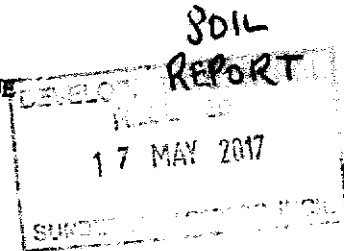




Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk



62 DURHAM ROAD, SUNDERLAND (LAND AT REAR) DESK BASED STUDY PLUS+ (PHASE 1) REPORT

CONTENTS

- 1 Introduction, Purpose and Objectives
- 2 Site Location and Description
- 3 Development History
- 4 Environmental Database Search
- 5 Geology, Mining & Previous Investigations
- 6 Radon
- 7 Hydrogeology
- 8 Hydrology
- 9 Historic Contaminating Land uses
- 10 Desk Study Assessment
- 11 Site Investigation Requirements
- 12 Summary and Conclusions

APPENDICES

Site Location
Selected Historical Maps
Site Plan and auger locations
Chemtech analysis results from augering
Plates

*Report Ref 17019a/b
20 February 2017*



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

Executive Summary

Intersoil undertook a desk based study plus limited soils sampling and analysis on a plot of land currently part of a rear garden. A walkover survey and hand augering was undertaken by a Chartered Geologist. The site comprises grassed land on a gentle slope with some tree stumps around the boundary. The fence is wooden and some pieces of cement board are present along one boundary.

Historical maps do not show any history of previous development. There is little evidence of industry in the wider area which is predominantly residential.

The geology is shown to comprise glaciofluvial drift over dolostones of the Ford Formation. No obvious risks from shallow underground mining have been highlighted with scrutiny to the Coal Authority Website.

The superficial drift is considered as a Secondary Aquifer and the solid geology are considered as a Principal Aquifer. Boreholes in the area show drift extending to at least 3.6m depth.

Two shallow pits to 1.2m depth were excavated by hand auger during the walkover within the plot. They revealed grey sometimes slightly ashy topsoil type (0.3-0.45m) with sand below. In one hole the sand was underlain by a firm brown clay. Four samples were taken and underwent chemical analysis to provide an indication of soil quality. No water was noted in either pit.

Flood risk is low and the nearest surface water feature is located 750m from the site.

Radon is not likely to be an issue with less than 3% of properties in the area possibly affected by radon bearing strata.

Other than some ashy topsoil and fragments of cement board along one boundary, which it is assumed will be removed prior to any work commencing, the perceived risks are low.

Should development or acquisition be planned, a soils investigation should be undertaken to accord with the requirements of the Local Authority and, include adequate geotechnical information as required by Building Regulations.



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

Our Ref No. 17019a/b
Date: 20 February 2017

62 Durham Road, Sunderland (Land at Rear) Desk Based Study (Phase 1) Report

1. Introduction, Purpose & Objectives

Intersoil was commissioned to undertake a desk based study on a plot of land at the rear of 62 Durham Road, Sunderland. The purpose of this report is to provide an overview of the environmental and historical context of the site via various desk based searches and a walkover assessment. It is understood that a new house is planned.

This report documents the Phase 1 work. This report has been prepared with reference to guidance published for use by developers and consultants by a group of Local Authorities (YAHPAC). The report has been prepared for use solely by Mr Paul Teasdale (the Client). It should not be used or relied upon by third parties. Where referenced, depths are from surface and distances are stated in metres (m). This report is valid for 12 months from the date of issue.

A number of appendices accompany this report. This report should not be read without reference to the appendices which are presented at the rear of this report.

2. Site Location & Description

A walkover survey was undertaken by a Chartered Geologist on the 9th February. A plan of the study area and location are presented in the Appendices. The site is centred on O.S. Grid Reference 436463E, 553715N. The plot has an area in the order of 220m². The site comprises a plot of grass (rear garden) with a gentle fall southward to a wooden fence at the foot of the garden. The grass cover is rather sparse. Some tree stumps were in the process of being removed during the site visit. A house is present just beyond the north end of the plot where a single garage is located. Some fragments of suspected asbestos cement (cement board) are present hard along the southern edge and appear to have been placed there to assist in a soil retaining capacity. The plot is set within a wholly residential area which is well established. Two hand augers were undertaken within the plot at the time of the visit (see later Section)



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

3. Development History

A number of maps previously issued by the Ordnance Survey were acquired and selected maps are presented in the Appendices. Table 1 shows the main features:

Date	Onsite	Offsite	Comments
1855	Agricultural fields	Road/ Track along east side High Farrington farm shown 80m north	Fields
1896	Little change (L/C)	Well 150m north, Durham Road East of site shown. Pond 200m north.	
1919	L/C	L/C	
1939	House with garden and garage shown	Houses developed along Durham Road	House, garage and garden
1953	L/C	Houses 100-200m north	
1959	L/C	Houses north east and school east of site Some earthworks possibly beyond south where hachures shown	
1964	L/C	Houses to the south forming Farrington Avenue	
1967/70	L/C	L/C	
1989/93	L/C	L/C	

TABLE 1: SUMMARY OF HISTORICAL LAND USE

Based on scrutiny of the historical maps, the house with garage and garden currently occupying the plot and ground to the north are the only phase of development on the site. There is possibly some earthworks that may have taken place south of the plot. This is thought to have been to prepare the ground for further housing (see later Section). Based on the above information, there are no historical potentially contaminating land uses within or close to the house and plot at the rear.

4. Environmental Database Search

An environmental database report from Groundsure (Ref: SG-BAR – 3625477 – available upon request: 9th February 2017) was acquired as part of the study and the following aspects of environmental information are summarised as follows:

Description	Onsite (Y/N)	Close to site (Y/N)	Comments
Landfill Site	N	N	Nearest is East Moorside; licence ref SLD07/SL24 – 880m south from the site. Silksworth – ref SLD71/SL060 – 1.2Km east of site. Inert. 1980-1994
Waste Transfer and treatment	N	N	-
Integrated Pollution Control (IPC & LAPPC)	N	N	-
Radioactive Licencing	N	N	-



Intersoil Limited
 Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
 Tel 01670 515566
info@intersoil.co.uk

Hazardous substances licencing	N	N	-
Dangerous Substances	N	N	-
Control of Major Accident Hazards	N	N	-
Emissions to air and incidents	N	N	-
Contraventions of groundwater or pollution	N	N	-
Contaminated land Register	N	N	-
Past Land uses	N	Y	Historical industry -- 370m south east (1855/56) Unspecified tank. 460m south east substation (1967). Some earthworks south of site also noted in old maps
Contemporary land uses	N	N	Nearest sub/station 288m south west. Piano Tuning noted 200m north at Tasmin Road. Acorn Pest Control 220m south west.
Flooding	N	N	Low flood risk. Pluvial flood risk

TABLE 2: ENVIRONMENTAL DATA

Key: - = no notes relating to features within 500m of the site.

5. Geology, Mining & Previous Investigations

Geology

Reference to information published by the British Geological Survey (BGS) shows that the site is located above glacio-fluvial deposits comprising sand and/or sand and gravel. Glacial Till is shown to be present in the surrounding area. The solid geology is shown to comprise dolostones (dolomite) of the Form Formation.

Mining

The site is within a coalfield. Reference to published Coal Authority data does not show that the site is within a 'High Risk Development Area'. There are no shallow coal seams shown to be present below the site and it is not considered to be subject to recorded shallow workings.

Previous Investigations

Intersoil are unaware of any data from previous investigations within the site. Scrutiny of the archived borehole logs catalogue held by the British Geological Survey reveals that there is 1 borehole record pertaining to previous investigations in the wider area. The summarised details are as follows:



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

Farrington Housing Estate Extension – 1956/57
Borehole extending to 3.6m (12foot(ft)). BH5
Topsoil – surface to 9 inches (in)
Yellow stoney clay to 5ft 7 in
Loamy sand and clay to 9ft 6 in
Brown stoney clay with sand partings to 12ft

On Site Soil Sampling & Analysis

Two soil augered holes were undertaken during the walkover survey by Intersoil on the 9th February 2017. These were undertaken in the plot (rear garden). They proved the following:

TP1 – Coordinates 36457, 53709

0-0.3m Dark grey black and grey brown topsoil type
0.3-1m Brown very sandy clay/clayey sand
1-1.2 Stiff dark brown clay

TP2 – Coordinates 36460, 53719

0-0.45m Grey black topsoil type
0.45-1.2m Fine to medium brown sand with little staining at base

Four soil samples were taken and underwent analysis in order to provide some preliminary data on the soil quality. The results are appended.

6. Radon

Reference to the Indicative Atlas of Radon in England and Wales indicates that the site does not lie within a radon affected area, with between 3% and 1% of properties potentially affected. No radon measures are expected to be required.

7. Hydrogeology

The superficial deposits shown to be present are considered as a Secondary A (minor) aquifer. The solid geology is considered as a Principal Aquifer and sensitive to water borne and leaching contamination. There are no abstraction licences in the area. The site is not within a Source Protection Zone (an Environment Agency Designation). The nearest nitrate vulnerable area is 800m from the site.

8. Hydrology

The Groundsure data shows the nearest surface water feature as an unclassified ditch approximately 750m south east of the site. It is close to an old railway line. The surface water flow on site is likely to follow the topography southward. However, there may be a local drainage network which will influence surface water flow. The site may be within an area potentially affected by pluvial flooding. There is no obvious history of flooding from nearby rivers or other surface water features.



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UB
Tel 01670 515566
info@intersoil.co.uk

9. Historic Contaminating Land Uses

Based on an assessment of the historical maps and environmental information provided, the site has been exposed to the following:

Major Contaminative use Onsite	None noted
Offsite Contaminative use (immediate vicinity)	None noted
Offsite Contaminative use (wider area)	None noted other than perhaps a substation.
Other issues	Topsoil shown to be grey black and a little ashy. Pieces of cement board along one boundary

TABLE 3: SUMMARY OF CONTAMINATIVE EXPOSURE & OTHER ISSUES

10. Desk Study Assessment

The data collated from site has been assessed and the following possible receptors have been considered within a 'conceptual model'. This is a summarised assessment which outlines the potential issues within or near the site that may impact the proposed development.

Potential Sources

In general, potential sources of contamination relate to determinants within the made ground which may contain toxic or phytotoxic substances which may be viewed as a potential hazard. Historical maps supplemented by other search and walkover survey data confirms that the site has no history of industrial development on or near the plot. However, there is evidence of ashy topsoils in places and some cement board fragments of suspect quality in places along one boundary (south fence). Analysis of the samples taken during augering by Intersoil when compared with residential threshold values¹ reveal one elevated lead concentration in the shallow soils. Some suspected cement board² is also present.

Potential Pathways

These are the means by which sources of contamination may reach sensitive receptors. This may comprise:

- Dermal contact
- Ingestion
- Inhalation
- Migration in dust
- Migration in vapours
- Groundwater & Surface water

¹ The results of soil analyses were compared to residential land use soil thresholds provided by the Environment Agency (CLEA) and supplemented by guidance issued by the Chartered Institute of Environmental Health (CIEH/LQM- S4ULS Edition). A threshold value of 310 mg/kg has been used for lead in the absence of a S4UL value. A conservative soil organic matter concentration was used (1%). Topsoil type soils underwent analysis for PAH and heavy metals; Deeper samples from the clay or sand underwent analysis for pH and sulphates. The results from deeper samples do not suggest any upgrading of concrete is required (BRE Digest 1).

² Cement board fragments to be removed by a licensed contractor or surveyor



Intersoil Limited
 Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
 Tel 01670 515566
info@intersoil.co.uk

Potential Receptors

There are a number of potential receptors to be considered when re-development is planned. These may comprise:

- Construction Workers
- Future End Users
- The Public and users of adjoining land
- Property (concrete and utilities)
- Vegetation & Animals
- Surface Water

For a potential hazard to be present there must be a relationship between the source and the receptors (or those at risk from contamination). This is termed the *source-pathway-receptor* relationship. Assuming all 3 elements are present, there are various combinations which may appear to be relevant to this site, albeit remote. A number of these are or may be perceived to be either likely (in terms of occurrence) or unlikely and a risk rating (in terms of potential effects or impact) has been assigned accordingly. The Conceptual Model provides information on relevant relationships that are thought possible or likely based on the sites current use.

Receptor	Pathway	Effects	Potential	Risk Rating
Shallow Groundwater from offsite source	Percolation through made ground	Contamination of perched water and drainage	LOW	LOW
Groundwater in Bedrock	Percolation from perched water	Contamination of groundwater	LOW	LOW
Construction Workers. Site Operatives	Dermal Contact Ingestion Inhalation	Health Effects	LOW	LOW
Public & Neighbours	Inhalation & Ingestion to Public	Health Effects	LOW	LOW
Future Site users	Inhalation, dermal contact & ingestion	Contamination from previous development and soil gas migration	LOW*	LOW*
Surface Water	Migration via perched water	Contamination from drainage and perched water migration	LOW	LOW
Property	Direct Contact	Aggressive Ground Conditions Soil Gas	MED	MED
Wildlife (Burrowing mammals or foragers)	Dermal Contact Ingestion Inhalation	Health Effects	LOW*	LOW*

TABLE 4: CONCEPTUAL MODEL & PRELIMINARY PERCEIVED RISK ASSESSMENT.

*-Assumes remedial measures as appropriate.

*-no burrows noted



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

This investigation has identified generally a 'low' risk category for the plot. It assumes that site clearance will take place and include removal of ashy topsoil and cement board fragments located along one boundary. A soil investigation will need to be undertaken at some time in the future in order to comply with Building Regulations. Other works may be required depending on the results of such an investigation.

This assessment of risk is preliminary in nature and should be reviewed as part of a soil investigation required under the Planning Regime and Building Regulations. If this report is to be used to assist in the purchase of the property (or part of it), it is recommended that a fuller soils investigation is undertaken to identify any abnormal costs that might be incurred in the development over and above that of a greenfield site. Such costs may in general terms include deepened foundations or piling, upgraded water pipe and sub-surface concrete, soil gas membrane installation and an uplift to the cost of offsite removal of ashy made ground to landfill. The list of these elements is not exhaustive. A field investigation (Phase 2) may also be used to provide a scope for the design of the development and costing of groundworks. The work should be proportional to the plot and intended land use.

11. Site Investigation Requirements

The presence and nature of any made ground on site is uncertain at this time. Soil gas, the presence of made ground and the possibility of rock at shallow depth have been identified. Given the proposed development area, a phased investigation initially comprising shallow 3 soil light percussion boreholes together with geotechnical testing and gas monitoring is suggested. This information will enable construction works to be planned and will allow the development to comply with building insurance purposes and for general health and safety and CDM planning.

Consultation is recommended with the Local Authority on the scope of any field investigation.

12. Summary & Conclusions

The following summary is provided:

- Intersoil undertook a desk based study plus limited soils sampling and analysis on a plot of land currently part of a rear garden. A walkover survey and hand augering was undertaken by a Chartered Geologist. The site comprises grassed land on a gentle slope with some tree stumps around the boundary. The fence is wooden and some pieces of suspected cement board are present along one boundary.
- Historical maps do not show any history of previous development. There is little evidence of industry in the wider area which is predominantly residential.
- Two shallow pits to 1.2m depth were excavated by hand auger during the walkover within the plot. They revealed grey sometimes slightly ashy topsoil type with sand below. In one



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

hole the sand was underlain by a firm brown clay. Four samples were taken and underwent analysis to provide an indication of soil quality.

- The geology is shown to comprise glaciofluvial drift over dolostones of the Ford Formation.
- No obvious risks from shallow underground mining have been highlighted with scrutiny to the Coal Authority Website.
- The superficial drift is considered as a Secondary Aquifer and the solid geology are considered as a Principal Aquifer. Boreholes in the area show drift extending to at least 3.6m depth.
- Flood risk is low and the nearest surface water feature is located 750m from the site.
- Radon is not likely to be an issue with less than 3% of properties in the area possibly affected by radon bearing strata.
- Other than some ashy topsoil and fragments of cement board along one boundary, which it is assumed will be removed prior to any work commencing, the perceived risks are low.
- Should development or acquisition be planned, a soils investigation should be undertaken to accord with the requirements of the Local Authority and include adequate geotechnical information as required by Building Regulations.

Report by
Alistair MacDonald
(BSc, MSc, LL.M, CGeol, FGS)



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

APPENDICES



Intersoil Limited
Suite 30, 58 Low Friar Street, Newcastle, NE1 5UE
Tel 01670 515566
info@intersoil.co.uk

APPENDICES

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
63388-1	TP1	0.00-0.25	N	
63388-2	TP1	1.00-1.20	N	
63388-3	TP2	0.10-0.40	N	
63388-4	TP2	1.00-1.20	N	

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample Id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
63388-1	TP1	0.00-0.25	Sandy Loam	-	-	20.4
63388-2	TP1	1.00-1.20	Clay	-	-	16.2
63388-3	TP2	0.10-0.40	Sandy Loam	-	-	18.9
63388-4	TP2	1.00-1.20	Sand	-	-	16.7



2531



CHEMTECH 
environmental

ANALYTICAL TEST REPORT

Contract no: 63388
Contract name: Durham Road, Sunderland
Client reference: -
Clients name: Intersoil
Clients address: Suite 30
58 Low Friar Street
Newcastle Upon Tyne
NE1 5UE
Samples received: 13 February 2017
Analysis started: 13 February 2017
Analysis completed: 16 February 2017
Report issued: 16 February 2017

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope. Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling. Methods, procedures and performance data are available on request. Results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without prior written approval. Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

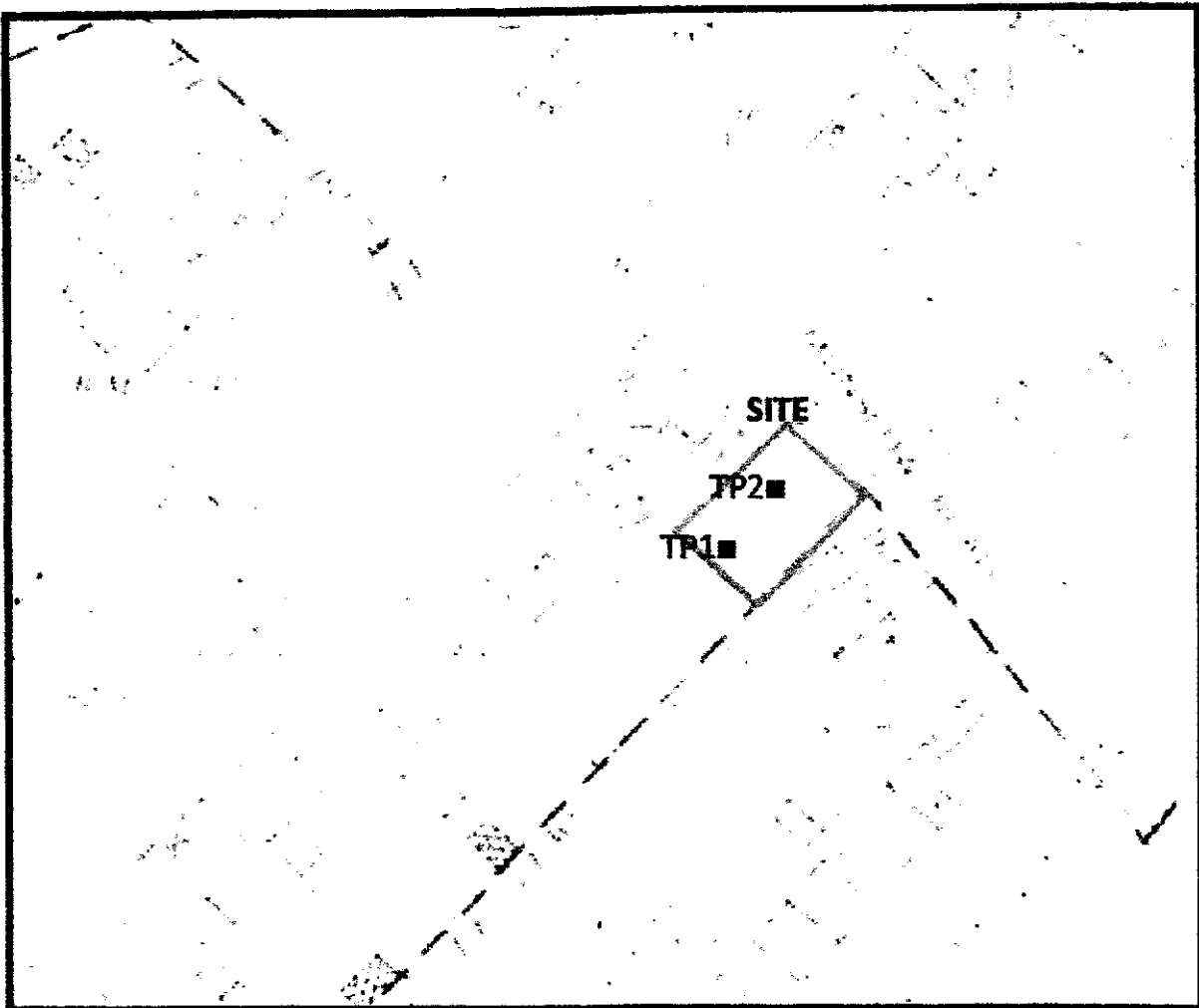
Approved by:

James Spittle
Customer Services Team Leader

Intersoil.co.uk

62 DURHAM ROAD (LAND AT REAR), SUNDERLAND SITE PLAN SHOWING AUGER HOLES

(NOT TO SCALE / DO NOT SCALE OFF PLAN)
For locations see coordinates in report text



Intersoil.co.uk

62 DURHAM ROAD (LAND AT REAR), SUNDERLAND PLATES



Site looking toward Munslow Road (Westward)



Site Looking east from access point on Munslow Road: tree stump removal



Firm clay and sand from TP1



Sand arisings from TP2