloids</b>								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	20	-	21	20
Barium (aqua regia extractable)	mg/kg	1	MCERTS	300	260	-	290	290
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.84	0.68	-	0.73	0.77
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.5	-	0.7	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	42	33	-	36	39
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	28	-	33	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	100	87	-	91	96
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	20	-	22	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	31	-	33	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	130	-	150	140
<b>Petroleum Hydrocarbons</b>								
TPH C10 - C40 <sub>EH_CU_ID_TOTAL</sub>	mg/kg	10	MCERTS	< 10	< 10	-	< 10	< 10
TPH2 (C6 - C10) <sub>HS_ID_TOTAL</sub>	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	< 0.1
<b>Pesticide and Herbicide Screen</b>								
GCMS Pesticide Screen		N/A	NONE	-	None Detected	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-53529  
Project / Site name: Lincolnshire Lakes

Lab Sample Number				2794742	2794743	2794744	2794745	2794746
Sample Reference				TP44	TP29	TP30	TP32	TP33
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
Date Sampled				16/08/2023	16/08/2023	16/08/2023	16/08/2023	16/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	20	5	15	14
Total mass of sample received	kg	0.001	NONE	0.9	0.9	1.1	0.8	1.2

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8	-	8.1	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0115	0.0593	-	0.016	-
Total Sulphur	mg/kg	50	MCERTS	400	760	-	660	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.027	0.042	-	0.025	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.7	4.2	-	2.5	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

#### Total Phenols

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

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.11	0.22	-	0.21	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.21	0.4	-	0.39	-
Pyrene	mg/kg	0.05	MCERTS	0.2	0.37	-	0.36	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.12	0.23	-	0.24	-
Chrysene	mg/kg	0.05	MCERTS	0.14	0.29	-	0.29	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.18	0.32	-	0.36	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.06	0.14	-	0.1	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.12	0.25	-	0.24	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.06	0.12	-	0.13	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.09	0.16	-	0.16	-

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.29	2.5	-	2.48	-
-----------------------------	-------	-----	-----------	------	-----	---	------	---

Analytical Report Number: 23-53529  
Project / Site name: Lincolnshire Lakes

Lab Sample Number				2794742	2794743	2794744	2794745	2794746
Sample Reference				TP44	TP29	TP30	TP32	TP33
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
Date Sampled				16/08/2023	16/08/2023	16/08/2023	16/08/2023	16/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				<b>Heavy Metals / Metalloids</b>				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	35	-	30	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	210	380	-	350	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.71	1.4	-	1	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.7	-	0.7	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	75	-	63	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	48	-	41	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	90	170	-	130	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	35	-	29	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30	57	-	45	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	220	-	190	-
<b>Petroleum Hydrocarbons</b>								
TPH C10 - C40 <sub>EH_CU_ID_TOTAL</sub>	mg/kg	10	MCERTS	< 10	< 10	-	< 10	-
TPH2 (C6 - C10) <sub>HS_ID_TOTAL</sub>	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	-
<b>Pesticide and Herbicide Screen</b>								
GCMS Pesticide Screen		N/A	NONE	-	-	None Detected	-	None Detected

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected