GroundSolve Ltd
Consulting Geotechnical Engineers

FACTUAL GROUND INVESTIGATION WYNNSTAY TECHNOLOGY PARK, RUABON

GSL3066R02

VERSION 1

24 APRIL 2024

FINAL

Prepared for:

Castle Mead Group

Prepared by: A Bell

GroundSolve Ltd

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This report has been prepared by GroundSolve Ltd with all reasonable care and diligence, within the best practice and guidance current at the time of issue within the proposed redline boundary and proposed Site end use as presented by the Client.

This report is confidential to the Client and GroundSolve Ltd accepts no responsibility whatsoever to third parties to whom this report is presented.

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1 INTRODUCTION

1.1 Report Objectives

GroundSolve Ltd was commissioned by Castle Mead Group to undertake additional Ground Investigation to identify if the stockpiled material was suitable for re-use on the proposed development.

This report presents the factual records of the fieldwork and laboratory testing.

1.2 Introduction

The scope of the investigation, which was specified as part of the ground investigation was to determine if any of the materials stockpile was suitable for re-use.

Six trial pits were proposed to allow sampling of the stockpiled material (topsoil) to recover samples for a general testing suite including Toxic Metal, PAH, TPH and asbestos.

Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of exploratory hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

All information given in this report is based on the ground conditions encountered during the site work and on the results of laboratory and field tests performed during the investigation. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations and water conditions between or below exploratory holes.

2 SITE DETAILS AND DESCRIPTION

Table 2.1 Current Site Overview.

Site name	Wynnstay Technology Park
Site address	Wynnstay Technology Park, Ruabon, Wrexham LL14 6EN
National Grid Reference (NGR)	329226 343570
Approximate Site area	2.07Ha
Site shape	Roughly Rectangular
Current land use on the Site	To the north of the site is the A539 Llangollen road with agricultural/arable land and a power station beyond. The west the site is bounded by Wynnstay Lane with residential properties some 50m from site. To the east and south of the site is an access round for Wynnstay Technology Park with industrial units beyond.
Surrounding land uses	The central part of the site is relatively flat with a general slope from north east 126m OD to south west 123m OD over 140m span. The northern and eastern boundary are formed by raised embankments which are typically 2.0m to 4.0m higher than the rest of the site. The east and southern boundaries comprise of metal fencing.
General topography and ground levels	The published geology on the Geological Survey of England and Wales 1:63,360/1:50,000 geological map series, Sheet 121, Wrexham, 1993. And the BGS GeoIndex (onshore), show the site to be underlain by glacial till (clay) with the bedrock comprising Pennine Middle Coal Measures (siltstone, sandstone and mudstone).

3 FIELDWORK

3.1 Introduction

Fieldwork was undertaken between 15th March 2024 and comprised the following:

Table 3.1 Scope of Intrusive Works and In Situ testing.

Exploratory Location/ Insitu Test Type	No.
Machine Excavated trial pits	6

The exploratory hole locations were selected by Groundsolve and were set out from local features.

3.2 Exploratory Holes

The exploratory holes were logged by an engineer in accordance with the recommendations of BS5930:2015 +A1:2020, which incorporates the requirements of BS EN ISO 14688-1, 14688-2:2018 and 14689:2018. Methods of formation and geological descriptions, together with sample records and observations made during formation of the exploratory hole are given in the logs presented in **Appendix A.**

A summary of the exploratory holes formed is listed in the following table.

Table 3.2 Summary of the Exploratory Holes/Location

Location	Date	Easting	Northing	Final Depth (m)
SP01	15/03/2024	328804.59	343692.95	0.60
SP02	15/03/2024	328758.79	343666.75	0.60
SP03	15/03/2024	328753.45	343693.38	0.60
SP04	15/03/2024	328764.79	343725.45	0.60
SP05	15/03/2024	328783.45	343730.39	0.60
SP06	15/03/2024	328787.99	343764.75	0.60

Prior to commencement, all exploratory positions were checked for services by reference to available plans, visual inspection and CAT/Genny survey.

3.3 Sampling

Samples for chemical testing and strata description were taken during the formation of the exploratory holes in general accordance with the specification, BS5930:2015, BS10175:2011 and BS EN ISO 22475-1:2006. Soil samples for laboratory chemical testing were despatched directly to (Elab) Laboratory).

4 LABORATORY TESTING

4.1 Chemical Laboratory Testing

Chemical samples were submitted to a UKAS accredited laboratory in accordance with ISO17025 and are also MCERTS accredited for soil analysis in accordance with the Environment Agency's scheme. The laboratory carries out Quality Assurance and Quality Control in accordance with BS ISO 17025 and participate in external laboratory comparison and quality control schemes. Details of the accreditation and the methods of analysis are provided on the relevant test reports.

The selected soil samples were tested for a range of typical contamination indicators including specific tests for contaminants suspected as being present from the observations made on-site.

Tests were also performed which were used to support the modelling of contaminant transport and impacts (e.g. TOC).

Each of the soil samples were analysed for the 'total' concentration of a suite of potential contaminants.

The results of the laboratory analysis are presented in **Appendix A**. The various suites of analysis for the soil are presented in Table 4.1 below:

Table 4.1: Suites of Analysis for Environmental Soil Samples

Determinand	Soil Suite 1
Number of Samples	6
Index Tests	
Asbestos Screen / Quantification	✓
pH	✓
Metals	
As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn (all totals)	✓
Inorganics	
Acid Soluble Sulphate	✓
Cyanide - Total	✓
Sulphate (2:1 extract on soil samples)	✓
Organics	
Phenols - Total (monohydric)	✓
Total Organic Carbon (TOC)	✓
PAH (Speciated USEPA 16)	✓
Speciated TPH (C5-C35)	✓
Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX);	✓

5 GROUND CONDITIONS

5.1 Topsoil / Anthropogenic Materials

The stockpiles comprised of topsoil and some vegetation from trees and shrubs across the site. The topsoil were generally described as below;

- Loose dark brown slightly gravelly sandy silt.
- Loose dark brown gravelly slightly silty sand.

No evidence of contamination were noted within the stockpile excavations.

6 GENERIC QUANTITATIVE RISK ASSESSMENT

6.1 Assessment for the Protection of Human Health

The results of the soil analyses are presented below, where they have been compared to suitable generic assessment criteria (GACs), in order to allow a generic quantitative risk assessment (GQRA) to be carried out for the site and the proposed development.

The Category 4 Screening Levels (C4SLs) published by DEFRA (2014) have been adopted in the first instance, which have been published for six substances to date. Where a C4SL is unavailable, the "Suitable 4 Use Levels" (S4ULs) published by LQM/CIEH (2015) have been adopted.

These criteria have been derived using the CLEA model for a range of standard end-use scenarios and a range of soil organic matter (SOM) contents. It should be noted that the C4SL values are derived on the basis of a "low level of toxicological concern", while the S4UL values are based on a "tolerable" or "minimal" level of risk. As such, the S4ULs describe a lower level of risk than the C4SLs, and are equivalent to the former Soil Guideline Values (SGVs, published by the Environment Agency) and the previous editions of the LQM/CIEH GAC values.

The GQRA is based on a soil with a Soil Organic Matter of 1.0%, for a residential end use with gardens.

A full summary of the chemical test results is presented in **Appendix C**.

Metals

The results from the metal analysis have recorded typically low concentrations with no exceedances of the applicable GACs.

PAHs

All samples selected for analysis have generally recorded low PAHs.

Petroleum Hydrocarbons (PHC)

No hydrocarbon impacted material was encountered during the fieldwork. The chemical results have typically been below the detection limit with no samples above any GACs.

Asbestos

Asbestos can be present in soil as fragments of bulk Asbestos Containing Materials (ACMs) (e.g., asbestos cement sheeting) and also as discrete asbestos fibres within the soil matrix. This investigation has carried out assessments to determine whether both bulk fragments of asbestos and discrete fibres are present in the soil at the site. The asbestos assessment commenced on site with inspection of the Made Ground by our site staff for the presence of bulk ACMs. During the fieldwork no suspected ACMs were identified.

Laboratory assessments were carried out in order to confirm the site assessment that ACMs were absent, and no asbestos was detected in any of the samples retrieved from site.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Ground Profile

A preliminary risk assessment has been carried out based on the contaminant-pathway-receptor model as defined in Statutory Guidance to Part IIA of the Environment Protection Act, 1990, and in accordance with BS 10175: 2011 +A1 2013 “Investigation of Potentially Contaminated Sites – Code of Practice”. The characteristic ground conditions and elements of the surrounding environment and has been summarised and a risk assessment carried out.

The proposed residential development comprises private gardens and soft landscaped areas. It has already been assessed that the gardens and soft landscaped areas will require a validated cover system.

7.2 Environmental Risk Assessment

The results of site investigation and laboratory analysis from existing stockpiles present on site generally record negligible concentrations of potential contaminants and no exceedance of the relevant GACs for residential landuse.

7.3 Re-use of Materials

The test results show that the stockpiled material is suitable for re-use within the proposed soft landscaping as part of the new development. However validation testing will be required as agreed within the remediation strategy with final submission to local authority.

8 REFERENCES

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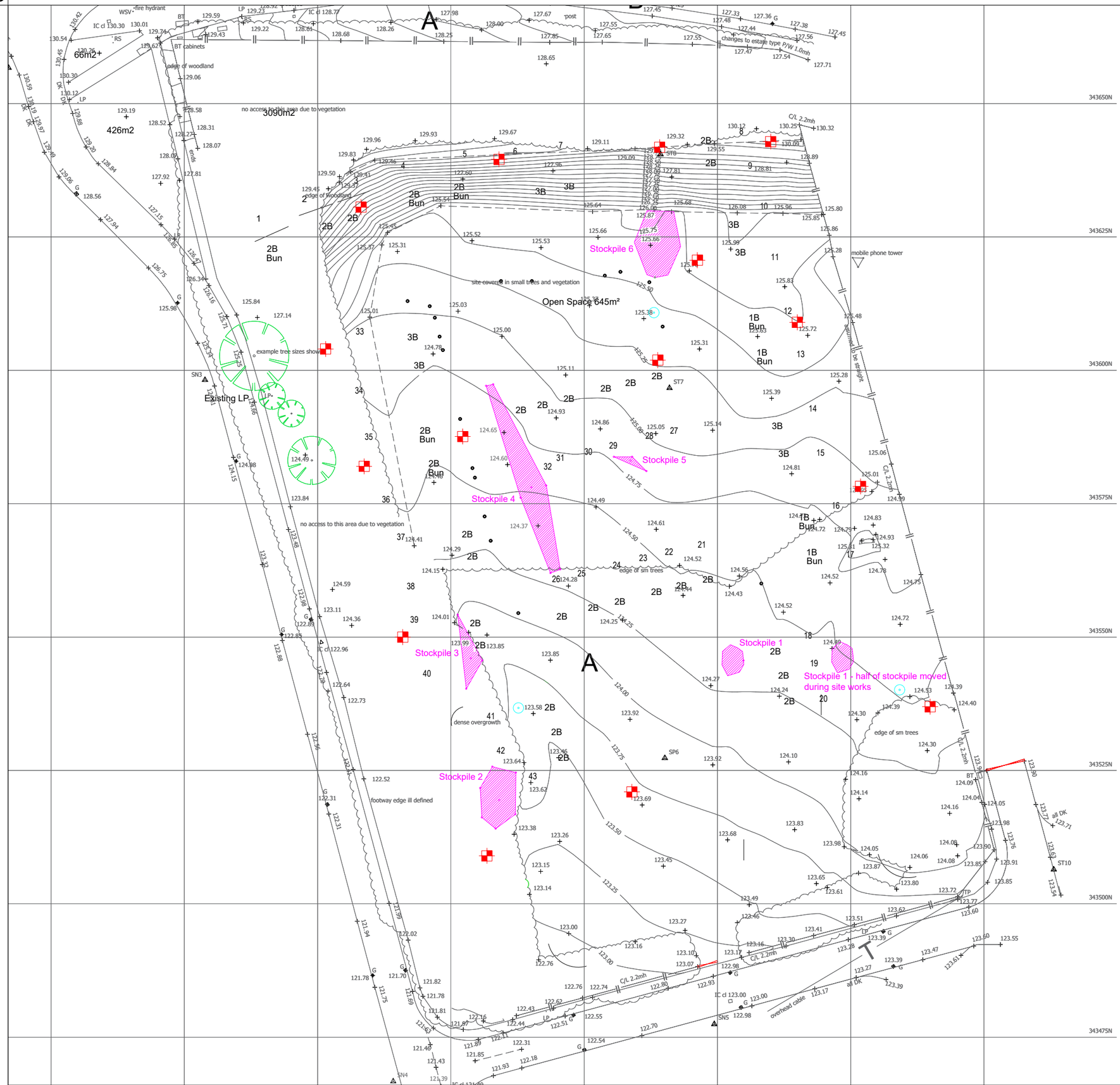
9 DEFINITIONS

AOD	Above Ordnance Datum
bgl	Below ground level
BGS	British Geological Survey
BRE	Building Research Establishment
CBR	California Bearing Ratio (test)
COMAH	Control of Major Accident Hazards (regulations)
DQRA	Detailed Quantitative Risk Assessment
DWS	Drinking Water Standard
EQS	Environmental Quality Standard
GAC	Generic Assessment Criterion
GQA	General Quality Assessment (Environment Agency)
GQRA	Generic Quantitative Risk Assessment
GSV	Gas Screening Value
HCV	Health Criteria Value
IPPC	Integrated Pollution Prevention and Control (regulations)
NGR	National Grid Reference
NIHHS	Notification of Installations Handling Hazardous Substances (regulations)
OS	Ordnance Survey
ppm	Parts per million
ppmv	Parts per million by volume
SAC	Special Area of Conservation
SPZ	Source Protection Zone
SSAC	Site-Specific Assessment Criterion
SSSI	Site of Special Scientific Interest

10 DRAWINGS

1. GSL3066-2-001 –Stockpile Location Plan

A3



Legend

2024 Site Investigation

Stockpile 2

Stockpile locations

Revision	Description	Date
A		

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Drawing Title

Stockpile Location Plan

Drawing Scale	Drawn By	Approved By
@ A3	JT	SF

Drawing Status	Date of Issue
FINAL	04/24

Drawing No	Revision
3066-2-001	

APPENDIX A – CHEMICAL TESTING RESULT

Job No: 3066
Site Location: Wynnstay Technology Park, Ruabon
Residential with gardens (1% SOM)

GroundSolve Ltd

Metals & Non-Metals	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Arsenic	25.4	21.4	25.5	11.9	10.9	15.8	16.9	10.9	14.1	10.9	25.5	16.98	9	37	C4SL	0
Cadmium	1.6	1.4	1.6	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	1.28	9	22	C4SL	0
Chromium	23	19.3	23.5	17.6	15.7	13.8	13.2	14.7	15.1	13.2	23.5	17.32	9	910	S4UL	0
Copper	43.9	37.3	44.2	30.8	32.2	45.2	54.7	31.3	40.4	30.8	54.7	40	9	2400	S4UL	0
Lead	65.6	58.4	71	97.2	84.1	45.3	45.4	66.1	66.1	45.3	97.2	66.58	9	200	C4SL	0
Mercury	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	1.2	S4UL	0
Nickel	39.2	34.2	42	17.9	18.7	32.6	46.3	24.1	25.5	17.9	46.3	31.17	9	130	S4UL	0
Total Monohydric Phenols	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	9	120	S4UL	0
Selenium	1.2	1.1	1.1	< 1.0	< 1.0	1	1.3	< 1.0	< 1.0	< 1.0	1.3	1.14	9	250	S4UL	0
Zinc	168	148	176	87.3	82.3	62.5	77.1	72.5	76.3	62.5	176	105.56	9	3700	S4UL	0

Petroleum Hydrocarbons	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Benzene	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	9	0.87	C4SL	0
Toluene	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	9	130	S4UL	0
Ethylbenzene	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	9	47	S4UL	0
xylenes	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	9	-	S4UL	9
>C5-C6 Aliphatic	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	9	42	S4UL	0
>C6-C8 Aliphatic	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	9	100	S4UL	0
>C8-C10 Aliphatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	27	S4UL	0
>C10-C12 Aliphatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	130	S4UL	0
>C12-C16 Aliphatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	1100	S4UL	0
>C16-C35 Aliphatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.5	< 1.0	< 1.0	2.6	< 1.0	7.5	5.05	9	65000	S4UL	0
>C35-C40 Aliphatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	65000	S4UL	0
>C5-C7 Aromatic	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	9	70	S4UL	0
>C7-C8 Aromatic	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	9	130	S4UL	0
>C8-C10 Aromatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	34	S4UL	0
>C10-C12 Aromatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	74	S4UL	0
>C12-C16 Aromatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	140	S4UL	0
>C16-C21 Aromatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9	260	S4UL	0
>C21-C35 Aromatic	< 1.0	< 1.0	1.3	< 1.0	< 1.0	6.4	< 1.0	< 1.0	2	< 1.0	6.4	3.23	9	1100	S4UL	0
>C35-C40 Aromatic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3	< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.3	9	1100	S4UL	0

Polyaromatic Hydrocarbons (PAH)	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Acenaphthene	< 0.5	< 0.5	< 0.5	1.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	1.1	9	210	S4UL	0
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	170	S4UL	0
Anthracene	< 0.5	< 0.5	< 0.5	1.2	1.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.3	1.25	9	2400	S4UL	0
Benzo(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	7.2	S4UL	0
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	5	C4SL	0
Benzo(b)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	0.5	9	2.6	S4UL	0
Benzo[g,h,i]perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	320	S4UL	0
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	77	S4UL	0
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	15	S4UL	0
Dibenzo(a,h)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	0.24	S4UL	0
Fluoranthene	< 0.5	< 0.5	< 0.5	0.7	< 0.5	0.7	< 0.5	< 0.5	< 0.5	< 0.5	0.7	0.7	9	280	S4UL	0
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	170	S4UL	0
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	27	S4UL	0
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9	2.3	S4UL	0
Phenanthrene	< 0.5	< 0.5	< 0.5	2.4	2.5	< 0.5	< 0.5	5.2	< 0.5	< 0.5	5.2	3.37	9	95	S4UL	0
Pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0.6	9	620	S4UL	0

Other Contaminants / Testing	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Soil Organic Matter	4	5.1	4.8	5.5	6.4	9.9	9.6	5.5	7.6	4	9.9	6.49	9	-	-	-
pH	7.7	7.7	7.7	7	6.5	5.7	5.8	5.7	6.6	5.7	7.7	6.71	9	-	-	-
Total Cyanide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0	1.2	9	-	-	-
Water Soluble Sulphate	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	0.05	< 0.02	< 0.02	< 0.02	0.04	9	-	-	-

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Certificate of Analysis

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	24-52895
Issue:	1a
Date of Issue:	27/03/2024
Contact:	Aaron Bell
Customer Details:	GroundSolve Ltd Unit 1 Well House Barns Chester Road Bretton FlintshireCH4 0DH
Quotation No:	Q24-04319
Order No:	Not Supplied
Customer Reference:	3066
Date Received:	19/03/2024
Date Approved:	27/03/2024
Details:	Wynnstay Technology Park, Ruabon
Approved by:	

Tim Reeve, Technical Coordinator

Sample Summary

Report No.: 24-52895, issue number 1a

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
355835	SP1 ES1	15/03/2024	19/03/2024	Silty loam	
355836	SP1 ES2	15/03/2024	19/03/2024	Silty loam	
355837	SP1 ES3	15/03/2024	19/03/2024	Silty loam	
355838	SP2 ES1	15/03/2024	19/03/2024	Silty loam	
355839	SP3 ES1	15/03/2024	19/03/2024	Silty loam	
355840	SP4 ES1	15/03/2024	19/03/2024	Silty loam	
355841	SP5 ES1	15/03/2024	19/03/2024	Silty loam	
355842	SP5 ES2	15/03/2024	19/03/2024	Silty loam	
355843	SP6 ES1	15/03/2024	19/03/2024	Silty loam	

Results Summary

Report No.: 24-52895, issue number 1a

				ELAB Reference	355835	355836	355837	355838	355839	355840	355841	355842	355843
				Customer Reference	ES1	ES2	ES3	ES1	ES1	ES1	ES1	ES2	ES1
				Sample ID									
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6
				Sample Depth (m)									
				Sampling Date	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Determinand	**Codes**	**Units**	**LOD**										
Soil sample preparation parameters													
Moisture Content	N	%	0.1		19.0	17.6	18.4	17.5	22.5	15.9	16.4	13.9	16.1
Stones Content	N	%	0.1		6.7	< 0.1	10.6	12.5	< 0.1	4.0	< 0.1	< 0.1	< 0.1
Material removed	N	%	0.1		6.7	< 0.1	10.6	12.5	< 0.1	4.0	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0		Stones	None	Stones	Stones	None	Stones	None	None	None
Metals													
Arsenic	M	mg/kg	1		25.4	21.4	25.5	11.9	10.9	15.8	16.9	10.9	14.1
Cadmium	M	mg/kg	0.5		1.6	1.4	1.6	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5		23.0	19.3	23.5	17.6	15.7	13.8	13.2	14.7	15.1
Copper	M	mg/kg	5		43.9	37.3	44.2	30.8	32.2	45.2	54.7	31.3	40.4
Lead	M	mg/kg	5		65.6	58.4	71.0	97.2	84.1	45.3	45.4	66.1	66.1
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		39.2	34.2	42.0	17.9	18.7	32.6	46.3	24.1	25.5
Selenium	M	mg/kg	1		1.2	1.1	1.1	< 1.0	< 1.0	1.0	1.3	< 1.0	< 1.0
Zinc	M	mg/kg	5		168	148	176	87.3	82.3	62.5	77.1	72.5	76.3
Anions													
Water Soluble Sulphate	M	g/l	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	0.05	< 0.02
Inorganics													
Total Cyanide	M	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02		0.14	0.13	0.13	0.10	0.08	0.29	0.46	0.11	0.16
Miscellaneous													
pH	M	pH units	0.1		7.7	7.7	7.7	7.0	6.5	5.7	5.8	5.7	6.6
Soil Organic Matter	U	%	0.1		4.0	5.1	4.8	5.5	6.4	9.9	9.6	5.5	7.6
Total Organic Carbon	N	%	0.01		4.9	4.7	3.6	6.4	8.8	12	16	4.7	8.2

Results Summary

Report No.: 24-52895, issue number 1a

			ELAB Reference	355835	355836	355837	355838	355839	355840	355841	355842	355843
			Customer Reference	ES1	ES2	ES3	ES1	ES1	ES1	ES1	ES2	ES1
			Sample ID									
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6
			Sample Depth (m)									
			Sampling Date	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Determinand	**Codes**	**Units**	**LOD**									
Organics												
>C8-C10 BCB (EH_1D_Total)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 BCB (EH_1D_Total)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 BCB (EH_1D_Total)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 BCB (EH_1D_Total)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diesel Range Organics (>C8-C21) (EH_1D_Total)	N	mg/kg	1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Phenols												
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons												
Naphthalene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	1.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	2.4	2.5	< 0.5	< 0.5	5.2	< 0.5
Anthracene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	1.2	1.3	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	0.7	< 0.5	0.7	< 0.5	< 0.5	< 0.5
Pyrene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b)fluoranthene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo[g,h,i]perylene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Coronene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16)	N	mg/kg	2	< 2	< 2	2.4	7.3	5.8	4.5	< 2	6.5	< 2

Results Summary

Report No.: 24-52895, issue number 1a

				ELAB Reference	355835	355836	355837	355838	355839	355840	355841	355842	355843
				Customer Reference	ES1	ES2	ES3	ES1	ES1	ES1	ES1	ES2	ES1
				Sample ID									
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	SP1	SP1	SP1	SP2	SP3	SP4	SP5	SP5	SP6
				Sample Depth (m)									
				Sampling Date	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Determinand	**Codes**	**Units**	**LOD**										
BTEX													
Benzene	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10		< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG													
>C5-C6 Aliphatic (HS_1D_MS_AL)	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS_AL)	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C35 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.5	< 1.0	< 1.0	2.6
>C21-C35 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.4	< 1.0	< 1.0	2.7
>C35-C40 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Aliphatic (HS_1D_MS+EH_CU_1D_AL)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.4	< 1.0	< 1.0	2.7
>C5-C7 Aromatic (HS_1D_MS_AR)	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS_AR)	N	mg/kg	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic (EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic (EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic (EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	1.3	< 1.0	< 1.0	6.4	< 1.0	< 1.0	2.0
>C35-C40 Aromatic (EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Aromatic (HS_1D_MS+EH_CU_1D_AR)	N	mg/kg	1		< 1.0	< 1.0	1.3	< 1.0	< 1.0	7.7	< 1.0	< 1.0	2.0
Total (>C5-C40) Ali/Aro (HS_1D_MS+EH_CU_1D_Total)	N	mg/kg	1		< 1.0	< 1.0	1.3	< 1.0	< 1.0	15.2	< 1.0	< 1.0	4.7
Total Petroleum Hydrocarbons													
Mineral Oil w Florisil (EH_CU_1D_Total)	N	mg/kg	5		< 5	< 5	< 5	< 5	< 5	< 5	6	< 5	< 5

Tests marked N are not UKAS accredited.
The Environmental Laboratory Ltd. Reg. No. 3882193

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Results Summary

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Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

In accordance with procedures, a 1kg soil sample should be analysed. For amounts less than this caution should be used when analysing the data as sample size is smaller than the recommended amount, therefore samples could be deemed as not being representative of the materials present on site.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)	F/mm2 (I)
355835		SP1 ES1	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355836		SP1 ES2	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355837		SP1 ES3	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355838		SP2 ES1	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355839		SP3 ES1	Brown Sandy Soil, Stones,	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355840		SP4 ES1	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355841		SP5 ES1	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355842		SP5 ES2	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t
355843		SP6 ES1	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t	n/t

Method Summary

Report No.: 24-52895, issue number 1a

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	21/03/2024	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	22/03/2024	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	21/03/2024	300	ICPMS
W. Sol Metals	N	Air dried sample	26/03/2024	300	ICPMS
Phenols in solids	N	As submitted sample	21/03/2024	121	HPLC
PAH (GC-FID)	N	As submitted sample	20/03/2024	133	GC-FID
Water soluble anions	M	Air dried sample	21/03/2024	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	22/03/2024	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	22/03/2024	181	GC-MS
BTEX in solids	M	As submitted sample	22/03/2024	181A	GC-MS
Total cyanide	M	As submitted sample	22/03/2024	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	25/03/2024	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	25/03/2024	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	25/03/2024	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	25/03/2024	214	GC-FID
Total organic carbon/Total sulphur	N	Air dried sample	25/03/2024	216	IR
Basic carbon banding in soil	N	As submitted sample	20/03/2024	218	GC-FID
Diesel range organics in soil	N	As submitted sample	22/03/2024	257	GC-FID
Asbestos identification	U	Air dried sample	25/03/2024	281	Microscopy
Soil organic matter	U	Air dried sample	21/03/2024	BS1377:P3	Titrimetry
TPH with Florisil clean up solids	N	As submitted sample	20/03/2024	GCL117	GC-FID

Tests marked N are not UKAS accredited

Report Information

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Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
	Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
	ELAB are unable to provide an interpretation or opinion on the content of this report.
	The results relate only to the sample received.
	PCB congener results may include any coeluting PCBs
	Uncertainty of measurement for the determinands tested are available upon request
	Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

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

End of Report