



Phase II Geo-Environmental Assessment

Basin Bridge Bungalow

Hinckley Lane
Higham on the Hill
Nuneaton
Leicestershire
CV13 6JL

Prepared for:

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BASIN BRIDGE BUNGALOW, HIGHAM ON THE HILL

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 is a plot of land on the edge of a commercial holding and includes a small bungalow in the north alongside various stockpiles of farming equipment and construction materials. Development proposals comprise the construction of a new residential dwelling and revised access, which will also include private gardens.
- A previous Phase I desk study completed by EPS in March 2023 highlighted potential risks from contamination due to the possibility of made ground (infilled soils) present below the surface, left over from former structures/ surfacing and adjacent farm buildings and associated activities.
- The follow up ground investigation included the excavation of eleven trial pits and found either topsoil next to the eastern boundary or a limited thickness of made ground in the form of dark greyish brown, gravelly, silt with varying amounts of brick and plastic waste overlying natural clay soils. Groundwater wasn't identified within any of the trial pits.
- Despite the presence of infilled soils within the majority of locations, no obvious or significant physical evidence of contamination was apparent. However, laboratory analysis did identify significant impacts to soil quality, particularly in trial holes formed in the western half (near the existing access), including asbestos and hydrocarbon compounds. As a result, the made ground does not meet modern planning standards for a residential gardens, and further works are required during the redevelopment to ensure the site is safe and suitable for use.
- The main requirement is for the removal and replacement of soils in the majority of future garden areas, particularly in the west, where a layer at least **600mm** thick will require replacing with clean cover soil. In the east, the thickness can be reduced to **300mm**, and may not be required at all in close proximity of the same boundary, where made ground isn't anticipated. Section 6 and Figure 3 of this report provide further guidance on the extent of future works, and a number of precautionary recommendations are also included in the same section to ensure safe development.

It is also recommended that a copy of this report be provided to the Environmental Health Department of the Hinckley & Bosworth Borough Council for inclusion in their land quality records and to support the current planning application.

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.

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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.

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1 INTRODUCTION

In February 2025, Environmental Protection Strategies Ltd (EPS) was commissioned by Peter Sheppard to complete a Phase II Geo-Environmental Assessment Report for the property known as Basin Bridge Bungalow, Hinckley Lane, Higham on the Hill, Nuneaton, Leicestershire, CV13 6JL ('the site'); see Figure 1.

The work was commissioned to address the requirements of Condition 8 of a current planning application for the '*demolition of the existing bungalow and erection of replacement dwelling including revised access*', relating to contaminated land issued by Hinckley & Bosworth Borough Council (*Planning Ref: 24/00305/FUL*).

A Phase I Geo-Environmental Desk Study has previously been completed for the site by EPS and issued in March 2023. The findings of the previous work are summarised in this document, as well as the findings, conclusions, and recommendations of the Phase II Geo-Environmental Assessment, undertaken as instructed. A selection of site photographs is presented in Appendix A and a proposed development plan is included as Appendix B.

1.1 Objectives

The objectives of this Phase II Geo-Environmental Assessment were as follows:

- a) Investigate potential contaminant linkages identified and established in the Conceptual Site Model (CSM) developed through the previous Preliminary Risk Assessment, by means of an Intrusive Investigation and Generic Quantitative Risk Assessment.
- b) Investigate 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*', BS 5930:2015+A1:2020 '*Code of practice for ground investigations*', the following tasks were undertaken:

Intrusive Investigation:

- Site walkover, inspection of any visual evidence of contamination and obtaining photographic records.
- Health and safety briefing / site supervision.
- Formation of eleven trial pits, all to a depth of approximately 1.5m below ground level (bgl), using a track-mounted excavator.

- 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.

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 & PREVIOUS WORK

The following section provides a summary of the information collected as part of the previous Phase I Geo-Environmental Desk Study, issued by EPS in March 2023. For full background and reference, it is recommended that the reader review the following document in full, which is briefly summarised in the following sections.

- *Phase I Geo-Environmental Desk Study – Basin Bridge Bungalow, Wykin Road, Stoke Golding, Nuneaton, CV13 6LJ* (EPS Report Ref: UK23.6353), Issue 1, dated 10th March 2023

2.1 Site & Location Description

Detail	Description
Location	The site is located north of Hinckley Lane to the west of Wykin, a hamlet in the county of Leicestershire which is approximately 2km north east of Nuneaton.
Grid Reference	439620, 295440
Topographic Elevation	The site is largely flat and level, with an approximate elevation of 93m Above Ordnance Datum (AOD) throughout.
Description of Site (Updated February 2025)	A walkover survey was conducted by EPS on the 14th February 2025 and the property was found to comprise an approximately rectangular plot to land, measuring roughly 0.72ha in surface area. The site had remained largely unchanged since the previous walkover in February 2023, although some of the surfacing waste appeared to have been removed such as the suspected asbestos fragments, previously identified in the south east. The site is accessed via a metal gate in the south west corner, with a formal track of concrete hardstanding extending north from this point, just inside the western boundary. This track widens further north, opening into a turning area which is rough ground, and located adjacent to a small bungalow that is clad with wood and has both flat and pitched sections of roofing. The structure was noted to be slightly dilapidated, but did benefit from a new roof felt. Around the building was an uncoupled trailer alongside various stockpiles of discarded materials; the largest of which was located towards the east, and included items such as tyres, metal drain piping, barb wire, disused appliances, and some empty oil containers. Further south, along the western boundary of the plot, were stacks of building materials such as steel beams, tiles, and bricks; and these are most likely surplus from a few more newly built (last ~10-15 years) farm buildings, situated to the north of the study area.

Detail	Description
Description of Site cont. (Updated February 2025)	Beyond these features were four shipping containers placed alongside a large water bowser. Former building footprints (in the form of weathered/ broken up hardstanding) were noted near the south east corner of the site, along with other evidence of demolition waste including bricks and wood. This hardstanding was set within a small parcel of established woodland which lies inside the southern limit and features a mixture of mature Oak and Poplar trees (amongst other species). The remainder of the site appeared to have been recently cleared and landscaped, evidenced by numerous stockpiles of green waste/ tree cuttings, with the surfacing featuring knee-high grasses with planted tree saplings tracking the east and west boundaries.

2.2 Desk Study Conclusions & Recommendations

The desk study issued by EPS in March 2023 identified a number of potential risks, primarily associated with the presence of current and historic buildings and surfacing culminating in the likely presence of shallow infilled soils in the sub-surface, as well as activities associated with the nearby farmyard including moving and standing vehicles.

In the context of potentially unacceptable or acceptable risks as outlined within the Environment Agency's *Land Contamination: Risk Management* guidance, the contaminant linkages which were considered to pose a potentially unacceptable risk and warrant further assessment to determine the most appropriate action were as follows:

- Human health risks associated with interaction between future residents and potentially contaminated shallow soils, especially within domestic garden areas.
- Potential exposure of site workers to contaminated soils during the proposed redevelopment including materials possibly containing asbestos.
- Risks to future infrastructure including buried foundations and sub-surface utilities such as potable water supply pipework from any mobile contaminants of concern present in shallow soils.

It was therefore recommended that, initially, the identified plausible contaminant linkages should be further investigated by means of an intrusive investigation, through obtaining representative shallow soil samples from areas of the site that coincide with proposed soft landscaping and beneath the areas of historic buildings and hardstanding.

Sub-surface soils should also be assessed in sections which have potentially been used for vehicle storage and traffic, to confirm the presence of any contamination associated with these activities. Those works have subsequently been carried out and are presented in the following sections.

3 SUMMARY OF INTRUSIVE INVESTIGATIONS

Intrusive ground investigations were undertaken on the 14th February 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 Trial Pit Locations

Trial pit 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.

A total of eleven trial holes (TP01 – TP11) were formed across the site to a target depth of ~1.5m, using a mechanical excavator. The overall objective in terms of trial pit locations was to provide an appropriate lateral and vertical coverage of the soils underlying the site to offer information relating to their quality and nature.

Particular focus was given to areas where evidence of made ground (infilled soils) was evident from surface, as well as any sections where former buildings and infrastructure were highlighted on historical mapping (TP01-TP04).

The trial pits were formed in accordance with standard EPS methodologies and all sub-contractors were supervised by an EPS engineer throughout the duration of the works.

A trial pit location plan is presented as Figure 2.

3.2 In-Situ Testing & Soil Sampling

Each trial pit 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. In these circumstances, soil samples will be placed into plastic bags, sealed, shaken and then allowed to rest for a few minutes to allow time for volatile vapour to accumulate in the air trapped within the bag. The PID probe will then be used to pierce the bag and sample the air above the soil to measure the concentration of volatile compounds that have accumulated. PID readings are only used to provide EPS with a basic means to quantify areas of volatile organic compound in the field to help guide the investigation.

As potentially volatile organic compounds (petroleum hydrocarbons associated with vehicle storage and movements near the turning head) were identified in the conceptual site model, PID readings were collected during the intrusive investigation. The results of the headspace testing using the PID are presented in part per million volumes (ppmV) on the site-specific trial pit logs which are included as Appendix C.

3.3 Laboratory Testing

Soil samples obtained for analysis of identified contaminants of concern were submitted to Element Materials Technology, Flintshire, who hold appropriate UKAS / MCERT accreditation for the required testing. Samples were transported in laboratory supplied containers and delivered by an approved courier.

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 Phase II intrusive investigation.

4.1 Ground Conditions

Geological maps of the area show the site to lie on superficial Alluvium (clay, silt, sand and gravel) above mudstone bedrock of the Mercia Mudstone Group; albeit some other superficial units (including glacial deposits) are expected between these two layers.

A total of eleven trial pits were formed at the site and the ground conditions encountered, from surface level, were interpreted to comprise:

- Topsoil/ Made Ground
- Alluvium

Site specific trial pit 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	0.8	0.2 – 0.8
Alluvium	>1.5	>0.7 – >1.3 (not proven)

4.1.1 Topsoil/ Made Ground

A limited thickness of topsoil was encountered from the surface in TP01, TP02 and TP09 beneath the grass covering and was observed as a dark brown, silty clay with active roots/ rootlets and progressed to around 0.2m depth. These locations were all formed just inside the eastern boundary of the property.

Made ground was encountered in all the other boreholes, below the grass covering in TP03, TP04, TP05, TP08 and TP11, and compacted road planings and gravel subbase in TP06, TP07 and TP10, near the road in the west.

This made ground was described as a dark greyish brown gravelly silt with varying amounts of brick (both fragmented and in-tact) and plastic waste, including bags and both hard and soft plastic packaging material. These constituents were most notable in TP05 near the entrance in the south west. The made ground commonly extended to ~0.5m, but was slightly deeper in TP08 and TP11 (0.8m), with those trial pits located towards the centre and north east respectively.

4.1.2 Alluvium

Directly underlying the topsoil and made ground, material interpreted as superficial Alluvium was encountered. This was recovered as a light yellowish brown, silty clay with common orange staining, which progressed to beyond the formation depth of each of the trial pits (1.5m).

4.2 Groundwater

No groundwater ingress was identified in any of the trial pits during the investigation.

However, in TP03-TP08, TP10, and TP11, where made ground was identified, minor surface water seepages were observed. This is anticipated as small pockets of perched surface water, suspended within the profile of the more granular surfacing materials, which allowed water to collect above the superficial clays beneath, which are typically of lower permeability.

4.3 Physical Evidence of Contamination

Despite the presence of the infilled/ made ground which included man-made materials such as brick, soft and hard plastics and carrier bags, no palpable evidence of contamination, such as hydrocarbon odours or staining, was encountered in any of the sampling locations during the investigation.

The results of the headspace testing using the PID reported no readings above minimum instrument detection limits (<0.1ppmV), within both the surfacing made ground and underlying natural deposits.

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 are also summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/kg)		Highest Location & Depth (m bgl)
			Min	Max	
Arsenic	6	6	1.8	11.4	TP01 (0-0.2)
Cadmium	6	2	0.8	1.5	TP01 (0-0.2)
Chromium III	6	6	54	68.3	TP07 (0.2-0.4)
Chromium VI	6	0	-		-
Copper	6	6	28	110	TP10 (0.1-0.2)
Lead	6	6	22	1,111	TP08 (0.1-0.4)
Mercury	6	3	0.1	0.2	TP10 (0.1-0.2)
Nickel	6	6	21.2	39.3	TP01 (0-0.2)
Selenium	6	1	1		TP01 (0-0.2)
Zinc	6	6	99	821	TP01 (0-0.2)
Naphthalene	6	4	0.08	1.71	TP05 (0.1-0.4)
Benzo(a)pyrene	6	6	0.20	48.13	TP05 (0.1-0.4)
Dibenz(ah)anthracene	6	4	0.14	6.61	TP05 (0.1-0.4)
PAH (Total of 16)	6	6	2	467	TP05 (0.1-0.4)
Total Cyanide	6	0	-		-
MTBE	6	0	-		-
Benzene	6	0	-		-
Toluene	6	1	0.007		TP10 (0.1-0.2)
Ethylbenzene	6	0	-		-
Xylenes	6	1	0.007		TP10 (0.1-0.2)
TPH (Total Aliphatics & Aromatics)	6	4	207	2,368	TP05 (0.1-0.4)
Asbestos (% of sample mass)	6	2	<0.001%	0.805%	TP05 (0.1-0.4)

Notes: - Contaminant not found above laboratory detection limits
 PAH Polycyclic Aromatic Hydrocarbons
 MTBE Methyl Tertiary Butyl Ether
 TPH Total Petroleum Hydrocarbons

- Significant concentrations of TPH, predominantly comprising longer chain aromatic fractions (C21-C40) were recorded in several samples of made ground, with the maximum impact (combined aliphatic and aromatic fractions) being 2,368mg/kg in TP05 (0.1-0.4m), with the next highest being 1,719mg/kg in TP03 (0.1-0.4). Interpretive comments from the laboratory suggest that PAH's and lubricating oil are the most likely source of these impacts in both cases.
- Asbestos containing material was detected by the laboratory within two of the shallow made ground samples, it was revealed to be amosite fibre bundles (accounting for <0.001% of the sample) in TP10 (0.1-0.2m), and chrysotile/crocidolite fibre bundles and cement in TP05 (0.1-0.4) at 0.805%.

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* guidance, this section represents the second tier of Stage 1, the Generic Quantitative Risk Assessment.

Risks to controlled waters have not been assessed, as potential impacts to these receptors (surface water and groundwater) from the potential presence of contamination in shallow soils were initially discounted as part of the Phase I risk assessment. Furthermore, given the findings of the intrusive investigation including field observations and the ground conditions comprising low permeability cohesive soils beneath the infilled materials, as well as the absence of groundwater, it has not been considered necessary to revise the conceptual site model and reintroduce these specific contaminant linkages.

5.1 Human Health

5.1.1 Land Use Setting

It is understood that the scheme includes demolition of the existing bungalow and erection of a replacement dwelling including revised access. It should be recognised that the new dwelling is to be located centrally on the plot, and surrounded by private gardens. Also with the planning boundary are peripheral areas of soft landscaping in close proximity of the proposed (revised) entrance route, which will be retained so that the commercial buildings to the north also remain accessible. Although these areas are separated by a newly planted hedgerow/ tree line, there are no specific controls anticipated that would dictate that they should be considered any less sensitive in the context of the current and proposed setting.

Therefore, in order to screen laboratory data for concentrations of contaminants in soil with potential to cause harm to human health, relevant generic screening criteria for a residential (with home-grown produce) land use setting have been adopted for the site, as this is anticipated to align with the most sensitive areas of the proposed development.

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.

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)
- *Development of Category 4 Screening Levels for assessment of land affected by contamination* – SP1010 – DEFRA (2013)

Category 4 Screening Levels (C4SL's) 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.

It is considered reasonable to utilise Benzo(a)pyrene (BaP) as a risk driver or marker representative of genotoxic PAHs (i.e. including dibenzo(ah)anthracene and benzo(b)fluoranthene) given the absence of any 'low risk' (C4SL) equivalent screening values for these compounds.

Where assessment of the risk to human health from asbestos in soil is concerned, there is not 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.

A summary of the screening criteria and the methodology used to derive them is included in Appendix E.

5.1.3 Assessment of Results – Soils

The results of the screening process for on-site human receptors show that the adopted generic screening criteria protective of human health in a residential (with home-grown produce) setting, have been exceeded by Lead as well as several PAH and TPH compounds. The most pertinent impacts, in relation to the most sensitive land use setting identified are summarised in the table below:

Contaminant	Generic Screening Criteria (mg/kg)	Number of Exceedances	Exceedances (mg/kg), Sampling Location & Depth
Lead	200	2	295 (TP05, 0.1-0.4) & 1,111 (TP08, 0.1-0.4)
Benzo(a)pyrene (BaP)	5	1	48.13 (TP05, 0.1-0.4)
EC21-EC35 (Aromatic TPH Fraction)	1,100	1	1,455 (TP05, 0.1-0.4)

A quantifiable concentration of asbestos was also recorded in TP05 (0.1-0.4m), in the form of chrysotile/ crocidolite fibre bundles and cement.

5.1.4 Discussion of Risks – Human Health

The exceedances of relevant screening criteria presented above appear primarily related to residual contamination within the made ground across the site and do 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.

Observations during the field works do suggest that the infilled soils around the track and its apron appeared more prevalent, with man-made materials such as plastic waste and construction debris being more common within the profile. These materials are also more likely to have been impacted by the presence of the entrance track itself, with road planings and similar material likely to have been mixed with shallow soils in close proximity of this feature. This is reflected in the highest concentrations of contaminants of concern recorded by the laboratory, with PAH's/ TPH being quite common in surfacing materials such as asphalt; as were recorded in TP05 and TP08, both of which were formed adjacent to the track. Therefore, it is concluded that the made ground materials in the western section of the plot are more likely to be affected by this feature, which extends to daily activities and movements along the track itself. It is also acknowledged that infilled soils were not recovered in selected trial pit locations towards the eastern boundary, which would further emphasise the extent and influence of this source zone.

The identified exceedances in the made ground samples are considered to represent unacceptable risks to future site users. As such, the site will be subject to remedial measures with the most significant exceedances being concentrations of Lead, BaP, TPH (aromatic EC21-EC35) and ACM in TP05, as well as an additional impact of Lead in TP08.

Whilst no exceedances were recorded in made ground samples recovered from trial holes in the east of the site, similar (but perhaps visually less common/ significant) inclusions of infilled materials were highlighted in these areas, and therefore, potentially unacceptable risks in this portion of the plot cannot be ruled out altogether and will be given full consideration as part of the remedial strategy outlined in the section below.

6 REMEDIAL STRATEGY & RECOMMENDATIONS

In the context of potentially unacceptable or acceptable risks as outlined within the Environment Agency's *Land Contamination: Risk Management guidance* (LC:RM, 2021), the risks identified by this work require further action, and are discussed below alongside recommendations which will need to be adhered at the appropriate stage in the redevelopment process. This section represents the Remedial Strategy for the site and its proposed residential development:

6.1 Source Removal & Soil Cover System

6.1.1 Western Section

Guidance presented within the BRE publication *Cover Systems for Land Regeneration: Thickness Design of Cover Systems for Contaminated Land* (BRE, Mar 2004) would indicate that a cover system of a **minimum of 600mm** certified/ clean soils would represent an appropriate control measure for any areas which are intended as soft landscaping where made ground or hardstanding currently exists across the western portion of the plot (as highlighted by the extent of the red hatching on **Figure 3** of this report). Given that levels are to be maintained, this process will involve significant source removal, including soils which have been found to contain asbestos and hydrocarbon compounds, and therefore is considered to be sufficiently robust in the context of the overall remedial strategy. There is no such requirement for areas beneath any hardstanding/ building footprints; which cover a notable proportion of the proposed development area.

The cover system calculations on which this minimum thickness is broadly based are included as Appendix F.

6.1.2 Eastern Section

Based on the findings of the risk assessment, the proposed cover system thickness can be reduced to **300mm** in the eastern section of the plot (as highlighted by the extent of the green hatching on **Figure 3** of this report). This is to account for the distribution of similar infilled soils in this area, which although have been found to be less severe both visually during the intrusive works and through laboratory analysis, do still have the potential to hold significant impacts of similar contaminants of concern.

It should be noted that cover soils are unlikely to be required across the entire eastern section, with only natural materials recovered in trial holes close to the boundary (i.e. TP01, TP02 and TP09) and therefore in the interests of promoting sustainability and not removing and replacing soils unnecessarily, it is recommended that excavations in this area only extent to sections where infilled soils containing evidence of constriction debris and plastic waste are noted. EPS can provide assistance during future remedial works to guide the extent of the excavations if required.

All imported soil for use within the cover system should be of a good quality and certified suitable for use within a residential setting both in terms of chemical and physical characteristics. Specific requirements of the clean soil cover system are outlined within the cover soils checklist included as Appendix G. Upon completion / installation of the cover system (which typically 'book ends' a redevelopment of this nature), the cover system should be verified and the findings of this process reported to the local authority for approval.

Additionally, other site limitations must be considered during this process, with excavations not permitted in close proximity of the adjacent canal, to avoid impacting/undermining this feature. Furthermore, it is recommended that no excavations take place where existing tree roots may be disturbed such as the southern section of the plot, and a reduced thickness of cover soil, in the order of 100mm is more likely to be appropriate in such areas, but should be confirmed with the local authority.

All other surface wastes such as building rubble/ materials, as well as the identified commercial and household waste stockpiles should also be cleared under the relevant duty of care. Waste transfer documentation must be retained.

6.2 Further Recommendations

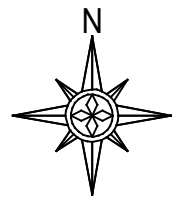
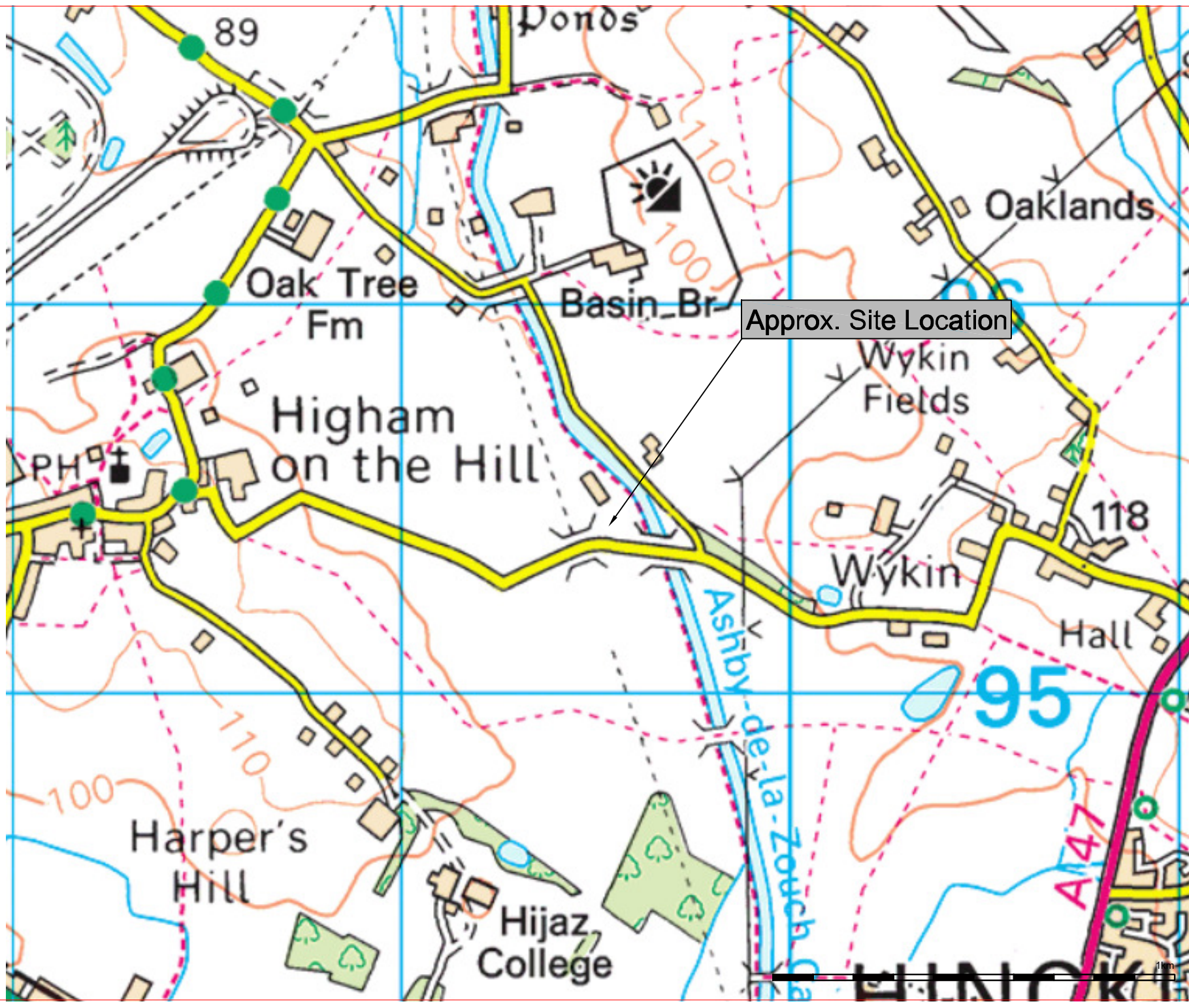
Additional risks posed to future site users (including construction workers), both during and post the redevelopment works should be controlled through the following health and safety precautions.

- a) Private (alkythene) drinking water supply pipes could possibly be at risk from contaminants in the ground, specifically petroleum hydrocarbons. Therefore, it would be advisable to confirm with the local water supplier whether an upgrade to barrier drinking water pipes would be necessary.

- b) The possibility of discrete pockets of ACM existing within the made ground should be given full consideration. If any evidence of visually identifiable ACM is suspected and is to be disturbed 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, which significantly varies from the conditions described above (including any previously unknown below ground features such as tanks for example), 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 encountering any unexpected contamination is included as Appendix H of this report.

It is also recommended that a copy of this report be provided to the Environmental Health Department of the Hinckley & Bosworth Borough Council for inclusion in their land quality records and to support the current planning application.

FIGURES



Rev	Date	Drawn	Description	Chkd



The Geotechnical and Environmental Engineers
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Site
Basin Bridge Bungalow, Hinckley Lane,
Higham On The Hill, Nuneaton, CV13 6JL

Client
Peter Sheppard

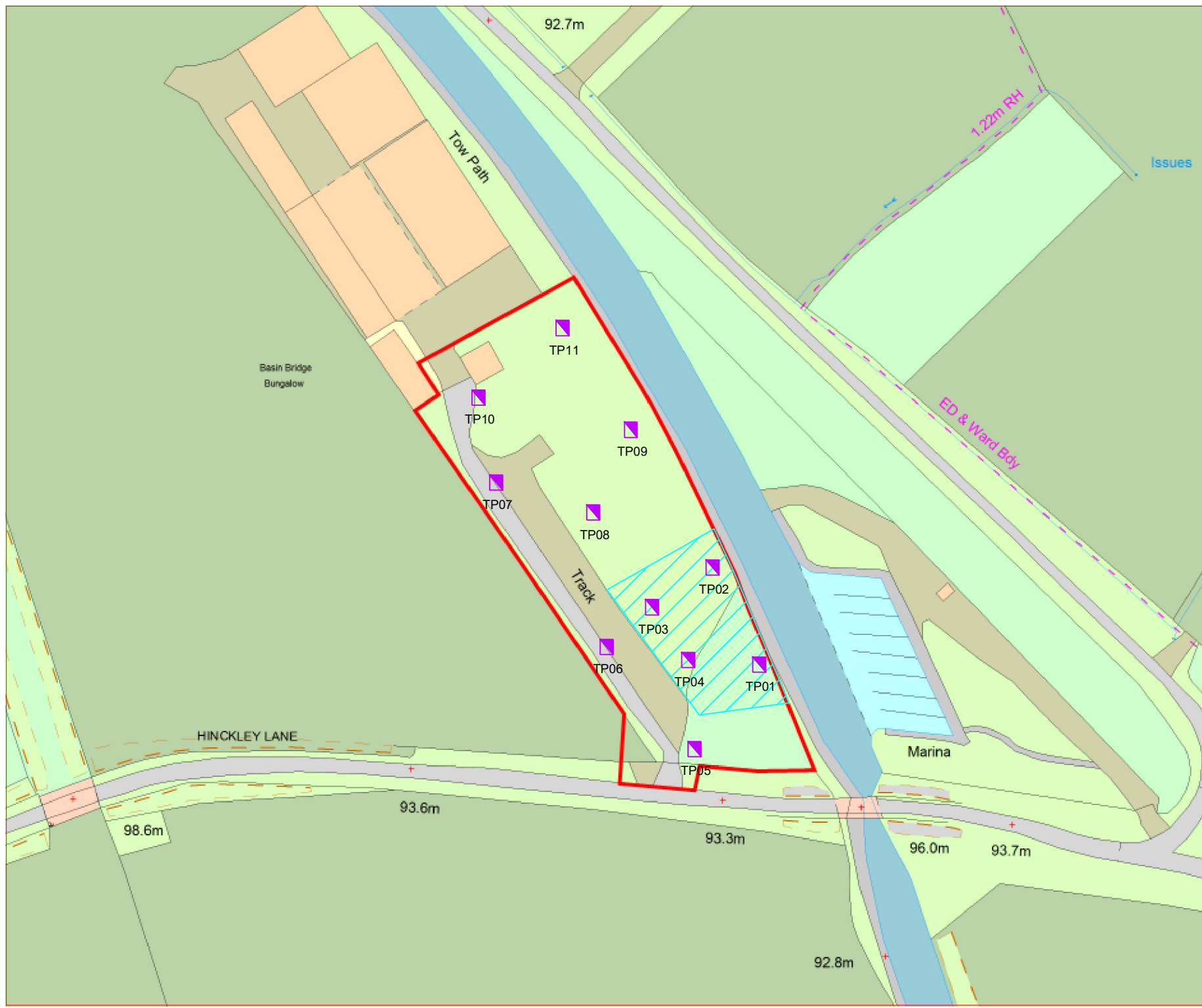
Title
Figure 1 - Current Site Layout

Surveyed		Drawn by	MC
Checked by	BV	Date	March 2025

Scale
Not to Scale

Job No
UK23.6353b

Rev
01



- KEY:
- SITE BOUNDARY
 - EPS TRIAL PIT (1.5m)
 - ▨ AREA OF CONCERN DUE TO HISTORIC BUILDINGS IDENTIFIED IN PHASE 1 DESK STUDY

Rev	Date	Drawn	Description	CHK'd



The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site: Basin Bridge Bungalow, Hinckley Lane,
Higham On The Hill, Nuneaton, CV13 6JL

Client: Peter Sheppard

Title: Figure 2 - Trial Pit Location Plan

Surveyed:		Drawn by:	MC
Checked by:	BV	Date:	March 2025

Scale:	(As Shown)	Drawing Reference:
Not to Scale		UK23.6353b_02

Job No:	UK23.6353b	Rev:	01
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- KEY:
- SITE BOUNDARY
 - APPROX. EXTENT OF MADE GROUND REQUIRING SOURCE REMOVAL & FULL 600MM OF COVER
 - APPROX. EXTENT OF MADE GROUND REQUIRING REDUCED 300MM COVER SYSTEM

Rev	Date	Drawn	Description	CHK'd



The Geotechnical and Environmental Engineers
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Site
Basin Bridge Bungalow, Hinckley Lane,
Higham On The Hill, Nuneaton, CV13 6JL

Client
Peter Sheppard

Title
Figure 3 - Remedial Strategy Plan

Surveyed		Drawn by	MC
Checked by	BV	Date	March 2025
Scale	(At Sheet)	Drawing Reference	UK23.6353b_03
Not to Scale		Job No	UK23.6353b
		Rev	01

TABLES

Table 1 – Laboratory Testing Schedule (Environmental)

Sample ID	Sample Depth (m bgl)	EPS Mini Suite	EPS TPH Suite
TP01	0.0-0.2	1	1
TP03	0.1-0.4	1	1
TP05	0.1-0.4	1	1
TP07	0.2-0.4	1	1
TP08	0.1-0.4	1	1
TP10	0.1-0.2	1	1

Notes:

mbgl

meters below ground level

1

Sample Analysed

-

Sample Not Analysed

EPS Mini Suite

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

EPS TPH Suite

Total Petroleum Hydrocarbons, Methyl Tertiary Butyl Ether, Benzene Toluene, Ethylbenzene & Xylenes

APPENDICES

APPENDIX A

Selected Site Photographs



○ SITE PHOTOGRAPH NUMBER

Rev	Date	Drawn	Description	Chk'd



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www.epstrategies.co.uk

Basin Bridge Bungalow, Hinckley Lane,
Higham On The Hill, Nuneaton, CV13 6JL

Client	Peter Sheppard
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Title	Appendix A - Site Photographs
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Surveyed:		Drawn by:	MC
Checked by:	BV	Date:	March 2025

Scale	[A4 Sheet]	Drawing Reference
Not to Scale		UK23.6353b_A

Job No	UK23.6353b	Rev	01
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Photo 1 – A photo looking north towards the existing farm buildings and bungalow.



Photo 2 – A photo looking south from the scrap metal stockpile across the site showing the old trailer.



Photo 3 – A photo of the existing bungalow to the north of the site.



Photo 4 – A photo of the trial pit excavated at TP01 near the south east corner.



Photo 5 – A photo of TP03 where made ground was recovered.



Photo 6 – The trial pit at TP10 showing the surfacing profile and underlying made ground.



APPENDIX B

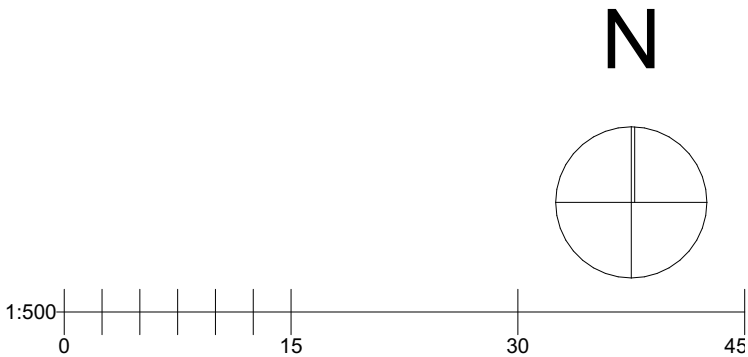
Proposed Development Plan



Issue Status			
Planning			
This drawing is copyright. Only figured dimensions to be worked to.			
Revision		Drawn	Check
P1	First Issue	WF	AD
P2	Amended to client comments	CR	WF

Materials

- Hardstanding
- Tarmac
- Tarmac
- Gravel



client			
Sheppard			
project			
Basin Bridge Farm, Stoke Golding Proposed Replacement Dwelling			
drawing			
Site Plan As Proposed			
date	scale	@ A1	
15.11.22	1:500		
drawn	check		
CR	AD		

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ARCHITECTURE + PLANNING
www.brown-co.com

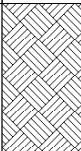
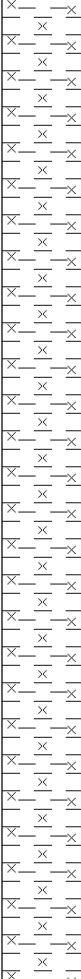
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St Neots 01480 213811

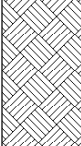
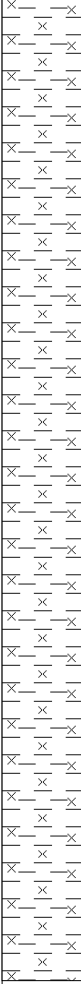
Humber Lincoln 01482 421234
01522 457800

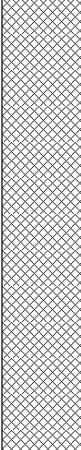
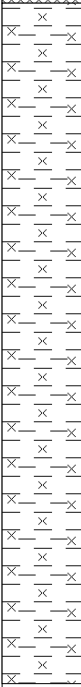
Brown & Co Registered Office: The Atrium, St. George's Street, Norwich, Norfolk, NR3 1AB.
Registration no: DC302092. Registered in England & Wales.

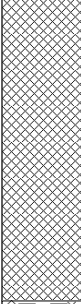
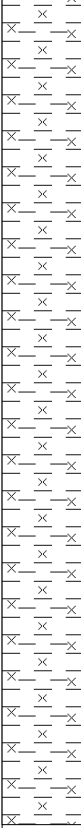
APPENDIX C

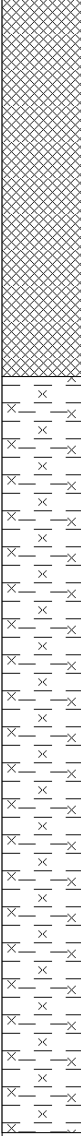
Site Specific Trial Pit Logs

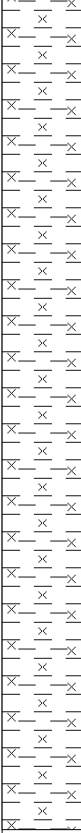
				Trial Pit Log			Trialpit No TP01 Sheet 1 of 1			
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439656.88 - 295413.88 Level:		Date 14/02/2025		
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m): Depth 1.50		1.1 0.4		Scale 1:10 Logged MC		
Client: Peter Sheppard										
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
	0.00 - 0.20	ES	PID=0	0.20			Dark brown, silty CLAY with active/decayed roots and rootlets (TOPSOIL)			
							Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)			
				1.50			End of pit at 1.50 m			
Remarks: No Groundwater Struck & Reached Target Depth										
Stability: Stable										

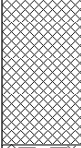
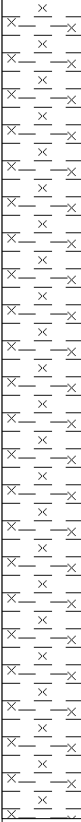
				Trial Pit Log			Trialpit No TP02 Sheet 1 of 1		
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439650.77 - 295432.12 Level:		Date 14/02/2025	
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m): Depth 1.50		1.2 0.4		Scale 1:10 Logged MC	
Client: Peter Sheppard									
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
			PID=0	0.20			Dark brown, silty CLAY with active/decayed roots and rootlets (TOPSOIL)		
							Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		
				1.50			End of pit at 1.50 m		
Remarks: No Groundwater Struck & Reached Target Depth									
Stability: Stable									

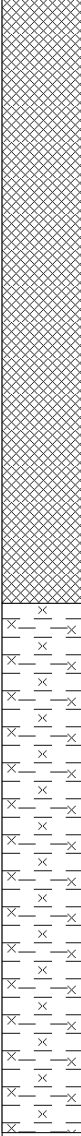
				Trial Pit Log			Trialpit No TP03 Sheet 1 of 1								
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439639.02 - 295428.40 Level:		Date 14/02/2025							
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Client: Peter Sheppard		Dimensions (m): Depth 1.50		1.1 0.4		Scale 1:10 Logged MC					
Water Strike		Samples and In Situ Testing				Depth (m)		Level (m)		Legend		Stratum Description			
		Depth		Type		Results									
		0.10 - 0.40		ES		PID=0		0.60				MADE GROUND: Dark, greyish brown, slightly gravelly SILT with fragmented brick and plastic waste. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.			
								1.50				Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		1	
												End of pit at 1.50 m		2	
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.															
Stability: Stable															

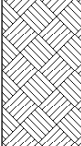
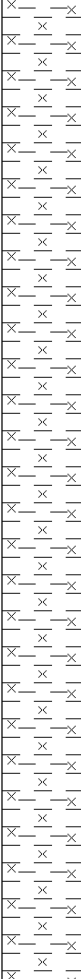
				Trial Pit Log			Trialpit No TP04 Sheet 1 of 1		
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439645.53 - 295414.37 Level:		Date 14/02/2025	
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m): Depth 1.50		1.1 0.4		Scale 1:10 Logged MC	
Client: Peter Sheppard									
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
			PID=0	0.40			MADE GROUND: Dark, greyish brown, slightly gravelly SILT with fragmented brick and plastic waste. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.		
							Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		
				1.50			End of pit at 1.50 m		
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.									
Stability: Stable									

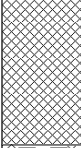
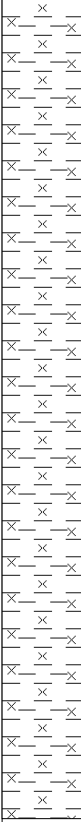
				Trial Pit Log			Trialpit No TP05 Sheet 1 of 1		
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439648.84 - 295383.34 Level:		Date 14/02/2025	
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m):		1.1		Scale 1:10	
Client: Peter Sheppard				Depth 1.50				Logged MC	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.10 - 0.40	ES	PID=0	0.50			MADE GROUND: Dark, yellowish to greyish brown, gravelly SILT with frequent, large fragmented brick and commercial/household plastic waste. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.		
							Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		
				1.50			End of pit at 1.50 m		
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.									
Stability: Stable									

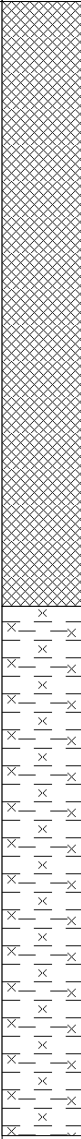
				Trial Pit Log			Trialpit No TP06 Sheet 1 of 1			
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439618.75 - 295415.90		Date 14/02/2025		
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m):		1.1		Scale 1:10		
Client: Peter Sheppard				Depth 1.50		0.4		Logged MC		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
			PID=0	0.10			Loose TARMAC SURFACING			1
							Loose GRAVEL SUBBASE. Gravel is rounded quartz cobbles (5-10mm).			
							MADE GROUND: Dark, greyish brown, slightly gravelly SILT with rare fragmented brick and plastic waste and common tarmac. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.			
							Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)			
			PID=0	0.40						2
				1.50			End of pit at 1.50 m			
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.										
Stability: Stable										

				Trial Pit Log			Trialpit No TP07 Sheet 1 of 1		
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439587.99 - 295459.91		Date 14/02/2025	
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m):		1.1		Scale 1:10	
Client: Peter Sheppard				Depth 1.50		0.4		Logged MC	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.20 - 0.40	ES	PID=0	0.10			Loose TARMAC SURFACING		
				0.20			Loose GRAVEL SUBBASE. Gravel is rounded quartz cobbles (5-10mm).		
							MADE GROUND: Dark, greyish brown, slightly gravelly SILT with rare fragmented brick and plastic waste and common tarmac. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.		
				0.40			Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		
			PID=0						
				1.50			End of pit at 1.50 m		
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.									
Stability: Stable									
									

				Trial Pit Log			Trialpit No TP08 Sheet 1 of 1			
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439610.86 - 295455.60		Date 14/02/2025		
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m):		1.1		Scale 1:10		
Client: Peter Sheppard				Depth 1.50				Logged MC		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
	0.10 - 0.40	ES	PID=0	0.80			MADE GROUND: Dark, greyish brown, slightly gravelly SILT with frequent, large fragmented brick and plastic waste. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.			
	Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)									
				1.50			End of pit at 1.50 m			
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.										
Stability: Stable										

				Trial Pit Log			Trialpit No TP09 Sheet 1 of 1								
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439629.29 - 295479.69 Level:		Date 14/02/2025							
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Client: Peter Sheppard		Dimensions (m): Depth 1.50		1.2 0.4		Scale 1:10 Logged MC					
Water Strike		Samples and In Situ Testing				Depth (m)		Level (m)		Legend		Stratum Description			
		Depth		Type		Results		0.20				Dark brown, silty CLAY with active/decayed roots and rootlets (TOPSOIL)			
						PID=0		1.50				Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		1	
												End of pit at 1.50 m		2	
Remarks: No Groundwater Struck & Reached Target Depth															
Stability: Stable															

				Trial Pit Log			Trialpit No TP10 Sheet 1 of 1		
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439585.34 - 295480.94 Level:		Date 14/02/2025	
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m):		1.2		Scale 1:10	
Client: Peter Sheppard				Depth 1.50		0.4		Logged MC	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.10 - 0.20	ES	PID=0	0.10			Loose TARMAC SURFACING		
				0.20			Loose GRAVEL SUBBASE. Gravel is rounded quartz cobbles (5-10mm).		
							MADE GROUND: Dark, greyish brown, slightly gravelly SILT with rare fragmented brick and plastic waste and common tarmac. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.		
				0.40			Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)		
				1.50			End of pit at 1.50 m		
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.									
Stability: Stable									
									

				Trial Pit Log			Trialpit No TP11 Sheet 1 of 1			
Project Name: Basin Bridge Bungalow, Nuneaton				Project No. UK23.6353b		Co-ords: 439608.04 - 295498.82		Date 14/02/2025		
Location: Basin Bridge Bungalow, Hinckley Lane, Higham On The Hill, Nuneaton, CV13 6JL				Dimensions (m):		1.1		Scale 1:10		
Client: Peter Sheppard				Depth 1.50				Logged MC		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
			PID=0	0.80			MADE GROUND: Dark, greyish brown, slightly gravelly SILT with frequent, large fragmented brick and plastic waste. Gravel is fine to coarse, angular to sub-rounded quartz and granite fragments.			
							Light, yellowish brown, slightly silty CLAY with common orange staining. (ALLUVIUM)			
				1.50			End of pit at 1.50 m			
Remarks: Reached Target Depth With Minor Surface Water Ingress Occurred From the More Granular Surfacing Materials Which Pooled Above the Exposed Natural Clay.										
Stability: Stable										

APPENDIX D

Environmental Laboratory Results – Soil

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



4225



Attention : Matthew Cook
Date : 7th March, 2025
Your reference : UK25.6353B
Our reference : Test Report 25/2797 Batch 1
Location : Basin Bridge, Nuneaton
Date samples received : 22nd February, 2025
Status : Final Report
Issue : 202503071659

Six samples were received for analysis on 22nd February, 2025 of which six 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 - 25.919 kg of CO2

Scope 1&2&3 emissions - 61.254 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: UK25.6353B
Location: Basin Bridge, Nuneaton
Contact: Matthew Cook
EMT Job No: 25/2797

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18					Please see attached notes for all abbreviations and acronyms		
Sample ID	TP01 ES1	TP03 ES1	TP05 ES1	TP07 ES1	TP08 ES1	TP10 ES1							
Depth	0.00-0.20	0.10-0.40	0.10-0.40	0.20-0.40	0.10-0.40	0.10-0.20							
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T							
Sample Date	19/02/2025	19/02/2025	19/02/2025	19/02/2025	19/02/2025	19/02/2025							
Sample Type	Clay	Loamy Clay	Clay	Clay	Clay	Sandy Clay							
Batch Number	1	1	1	1	1	1							
Date of Receipt	22/02/2025	22/02/2025	22/02/2025	22/02/2025	22/02/2025	22/02/2025					LOD/LOR	Units	Method No.
Arsenic ^{#M}	11.4	3.0	5.7	1.8	5.9	8.3					<0.5	mg/kg	TM30/PM15
Cadmium ^{#M}	1.5	<0.1	0.8	<0.1	<0.1	<0.1					<0.1	mg/kg	TM30/PM15
Chromium ^{#M}	61.6	66.4	66.1	68.3	59.4	54.0					<0.5	mg/kg	TM30/PM15
Copper ^{#M}	38	32	28	28	33	110					<1	mg/kg	TM30/PM15
Lead ^{#M}	51	23	295	22	1111	103					<5	mg/kg	TM30/PM15
Mercury ^{#M}	0.1	<0.1	<0.1	<0.1	0.1	0.2					<0.1	mg/kg	TM30/PM15
Nickel ^{#M}	39.3	21.2	25.0	22.8	27.2	24.8					<0.7	mg/kg	TM30/PM15
Selenium ^{#M}	1	<1	<1	<1	<1	<1					<1	mg/kg	TM30/PM15
Total Sulphate as SO4 ^{#M}	793	504	1143	391	794	521					<50	mg/kg	TM50/PM29
Zinc ^{#M}	821	110	178	99	162	323					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene ^{#M}	0.08	0.29 ^{AA}	1.71 ^{AB}	<0.04	<0.04	0.39					<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	1.21 ^{AA}	10.13 ^{AB}	0.13	<0.03	0.10					<0.03	mg/kg	TM4/PM8
Acenaphthene ^{#M}	<0.05	<0.25 ^{AA}	3.41 ^{AB}	<0.05	<0.05	0.57					<0.05	mg/kg	TM4/PM8
Fluorene ^{#M}	<0.04	<0.20 ^{AA}	3.32 ^{AB}	<0.04	<0.04	0.29					<0.04	mg/kg	TM4/PM8
Phenanthrene ^{#M}	0.48	2.44 ^{AA}	36.63 ^{AB}	0.20	0.09	3.25					<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	0.96 ^{AA}	14.60 ^{AB}	0.12	<0.04	1.25					<0.04	mg/kg	TM4/PM8
Fluoranthene ^{#M}	0.62	5.48 ^{AA}	71.25 ^{AB}	0.69	0.29	4.69					<0.03	mg/kg	TM4/PM8
Pyrene [#]	0.41	4.75 ^{AA}	62.49 ^{AB}	0.65	0.26	3.87					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	0.14	2.90 ^{AA}	31.68 ^{AB}	0.42	0.20	2.60					<0.06	mg/kg	TM4/PM8
Chrysene ^{#M}	0.38	2.77 ^{AA}	31.81 ^{AB}	0.49	0.18	2.43					<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene ^{#M}	0.56	6.94 ^{AA}	68.80 ^{AB}	1.36	0.37	4.15					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	0.20	4.44 ^{AA}	48.13 ^{AB}	0.82	0.22	2.66					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene ^{#M}	0.17	4.90 ^{AA}	41.86 ^{AB}	0.83	0.18	1.88					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	0.85 ^{AA}	6.61 ^{AB}	0.14	<0.04	0.41					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	0.15	4.71 ^{AA}	34.57 ^{AB}	0.76	0.16	1.46					<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.2	42.6 ^{AA}	467.0 ^{AB}	6.6	2.0	30.0					<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.40	5.00 ^{AA}	49.54 ^{AB}	0.98	0.27	2.99					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.16	1.94 ^{AA}	19.26 ^{AB}	0.38	0.10	1.16					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	97 ^{AA}	86 ^{AB}	94	92	91					<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) ^{#M}	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) ^{#M}	<0.1	0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) ^{#M}	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) ^{#M}	7	<4	<4	<4	<4	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) ^{#M}	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) ^{#M}	<7	114	99	134	<7	15					<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	41	39	41	<7	<7					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	155	138	175	<26	<26					<26	mg/kg	TM5/PM8/PM16/PM12/PM15

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

Please see attached notes for all abbreviations and acronyms

Matrix : Solid

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Client Name: EPS Ltd
Reference: UK25.6353B
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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.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
25/2797	1	TP01 ES1	0.00-0.20	3	Catherine Coles	28/02/2025	General Description (Bulk Analysis)	brown soils,stone
					Catherine Coles	28/02/2025	Asbestos Fibres	NAD
					Catherine Coles	28/02/2025	Asbestos ACM	NAD
					Catherine Coles	28/02/2025	Asbestos Type	NAD
25/2797	1	TP03 ES1	0.10-0.40	6	Anthony Carman	28/02/2025	General Description (Bulk Analysis)	Brown Soil/Stones
					Anthony Carman	28/02/2025	Asbestos Fibres	NAD
					Anthony Carman	28/02/2025	Asbestos ACM	NAD
					Anthony Carman	28/02/2025	Asbestos Type	NAD
25/2797	1	TP05 ES1	0.10-0.40	9	Anthony Carman	28/02/2025	General Description (Bulk Analysis)	Brown Soil/Stones
					Anthony Carman	28/02/2025	Asbestos Fibres	Fibre Bundles
					Anthony Carman	28/02/2025	Asbestos Fibres (2)	Fibre Bundles
					Anthony Carman	28/02/2025	Asbestos ACM	Asbestos Cement
					Anthony Carman	28/02/2025	Asbestos ACM (2)	Asbestos Cement
					Anthony Carman	28/02/2025	Asbestos Type	Chrysotile
					Anthony Carman	28/02/2025	Asbestos Type (2)	Crocidolite
					Anthony Carman	06/03/2025	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					Anthony Carman	06/03/2025	Total Detailed Gravimetric Quantification (% Asb)	0.805 (mass %)
					Anthony Carman	06/03/2025	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.805 (mass %)
					Emily Smith	07/03/2025	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					Emily Smith	07/03/2025	Asbestos Gravimetric & PCOM Total	0.805 (mass %)
25/2797	1	TP07 ES1	0.20-0.40	12	Simon Postlewhite	28/02/2025	General Description (Bulk Analysis)	Brown soil/stones
					Simon Postlewhite	28/02/2025	Asbestos Fibres	NAD
					Simon Postlewhite	28/02/2025	Asbestos ACM	NAD
					Simon Postlewhite	28/02/2025	Asbestos Type	NAD
25/2797	1	TP08 ES1	0.10-0.40	15	Simon Postlewhite	28/02/2025	General Description (Bulk Analysis)	Brown soil/stones
					Simon Postlewhite	28/02/2025	Asbestos Fibres	NAD
					Simon Postlewhite	28/02/2025	Asbestos ACM	NAD
					Simon Postlewhite	28/02/2025	Asbestos Type	NAD
25/2797	1	TP10 ES1	0.10-0.20	18	Catherine Coles	28/02/2025	General Description (Bulk Analysis)	brown soil,stone
					Catherine Coles	28/02/2025	Asbestos Fibres	Fibre Bundles
					Catherine Coles	28/02/2025	Asbestos Fibres (2)	Fibre Bundles
					Catherine Coles	28/02/2025	Asbestos ACM	NAD
					Catherine Coles	28/02/2025	Asbestos ACM (2)	NAD
					Catherine Coles	28/02/2025	Asbestos Type	Chrysotile

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[illegible]

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[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.: 25/2797

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
AA	x5 Dilution
AB	x10 Dilution

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: 25/2797

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: 25/2797

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 ₂ 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 ₄ ⁺ 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 ₄ ⁺ 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: 25/2797

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
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

Summary of Generic Screening Criteria



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.

EPS Generic Quantitative Risk Assessment - Residential Land Use

Contaminant	Soil Targets			Groundwater Targets		
	Human Health	Controlled Waters		Human Health	Controlled Waters	
		Surface Water	Groundwater		Surface Water	Groundwater
Unit	mg/kg			µg/l		
Arsenic	See C4SL	n/c	n/c	n/c	50	10
Cadmium	See C4SL	n/c	n/c	n/c	1.5	5
Chromium III	910	n/c	n/c	n/c	15	50
Chromium VI	See C4SL	n/c	n/c	n/c	3.4	2000
Copper	2400	n/c	n/c	n/c	93.1#	1
Mercury (elemental)	1.2	0.085	1.22	1.1	0.07	1
Nickel	180	n/c	n/c	n/c	14.8#	20
Lead	See C4SL	n/c	n/c	n/c	27.7#	10
Selenium	250	n/c	n/c	n/c	10	10
Zinc	3700	n/c	n/c	n/c	373#	3000
Benzene	See C4SL	0.064	0.0064	500	10	1
Toluene	130	1.33	12.6	230,000	74	700
Ethylbenzene	47	0.77	11.5	10,000	20	300
Xylene (para)	56	1.18	19.6	9,900	30	500
MTBE	49	4.41	0.026	83,000	15	15
Benzo(a)Pyrene	See C4SL	n/c	n/c	n/c	0.27	0.01
Naphthalene	See C4SL	0.11	0.11	1400	2	2
Aliphatic C5-C6	42	4.06	0.81	1,900	300†	300†
Aliphatic C6-C8	100	17.8	3.57	1,500	300†	300†
Aliphatic C8-C10	27	n/c	n/c	57	300	300
Aliphatic C10-C12	130(48)*	n/c	n/c	37	300	300
Aliphatic C12-C16	1100(8.48)**	n/c	n/c	n/c	300	300
Aliphatic C16-C35	65000 (8.48)**	n/c	n/c	n/c	-	-
Aromatic C8-C10	34	6.71	1.34	1,900	300	300
Aromatic C10-C12	74	10.6	2.13	6,800	90	90
Aromatic C12-C16	140	21.2	4.23	39,000	90	90
Aromatic C16-C21	260	n/c	n/c	n/c	90	90
Aromatic C21-C35	1100	n/c	n/c	n/c	90	90
Tetrachloroethene	See C4SL	0.24	0.24	61	10	10
Trichloroethene	See C4SL	0.13	0.13	3.2	10	10
cis-1,2 Dichloroethene	See C4SL	0.21	0.21	370	-	-
Vinyl Chloride	See C4SL	0.0012	0.0012	12	0.5	0.5
PFOS	See C4SL	-	-	n/c	0.1	0.1
PFOA	See C4SL	-	-	n/c	0.1	0.1
Asbestos##	0.001%	-	-	-	-	-

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 - Residential Land Use (without plant uptake)

Contaminant	Soil Targets			Groundwater Targets		
	Human Health	Controlled Waters		Human Health	Controlled Waters	
		Surface Water	Groundwater		Surface Water	Groundwater
Unit	mg/kg			µg/l		
Arsenic	See C4SL	n/c	n/c	n/c	50	10
Cadmium	See C4SL	n/c	n/c	n/c	1.5	5
Chromium III	910	n/c	n/c	n/c	15	50
Chromium VI	See C4SL	n/c	n/c	n/c	3.4	
Copper	7100	n/c	n/c	n/c	93.1#	2000
Mercury (elemental)	1.2	0.085	1.22	1.1	0.07	1
Nickel	180	n/c	n/c	n/c	14.8#	20
Lead	See C4SL	n/c	n/c	n/c	27.7#	10
Selenium	430	n/c	n/c	n/c	10	10
Zinc	40000	n/c	n/c	n/c	373#	3000
Benzene	See C4SL	0.064	0.0064	500	10	1
Toluene	880 (869)*	1.33	12.6	230,000	74	700
Ethylbenzene	83	0.77	11.5	10,000	20	300
Xylene (para)	79	1.18	19.6	9,900	30	500
MTBE	73	4.41	0.026	83,000	15	15
Benzo(a)Pyrene	See C4SL	n/c	n/c	n/c	0.27	0.01
Naphthalene	See C4SL	0.11	0.11	1400	2	2
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Aliphatic C12-C16	1100(8.48)**	n/c	n/c	n/c	300	300
Aliphatic C16-C35	65000 (8.48)**	n/c	n/c	n/c	-	-
Aromatic C8-C10	47	6.71	1.34	1,900	300	300
Aromatic C10-C12	250	10.6	2.13	6,800	90	90
Aromatic C12-C16	1800	21.2	4.23	39,000	90	90
Aromatic C16-C21	1900f	n/c	n/c	n/c	90	90
Aromatic C21-C35	1900f	n/c	n/c	n/c	90	90
Tetrachloroethene	See C4SL	0.24	0.24	61	10	10
Trichloroethene	See C4SL	0.13	0.13	3.2	10	10
cis-1,2 Dichloroethene	See C4SL	0.21	0.21	370	-	-
Vinyl Chloride	See C4SL	0.0012	0.0012	12	0.5	0.5
PFOS	See C4SL	-	-	n/c	0.1	0.1
PFOA	See C4SL	-	-	n/c	0.1	0.1
Asbestos##	0.001%	-	-	-	-	-

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.

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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.

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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).

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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.

APPENDIX F

Cover System Calculations

mm(mm)0

APPENDIX G

Cover Soils Checklist



ADVISORY NOTE:

SOILS FOR USE IN COVER SYSTEMS

EPS' simple soil-based cover systems are designed in general accordance 'BRE465 - Cover Systems for Land Regeneration, Thickness of Cover Systems for Contaminated Land (2004)'. Local Authority guidance may also apply, including the National Contaminated Land Officers Group (NCLOG) 'A Regulator's Guide to Cover Systems and their Verification' (2024). Input from the local authority is welcomed on the use of BRE465 and whether an alternative approach would be preferred in their district, as EPS acknowledge it is not universally accepted (albeit not withdrawn).

Where a specific thickness has been defined, it is what EPS considers sufficient to mitigate the risks from underlying contamination through complete intermixing with the clean cover soils over time, balanced against the realistic quality of soils available in the UK and the overall sustainability of the scheme. The aim being that an acceptable reduction in exposure to contamination is achieved, rather than absolute prevention.

EPS usually carry out a verification exercise of your site to demonstrate that the cover system has been implemented as intended in order to satisfy the planning process, where the visual quality and thickness will need to be checked on-site. If you wish EPS to do this, please call us before purchasing soil and read the following advisory:

Pre-Verification Check:

EPS' strongly recommends soils are sourced from British Sugar (i.e. Landscape 20 product) with evidence provided of delivery direct to your site and the accompanying Tim O'Hare Associates Soil Quality Report. British Sugar soil from beet washings is usually high quality and that is confirmed at source, although generally only available in East Anglia & the South East.

If other soils have been used (i.e. recycled/screened), EPS will need to inspect and test them. This should be done from a stockpile prior to installation. If the soils are put into gardens before testing, it may need to all be removed later so this is not advisable. Often recycled soils are not suitable for use in cover systems.

EPS Contact Details:

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APPENDIX H

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 (Automatically forwarded to the above and office-based personnel)



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