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Intrusive Site Investigation

22 March 2024

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Land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY

Report by Mr Louis Turner BSc (Hons)
Supervised by Mr Joseph Turner

CONTENTS

1. Introduction

The following document is an Intrusive Site Investigation carried out by Oakshire Environmental, and includes details of the site, sampling methodology, ground conditions, an evaluation of risk and an assessment of further investigations.

1.1 Project Overview

The client's proposed project involves the erection of a community shop, café and post office with associated access and parking on land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY. Following the identification of potential contaminant linkages at the site, an intrusive site investigation has been recommended. Oakshire Environmental have carried out an Intrusive Site Investigation, as described below.

1.2 Purpose of Investigation

The objectives of the Intrusive Site Investigation will be to:

- Establish the context and setting of development at the site.
- Identify and assess the nature and extent of contamination risk at the site.
- Determine the requirement for further investigations, remediation or mitigation measures.

1.3 Scope of Work

- Assess the site and previous investigations, to establish the context and setting of development.
- In order to identify the nature and extent of contamination, 6 x samples were taken down to a maximum depth of ~0.6m and analysed for Metals (As,Be,Cd,Cu,Pb,Hg,Ni,Se,V,Zn), Chromium (III & VI), Phenols, PAHs, BTEX & MTBE, TPH CWG (Aliphatic/ Aromatic), pH, Organic Matter and Asbestos (Qualitative) in a UKAS accredited laboratory.
- Ground conditions encountered at the site, including identification of groundwater and made ground, have been noted and used to inform recommendations and conclusions.
- Results of laboratory testing have been assessed with reference to suitable screening values, including LQM/CIEH Suitable 4 Use Levels (S4ULs), CL:AIRE Category 4 Screening Levels (C4SLs) and Generic Assessment Criteria (GAC).
- This information has been used to update the Conceptual Site Model, produced as part of previous investigations to categorise the severity of consequence and probability of identified contaminant linkages, and conduct an evaluation of contamination risk to determine the requirement for further investigations, remediation or mitigation measures.
- Supporting appendix includes photographs, maps and plans of the site.

1.4 Limitations

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This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

Oakshire Environmental cannot be held responsible for incorrect analysis of samples. The information and conclusions provided in this report are limited to, and representative of, the samples taken and cannot be extended to apply to the whole site, in addition, Oakshire Environmental cannot guarantee the accuracy of analysis for samples not taken at the source by the company or those which deviate due to exceedance of holding time or inappropriate sampling practises. The findings and/or recommendations of this report do not take into account any conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

2. Site

The following section provides a description of the site and location, proposed project and previous investigations, utilising information obtained from the client and publicly available sources.

2.1 Site Description and Location

The site is located on land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY and comprises a plot of grassland within the curtilage of Walwyn Court.

The site is bordered by an access road to the north west, grassland and trees to the north east, a residential dwelling to the south east and the B4024 to the south west.

National Grid Reference: SO 65700 33246

2.2 Proposed Development

The client's proposed development involves the construction of a community shop, café and post office with associated access and parking.

2.3 Previous Investigations

A Phase 1 Contaminated Land Assessment was carried out by GeoSmart, in January 2024, which considered there to be a potential risk to site users from an infilled pond at the site. Following the identification of potential contaminant linkages at the site, an intrusive site investigation was recommended, to include sampling of shallow and deeper soil at the site, to be tested for suite of contaminants including heavy metals, hydrocarbons and asbestos.

Based on the findings of the Phase 1 Contaminated Land Assessment, Oakshire Environmental has carried out sampling of soil at the site, which has been tested for a comprehensive suite of contaminants including Metals (As,Be,Cd,Cu,Pb,Hg,Ni,Se,V,Zn), Chromium (III & VI), Phenols, Polycyclic Aromatic Hydrocarbons (PAHs), BTEX & MTBE, Total Petroleum Hydrocarbons (TPHs) CWG (Aliphatic/ Aromatic), pH, Organic Matter and Asbestos (Qualitative).

3. Methodology

3.1 Sampling Work

Four trial pits were dug at the locations shown on plans in the appendix, with ground conditions noted during the sampling process to inform recommendations and conclusions.

Soil samples were collected using a window sampler and soil was then collected from the sampler and placed into sealed sample containers. Samples collected for VOC analysis were filled as much as possible to minimise air spaces, as volatile compounds can be lost into these spaces. Sampling equipment was wiped clean between sample locations to minimise cross contamination.

3.2 Sampling Strategy

Six samples was considered to be a sufficient sample size, based on the size of the site, proposed use areas and the levels of contamination expected. Locations were chosen to focus on the external landscaping and buildings areas and determine the composition of material used to infill the former pond on the site. The specific location of the infilled pond is not known, however, small scale historical mapping suggests that it was situated in the centre and covered a large portion of the site.

A range of sample depths were chosen to allow identification of variability through the soil profile. Soil in external landscaping areas at the site were sampled as this will represent the soil that is most likely to impact future site users through inhalation, ingestion and dermal contact pathways. Samples taken from beneath the proposed buildings were also collected to determine the risk to future site users and the proposed building from the ingress of vapours and ground gases.

3.3 Health & Safety

When collecting soil samples on a potentially contaminated site it must be assumed that the soil is contaminated in order to protect the health of the assessor. Protective rubber gloves were worn at all times as well as substantial footwear. Equipment was washed thoroughly before and after use and kept in a container when transported to avoid the spread of any possible contamination. Sample containers were packed with biodegradable fill for protection and placed in a sealed plastic container for transportation to the laboratory.

4. Ground Conditions

Ground conditions identified at the site during sampling consisted of infilled ground comprising reddish brown clay with gravel, roots, concrete, cobbles and occasional charcoal.

Identified concrete fragments and gravel below 0.50m in trial pit TP01 are likely associated with nearby disused drainage and electrical infrastructure at the site, in addition, occasional charcoal fragments were identified, however, it appears that the former pond at the site was infilled with soil arisings from adjacent land.

No groundwater was identified during sampling, however, trial pits were partially flooded with surface water, due to recent rain and the impermeable ground conditions.

Detailed trial pit logs are provided in the Appendix.

5. Evaluation of Results

5.1 Screening Values

Results of laboratory testing of soil samples were analysed by comparing them to industry standard screening levels used for risk assessments. Screening levels used include the DEFRA Category 4 Screening Levels (C4SLs) based on Low Level of Toxicological Risk and the LQM/CIEH S4ULs for Human Health Risk Assessment. These levels cover multiple Soil Organic Matter (SOM) contents (1%, 2% and 6%) and assume a pH of 8. The 'commercial' screening values were used to assess results. This land use considers direct soil and indoor dust ingestion and inhalation, skin contact with soils and dust and inhalation of vapours as exposure pathways. These levels take a conservative approach to assessing potential risk and concentrations below these screening values can be considered to represent 'uncontaminated conditions' which pose 'LOW' risk to human health based on the proposed land use.

It is important to note that exceedance of a relevant screening value does not necessarily constitute evidence of either a 'significant possibility of significant harm' or the need for remediation under the UK's planning regimes. Rather such exceedance should usually trigger a further detailed quantitative risk assessment, where site-specific parameters are used to derive site-specific assessment criteria. Common sense tells us, and a robust risk evaluation reveals, that a gross exceedance is a good indicator that an unacceptable risk is present.

5.2 Summary of Results

- Metal concentrations were low in all samples
- pH was alkaline in all samples
- Phenols (total) concentrations were all below the laboratory limit of detection suggesting they may not be present at all
- Total Organic Carbon values were low in samples S01, S02, S03 and S06 and were moderate in samples S04 and S05
    - Soils with low organic matter content may allow the leaching of hydrocarbons through the soil as organic contaminants adsorb to organic matter particles
- Polycyclic Aromatic Hydrocarbons (PAHs) concentrations were slightly elevated in sample S05, however, concentrations were below commercial land use screening values in all samples
    - Slightly elevated PAH concentrations in sample S05 are likely the result of charcoal fragments identified in sampled soil
    - In addition, given that PAH concentrations in sample S06, taken from deeper soil in trial pit TP04, were very low, the elevated PAH concentrations are considered to be localised to shallow soil
- BTEX & MTBE concentrations were below the laboratory limit of detection
- Total Petroleum Hydrocarbons (TPHs) concentrations were low, with most fractions below the laboratory limit of detection
- No Asbestos was detected in sampled soil

5.3 Risk Assessment Methodology

The potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the contaminant linkage on the receptor, if it is assumed to be present, and the probability of the contaminant linkage being present.

Severities are categorised from Minor to Severe and probabilities are categorised from Unlikely to High Likelihood to give a potential level of risk output.

Table 1: Risk Matrix

Probability	Severity of Consequence			
	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk
Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Very High Risk

There is a high probability that severe harm could arise to a designated receptor from an identified source; or there is evidence that severe harm to a designated receptor is currently happening.

High Risk

Harm is likely to arise to a designated receptor from an identified source.

Moderate Risk

It is possible that harm could arise to a designated receptor from an identified source. It is relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild.

Low Risk

It is possible that harm could arise to a designated receptor from an identified source, however, it is likely that this harm, if realised, would normally be mild.

Very Low Risk

There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

5.4 Conceptual Site Model

The information in this section has been compiled to produce an initial conceptual site model outlining the potential sources, pathways and receptors to consider at the site. The level of risk was categorised by considering the severity and probability, as outlined in the previous section.

Table 2: Conceptual site model

Sources	Pathways	Receptors	Severity	Probability	Potential Level of Risk	
Infilled pond	Ingestion/inhalation of contaminated soil dust Dermal contact with contaminated soil Inhalation of soil vapours	Future site users	**Medium**	**Unlikely**	**Low**	Identified contaminant concentrations were all below commercial screening values, therefore, the risk to future site users is considered to be low. In addition, volatile contamination and organic matter content was low, therefore, the risk of on-site ground gas generation is low.
	Leaching through soil	Groundwater	**Mild**	**Low Likelihood**	**Low**	Contaminant concentrations were found to be generally low and are considered to be localised to shallow soil, in addition, the impermeable clay soil at the site will also limit leaching of contaminants, therefore, leaching of contaminants through soil to underlying groundwater is not likely.

6. Conclusions

6.1 Risk Evaluation

The conceptual site model has identified the following contaminant linkages present at the site and the following conclusions have been drawn:

- There is a **low risk** to future site users from the ingestion/inhalation of contaminated soil dust, dermal contact with contaminated soil and inhalation of soil vapours from the infilled pond.

- There is a **low risk** to groundwater from the leaching of contaminants through soil from the infilled pond.

6.2 Further Investigation

Based on laboratory testing of soil samples from the site and the updated conceptual site model, the risk at the site to future site users is considered to be low. Further investigation or remediation is, therefore, not considered necessary. It is important to note that this conclusion is based on the proposed development plan.

If visible or olfactory evidence of contamination is identified during excavations at the site, work should cease in order to allow further investigation to be carried out. In addition, to ensure regulatory compliance, Waste Classification & Waste Acceptance Criteria (WAC) testing of excavated material from the site may be required prior to off-site disposal.

7. References

Environment Agency, 2021. *Land contamination: risk management*. [online] Available at: <gov.uk/guidance/land-contamination-how-to-manage-the-risks>.

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Nathanail, C.P.; McCaffrey,C.; Gillett, A.G.; Ogden, R.C. & Nathanail, J.F., 2015. *The LQM/CIEH S4ULs for Human Health Risk Assessment*. Nottingham: Land Quality Press

USEPA, 2022. *Regional Screening Levels (RSLs).* [online] Available at: <epa.gov/risk/regional-screening-levels-rsls>.

GeoSmart, 2024. *Phase 1 Contaminated Land Assessment, January 2024.*

Oakshire Environmental. Available at: <oakshireenvironmental.co.uk>.

Appendix - Site Maps & Plans	
Description	
Site location plan	
Sources	
Contains OS data © Crown copyright and database rights	
Key	
	Site boundary
▲	North

Appendix - Site Maps & Plans	
Description	
Site plan showing trial pit locations	
Sources	
Contains OS data © Crown copyright and database rights	
Key	
	Site boundary
	Trial pit location
▲	North

Appendix - Site Photos
Description
Photo showing the depth of trial pit TP01
Sources
Oakshire Environmental

Appendix - Site Photos
Description
Photo showing the location of trial pit TP01
Sources
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Appendix - Site Photos
Description
Photo showing the depth of trial pit TP02
Sources
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Appendix - Site Photos
Description
Photo showing the location of trial pit TP02
Sources
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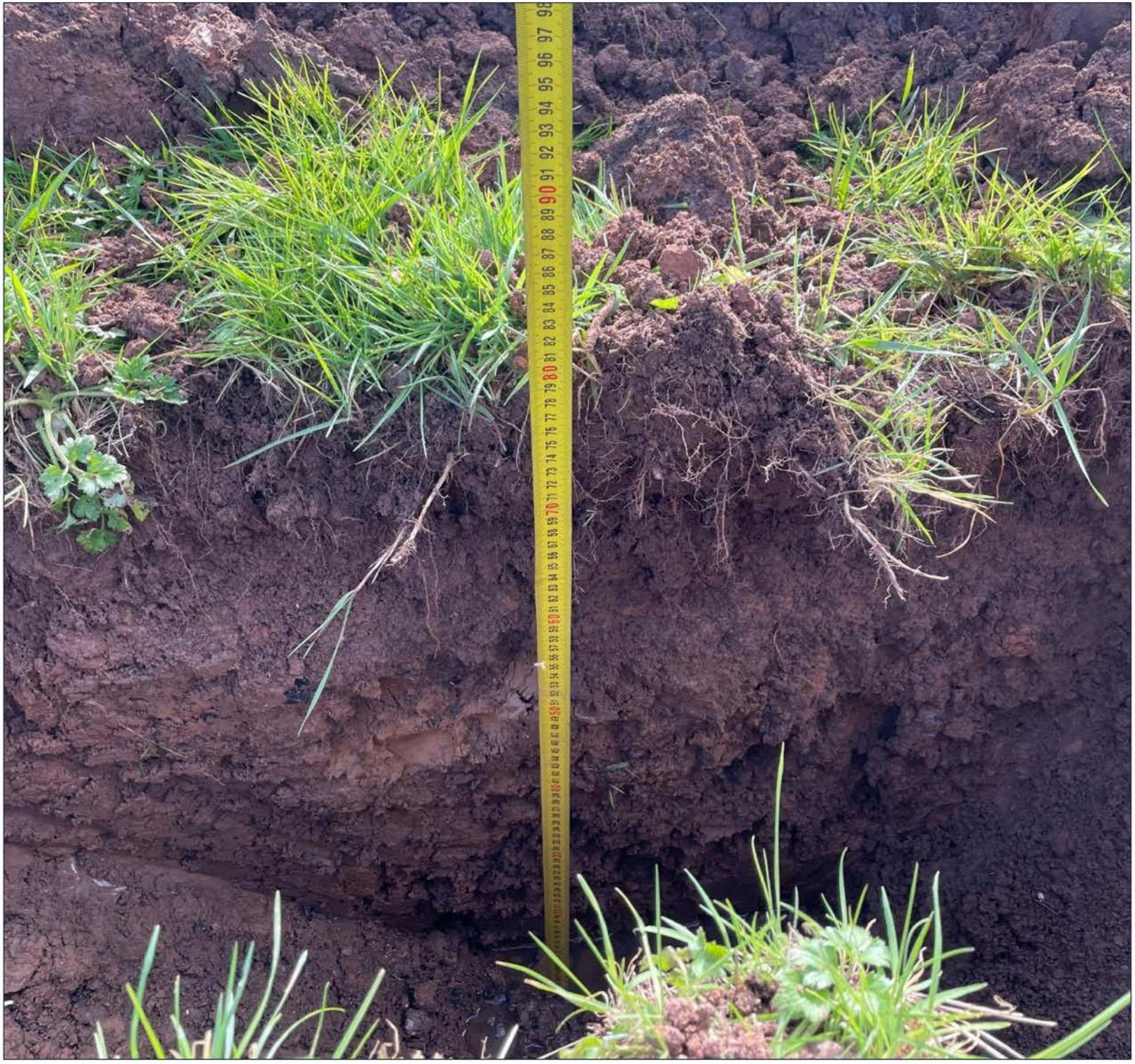
Appendix - Site Photos
Description
Photo showing the location of trial pit TP03
Sources
Oakshire Environmental



Appendix - Site Photos
Description
Photo showing the depth of trial pit TP04
Sources
Oakshire Environmental

Appendix - Site Photos
Description
Photo showing the location of trial pit TP04
Sources
Oakshire Environmental

Site	Land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY	Reference	TP01	**Appendix - Ground Conditions**

Samples		Description of Strata	Thickness (m)	Depth (m)	Symbol
Depth (m)	ID				
0.60	S01	Grass overlying reddish brown silty CLAY with gravel, roots and spherical cobbles (FILL)	0.50	0.50	
		Reddish brown silty CLAY with gravel, roots, concrete and spherical cobbles (FILL)	0.20	0.70	

Remarks and comments

No groundwater identified, however, trial pits were partially flooded due to recent rain and the impermeable ground conditions
Concrete fragments and gravel below 0.5m likely associated with nearby disused drainage and electrical infrastructure

Site	Land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY	Reference	TP02	**Appendix - Ground Conditions**

Samples		Description of Strata	Thickness (m)	Depth (m)	Symbol
Depth (m)	ID				
0.30	S02	Grass overlying reddish brown silty CLAY with gravel, roots and occasional charcoal and spherical cobbles (FILL)	0.70	0.70	

Remarks and comments

No groundwater identified, however, trial pits were partially flooded due to recent rain and the impermeable ground conditions
Occasional charcoal fragments were identified, however, the former pond is considered to have been infilled with soil arisings from adjacent land

Site	Land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY	Reference	TP03	**Appendix - Ground Conditions**

Samples		Description of Strata	Thickness (m)	Depth (m)	Symbol
Depth (m)	ID				
0.30	S03	Grass overlying reddish brown silty CLAY with gravel, roots and occasional charcoal and spherical cobbles (FILL)	0.70	0.70	
0.60	S04				

Remarks and comments

No groundwater identified, however, trial pits were partially flooded due to recent rain and the impermeable ground conditions
Occasional charcoal fragments were identified, however, the former pond is considered to have been infilled with soil arisings from adjacent land

Site	Land at Walwyn Court, Dymock Road, Much Marcle, Herefordshire, HR8 2LY	Reference	TP04	**Appendix - Ground Conditions**

Samples		Description of Strata	Thickness (m)	Depth (m)	Symbol
Depth (m)	ID				
0.30	S05				
0.60	S06				
		Grass overlying reddish brown silty CLAY with gravel, roots and occasional charcoal and spherical cobbles (WORKED GROUND)	0.70	0.70	

Remarks and comments

No groundwater identified, however, trial pits were partially flooded due to recent rain and the impermeable ground conditions
Occasional charcoal fragments were identified, however, the former pond is considered to have been infilled with soil arisings from adjacent land

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Certificate of Analysis

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	24-52692
Issue:	1
Date of Issue:	14/03/2024
Contact:	Louis Turner
Customer Details:	Oakshire Environmental 6 Vine Close Bottesford Nottingham NG13 0FW
Quotation No:	Q23-03962
Order No:	Not Supplied
Customer Reference:	Not Supplied
Date Received:	07/03/2024
Date Approved:	14/03/2024
Details:	Barber-Starkey
Approved by:	[redacted]

Tim Reeve, Technical Coordinator

Sample Summary

Report No.: 24-52692, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
354871	S01 TP01 0.60	05/03/2024	07/03/2024	Silty clayey loam	
354872	S02 TP01 0.30	05/03/2024	07/03/2024	Silty clayey loam	
354873	S03 TP02 0.30	05/03/2024	07/03/2024	Silty clayey loam	
354874	S04 TP02 0.60	05/03/2024	07/03/2024	Silty clayey loam	
354875	S05 TP03 0.30	05/03/2024	07/03/2024	Silty clayey loam	
354876	S06 TP03 0.60	05/03/2024	07/03/2024	Silty clayey loam	

Results Summary

2683

Report No.: 24-52692, issue number 1

ELAB Reference				354871	354872	354873	354874	354875	354876
Customer Reference				TP01	TP02	TP03	TP03	TP04	TP04
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				S01	S02	S03	S04	S05	S06
Sample Depth (m)				0.60	0.30	0.30	0.60	0.30	0.60
Sampling Date				05/03/2024	05/03/2024	05/03/2024	05/03/2024	05/03/2024	05/03/2024
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Moisture Content	N	%	0.1	15.5	15.4	17.7	25.4	16.5	18.7
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None	None
Metals									
Arsenic	M	mg/kg	0.5	6.3	4.5	5.7	7.7	4.9	5.5
Beryllium	M	mg/kg	0.5	1.0	0.9	1.0	1.1	0.9	0.8
Cadmium	M	mg/kg	0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	M	mg/kg	1	32.5	30.1	28.6	29.7	26.6	28.9
Chromium (III)	N	mg/kg	5	32.5	30.1	28.6	29.7	26.6	28.9
Copper	M	mg/kg	4	25.3	17.3	19.1	31.0	22.7	20.8
Lead	M	mg/kg	1	41.9	19.5	30.1	73.1	36.0	25.3
Mercury	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Nickel	M	mg/kg	1	41.7	39.3	36.8	46.9	32.4	36.7
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	0.5	37.7	38.3	38.8	32.8	40.5	40.5
Zinc	M	mg/kg	4.5	81.2	53.9	85.7	92.5	70.3	63.2
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1	8.6	8.6	8.6	8.3	8.4	8.6
Total Organic Carbon	N	%	0.01	0.87	0.31	0.56	2.1	2.0	0.51

Results Summary

2683

Report No.: 24-52692, issue number 1

ELAB Reference				354871	354872	354873	354874	354875	354876
Customer Reference				TP01	TP02	TP03	TP03	TP04	TP04
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				S01	S02	S03	S04	S05	S06
Sample Depth (m)				0.60	0.30	0.30	0.60	0.30	0.60
Sampling Date				05/03/2024	05/03/2024	05/03/2024	05/03/2024	05/03/2024	05/03/2024
Determinand	**Codes**	**Units**	**LOD**						
Phenols									
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	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
Acenaphthylene	N	mg/kg	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	< 0.5	< 0.5	< 0.5
Fluorene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	N	mg/kg	0.5	0.9	< 0.5	0.6	< 0.5	2.5	< 0.5
Anthracene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.9	< 0.5
Fluoranthene	N	mg/kg	0.5	2.7	< 0.5	1.8	< 0.5	8.6	1.0
Pyrene	N	mg/kg	0.5	2.3	< 0.5	1.5	< 0.5	7.0	0.8
Benzo(a)anthracene	N	mg/kg	0.5	1.4	< 0.5	1.0	< 0.5	5.4	0.6
Chrysene	N	mg/kg	0.5	1.6	< 0.5	1.2	< 0.5	6.9	0.8
Benzo(b)fluoranthene	N	mg/kg	0.5	1.5	< 0.5	1.0	< 0.5	5.8	0.6
Benzo(k)fluoranthene	N	mg/kg	0.5	1.3	< 0.5	0.9	< 0.5	5.3	0.6
Benzo(a)pyrene	N	mg/kg	0.5	1.5	< 0.5	1.0	< 0.5	5.5	0.6
Indeno(1,2,3-cd)pyrene	N	mg/kg	0.5	1.0	< 0.5	0.7	< 0.5	3.9	< 0.5
Dibenzo(a,h)anthracene	N	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5
Benzo[g,h,i]perylene	N	mg/kg	0.5	0.9	< 0.5	0.6	< 0.5	3.9	< 0.5
Total PAH(16)	N	mg/kg	2	15.4	2.6	10.9	< 2	57.0	6.2

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

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Results Summary

Report No.: 24-52692, issue number 1

ELAB Reference				354871	354872	354873	354874	354875	354876
Customer Reference				TP01	TP02	TP03	TP03	TP04	TP04
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				S01	S02	S03	S04	S05	S06
Sample Depth (m)				0.60	0.30	0.30	0.60	0.30	0.60
Sampling Date				05/03/2024	05/03/2024	05/03/2024	05/03/2024	05/03/2024	05/03/2024
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10	< 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
Ethylbenzene	M	ug/kg	10	< 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
MTBE	N	ug/kg	10	< 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
>C6-C8 Aliphatic (HS_1D_MS_AL)	N	mg/kg	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
>C10-C12 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 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
>C16-C21 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	2.3	< 1.0
>C21-C35 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	38.5	5.1
>C35-C40 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	9.0	< 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	49.8	5.1
>C5-C7 Aromatic (HS_1D_MS_AR)	N	mg/kg	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
>C8-C10 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 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
>C12-C16 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	1.1	< 1.0	< 1.0	< 1.0	5.3	< 1.0
>C21-C35 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	16.3	3.7	3.5	< 1.0	81.8	5.1
>C35-C40 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	1.6	< 1.0	< 1.0	< 1.0	14.5	< 1.0
Total (>C5-C40) Aromatic (HS_1D_MS+EH_CU_1D_AR)	N	mg/kg	1	19.1	3.7	3.5	< 1.0	102	5.1
Total (>C5-C40) Ali/Aro (HS_1D_MS+EH_CU_1D_Total)	N	mg/kg	1	19.1	3.7	3.5	< 1.0	151	10.2

Tests marked N are not UKAS accredited.

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Results Summary

Report No.: 24-52692, issue number 1

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)
354872	0.30	S02 TP02	Red Soil, Stones, Organics	No asbestos detected	n/t	n/t	n/t	n/t	n/t
354873	0.30	S03 TP03	Brown Soil, Stones, Clinker, Glass, Organics	No asbestos detected	n/t	n/t	n/t	n/t	n/t
354875	0.30	S05 TP04	Brown/ Red Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t	n/t

Method Summary

Report No.: 24-52692, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	08/03/2024	110	Colorimetry
pH	M	Air dried sample	08/03/2024	113	Electromeric
Phenols in solids	M	As submitted sample	08/03/2024	121	HPLC
PAH (GC-FID)	N	As submitted sample	07/03/2024	133	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	12/03/2024	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	12/03/2024	181	GC-MS
BTEX in solids	M	As submitted sample	12/03/2024	181A	GC-MS
Total organic carbon/Total sulphur	N	Air dried sample	11/03/2024	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	07/03/2024	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	13/03/2024	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	13/03/2024	214	GC-FID
Asbestos identification	U	Air dried sample	13/03/2024	281	Microscopy
Aqua regia extractable metals	M	Air dried sample	08/03/2024	300	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 24-52692, issue number 1

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