



## **Phase II Geo-Environmental Assessment**

### **Land adjacent to Horseshoe Farm**

London Road  
Barley  
Hertfordshire  
SG8 8JE

### **Prepared for:**

#### **Mr Geoffrey Wilkerson**

Homestall  
The Mount  
Barley  
Royston  
Hertfordshire  
SG8 8JG

**EPS Project Reference:** UK25.7240B

**Date Issued:** 29<sup>th</sup> April 2025

**Report Status:** Issue 1



## LAND ADJACENT TO HORSESHOE FARM, BARLEY

### NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a Phase II Intrusive Investigation undertaken to determine ground conditions and establish if there are any environmental risks associated with the site and its development. Pertinent findings and conclusions may be summarised as follows:

- The site currently consists of a disused barn and outbuildings which form part of Horseshoe Farm within the village of Barley, Hertfordshire. The proposed development involves the conversion of the central barn to a residential dwelling and associated private garden.
- A previous Phase I Desk Study completed for the site by EPS in February 2025, concluded that the site has had a predominately agricultural use and an infilled pond was identified in the south-east of the plot. On this basis, some plausible risks associated with potential contamination were established, and further assessment was considered necessary.
- The subsequent EPS site investigation involved the drilling of five boreholes to a depth of 1.0m. Ground conditions largely comprised either topsoil and made ground, in the form of gravelly clay containing fragments of flint and brick. Natural clays were recorded beneath the surfacing soils.
- The results of the laboratory testing have highlighted concentrations of asbestos in the existing soils which could pose an unacceptable risk to future site users, likely a result of the material's usage in agricultural buildings in the past. Therefore, recommendations have been made for installation of a soil capping within the proposed garden areas, consisting of at least **300mm** of clean certified soil, underlain by a clear, no dig geotextile like high visibility Terram<sup>TM</sup>. Risks to groundworkers also need to be accounted for. Consideration could also be given to undertaking further testing of shallow soils across the site in order to build a larger dataset and refine these recommendations as it may be possible to develop a more targeted approach.
- This report should be submitted to North Hertfordshire District Council to satisfy the pre-commencement requirements of the planning process relating to contaminated land. The above remedial works will need to be verified prior to completion, EPS can assist in this process if requested.

The above points represent a simplified summary of the findings of this assessment and **must not** form the basis for key decisions for the proposed development. A thorough review of the details is contained within the following report, or alternatively get in touch and we'll talk you through it.



|                             |                                                                                    |                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Project Reference:</b>   | UK25.7240B                                                                         |                                                                                                 |
| <b>Title:</b>               | Phase II Geo-Environmental Assessment –<br>Land adjacent to Horseshoe Farm, Barley |                                                                                                 |
| <b>Client:</b>              | Mr Geoffrey Wilkerson                                                              |                                                                                                 |
| <b>Date:</b>                | 29 <sup>th</sup> April 2025                                                        |                                                                                                 |
| <b>EPS Contact Details:</b> | 7B Caxton House<br>Broad Street<br>Cambourne<br>Cambridge CB23 6JN                 | <b>T:</b> 01954 710666<br><b>E:</b> info@epstrategies.co.uk<br><b>W:</b> www.epstrategies.co.uk |
| <b>Status:</b>              | Issue 1                                                                            |                                                                                                 |

|                            |                      |                    |
|----------------------------|----------------------|--------------------|
| <b>Author:</b>             | <b>Reviewed:</b>     | <b>Authorised:</b> |
| <i>F Edwards</i>           | <i>M Judson</i>      | <i>M Bell</i>      |
| Frank Edwards              | Michael Judson       | Marcus Bell        |
| Geo-Environmental Engineer | Principal Consultant | Director           |

This report has been prepared for the client(s) listed on the report title page. EPS accepts no liability or responsibility for use of, or reliance upon, this report and / or the information contained within it by third parties.

If third parties have been contracted / consulted during compilation of this report, the validity of any data they may have supplied, and which are included in the report, have been assessed as far as possible by EPS however, EPS cannot guarantee the validity of these data.

No part of this report, or references to it, may be included in published documents of any kind without approval from EPS.

This report and its contents, together with any supporting correspondence or other documentation, remain the property of Environmental Protection Strategies Ltd until paid for in full.

Where ground investigations have been conducted, these have been limited to the level of detail required for the site in order to achieve the objectives of the investigation.

The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.

As stated within DEFRA's Contaminated Land Statutory Guidance, with any complex risk assessment it is possible that different suitably qualified people may reach slightly different conclusions when interpreting the same information. EPS recognises this and considers the conclusions presented within this report to be robust and appropriate but input from the Local Authority and their judgement in line with this guidance would still be welcomed.

---

## TABLE OF CONTENTS

|          |                                                     |           |
|----------|-----------------------------------------------------|-----------|
| <b>1</b> | <b>INTRODUCTION .....</b>                           | <b>1</b>  |
| 1.1      | Objectives .....                                    | 1         |
| 1.2      | Scope of Work.....                                  | 1         |
| 1.3      | Limitations and Constraints.....                    | 2         |
| <b>2</b> | <b>SITE CHARACTERISATION.....</b>                   | <b>3</b>  |
| 2.1      | Site & Location Description .....                   | 3         |
| 2.2      | Geo-Environmental Setting .....                     | 4         |
| 2.3      | Phase I Findings & Conclusions.....                 | 5         |
| <b>3</b> | <b>SUMMARY OF INTRUSIVE INVESTIGATIONS.....</b>     | <b>6</b>  |
| 3.1      | Borehole Locations .....                            | 6         |
| 3.2      | In-Situ Testing & Soil Sampling.....                | 6         |
| 3.3      | Laboratory Testing.....                             | 6         |
| <b>4</b> | <b>FINDINGS OF THE INVESTIGATION .....</b>          | <b>8</b>  |
| 4.1      | Ground Conditions.....                              | 8         |
| 4.1.1    | <i>Topsoil/ Made Ground.....</i>                    | <i>8</i>  |
| 4.1.2    | <i>Lowestoft Formation.....</i>                     | <i>8</i>  |
| 4.2      | Groundwater.....                                    | 9         |
| 4.3      | Physical Evidence of Contamination.....             | 9         |
| 4.4      | Laboratory Analysis – Soil.....                     | 9         |
| <b>5</b> | <b>ENVIRONMENTAL APPRAISAL .....</b>                | <b>10</b> |
| 5.1      | Human Health.....                                   | 10        |
| 5.1.1    | <i>Land Use Setting .....</i>                       | <i>10</i> |
| 5.1.2    | <i>Generic Screening – Soils .....</i>              | <i>10</i> |
| 5.1.3    | <i>Assessment of Soil Results-Human Health.....</i> | <i>11</i> |
| 5.2      | Summary of Findings .....                           | 11        |
| 5.3      | Recommendations.....                                | 12        |

## **TABLE OF CONTENTS (CONTINUED)**

### **Figures**

|          |                        |
|----------|------------------------|
| Figure 1 | Site Location Plan     |
| Figure 2 | Borehole Location Plan |

### **Tables**

|         |                                             |
|---------|---------------------------------------------|
| Table 1 | Laboratory Testing Schedule (Environmental) |
|---------|---------------------------------------------|

### **Appendices**

|            |                                                            |
|------------|------------------------------------------------------------|
| Appendix A | Selected Site Photographs                                  |
| Appendix B | Proposed Development Plan                                  |
| Appendix C | Site Specific Borehole Logs                                |
| Appendix D | Laboratory Results- Environmental                          |
| Appendix E | Generic Screening Criteria                                 |
| Appendix F | Cover Soils Checklist                                      |
| Appendix G | Method Statement for Encountering Unexpected Contamination |

## 1 INTRODUCTION

In March 2025, Environmental Protection Strategies Ltd (EPS) was commissioned by Mr Geoffrey Wilkerson to complete a Phase II Geo-Environmental Assessment for Land adjacent to Horseshoe Farm, London Road, Barley, Hertfordshire, SG8 8JE ('the site'); see Figure 1. Selected site photographs are included as Appendix A.

The work was commissioned to support full planning proposals for the conversion of a barn to one 4-bed dwelling, including single storey extension, and associated infrastructure works, by addressing the requirements of the planning process, as relating to contaminated land. The proposals have been filed under North Hertfordshire District Council application reference: 23/02707/FP.

This report also follows on from, and intends to address, recommendations made in a previous Phase I Desk Study completed for the site by EPS in February 2025, which included a Conceptual Site Model (CSM) developed in order to illustrate the potential risks the site and its operations may pose to human and environmental receptors both currently and in future. This report presents a brief summary of the previous Phase I Desk Study followed by the findings, conclusions, and recommendations of the current Phase II Intrusive Investigation undertaken as instructed.

### 1.1 Objectives

The objectives of this investigation were as follows:

- a) Investigate potential contaminant linkages identified in the CSM by means of investigating shallow soils and soil gases.
- b) Determine the potential risks posed by the site and make recommendations for further work that may be required, to ensure safe development in accordance with the Environment Agency's *Land Contamination: Risk Management* guidance (LC:RM) and the *National Planning Policy Framework*.

### 1.2 Scope of Work

To perform an exploratory assessment of the site in accordance with the principles and requirements of DEFRA's '*Contaminated Land Statutory Guidance*' (2012), BS10175 – '*Investigation of Potentially Contaminated Sites*' and BS 5930:2015+A1:2020 '*Code of practice for ground investigations*' the following tasks were undertaken:

#### Intrusive Investigation:

- Health and safety briefing / site supervision.
- Drilling of five hand auger sample boreholes to a depth of 1.0m below ground level (bgl), using a hand auger.
- Continual logging of ground conditions including inspection of samples for visual and olfactory contamination, and laboratory analysis of selected representative samples.

Reporting:

- Data collection
- Interpretation of data including completion of Generic Quantitative Risk Assessment

The findings and conclusions of these investigations are presented in the following sections.

### **1.3 Limitations and Constraints**

The purpose of this report is to present the findings of a soil sampling investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, Environmental Protection Strategies Ltd (EPS) makes the following statements:

No investigation method is capable of completely identifying all ground conditions that might be present in the soil or groundwater under a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes and / or trial pits to recover soil and / or groundwater samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface however, ground conditions are naturally variable and it may be possible that the conditions encountered may differ to those found during the investigation.

No visible evidence of Japanese Knotweed was identified during the site walkover. However, this plant can be difficult to identify in the early stages of growth and therefore it is not always possible to identify its' presence at certain times of the year. For this reason, EPS cannot confirm that Japanese Knotweed rhizomes do not exist and it is recommended that if it is suspected that this species, or other similarly invasive plants are present at the site, a specialist contractor should be commissioned to make a detailed assessment.

This report does not include specific investigation for the presence of Potential Asbestos Containing Material (PACM). Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected. Asbestos has been assessed as a soil contaminant, but this does not represent an Asbestos Survey, EPS are not licensed surveyors.

Whilst it is recognised that information contained within this report may assist relevant and suitably qualified professionals, this report does not provide a geotechnical appraisal of ground conditions with respect to suitability of foundations or future structures, nor does it intend to identify a need for any associated geotechnical ground improvement works.

The investigation was carried out to assess the significance of contamination resulting from the use of the site as identified in this report. Unless EPS has otherwise indicated, no assessment of potential impact of any other previous uses has been made.

## 2 SITE CHARACTERISATION

The following section provides background information for the site and a summary of the findings and conclusions of the previous Phase I Desk Study completed for the site by EPS in February 2025. For full detail and reference, it is recommended that the following document be read in conjunction with which this report.

- EPS (2025), *Phase 1 Geo-Environmental Desk Study – land adjacent to Horseshoe Farm, London Road, Barley* (dated 19<sup>th</sup> February 2025, report reference UK15.7240)

### 2.1 Site & Location Description

| Detail                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Location</b>              | The site is located approximately 6.4km southeast of Royston, in the west of the village of Barley, immediately south of London Road.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Grid Reference</b>        | 539730, 238230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Topographic Elevation</b> | The site lies around 112m Above Ordnance Datum (AOD) and is relatively flat.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description of Site</b>   | <p>A walkover survey was completed by EPS in January 2025 and the study area was found to comprise a roughly rectangular plot of land measuring 0.24 hectares. Access was gained from the east via Smith's End Lane, which leads to a private road that arcs between structures located just inside the eastern boundary, and the main barn (east of centre); which is to be converted as part of proposed development plans.</p> <p>This barn consisted of a disused timber frame and clad structure, with corrugated sheet metal roofing and some internal brick walls. A large, bolted door was noted on the eastern elevation, and adjacent to this, along the southern side is a concrete extension. To the west of the building is a smaller shed and sporadic miscellaneous farm equipment.</p> <p>Further west are two rectangular buildings of similar construction, made with timber and metal. These structures run just inside the northern and southern borders of this portion of the study area, and are surrounded by overgrown vegetation. Trees, bushes and shrubs also extend further west, covering much of this third of the plot.</p> <p>An open-sided structure was noted opposite the main barn to the east, made of the same timber cladding and a tiled roof. This barn appeared to have stored more miscellaneous farm equipment and was partially obscured by further climbing plants.</p> |

|                             |                                                                                                                                                                                                                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | <p>The buildings all benefited from concrete floors throughout and no evidence of fuel or chemical storage was identified.</p> <p>Anecdotal evidence from the Client indicates the main barn is approximately 100 to 150 years old and was used to ration/ store animal feed.</p> |
| <b>Surrounding Land Use</b> | <p>The site is surrounded to the south and west by undeveloped agricultural fields. To the north and east are residential dwellings within the village of Barley, including the main farmhouse associated with Horseshoe Farm.</p>                                                |

## 2.2 Geo-Environmental Setting

| Detail                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Geology</b>                 | <p>Geological maps of the area indicate the site is underlain by superficial Diamicton of the Lowestoft Formation and Lewes Nodular Chalk Formation and Seaford Chalk Formation bedrock below.</p>                                                                                                                                                                                                                                                                                                                    |
| <b>Hydrogeology</b>            | <p>Groundwater vulnerability maps of the area indicate the superficial geology is classified as a Secondary Aquifer, whilst the bedrock is classified as a sensitive Principal Aquifer.</p> <p>No groundwater abstractions have been noted within 500m, however the plot is located within a Zone 3 (Total Catchment) Source Protection Zone (SPZ).</p>                                                                                                                                                               |
| <b>Hydrology</b>               | <p>The nearest surface water feature is located 215m southeast of the site and appears to be a small pond. The nearest watercourse comprises an unnamed drain around 320m south, with the more notable watercourses Wardington Bottom and Cumberton Bottom around 900m west and 1.1km east respectively.</p> <p>No surface water abstractions are located within 500m.</p>                                                                                                                                            |
| <b>Landfill &amp; Waste</b>    | <p>No active or historic landfills were recorded within 500m. Additionally, there is no potentially infilled land entries within 500m.</p> <p>However, four areas of potentially infilled land (water) were noted within 250m, the closest of which is around 86m south.</p>                                                                                                                                                                                                                                          |
| <b>Summary of Site History</b> | <p>From 1887 to the mid-1970s, the site consisted of the existing agricultural buildings in the centre east of the plot and along the eastern boundary with a small orchard possibly present to the west. The property remained unchanged until approximately 1976 when two more agricultural buildings were constructed, running perpendicular to the original structures and effectively replacing the orchard. A pond was also present towards the southeast corner which appears to have been infilled by the</p> |

| Detail | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | <p>1970s. During this time, the site appeared to adopt the name Horseshoe Farm and has remained relatively unchanged since.</p> <p>In the late 1800s, the farmhouse and associated buildings appeared to extend offsite to the north and remained for such a purpose until it was recently adjusted for predominantly residential use. As in the present, the land to the south has broadly remained undeveloped throughout the period whilst the village of Barley has gradually expanded to the north and east through the documented map series. The only real exception to this was a poultry houses located around 100-200m east between the 1970s and 2000.</p> |

### 2.3 Phase I Findings & Conclusions

A Conceptual Site Model was developed through the Preliminary Risk Assessment within the Phase I report, taking into account the potential sources at the site and in the surrounding area to identify the plausible contaminant linkages (risks) that are either already active or have the potential to become active through any future development or change of the land use.

The site identified risks to human health associated with interaction with potentially contaminated made ground on the site, as well as associated with infilled soils which could prevail throughout the sub surface, beneath sections of hardstanding, current and historic buildings and within the footprint of the former pond. Risks to controlled waters were not identified.

It was therefore recommended that the identified plausible contaminant linkages should be further investigated by means of an exploratory intrusive. The following sections detail the findings and conclusions of the Phase II intrusive investigation carried out by EPS in order to determine the ground conditions and the presence of any soil contamination; in response to the above recommendations.

### 3 SUMMARY OF INTRUSIVE INVESTIGATIONS

Intrusive ground investigations were undertaken on 20<sup>th</sup> March 2025 in accordance with EPS standard operating procedures, copies of which will be made available on request. A summary of all site activities is presented in the following sections:

#### 3.1 Borehole Locations

Borehole locations were selected through consideration of the potential contaminant linkages identified through the Phase I Desk Study, the proposed development layout, the location of below ground utilities, as well as operational and health & safety considerations.

Five hand augured boreholes (HA01 – HA05) were formed at the site to a depth of 1.0m.

The overall objective in terms of exploratory hole locations was to provide an appropriate lateral and vertical coverage of the soils underlying the plot in order to offer information relating to their quality and nature.

| Location | Rationale                                                                              |
|----------|----------------------------------------------------------------------------------------|
| HA01     | Provide information on the shallow soils in the area of the potentially infilled pond. |
| HA02-05  | Provide information on the shallow soils in the area of the proposed garden areas.     |

All borehole locations were completed in accordance with EPS standard operating procedures and backfilled using compacted soil arising's upon completion.

A borehole location plan is presented as Figure 2.

#### 3.2 In-Situ Testing & Soil Sampling

Each borehole was logged for ground conditions encountered and inspected for any physical evidence of contamination, such as soil staining, odour and the presence of separate phase liquids on a precautionary basis.

Where potentially volatile organic compounds are suspected, EPS carries a Photoionisation Detector (PID), which can be used to measure the relative concentrations of vapour associated with soil samples collected from different depths and locations at the site. However, as no visual or olfactory evidence of potentially volatile contamination was identified in the field, no headspace testing was completed.

#### 3.3 Laboratory Testing

Samples obtained for analysis of identified contaminants of concern were submitted to Element Materials Technology of Flintshire, who hold appropriate UKAS / MCERT



accreditation for the required testing. Samples were transported in laboratory supplied containers and delivered by an approved courier.

Copies of chain of custody documentation are held by EPS and will be made available on request.

A laboratory testing schedule is included as Table 1.

## 4 FINDINGS OF THE INVESTIGATION

This section of the report provides a summary of the findings of the various aspects of the ground investigation.

### 4.1 Ground Conditions

A total of five hand auger boreholes were formed at the site and the ground conditions encountered, from surface level, were interpreted to comprise:

- Topsoil/ Made Ground
- Lowestoft Formation

Site specific borehole logs are included as Appendix C and give descriptions and depths of strata encountered. A summary of the general strata encountered across the site is provided in the table below, with more detailed description given in the following sub sections.

| Geological Strata    | Maximum Depth to Base of Strata (m bgl) | Strata Thickness (m)    |
|----------------------|-----------------------------------------|-------------------------|
| Topsoil/ Made Ground | 0.5                                     | 0.4-0.5                 |
| Lowestoft Formation  | >1.0                                    | >0.5m->0.6 (not proven) |

#### 4.1.1 Topsoil/ Made Ground

Topsoil was encountered from the surface in all locations except HA01 and HA02 and was observed as a dark brown, slightly gravelly sandy clay with flint and progressed to between 0.1m and 0.2m in depth.

Made ground was encountered from the surface in HA01 and HA02, consisting of a similar material but with infrequent brick fragments. This was observed to a depth of 0.5m.

Made ground was also encountered at lower depths in HA03, HA04 and HA05, consisting of a similar material but with infrequent brick and concrete fragments. This was observed from 0.2-0.5 bgl. Layers of concrete were also encountered in HA03 and HA05 from 0.1 – 0.3m bgl as well as a layer of brick in WS04 from 0.1-0.2m bgl.

#### 4.1.2 Lowestoft Formation

Directly underlying the topsoil/ made ground, material interpreted as the Lowestoft Formation was encountered. This was recovered as a dark brown, slightly gravelly clay with fragments of chalk, to beyond the formation depth of each of the boreholes (>1.0m).

## 4.2 Groundwater

Groundwater was not encountered during the intrusive investigations.

## 4.3 Physical Evidence of Contamination

Despite the presence of a limited thickness of made ground in all locations containing brick and concrete fragments, there was no palpable evidence of contamination encountered in any of the sampling locations during the investigation, including any visual or olfactory evidence of hydrocarbon staining.

## 4.4 Laboratory Analysis – Soil

A laboratory analysis testing schedule is presented as Table 1 and all environmental sample results obtained from the laboratory are included as Appendix D. The key results of laboratory testing on environmental soil samples are summarised below.

| Contaminant                          | No. of Samples | No of Detections | Range of Detections (mg/kg) |      | Highest Location & Depth (m bgl) |
|--------------------------------------|----------------|------------------|-----------------------------|------|----------------------------------|
|                                      |                |                  | Min                         | Max  |                                  |
| Arsenic                              | 5              | 5                | 9.5                         | 15.6 | HA05 (0.7-0.9)                   |
| Cadmium                              | 5              | 0                | -                           |      | -                                |
| Chromium                             | 5              | 5                | 39.7                        | 51.3 | HA03 (0.2-0.5)                   |
| Copper                               | 5              | 5                | 18                          | 35   | HA04 (0.2-0.5)                   |
| Lead                                 | 5              | 4                | 18                          | 89   | HA03 (0.2-0.5)                   |
| Mercury                              | 5              | 2                | 0.1                         | 0.2  | HA04 (0.2-0.5)                   |
| Nickel                               | 5              | 5                | 20.7                        | 47.1 | HA05 (0.7-0.9)                   |
| Selenium                             | 5              | 1                | 1                           |      | HA01 (0.1-0.3)                   |
| Zinc                                 | 5              | 5                | 99                          | 272  | HA03 (0.2-0.5)                   |
| Naphthalene                          | 5              | 1                | 0.20                        |      | HA03 (0.2-0.5)                   |
| Benzo[a]pyrene                       | 5              | 4                | 0.08                        | 0.90 | HA03 (0.2-0.5)                   |
| Dibenz(ah)anthracene                 | 5              | 2                | 0.07                        | 0.16 | HA03 (0.2-0.5)                   |
| PAH 16 Total                         | 5              | 4                | 1.0                         | 12.0 | HA03 (0.2-0.5)                   |
| Phenols                              | 5              | 2                | 0.3                         | 3.89 | HA01 (0.1-0.3)                   |
| Total Aromatics & Aliphatics (C5-40) | 5              | 2                | 58                          | 83   | HA04 (0.2-0.5)                   |
| Asbestos (%)                         | 5              | 1                | 0.147%                      |      | HA02 (0.6-0.8)                   |

**Notes:** - Contaminant not found above laboratory detection limits

- A detectable concentration of ACM, in the form of Chrysotile, Amosite and Crocidolite fibre bundles and asbestos cement were identified in shallow soils recovered from HA02. Quantification analysis was completed on the material and the percentage of asbestos fibres by sample mass was declared at <0.001% with the percentage of ACM in the cement fragments being 0.147%. It should be recognised that ACM was not detected above minimum instrument limits (<0.001%) within any of the remaining four boreholes.

## 5 ENVIRONMENTAL APPRAISAL

The following section outlines the approach applied to assessing the risks posed to human health, then identifies any sample results found by this investigation which warrant further consideration. In accordance with the Environment Agency's Land Contamination: Risk Management, this section represents the second tier of Stage 1, the Generic Quantitative Risk Assessment.

### 5.1 Human Health

#### 5.1.1 Land Use Setting

It is understood that development proposals for the site include conversion of a barn to one 4-bed dwelling, including single storey extension, and associated infrastructure works. In order to screen laboratory data for concentrations of contaminants in soil with potential to cause harm to human health in these soft landscaped areas, relevant generic screening values most applicable to this land use have been utilised. A land use setting of Residential (with home-grown produce) has been adopted, as it is considered the most representative.

The technical framework used to derive DEFRA's Category 4 Screening Levels (Policy Companion Document '*SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination*') outlines the relevant factors for determining land use selection in the application of the screening levels and the following key considerations have been taken into account.

#### 5.1.2 Generic Screening – Soils

The technical framework used to derive the assessment criteria and the documents in which they are published are summarised as follows:

- *EA Science Reports* (SC050021/SR2, SC050021/SR3, and SC050021/SR7)
- *EA Soil Guideline Value Science Reports*
- *Suitable For Use Levels (S4ULs) for Human Health Risk Assessment* – LQM & CIEH (2015)
- *Soil Generic Assessment Criteria for Human Health Risk Assessment* - EIC/AGS/CL:AIRE (2010)

Category 4 Screening Levels (C4SLs) provide generic suitable for use screening values for common contaminants in a variety of land uses and are also utilised as appropriate generic screening criteria.

Where assessment of the risk to human health from asbestos in soil is concerned there is no nationally recognised suitable for use /generic screening value commonly referred to through the planning system. Due to this, it is necessary to take a more qualitative

approach to the risks posed to future site users from asbestos on a site-specific basis although EPS will also cite a numerical screening value of 0.001%, which is the accredited laboratory detection limit.

A copy of the generic screening criteria are included as Appendix E.

### 5.1.3 Assessment of Soil Results-Human Health

The results of the screening process for on-site human receptors showed that the adopted criteria, representative of suitability limits to future site users, were exceeded for asbestos; as detailed in the below table.

| Contaminant | Screening Criteria | No. of Exceedances | Maximum Exceedance (mg/kg), Sampling Location & Depth. |
|-------------|--------------------|--------------------|--------------------------------------------------------|
| Asbestos    | 0.001%             | 1                  | 0.147 (HA02, 0.6-0.8m)                                 |

The exceedances of relevant screening criteria above appear primarily related to the quality of shallow soils across the site (particularly around HA02) and does require further consideration. With reference to the *CL:AIRE guidance, 'Comparing Soil Concentration Data with a Critical Concentration'* (2020), the available dataset is not appropriate to undertake comprehensive statistical analysis and there is not any reasonable justification or evidence for splitting the dataset into several populations at this stage.

The ACM concentrations in shallow soils across the south of the site are considered to represent potentially unacceptable risks to future site users. It should be noted that although the soils in HA02 at the depth from which this sample was taken appeared to be natural during the field works, it is possible that the soil has been disturbed by man-made processes to greater depths and simply limited evidence was encountered. It should also be noted that the ACM was noted to comprise a fragment of cement board and the quantification on fibres was found to fall below method detection limit, it is likely associated with the use of asbestos cement on former agricultural buildings.

Nevertheless, the presence of asbestos in soils could pose an unacceptable risk to groundworkers or future site users and as such details for appropriate control measures to address the presence of shallow soil contamination are included in Section 5.5 of this report.

## 5.2 Summary of Findings

A Phase I Desk Study completed for the site by EPS in February 2025 identified potential risks to human health associated with interaction with potentially contaminated made

ground on the site, as well as associated with infilled soils within the footprint of the former pond. These risks are quite common when agricultural land uses are converted into a more sensitive residential usage.

EPS' intrusive investigations therefore comprised the drilling of five shallow hand augur boreholes across the site, all progressing to a depth of 1.0m bgl, with the collection of soil samples for inspection for physical evidence of contamination and subsequent laboratory analysis.

The ground conditions found an initial layer of topsoil (with some typical made ground materials also recovered from all boreholes) up to ~0.5m bgl, underlain by natural clays of the Lowestoft Formation. Groundwater ingress wasn't recorded during the initial works.

Limited evidence of contamination was recorded during the site investigation, despite the presence of made ground including layers of brick and concrete in HA03 and HA05. Laboratory analysis of shallow soils sampled from across the site has confirmed that the adopted screening criteria protective of future site users (including residents) have been exceeded by a concentration of ACM (asbestos) in one location. This sample was obtained at depth and appears to be associated with a fragment of cement bound material in the soil rather than free fibres, however risks from asbestos in shallow soils elsewhere cannot be ruled out based on the available dataset. Therefore, either some further shallow soil sampling could be undertaken or implementation of a remedial control measure, options for which are outlined in Section 5.5 below.

In the context of potentially unacceptable or acceptable risks as outlined within the Environment Agency's *Land Contamination: Risk Management* guidance, the risks identified by this work can be addressed through implementation of the following recommendations.

### 5.3 Recommendations

The following recommendations are made to either further assess or mitigate the risks from the asbestos identified within the shallow soils, with either of the following options implemented. This section represents the Remedial Strategy for the site:

- 1) The most appropriate form of remedial action / control measure that will mitigate risks associated with the identified contamination in shallow soils to acceptable levels is considered to be the implementation of a clean soil cover system, underlain by a no-dig geotextile (such as high visibility Terram<sup>TM</sup>) in all areas of proposed gardens and soft landscaping within the planning boundary, as per the *BRE publication: Cover Systems for Land Regeneration: Thickness Design of Cover Systems for Contaminated Land (BRE, Mar 2004)*. The minimum recommended thickness is **300mm** and is based on this guidance and the worst-case laboratory data, and also designed to ensure a practical thickness can be implemented. It should be noted that this

recommendation is made only for areas of gardens and soft landscaping, and there is no such requirement for areas beneath any hardstanding or building footprints. Whilst the detection of asbestos in HA02 is quite significant (it would render the soils hazardous in a waste management context), it does not appear to be a widespread problem and where moisture content is maintained above about 10% in soils, it is known to inhibit the release of airborne fibres and this has been taken into account in the design of this remedial measure.

It is recognised that some shallow soils will need to be removed to achieve this cover thickness. Following the sufficient removal of shallow soils (to allow for the recommended cover system thickness), the excavations should then be made up with clean imported soils accompanied by appropriate laboratory analysis to demonstrate its chemical suitability for use. A Cover Soils Checklist which details these requirements further is presented as Appendix F.

These remedial works must be verified and EPS can assist in this process. All waste transfer documentation must be retained, with photographs of the excavations including any exposed clean natural soils and compiling the information outlined in the Cover Soils Checklist. If an established supplier such as British Sugar was used, then the soil is tested at source and no further analysis would typically be needed.

**Or;**

- 2) Alternatively, further sampling could be undertaken across the site to gather a larger dataset on the potential presence of ACM in the proposed garden areas and enable potential refinement of the remedial recommendations above. Given the size of the garden area, and the potential costs of associated soil removal / import, this may represent a cost-effective way to refine the areas where remediation is required, although it should be noted that following this the above recommendations may stand if similar concentrations of ACM or other contaminants are encountered elsewhere across the site.

The following precautionary measures are also recommended to ensure safe development, as follows:

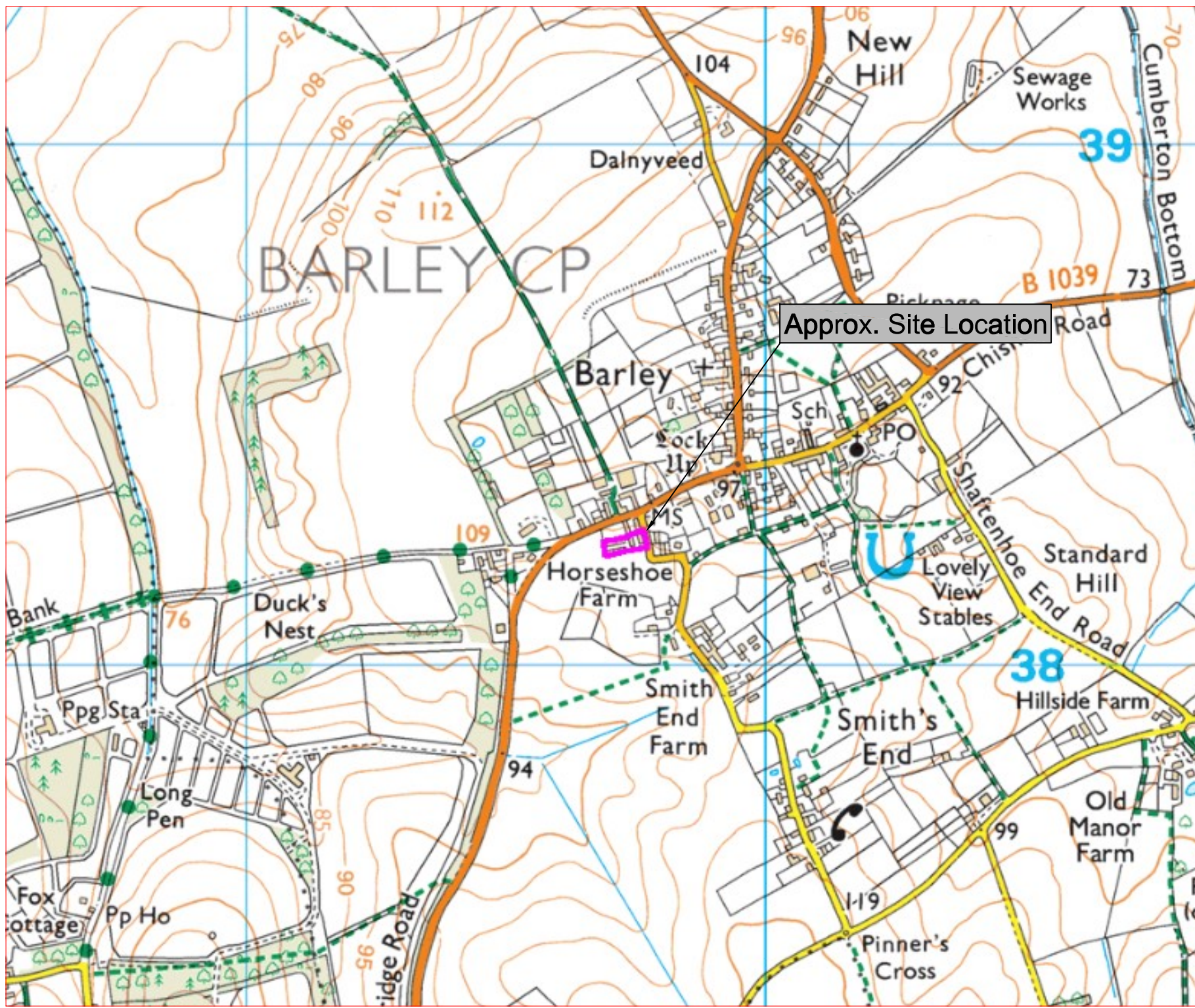
- a) All construction workers operating at the site should be advised of the potential for contact with made ground material within shallow soils. Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to infilled soils. Reference should be made to relevant health & safety guidance including the following CIRIA document: *R132 Guide to Safe Working on Contaminated Sites*.
- b) Risks to ground workers from asbestos in the soils must be accounted for. Although the findings of the investigation would suggest that significant quantities of asbestos are unlikely to be encountered, the possibility of discrete pockets of this material

existing within the made ground remains and there evidently is potentially hazardous levels of fibres in certain areas. All soils will need to be kept damp during earthworks including implementation of the above cover system. If any evidence of widespread visually identifiable ACM is encountered during the site development, it is recommended that all works are postponed until suitable assessment and control measures (including a Safe Working Method (SWM)) are created. This SWM should be prepared in accordance with guidance from CIRIA as well as CL:AIRE and it will support the principal contractor in their duties under *The Construction (Design & Management) Regulations 2015* (CDM). EPS can assist with this SWM if required.

- c) Should any palpable evidence of unexpected contamination be encountered during the redevelopment work, it should be reported to EPS so that an inspection can be made and appropriate sampling and assessment work carried out, a method statement for this is provided as Appendix G.

It is recommended that a copy of this report be provided to the Environmental Health Department of North Hertfordshire District Council so that the information may be incorporated into their land quality records and used to support the current planning application. This report should satisfy the pre-commencement requirements of the planning process relating to contamination. A Verification Report will be required documenting the implementation of the remediation prior to completion.

## FIGURES



KEY:  
SITE BOUNDARY

| Rev | Date | Drawn | Description | By |
|-----|------|-------|-------------|----|
|     |      |       |             |    |



The Geotechnical and Environmental Engineers  
[www.epstrategies.co.uk](http://www.epstrategies.co.uk)

Site  
Land Adjacent to Horseshoe Farm  
London Road, Barley, Hertfordshire, SG8 8JE

Client  
Geoffrey Wilkerson

Title  
Figure 1 - Site Location Plan

|              |    |           |            |
|--------------|----|-----------|------------|
| Surveyed by: |    | Drawn by: | FE         |
| Checked by:  | MJ | Date:     | 22/04/2025 |

Scale: NTS [At Sheet] Drawing Reference: UK25.7240B\_01

|         |            |      |    |
|---------|------------|------|----|
| Job No: | UK25.7240B | Rev: | 01 |
|---------|------------|------|----|



KEY:  
— SITE BOUNDARY  
— EPS HANDAUGER BOREHOLE

|     |      |       |             |      |
|-----|------|-------|-------------|------|
|     |      |       |             |      |
| Rev | Date | Drawn | Description | Cr'd |



The Geotechnical and Environmental Engineers  
[www.epstrategies.co.uk](http://www.epstrategies.co.uk)

Site  
Land Adjacent to Horseshoe Farm  
London Road, Barley, Hertfordshire, SG8 8JE

Client  
Mr Geoffrey Wilkerson

Title  
Figure 2 - Borehole Location Plan

|             |    |           |            |
|-------------|----|-----------|------------|
| Surveyed:   |    | Drawn by: | FE         |
| Checked by: | MJ | Date:     | 22/04/2025 |

|              |            |                   |
|--------------|------------|-------------------|
| Scale        | [A4 Sheet] | Drawing Reference |
| Not to Scale |            | UK25.7240B_02     |

|            |     |
|------------|-----|
| Job No     | Rev |
| UK25.7240B | 02  |

## TABLES

**Table 1 – Laboratory Testing Schedule**

| Sample ID | Sample Depth<br>(m bgl) | EPS Mini<br>Suite | EPS TPH Suite |
|-----------|-------------------------|-------------------|---------------|
| HA01      | 0.1 – 0.3               | 1                 | 1             |
| HA02      | 0.6 – 0.8               | 1                 | 1             |
| HA03      | 0.2 – 0.5               | 1                 | 1             |
| HA04      | 0.2 – 0.5               | 1                 | 1             |
| HA05      | 0.7 – 0.9               | 1                 | 1             |

**Notes:**

**mbgl**

meters below ground level

**1**

Sample Taken

**EPS Mini Suite**

Organic Matter, Cyanide, Metals, PAH's, Phenols & Asbestos Screen

**EPS TPH Suite**

Total Petroleum Hydrocarbons, speciated to TPH Criteria Working Group

## **APPENDICES**

## **APPENDIX A**

### **Selected Site Photographs**

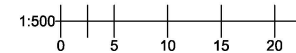
|                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Photo 1: View showing the soil cores from HA01.                                     | Photo 2: View showing the location of from HA02.                                     |
|    |    |
| Photo 3: View showing the soil cores from HA03.                                     | Photo 4: View showing the location of HA04.                                          |
|   |   |
| Photo 4: View showing the soil cores from HA04.                                     | Photo 4: View showing the location of HA05.                                          |
|  |  |

## **APPENDIX B**

### **Proposed Development Plan**



| Issue Status                                                        |       |
|---------------------------------------------------------------------|-------|
| Planning                                                            |       |
| This drawing is copyright. Only figured dimensions to be worked to. |       |
| Revision                                                            | Drawn |
| P1 First Issue                                                      | W     |
| P2 Amendments as per conservation officer comments                  | W     |
| P3 Updated as per conservation officer comments                     | W     |



|         |                                             |
|---------|---------------------------------------------|
| client  | Wilkerson                                   |
| project | Barn Conversion<br>Smith End Lane<br>Barley |
| drawing | Site Plan As Proposed                       |
| date    | 03.08.23                                    |
| drawn   | WF                                          |
| scale   | 1:500                                       |
| check   | AD                                          |

**BROWN & CO**  
ARCHITECTURE + PLANNING  
www.brown-co.com

Norwich 01603 929871  
St. Neots 01480 213811  
Humber Lincoln  
Brown & Co Registered Office: The Atrium, St. George's Street, Norwich,  
Registration no: 00302082. Registered in England & Wales.

|    |     |     |
|----|-----|-----|
| 22 | 121 | P00 |
|----|-----|-----|

## **APPENDIX C**

### **Site Specific Borehole Logs**



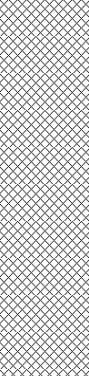
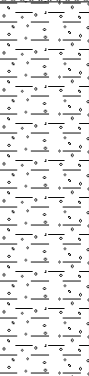
# Borehole Log

Borehole No.

**HA01**

Sheet 1 of 1

|               |                                    |             |            |          |                   |           |      |
|---------------|------------------------------------|-------------|------------|----------|-------------------|-----------|------|
| Project Name: | Land Adjacent to Horseshoe Farm    | Project No. | UK25.7240B | Co-ords: | 539767E - 238228N | Hole Type | HA   |
| Location:     | London Road, Barley, Hertfordshire |             |            | Level:   |                   | Scale     | 1:10 |
| Client:       | Mr Geoffrey Wilkerson              |             |            | Dates:   | 20/03/2025        | Logged By | FE   |

| Well | Water Strikes | Sample and In Situ Testing |      |                 | Depth (m) | Level (m) | Legend                                                                             | Stratum Description                                                                                                                                             |   |
|------|---------------|----------------------------|------|-----------------|-----------|-----------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                  | Type | In Situ Results |           |           |                                                                                    |                                                                                                                                                                 |   |
|      |               | 0.10 - 0.30                | ES   |                 |           |           |   | MADE GROUND: Dark brown slightly sandy gravelly CLAY. Gravel consists of fine to medium sub rounded fragments of concrete, brick and flint with frequent roots. |   |
|      |               |                            |      |                 | 0.50      |           |  | Dark brown slightly gravelly CLAY. Gravel consists of fine sub angular chalk. (LOWESTOFT FORMATION)                                                             |   |
|      |               |                            |      |                 | 1.00      |           |                                                                                    | End of Borehole at 1.000m                                                                                                                                       | 1 |
|      |               |                            |      |                 |           |           |                                                                                    |                                                                                                                                                                 | 2 |

**Remarks**

No Groundwater Struck &amp; Reached Target Depth





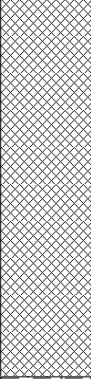
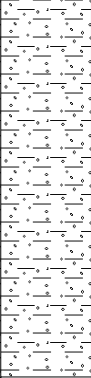
# Borehole Log

Borehole No.

**HA02**

Sheet 1 of 1

|               |                                    |             |            |          |                   |           |      |
|---------------|------------------------------------|-------------|------------|----------|-------------------|-----------|------|
| Project Name: | Land Adjacent to Horseshoe Farm    | Project No. | UK25.7240B | Co-ords: | 539742E - 238225N | Hole Type | HA   |
| Location:     | London Road, Barley, Hertfordshire |             |            | Level:   |                   | Scale     | 1:10 |
| Client:       | Mr Geoffrey Wilkerson              |             |            | Dates:   | 20/03/2025        | Logged By | FE   |

| Well | Water Strikes | Sample and In Situ Testing |      |                 | Depth (m) | Level (m) | Legend                                                                             | Stratum Description                                                                                                                               |   |
|------|---------------|----------------------------|------|-----------------|-----------|-----------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                  | Type | In Situ Results |           |           |                                                                                    |                                                                                                                                                   |   |
|      |               | 0.60 - 0.80                | ES   |                 | 0.50      |           |   | MADE GROUND: Dark Brown slightly gravelly sandy CLAY. Gravel consists of fine to medium sub rounded flint, chalk and brick with occasional roots. |   |
|      |               |                            |      |                 | 1.00      |           |  | Dark brown slightly gravelly CLAY. Gravel consists of fine sub rounded chalk and flint. (LOWESTOFT FORMATION)                                     |   |
|      |               |                            |      |                 |           |           |                                                                                    | End of Borehole at 1.000m                                                                                                                         | 1 |
|      |               |                            |      |                 |           |           |                                                                                    |                                                                                                                                                   | 2 |

## Remarks

No Groundwater Struck &amp; Reached Target Depth





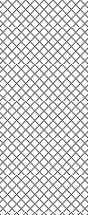
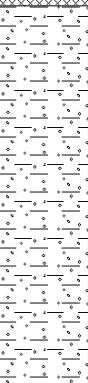
# Borehole Log

Borehole No.

**HA03**

Sheet 1 of 1

|               |                                    |             |            |          |                   |           |      |
|---------------|------------------------------------|-------------|------------|----------|-------------------|-----------|------|
| Project Name: | Land Adjacent to Horseshoe Farm    | Project No. | UK25.7240B | Co-ords: | 539733E - 238245N | Hole Type | HA   |
| Location:     | London Road, Barley, Hertfordshire |             |            | Level:   |                   | Scale     | 1:10 |
| Client:       | Mr Geoffrey Wilkerson              |             |            | Dates:   | 20/03/2025        | Logged By | FE   |

| Well | Water Strikes | Sample and In Situ Testing |      |                 | Depth (m) | Level (m) | Legend                                                                             | Stratum Description                                                                                                                                 |   |
|------|---------------|----------------------------|------|-----------------|-----------|-----------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                  | Type | In Situ Results |           |           |                                                                                    |                                                                                                                                                     |   |
|      |               | 0.20 - 0.50                | ES   |                 | 0.10      |           |   | TOP SOIL: Dark brown sandy gravelly clay. Gravel consists of fine to medium sub angular flint with frequent roots.                                  |   |
|      |               |                            |      |                 | 0.20      |           |   | CONCRETE                                                                                                                                            |   |
|      |               |                            |      |                 | 0.50      |           |   | MADE GROUND: Dark brown gravelly CLAY. Gravel consists of fine to medium sub angular to sub rounded fragments of chalk, flint, brick and concrete.  |   |
|      |               |                            |      |                 | 1.00      |           |  | Dark brown slightly gravelly CLAY. Gravel consists of fine to medium sub angular chalk with clay becoming lighter with depth. (LOWESTOFT FORMATION) |   |
|      |               |                            |      |                 |           |           |                                                                                    | End of Borehole at 1.000m                                                                                                                           | 1 |
|      |               |                            |      |                 |           |           |                                                                                    |                                                                                                                                                     | 2 |

## Remarks

No Groundwater Struck &amp; Reached Target Depth





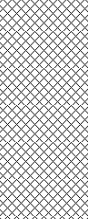
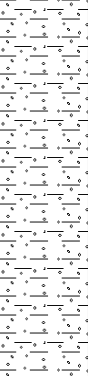
# Borehole Log

Borehole No.

**HA04**

Sheet 1 of 1

|               |                                    |             |            |          |                   |           |      |
|---------------|------------------------------------|-------------|------------|----------|-------------------|-----------|------|
| Project Name: | Land Adjacent to Horseshoe Farm    | Project No. | UK25.7240B | Co-ords: | 539732E - 238232N | Hole Type | HA   |
| Location:     | London Road, Barley, Hertfordshire |             |            | Level:   |                   | Scale     | 1:10 |
| Client:       | Mr Geoffrey Wilkerson              |             |            | Dates:   | 20/03/2025        | Logged By | FE   |

| Well | Water Strikes | Sample and In Situ Testing |      |                 | Depth (m) | Level (m) | Legend                                                                             | Stratum Description                                                                                                                                   |   |
|------|---------------|----------------------------|------|-----------------|-----------|-----------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                  | Type | In Situ Results |           |           |                                                                                    |                                                                                                                                                       |   |
|      |               | 0.20 - 0.50                | ES   |                 | 0.20      |           |   | TOP SOIL: Dark brown slightly gravelly sandy CLAY. Gravel consists of fine sub angular flint.                                                         |   |
|      |               |                            |      |                 | 0.50      |           |   | MADE GROUND: Dark brown slightly sandy gravelly CLAY. Gravel consists of fine to coarse sub rounded fragments of concrete, brick and flint and chalk. |   |
|      |               |                            |      |                 | 1.00      |           |  | Brown slightly gravelly CLAY. Gravel consists of fine sub angular chalk. Clay becoming lighter with depth. (LOWESTOFT FORMATION)                      |   |
|      |               |                            |      |                 |           |           |                                                                                    | End of Borehole at 1.000m                                                                                                                             | 1 |
|      |               |                            |      |                 |           |           |                                                                                    |                                                                                                                                                       | 2 |

## Remarks

No Groundwater Struck &amp; Reached Target Depth





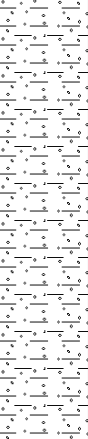
# Borehole Log

Borehole No.

**HA05**

Sheet 1 of 1

|               |                                    |             |            |          |                   |           |      |
|---------------|------------------------------------|-------------|------------|----------|-------------------|-----------|------|
| Project Name: | Land Adjacent to Horseshoe Farm    | Project No. | UK25.7240B | Co-ords: | 539708E - 238228N | Hole Type | HA   |
| Location:     | London Road, Barley, Hertfordshire |             |            | Level:   |                   | Scale     | 1:10 |
| Client:       | Mr Geoffrey Wilkerson              |             |            | Dates:   | 20/03/2025        | Logged By | FE   |

| Well | Water Strikes | Sample and In Situ Testing |      |                 | Depth (m) | Level (m) | Legend                                                                             | Stratum Description                                                                                                       |   |
|------|---------------|----------------------------|------|-----------------|-----------|-----------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---|
|      |               | Depth (m)                  | Type | In Situ Results |           |           |                                                                                    |                                                                                                                           |   |
|      |               |                            |      |                 | 0.10      |           |   | TOP SOIL: Dark brown slightly sandy slightly gravelly CLAY. Gravel consists of fine sub angular flint with frequent roots |   |
|      |               |                            |      |                 | 0.20      |           |   | BRICK                                                                                                                     |   |
|      |               |                            |      |                 | 0.30      |           |   | CONCRETE                                                                                                                  |   |
|      |               |                            |      |                 | 0.40      |           |   | MADE GROUND: Dark brown gravelly CLAY. Gravel consists of fine to medium sub rounded fragments of brick and flint.        |   |
|      |               |                            |      |                 |           |           |  | Brown slightly gravelly CLAY. Gravel consists of fine sub rounded chalk. (LOWESTOFT FORMATION)                            |   |
|      |               | 0.70 - 0.90                | ES   |                 | 1.00      |           |                                                                                    | End of Borehole at 1.000m                                                                                                 | 1 |
|      |               |                            |      |                 |           |           |                                                                                    |                                                                                                                           | 2 |

## Remarks

No Groundwater Struck &amp; Reached Target Depth



## **APPENDIX D**

### **Laboratory Results – Environmental**

EPS Ltd  
7B Caxton House  
Broad Street  
Cambourne  
Cambridgeshire  
United Kingdom  
CB23 6JN



4225



**Attention :** Michael Judson  
**Date :** 24th April, 2025  
**Your reference :** UK25.7240  
**Our reference :** Test Report 25/4641 Batch 1  
**Location :** Land adjacent to Horseshoe Farm  
**Date samples received :** 22nd March, 2025  
**Status :** Final Report  
**Issue :** 202504240853

Five samples were received for analysis on 22nd March, 2025 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 20.996 kg of CO2

Scope 1&2&3 emissions - 49.619 kg of CO2

**Authorised By:**



**Bruce Leslie**  
Project Manager

Please include all sections of this report if it is reproduced

## Element Materials Technology

**Client Name:** EPS Ltd  
**Reference:** UK25.7240  
**Location:** Land adjacent to Horseshoe Farm  
**Contact:** Michael Judson  
**EMT Job No:** 25/4641

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

| EMT Sample No.                          | 1-4        | 5-8        | 9-12       | 13-16      | 17-20      |  |  |  |  |  | Please see attached notes for all abbreviations and acronyms |       |                        |
|-----------------------------------------|------------|------------|------------|------------|------------|--|--|--|--|--|--------------------------------------------------------------|-------|------------------------|
| Sample ID                               | HA01 ES1   | HA02 ES1   | HA03 ES1   | HA04 ES1   | HA05 ES1   |  |  |  |  |  |                                                              |       |                        |
| Depth                                   | 0.10-0.30  | 0.60-0.80  | 0.20-0.50  | 0.20-0.50  | 0.70-0.90  |  |  |  |  |  |                                                              |       |                        |
| COC No / misc                           |            |            |            |            |            |  |  |  |  |  |                                                              |       |                        |
| Containers                              | V J T      | V J T      | V J T      | V J T      | V J T      |  |  |  |  |  |                                                              |       |                        |
| Sample Date                             | 20/03/2025 | 20/03/2025 | 20/03/2025 | 20/03/2025 | 20/03/2025 |  |  |  |  |  |                                                              |       |                        |
| Sample Type                             | Clay       | Clay       | Clay       | Clay       | Clay       |  |  |  |  |  |                                                              |       |                        |
| Batch Number                            | 1          | 1          | 1          | 1          | 1          |  |  |  |  |  |                                                              |       |                        |
| Date of Receipt                         | 22/03/2025 | 22/03/2025 | 22/03/2025 | 22/03/2025 | 22/03/2025 |  |  |  |  |  | LOD/LOR                                                      | Units | Method No.             |
| Arsenic <sup>#M</sup>                   | 9.5        | 12.3       | 10.9       | 13.1       | 15.6       |  |  |  |  |  | <0.5                                                         | mg/kg | TM30/PM15              |
| Cadmium <sup>#M</sup>                   | <0.1       | <0.1       | <0.1       | <0.1       | <0.1       |  |  |  |  |  | <0.1                                                         | mg/kg | TM30/PM15              |
| Chromium <sup>#M</sup>                  | 40.8       | 39.7       | 51.3       | 40.6       | 45.1       |  |  |  |  |  | <0.5                                                         | mg/kg | TM30/PM15              |
| Copper <sup>#M</sup>                    | 18         | 22         | 29         | 35         | 21         |  |  |  |  |  | <1                                                           | mg/kg | TM30/PM15              |
| Lead <sup>#M</sup>                      | 25         | 27         | 89         | 51         | 18         |  |  |  |  |  | <5                                                           | mg/kg | TM30/PM15              |
| Mercury <sup>#M</sup>                   | <0.1       | <0.1       | <0.1       | 0.2        | 0.1        |  |  |  |  |  | <0.1                                                         | mg/kg | TM30/PM15              |
| Nickel <sup>#M</sup>                    | 20.7       | 27.2       | 24.1       | 29.4       | 47.1       |  |  |  |  |  | <0.7                                                         | mg/kg | TM30/PM15              |
| Selenium <sup>#M</sup>                  | 1          | <1         | <1         | <1         | <1         |  |  |  |  |  | <1                                                           | mg/kg | TM30/PM15              |
| Total Sulphate as SO4 <sup>#M</sup>     | 872        | 825        | 885        | 1040       | 414        |  |  |  |  |  | <50                                                          | mg/kg | TM50/PM29              |
| Zinc <sup>#M</sup>                      | 110        | 209        | 272        | 204        | 99         |  |  |  |  |  | <5                                                           | mg/kg | TM30/PM15              |
| PAH MS                                  |            |            |            |            |            |  |  |  |  |  |                                                              |       |                        |
| Naphthalene <sup>#M</sup>               | <0.04      | <0.04      | 0.20       | <0.04      | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| Acenaphthylene                          | 0.08       | <0.03      | 0.17       | <0.03      | <0.03      |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8                |
| Acenaphthene <sup>#M</sup>              | <0.05      | <0.05      | <0.05      | <0.05      | <0.05      |  |  |  |  |  | <0.05                                                        | mg/kg | TM4/PM8                |
| Fluorene <sup>#M</sup>                  | <0.04      | <0.04      | 0.12       | <0.04      | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| Phenanthrene <sup>#M</sup>              | 0.70       | 0.11       | 1.96       | 0.18       | <0.03      |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8                |
| Anthracene <sup>#</sup>                 | 0.06       | <0.04      | 0.11       | <0.04      | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| Fluoranthene <sup>#M</sup>              | 0.95       | 0.17       | 2.03       | 0.30       | <0.03      |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8                |
| Pyrene <sup>#</sup>                     | 0.73       | 0.13       | 1.51       | 0.23       | <0.03      |  |  |  |  |  | <0.03                                                        | mg/kg | TM4/PM8                |
| Benzo(a)anthracene <sup>#</sup>         | 0.34       | 0.11       | 0.51       | 0.17       | <0.06      |  |  |  |  |  | <0.06                                                        | mg/kg | TM4/PM8                |
| Chrysene <sup>#M</sup>                  | 0.46       | 0.08       | 1.01       | 0.17       | <0.02      |  |  |  |  |  | <0.02                                                        | mg/kg | TM4/PM8                |
| Benzo(b)fluoranthene <sup>#M</sup>      | 0.82       | 0.19       | 1.80       | 0.27       | <0.07      |  |  |  |  |  | <0.07                                                        | mg/kg | TM4/PM8                |
| Benzo(a)pyrene <sup>#</sup>             | 0.47       | 0.08       | 0.90       | 0.14       | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| Indeno(123cd)pyrene <sup>#M</sup>       | 0.40       | 0.10       | 0.86       | 0.12       | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| Dibenzo(ah)anthracene <sup>#</sup>      | 0.07       | <0.04      | 0.16       | <0.04      | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| Benzo(ghi)perylene <sup>#</sup>         | 0.30       | 0.07       | 0.62       | 0.09       | <0.04      |  |  |  |  |  | <0.04                                                        | mg/kg | TM4/PM8                |
| PAH 16 Total                            | 5.4        | 1.0        | 12.0       | 1.7        | <0.6       |  |  |  |  |  | <0.6                                                         | mg/kg | TM4/PM8                |
| Benzo(b)fluoranthene                    | 0.59       | 0.14       | 1.30       | 0.19       | <0.05      |  |  |  |  |  | <0.05                                                        | mg/kg | TM4/PM8                |
| Benzo(k)fluoranthene                    | 0.23       | 0.05       | 0.50       | 0.08       | <0.02      |  |  |  |  |  | <0.02                                                        | mg/kg | TM4/PM8                |
| PAH Surrogate % Recovery                | 90         | 91         | 90         | 89         | 89         |  |  |  |  |  | <0                                                           | %     | TM4/PM8                |
| TPH CWG                                 |            |            |            |            |            |  |  |  |  |  |                                                              |       |                        |
| Aliphatics                              |            |            |            |            |            |  |  |  |  |  |                                                              |       |                        |
| >C5-C6 (HS_1D_AL) <sup>#M</sup>         | <0.1       | <0.1       | <0.1       | <0.1       | <0.1       |  |  |  |  |  | <0.1                                                         | mg/kg | TM36/PM12              |
| >C6-C8 (HS_1D_AL) <sup>#M</sup>         | 0.1        | <0.1       | <0.1       | <0.1       | <0.1       |  |  |  |  |  | <0.1                                                         | mg/kg | TM36/PM12              |
| >C8-C10 (HS_1D_AL)                      | <0.1       | <0.1       | <0.1       | <0.1       | <0.1       |  |  |  |  |  | <0.1                                                         | mg/kg | TM36/PM12              |
| >C10-C12 (EH_CU_1D_AL) <sup>#M</sup>    | <0.2       | <0.2       | <0.2       | 11.2       | <0.2       |  |  |  |  |  | <0.2                                                         | mg/kg | TM5/PM8/PM16           |
| >C12-C16 (EH_CU_1D_AL) <sup>#M</sup>    | <4         | <4         | <4         | 16         | <4         |  |  |  |  |  | <4                                                           | mg/kg | TM5/PM8/PM16           |
| >C16-C21 (EH_CU_1D_AL) <sup>#M</sup>    | <7         | <7         | <7         | 17         | <7         |  |  |  |  |  | <7                                                           | mg/kg | TM5/PM8/PM16           |
| >C21-C35 (EH_CU_1D_AL) <sup>#M</sup>    | <7         | <7         | <7         | 39         | <7         |  |  |  |  |  | <7                                                           | mg/kg | TM5/PM8/PM16           |
| >C35-C40 (EH_CU_1D_AL)                  | <7         | <7         | <7         | <7         | <7         |  |  |  |  |  | <7                                                           | mg/kg | TM5/PM8/PM16           |
| Total aliphatics C5-40 (EH_CU+HS_1D_AL) | <26        | <26        | <26        | 83         | <26        |  |  |  |  |  | <26                                                          | mg/kg | TM5/PM8/PM16/PM12/PM15 |

## Element Materials Technology

**Client Name:** EPS Ltd  
**Reference:** UK25.7240  
**Location:** Land adjacent to Horseshoe Farm  
**Contact:** Michael Judson  
**EMT Job No:** 25/4641

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

| EMT Sample No.                                            | 1-4                      | 5-8           | 9-12               | 13-16              | 17-20        |  |  |  |  |  | Please see attached notes for all abbreviations and acronyms |          |                        |
|-----------------------------------------------------------|--------------------------|---------------|--------------------|--------------------|--------------|--|--|--|--|--|--------------------------------------------------------------|----------|------------------------|
| Sample ID                                                 | HA01 ES1                 | HA02 ES1      | HA03 ES1           | HA04 ES1           | HA05 ES1     |  |  |  |  |  |                                                              |          |                        |
| Depth                                                     | 0.10-0.30                | 0.60-0.80     | 0.20-0.50          | 0.20-0.50          | 0.70-0.90    |  |  |  |  |  |                                                              |          |                        |
| COC No / misc                                             |                          |               |                    |                    |              |  |  |  |  |  |                                                              |          |                        |
| Containers                                                | V J T                    | V J T         | V J T              | V J T              | V J T        |  |  |  |  |  |                                                              |          |                        |
| Sample Date                                               | 20/03/2025               | 20/03/2025    | 20/03/2025         | 20/03/2025         | 20/03/2025   |  |  |  |  |  |                                                              |          |                        |
| Sample Type                                               | Clay                     | Clay          | Clay               | Clay               | Clay         |  |  |  |  |  |                                                              |          |                        |
| Batch Number                                              | 1                        | 1             | 1                  | 1                  | 1            |  |  |  |  |  |                                                              |          |                        |
| Date of Receipt                                           | 22/03/2025               | 22/03/2025    | 22/03/2025         | 22/03/2025         | 22/03/2025   |  |  |  |  |  | LOD/LOR                                                      | Units    | Method No.             |
| TPH CWG                                                   |                          |               |                    |                    |              |  |  |  |  |  |                                                              |          |                        |
| <b>Aromatics</b>                                          |                          |               |                    |                    |              |  |  |  |  |  |                                                              |          |                        |
| >C5-EC7 (HS_1D_AR) #                                      | <0.1                     | <0.1          | <0.1               | <0.1               | <0.1         |  |  |  |  |  | <0.1                                                         | mg/kg    | TM36/PM12              |
| >EC7-EC8 (HS_1D_AR) #                                     | <0.1                     | <0.1          | <0.1               | <0.1               | <0.1         |  |  |  |  |  | <0.1                                                         | mg/kg    | TM36/PM12              |
| >EC8-EC10 (HS_1D_AR) #M                                   | <0.1                     | <0.1          | <0.1               | <0.1               | <0.1         |  |  |  |  |  | <0.1                                                         | mg/kg    | TM36/PM12              |
| >EC10-EC12 (EH_CU_1D_AR) #                                | <0.2                     | <0.2          | <0.2               | <0.2               | <0.2         |  |  |  |  |  | <0.2                                                         | mg/kg    | TM5/PM8/PM16           |
| >EC12-EC16 (EH_CU_1D_AR) #                                | <4                       | <4            | <4                 | <4                 | <4           |  |  |  |  |  | <4                                                           | mg/kg    | TM5/PM8/PM16           |
| >EC16-EC21 (EH_CU_1D_AR) #                                | <7                       | <7            | 14                 | <7                 | <7           |  |  |  |  |  | <7                                                           | mg/kg    | TM5/PM8/PM16           |
| >EC21-EC35 (EH_CU_1D_AR) #                                | <7                       | <7            | 44                 | <7                 | <7           |  |  |  |  |  | <7                                                           | mg/kg    | TM5/PM8/PM16           |
| >EC35-EC40 (EH_CU_1D_AR)                                  | <7                       | <7            | <7                 | <7                 | <7           |  |  |  |  |  | <7                                                           | mg/kg    | TM5/PM8/PM16           |
| Total aromatics C5-40 (EH_CU+HS_1D_AR)                    | <26                      | <26           | 58                 | <26                | <26          |  |  |  |  |  | <26                                                          | mg/kg    | TM5/PM8/PM16/PM12/PM10 |
| Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total) | <52                      | <52           | 58                 | 83                 | <52          |  |  |  |  |  | <52                                                          | mg/kg    | TM5/PM8/PM16/PM12/PM10 |
| MTBE #                                                    | <5                       | <5            | <5                 | <5                 | <5           |  |  |  |  |  | <5                                                           | ug/kg    | TM36/PM12              |
| Benzene #                                                 | <5                       | <5            | <5                 | <5                 | <5           |  |  |  |  |  | <5                                                           | ug/kg    | TM36/PM12              |
| Toluene #                                                 | <5                       | <5            | <5                 | <5                 | <5           |  |  |  |  |  | <5                                                           | ug/kg    | TM36/PM12              |
| Ethylbenzene #                                            | <5                       | <5            | <5                 | <5                 | <5           |  |  |  |  |  | <5                                                           | ug/kg    | TM36/PM12              |
| m/p-Xylene #                                              | <5                       | <5            | <5                 | <5                 | <5           |  |  |  |  |  | <5                                                           | ug/kg    | TM36/PM12              |
| o-Xylene #                                                | <5                       | <5            | <5                 | <5                 | <5           |  |  |  |  |  | <5                                                           | ug/kg    | TM36/PM12              |
| Total Phenols HPLC                                        | 3.89                     | <0.15         | 0.30               | <0.15              | <0.15        |  |  |  |  |  | <0.15                                                        | mg/kg    | TM26/PM21B             |
| Natural Moisture Content                                  | 19.9                     | 20.6          | 19.7               | 29.9               | 16.9         |  |  |  |  |  | <0.1                                                         | %        | PM4/PM0                |
| Hexavalent Chromium #                                     | <0.3                     | <0.3          | <0.3               | <0.3               | <0.3         |  |  |  |  |  | <0.3                                                         | mg/kg    | TM38/PM20              |
| Sulphate as SO4 (2:1 Ext) #M                              | <0.0015                  | 0.0197        | 0.0130             | 0.0025             | 0.0372       |  |  |  |  |  | <0.0015                                                      | g/l      | TM38/PM20              |
| Chromium III                                              | 40.8                     | 39.7          | 51.3               | 40.6               | 45.1         |  |  |  |  |  | <0.5                                                         | mg/kg    | NONE/NONE              |
| Total Cyanide #M                                          | <0.5                     | <0.5          | <0.5               | <0.5               | <0.5         |  |  |  |  |  | <0.5                                                         | mg/kg    | TM89/PM45              |
| Organic Matter                                            | 5.0                      | 3.5           | 4.5                | 4.6                | 1.6          |  |  |  |  |  | <0.2                                                         | %        | TM21/PM24              |
| pH #M                                                     | 7.34                     | 7.89          | 7.71               | 7.63               | 8.10         |  |  |  |  |  | <0.01                                                        | pH units | TM73/PM11              |
| Sample Type                                               | Clay                     | Clay          | Clay               | Clay               | Clay         |  |  |  |  |  |                                                              | None     | PM13/PM0               |
| Sample Colour                                             | Medium Brown             | Medium Brown  | Medium Brown       | Medium Brown       | Medium Brown |  |  |  |  |  |                                                              | None     | PM13/PM0               |
| Other Items                                               | vegetation, wood, stones | stones, roots | Vegetation, stones | stones, vegetation | vegetation   |  |  |  |  |  |                                                              | None     | PM13/PM0               |

**Matrix : Solid**

4 of 13

**Client Name:** EPS Ltd  
**Reference:** UK25.7240  
**Location:** Land adjacent to Horseshoe Farm  
**Contact:** Michael Judson

**Note:**

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

| EMT Job No. | Batch | Sample ID | Depth     | EMT Sample No. | Analyst Name         | Date Of Analysis | Analysis                                                         | Result                  |
|-------------|-------|-----------|-----------|----------------|----------------------|------------------|------------------------------------------------------------------|-------------------------|
| 25/4641     | 1     | HA01 ES1  | 0.10-0.30 | 3              | Miriam Silverlock    | 26/03/2025       | <b>General Description (Bulk Analysis)</b>                       | Brown soil, stones      |
|             |       |           |           |                | Miriam Silverlock    | 26/03/2025       | <b>Asbestos Fibres</b>                                           | NAD                     |
|             |       |           |           |                | Miriam Silverlock    | 26/03/2025       | <b>Asbestos ACM</b>                                              | NAD                     |
|             |       |           |           |                | Miriam Silverlock    | 26/03/2025       | <b>Asbestos Type</b>                                             | NAD                     |
| 25/4641     | 1     | HA02 ES1  | 0.60-0.80 | 7              | Catherine Coles      | 26/03/2025       | <b>General Description (Bulk Analysis)</b>                       | brown soil,stone,debris |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos Fibres</b>                                           | Fibre Bundles           |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos Fibres (2)</b>                                       | Fibre Bundles           |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos Fibres (3)</b>                                       | Fibre Bundles           |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos ACM</b>                                              | Asbestos Cement         |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos ACM (2)</b>                                          | Asbestos Cement         |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos ACM (3)</b>                                          | Asbestos Cement         |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos Type</b>                                             | Chrysotile              |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos Type (2)</b>                                         | Amosite                 |
|             |       |           |           |                | Catherine Coles      | 26/03/2025       | <b>Asbestos Type (3)</b>                                         | Crocidolite             |
|             |       |           |           |                | Catherine Coles      | 01/04/2025       | <b>Total ACM Gravimetric Quantification (% Asb)</b>              | <0.001 (mass %)         |
|             |       |           |           |                | Catherine Coles      | 01/04/2025       | <b>Total Detailed Gravimetric Quantification (% Asb)</b>         | 0.147 (mass %)          |
|             |       |           |           |                | Catherine Coles      | 01/04/2025       | <b>Total Gravimetric Quantification (ACM + Detailed) (% Asb)</b> | 0.147 (mass %)          |
|             |       |           |           |                | Remigiusz Blichowski | 03/04/2025       | <b>Asbestos PCOM Quantification (Fibres)</b>                     | <0.001 (mass %)         |
|             |       |           |           |                | Remigiusz Blichowski | 03/04/2025       | <b>Asbestos Gravimetric &amp; PCOM Total</b>                     | 0.147 (mass %)          |
| 25/4641     | 1     | HA03 ES1  | 0.20-0.50 | 11             | Miriam Silverlock    | 26/03/2025       | <b>General Description (Bulk Analysis)</b>                       | Brown soil, stones      |
|             |       |           |           |                | Miriam Silverlock    | 26/03/2025       | <b>Asbestos Fibres</b>                                           | NAD                     |
|             |       |           |           |                | Miriam Silverlock    | 26/03/2025       | <b>Asbestos ACM</b>                                              | NAD                     |
|             |       |           |           |                | Miriam Silverlock    | 26/03/2025       | <b>Asbestos Type</b>                                             | NAD                     |
| 25/4641     | 1     | HA04 ES1  | 0.20-0.50 | 15             | Simon Postlewhite    | 26/03/2025       | <b>General Description (Bulk Analysis)</b>                       | Brown soil/stones       |
|             |       |           |           |                | Simon Postlewhite    | 26/03/2025       | <b>Asbestos Fibres</b>                                           | NAD                     |
|             |       |           |           |                | Simon Postlewhite    | 26/03/2025       | <b>Asbestos ACM</b>                                              | NAD                     |
|             |       |           |           |                | Simon Postlewhite    | 26/03/2025       | <b>Asbestos Type</b>                                             | NAD                     |
| 25/4641     | 1     | HA05 ES1  | 0.70-0.90 | 19             | Charlotte Taylor     | 26/03/2025       | <b>General Description (Bulk Analysis)</b>                       | brown soil/stones       |
|             |       |           |           |                | Charlotte Taylor     | 26/03/2025       | <b>Asbestos Fibres</b>                                           | NAD                     |
|             |       |           |           |                | Charlotte Taylor     | 26/03/2025       | <b>Asbestos ACM</b>                                              | NAD                     |
|             |       |           |           |                | Charlotte Taylor     | 26/03/2025       | <b>Asbestos Type</b>                                             | NAD                     |

|                     |                                 |
|---------------------|---------------------------------|
| <b>Client Name:</b> | EPS Ltd                         |
| <b>Reference:</b>   | UK25.7240                       |
| <b>Location:</b>    | Land adjacent to Horseshoe Farm |
| <b>Contact:</b>     | Michael Judson                  |

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/4641

## SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

## WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

## STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

## DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

## BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

**NOTE**

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

**REPORTS FROM THE SOUTH AFRICA LABORATORY**

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

**Measurement Uncertainty**

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

**Customer Provided Information**

Sample ID and depth is information provided by the customer.

**Age of Diesel**

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

**Tentatively Identified Compounds (TICs)**

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitatively, with a matrix specific limit of detection.

Note, other compounds may be present but are not reported.

## ABBREVIATIONS and ACRONYMS USED

|         |                                                                                                                                                                          |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #       | ISO17025 (UKAS Ref No. 4225) accredited - UK.                                                                                                                            |
| SA      | ISO17025 (SANAS Ref No.T0729) accredited - South Africa                                                                                                                  |
| B       | Indicates analyte found in associated method blank.                                                                                                                      |
| DR      | Dilution required.                                                                                                                                                       |
| M       | MCERTS accredited.                                                                                                                                                       |
| NA      | Not applicable                                                                                                                                                           |
| NAD     | No Asbestos Detected.                                                                                                                                                    |
| ND      | None Detected (usually refers to VOC and/SVOC TICs).                                                                                                                     |
| NDP     | No Determination Possible                                                                                                                                                |
| SS      | Calibrated against a single substance                                                                                                                                    |
| SV      | Surrogate recovery outside performance criteria. This may be due to a matrix effect.                                                                                     |
| W       | Results expressed on as received basis.                                                                                                                                  |
| +       | AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.                                                               |
| >>      | Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher. |
| *       | Analysis subcontracted to an Element Materials Technology approved laboratory.                                                                                           |
| CO      | Suspected carry over                                                                                                                                                     |
| LOD/LOR | Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS                                                                                                |
| ME      | Matrix Effect                                                                                                                                                            |
| NFD     | No Fibres Detected                                                                                                                                                       |
| BS      | AQC Sample                                                                                                                                                               |
| LB      | Blank Sample                                                                                                                                                             |
| N       | Client Sample                                                                                                                                                            |
| TB      | Trip Blank Sample                                                                                                                                                        |
| OC      | Outside Calibration Range                                                                                                                                                |
|         |                                                                                                                                                                          |

## HWOL ACRONYMS AND OPERATORS USED

|       |                                                                      |
|-------|----------------------------------------------------------------------|
| 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    | EU_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.                                                   |

EMT Job No: 25/4641

| Test Method No. | Description                                                                                                                                                                                                        | Prep Method No. (if appropriate) | Description                                                                                                                                                                                       | ISO 17025 (UKAS/ANAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|-------------------------------------------------|------------------------------|
| PM4             | Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.                          | PM0                              | No preparation is required.                                                                                                                                                                       |                       |                        | AR                                              |                              |
| TM4             | Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.                                                                                                                 | PM8                              | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.                                                                             |                       |                        | AR                                              | Yes                          |
| TM4             | Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.                                                                                                                 | PM8                              | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.                                                                             | Yes                   |                        | AR                                              | Yes                          |
| TM4             | Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.                                                                                                                 | PM8                              | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.                                                                             | Yes                   | Yes                    | AR                                              | Yes                          |
| TM5             | Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present. | PM16                             | Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.                                                                                                                      |                       |                        | AR                                              |                              |
| TM5             | Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present. | PM8/PM16                         | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE. |                       |                        | AR                                              | Yes                          |
| TM5             | Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present. | PM8/PM16                         | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE. | Yes                   |                        | AR                                              | Yes                          |
| TM5             | Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present. | PM8/PM16                         | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE. | Yes                   | Yes                    | AR                                              | Yes                          |
| TM5/TM36        | please refer to TM5 and TM36 for method details                                                                                                                                                                    | PM8/PM12/PM16                    | please refer to PM8/PM16 and PM12 for method details                                                                                                                                              |                       |                        | AR                                              | Yes                          |
| PM13            | A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.                                                      | PM0                              | No preparation is required.                                                                                                                                                                       |                       |                        | AR                                              | No                           |

EMT Job No: 25/4641

| Test Method No. | Description                                                                                                                                                                                                                                                                                                                      | Prep Method No. (if appropriate) | Description                                                                                                                                                                                                                                                                                                           | ISO 17025 (UKAS/ANAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|-------------------------------------------------|------------------------------|
| TM21            | Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO <sub>2</sub> generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil.         | PM24                             | Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.                                                                                                                                                                                                                                             |                       |                        | AD                                              | Yes                          |
| TM26            | Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.                                                                                                                                                                                                               | PM21B                            | As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.                                                                                                                                                                                                                                    |                       |                        | AR                                              | Yes                          |
| TM30            | Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996 | PM15                             | Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.                                                                                                                                                            | Yes                   | Yes                    | AD                                              | Yes                          |
| TM36            | Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested. | PM12                             | Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                                                              |                       |                        | AR                                              | Yes                          |
| TM36            | Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested. | PM12                             | Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                                                              | Yes                   |                        | AR                                              | Yes                          |
| TM36            | Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested. | PM12                             | Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.                                                                                                                                                                                                              | Yes                   | Yes                    | AR                                              | Yes                          |
| TM38            | Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH <sub>4</sub> <sup>+</sup> 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I   | PM20                             | Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker. | Yes                   | Yes                    | AD                                              | Yes                          |
| TM38            | Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH <sub>4</sub> <sup>+</sup> 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I   | PM20                             | Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker. | Yes                   |                        | AR                                              | Yes                          |
| TM50            | Acid soluble sulphate (Total Sulphate) analysed by ICP-OES                                                                                                                                                                                                                                                                       | PM29                             | A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.                                                                                                                                                                                                       | Yes                   | Yes                    | AD                                              | Yes                          |
| TM65            | Asbestos Bulk Identification method based on HSG 248 Second edition (2021)                                                                                                                                                                                                                                                       | PM42                             | Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.                                                                                                                            | Yes                   |                        | AR                                              |                              |

EMT Job No: 25/4641

| Test Method No. | Description                                                                                                                                                                                   | Prep Method No. (if appropriate) | Description                                                                                                                                                                                | ISO 17025 (UKAS/S ANAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------|-------------------------------------------------|------------------------------|
| TM73            | Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.                                                     | PM11                             | Extraction of as received solid samples using one part solid to 2.5 parts deionised water.                                                                                                 | Yes                     | Yes                    | AR                                              | No                           |
| TM89            | Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.        | PM45                             | As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.                                                                     | Yes                     | Yes                    | AR                                              | Yes                          |
| TM131           | Quantification of Asbestos Fibres and ACM based on HSG 248 Second edition:2021, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018 | PM42                             | Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065. | Yes                     |                        | AR                                              | Yes                          |
| NONE            | No Method Code                                                                                                                                                                                | NONE                             | No Method Code                                                                                                                                                                             |                         |                        | AD                                              | Yes                          |
|                 |                                                                                                                                                                                               |                                  |                                                                                                                                                                                            |                         |                        |                                                 |                              |
|                 |                                                                                                                                                                                               |                                  |                                                                                                                                                                                            |                         |                        |                                                 |                              |
|                 |                                                                                                                                                                                               |                                  |                                                                                                                                                                                            |                         |                        |                                                 |                              |
|                 |                                                                                                                                                                                               |                                  |                                                                                                                                                                                            |                         |                        |                                                 |                              |
|                 |                                                                                                                                                                                               |                                  |                                                                                                                                                                                            |                         |                        |                                                 |                              |
|                 |                                                                                                                                                                                               |                                  |                                                                                                                                                                                            |                         |                        |                                                 |                              |

## **APPENDIX E**

### **Generic Screening Criteria**

## EPS Generic Quantitative Risk Assessment - Residential Land Use

| Contaminant            | Soil Targets   |                   |             |
|------------------------|----------------|-------------------|-------------|
|                        | Human Health   | Controlled Waters |             |
|                        |                | Surface Water     | Groundwater |
| Unit                   | mg/kg          |                   |             |
| Arsenic                | See C4SL       | n/c               | n/c         |
| Cadmium                | See C4SL       | n/c               | n/c         |
| Chromium III           | 910            | n/c               | n/c         |
| Chromium VI            | See C4SL       | n/c               | n/c         |
| Copper                 | 2400           | n/c               | n/c         |
| Mercury (elemental)    | 1.2            | 0.085             | 1.22        |
| Nickel                 | 180            | n/c               | n/c         |
| Lead                   | See C4SL       | n/c               | n/c         |
| Selenium               | 250            | n/c               | n/c         |
| Zinc                   | 3700           | n/c               | n/c         |
| Benzene                | See C4SL       | 0.064             | 0.0064      |
| Toluene                | 130            | 1.33              | 12.6        |
| Ethylbenzene           | 47             | 0.77              | 11.5        |
| Xylene (para)          | 56             | 1.18              | 19.6        |
| MTBE                   | 49             | 4.41              | 0.026       |
| Benzo(a)Pyrene         | See C4SL       | n/c               | n/c         |
| Naphthalene            | See C4SL       | 0.11              | 0.11        |
| Aliphatic C5-C6        | 42             | 4.06              | 0.81        |
| Aliphatic C6-C8        | 100            | 17.8              | 3.57        |
| Aliphatic C8-C10       | 27             | n/c               | n/c         |
| Aliphatic C10-C12      | 130(48)*       | n/c               | n/c         |
| Aliphatic C12-C16      | 1100(8.48)**   | n/c               | n/c         |
| Aliphatic C16-C35      | 65000 (8.48)** | n/c               | n/c         |
| Aromatic C8-C10        | 34             | 6.71              | 1.34        |
| Aromatic C10-C12       | 74             | 10.6              | 2.13        |
| Aromatic C12-C16       | 140            | 21.2              | 4.23        |
| Aromatic C16-C21       | 260            | n/c               | n/c         |
| Aromatic C21-C35       | 1100           | n/c               | n/c         |
| Tetrachloroethene      | See C4SL       | 0.24              | 0.24        |
| Trichloroethene        | See C4SL       | 0.13              | 0.13        |
| cis-1,2 Dichloroethene | See C4SL       | 0.21              | 0.21        |
| Vinyl Chloride         | See C4SL       | 0.0012            | 0.0012      |
| PFOS                   | See C4SL       | -                 | -           |
| PFOA                   | See C4SL       | -                 | -           |
| Asbestos##             | 0.001%         | -                 | -           |

| Contaminant | Groundwater Targets |                   |             |
|-------------|---------------------|-------------------|-------------|
|             | Human Health        | Controlled Waters |             |
|             |                     | Surface Water     | Groundwater |
| Unit        | µg/l                |                   |             |
| n/c         | 50                  | 10                |             |
| n/c         | 1.5                 | 5                 |             |
| n/c         | 15                  | 50                |             |
| n/c         | 3.4                 |                   |             |
| n/c         | 93.1#               | 2000              |             |
| 1.1         | 0.07                | 1                 |             |
| n/c         | 14.8#               | 20                |             |
| n/c         | 27.7#               | 10                |             |
| n/c         | 10                  | 10                |             |
| n/c         | 373#                | 3000              |             |
| 500         | 10                  | 1                 |             |
| 230,000     | 74                  | 700               |             |
| 10,000      | 20                  | 300               |             |
| 9,900       | 30                  | 500               |             |
| 83,000      | 15                  | 15                |             |
| n/c         | 0.27                | 0.01              |             |
| 1400        | 2                   | 2                 |             |
| 1,900       | 300†                | 300†              |             |
| 1,500       | 300†                | 300†              |             |
| 57          | 300                 | 300               |             |
| 37          | 300                 | 300               |             |
| n/c         | 300                 | 300               |             |
| n/c         | -                   | -                 |             |
| 1,900       | 300                 | 300               |             |
| 6,800       | 90                  | 90                |             |
| 39,000      | 90                  | 90                |             |
| n/c         | 90                  | 90                |             |
| n/c         | 90                  | 90                |             |
| 61          | 10                  | 10                |             |
| 3.2         | 10                  | 10                |             |
| 370         | -                   | -                 |             |
| 12          | 0.5                 | 0.5               |             |
| n/c         | 0.1                 | 0.1               |             |
| n/c         | 0.1                 | 0.1               |             |
| -           | -                   | -                 |             |

### Notes:

\* = S4UL exceeds vapour saturation limit (in brackets)      \*\* = S4UL exceeds solubility saturation limit (in brackets)  
n/c = not calculated. Under normal conditions contaminant exhibits low solubility /volatility, therefore risks from leaching and or vapour pathways are considered low.

# To establish suitable compliance criteria for Surface Water, review of baseline groundwater quality in England and Wales was completed following research reported in Shand, P, Edmunds, W M, Lawrence, A R, Smedley, P L, and Burke, S. 2007. The natural (baseline) quality of groundwater in England and Wales. British Geological Survey Research Report No. RR/07/06. Where compliance criteria was found below the 97.7 percentile of baseline value, the latter was adopted as GAC.

## Where assessment of the risk to human health from asbestos in soil is concerned there is no nationally recognised suitable for use /generic screening value commonly referred to through the planning system. As such, EPS has adopted a conservative value of 0.001% as a screening tool for initial risk assessment, although this should be supplemented with a qualitative assessment of the risk.

### Soil Targets

Targets for Human Health have been taken from S4ULs 'Suitable For Use Levels for Human Health Risk Assessment' – LQM and CIEH (2014) derived using standard sandy loam soil with 1% SOM, except (\*) = EIC/AGS/CL:AIRE GAC 'Soil Generic Assessment Criteria' (2010). For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the generic human health targets may be revised.

Targets for Controlled Waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for Surface Water and Groundwater respectively (see notes for GW targets).

### Groundwater Targets

For Surface Water, targets have been taken as Freshwater EQS, using the annual average where available, or else the maximum allowable concentration. For MTBE, in the absence of UK EQS, the UKDWS has been used. For individual TPH fractions, in absence of UK EQS, the WHO Drinking Water Standards have been used.

For Groundwater, targets have been taken as UKDWS where available. In the absence of UK targets internationally recognised criteria were adopted, notably WHO Drinking Water Standards for individual TPH fractions, BTEX and MTBE. † = Aliphatic C5-C8 ranges have utilised the longer chain values on a conservative basis (300ug/l compared to the published 15,000ug/l).

Targets for Human Health have been taken from Society of Brownfield Risk Assessment (SoBRA) 'Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater' - Version 2.0, September 2024, derived using sandy soil and 1%SOM. GAC were set up assuming source at 50cm below typical ground bearing slab of 15cm thickness. GAC were derived for vapour pathways only. For sites where ground conditions, or differ significantly from described above, the generic human health targets may be revised.



## EPS Generic Quantitative Risk Assessment

### Generic Screening Criteria (C4SLs) - All Land Uses

|                               | Soil Targets            |                            |            |            |                    |       |
|-------------------------------|-------------------------|----------------------------|------------|------------|--------------------|-------|
| Contaminant                   | Residential             |                            | Allotments | Commercial | Public Open Spaces |       |
|                               | With Home Grown Produce | Without Home Grown Produce |            |            | Residential        | Parks |
| Unit                          | mg/kg                   |                            |            |            |                    |       |
| Arsenic                       | 37                      | 40                         | 49         | 640        | 79                 | 168   |
| Benzene                       | 0.87                    | 3.3                        | 0.18       | 98         | 140                | 230   |
| Benzo(a)pyrene                | 5                       | 5.3                        | 5.7        | 76         | 10                 | 21    |
| Cadmium                       | 26                      | 149                        | 4.9        | 410        | 220                | 880   |
| Chromium (VI)                 | 21                      | 21                         | 170        | 49         | 23                 | 250   |
| Lead                          | 200                     | 310                        | 80         | 2330       | 630                | 1300  |
| Chloroethene (Vinyl Chloride) | 0.0064                  | 0.015                      | 0.0017     | 1.1        | 7.8                | 18    |
| Trichloroethene (TCE)         | 0.0093                  | 0.097                      | 0.032      | 0.73       | 76                 | 41    |
| Tetrachloroethene (PCE)       | 0.31                    | 0.32                       | 2          | 24         | 3200               | 1400  |
| cis-1,2 Dichloroethene        | 0.46                    | 0.5                        | 0.89       | 38         | 3800               | 2000  |
| Naphthalene                   | 15                      | 15                         | 65         | 1600       | 11000              | 800   |
| PFOS                          | 0.013                   | 0.041                      | 0.0027     | 0.6        | 0.079              | 0.17  |
| PFOA                          | 0.0076                  | 0.041                      | 0.0014     | 0.6        | 0.079              | 0.17  |

#### Notes:

Targets for Human Health have been taken from the publicly available Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination issued by DEFRA/CL:AIRE between December 2013 and May 2024.

Within the modelling for the original six C4SLs (Arsenic, Benzene, Benzo(a)pyrene, Cadmium, Chromium VI, Lead), a Soil Organic Matter content of 6% was used. This differs from the older Suitable for Use Levels (S4ULs) which modelled contaminants with 1%, 2.5% and 6% SOM, with the latter the least conservative. These numbers are therefore not particularly conservative, however sensitivity analysis has shown that a change in SOM only makes a notable difference for Benzene and therefore caution should be taken when using the value for Benzene. For the remaining, newer C4SLs, these were modelled in all SOM and therefore the most conservative 1% values have been used. Reference to site-specific data should be made where possible.

Aug-24

## **APPENDIX F**

### **Cover Soils Checklist**



---

## ADVISORY NOTE

### SOILS FOR USE IN COVER SYSTEMS

This note applies where there is a need for a control measure in the form of a defined thickness of clean soil to be used in gardens and soft landscaped areas in order to reduce risks from underlying contamination (a 'cover system'). Where a specific thickness has been presented, it is what EPS consider sufficient provided the soil forming the cover system is good quality, as it is assumed that over time this soil will become intermixed with the underlying soils and therefore needs to have the necessary 'dilution' effect. The aim being that an acceptable reduction in exposure to contamination is achieved, rather than absolute prevention.

These simple cover systems are designed in general accordance with the BRE 2004 guidance '*Cover Systems for Land Regeneration, Thickness of Cover Systems for Contaminated Land*'. In many cases guidance from a Local Planning Authority or NHBC/Approved Inspector may also apply and need to be taken into account. In most cases, to design the cover system EPS have to assume a certain quality of cover soils in advance. In these circumstances, we utilise what we consider to represent 'good quality soil' in that the soil could never be considered 'contaminated' but is also pragmatic and does not represent an unrealistic or unsustainable objective for much of the soils in the UK. In numerical terms, this standard typically equates to soil containing contaminants at around 25% of their adopted screening values in the risk assessment.

For the cover system itself, EPS would usually carry out a verification process of your site to demonstrate the control measure has been implemented as intended to satisfy all interested parties such as planning authorities, the NHBC and the future property owner. To document this process, EPS will prepare a Verification Report. If you wish for EPS to do this, we will need the following points confirmed relating to the soils preferably before they are installed in gardens.

If there are any queries, please contact EPS before purchasing any soil.

#### **EPS Contact Details:**

Tel: 01954 710666

Email: [info@epstrategies.co.uk](mailto:info@epstrategies.co.uk)



| Pre-Verification Cover System Checklist |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes? |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Soil Source                             | The soil must not be a waste. Has it been confirmed that the soil is not a waste and has never been deemed as such in the past?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |
|                                         | Has the source of the soil been provided?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |
|                                         | Have all the delivery notes confirming the source, volume and type of soil been provided for all that is to be used? Where suppliers such as British Sugar are used, the soils should be delivered direct to site (not via an intermediary depot).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |
| Soil Quality                            | The soils are free of invasive plant species such as Japanese Knotweed, and have not been sourced from an affected area?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |
|                                         | Do the soils look clean and of a high quality? I.e. the soil must not have an odour or contain any visual evidence of contamination, including oils, asbestos, glass, plastic, rubble, metal, ash, sharp objects or tarmac/bitumen?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |
|                                         | Testing to 'BS 3882:2015 <i>Specification for topsoil and requirements for use</i> ' is preferable but generally not essential for public health regulation, provided you can confirm the soils comply with the above points, are suitable for their intended purpose and will provide an adequate growing medium?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |
|                                         | Has the soil been chemically tested prior to it arriving at site?<br><br>Any soil test results presented to EPS by a third party must be current and clearly relate to the soil used, i.e. the testing must generally be dated within 6 weeks of delivery. The quantity of testing will be dependent on how much confidence is generated in the quality of the material, as well any specific local regulatory requirements. If the soil is clean soil from an established source such as British Sugar, the testing they provide at source may be sufficient alone without further testing (by EPS).<br><br>For other soils, EPS can advise on the likely testing frequencies but as a rule of thumb, anticipate at least one sample per average-sized plot. The testing would usually comprise the following: Heavy Metals, Poly Aromatic Hydrocarbons, Asbestos and Total Petroleum Hydrocarbons at an accredited lab. If adequate testing has not been completed, then EPS will need to test it from stockpiles prior to installation. Installing the soils into gardens without any testing data is not advised, as it may need to all be removed later. |      |
| Cover Thickness                         | Are all excavations ready which will allow the necessary thickness of cover soils to be installed?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |
|                                         | If yes, can you provide waste transfer documentation for any excavated soils?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |

## **APPENDIX G**

### **Method Statement for Encountering Unexpected Contamination**



---

## METHOD STATEMENT

### ACTIONS TO BE TAKEN IN THE EVENT OF DISCOVERING UNEXPECTED CONTAMINATION DURING INTRUSIVE GROUNDWORKS

If at any point during intrusive groundworks at a site, evidence of unforeseen contamination is encountered in the form of significant noxious odours, discolouration, or instability within soils or sheen/ discolouration in groundwater, the following actions will be taken:

- Intrusive works in the immediate area of the impacted ground will be suspended and the continuation of work in other areas of the site will be considered within the context of the site specific health & safety plan.
- Environmental Protection Strategies Ltd (EPS) will be contacted and appraised of the situation so that arrangements can be made to characterise the impact and determine what action may be necessary in addition to the scheduled site works. Where possible / health & safety plan permits, digital photographs of the impacted ground will be taken and emailed to EPS at the address below to assist in the initial assessment
- It may well be necessary for EPS to attend site to undertake visual inspection and obtain samples for field and/or laboratory analysis, although the actions taken will be dependent on the nature of what is encountered
- In cases where EPS consider the unforeseen contamination likely to pose a significant risk of significant harm to adjacent site users or local environmental receptors, the local authority and the Environment Agency will be informed of the situation and the actions being taken
- Once appropriate action has been agreed and undertaken, a written summary will be produced by EPS for submission to the Local Authority, (and where relevant, the Environment Agency) in accordance with planning requirements. The submission will include details of work undertaken, analytical results of investigative and validation samples obtained and conclusions and recommendations for any further actions considered necessary
- Where regulatory bodies have been involved, site works should only recommence following their agreement and in all cases should only recommence when the site manager considers it safe to do so within the context of the site specific health & safety plan.

#### EPS Contact Details:

|               |          |                    |
|---------------|----------|--------------------|
| Marcus Bell   | Director | Tel: 0787 206 9979 |
| Will Evans    | Director | Tel: 0781 253 9655 |
| Steve Bullock | Director | Tel: 0786 694 9221 |

Email: [info@epstrategies.co.uk](mailto:info@epstrategies.co.uk) (Automatically forwarded to the above and office-based personnel)



7B Caxton House  
Broad Street  
Cambourne  
Cambridge CB23 6JN

**T** +44(0) 1954 710666  
**E** [info@epstrategies.co.uk](mailto:info@epstrategies.co.uk)  
**W** [www.epstrategies.co.uk](http://www.epstrategies.co.uk)

Registered Number: 4330320

