Our Ref: ER/SKT/AM/J15856/20.11.2024.let

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20 November 2024

The Hunter Group
Nash Manor (Estate Office)
Nutbourne Lane
Nutbourne
West Sussex
RH20 2HS

**For the attention of Lee Goossens**
(By email: lg@thehuntergroup.co.uk)

Dear Sirs,

**Re: Geoenvironmental Investigation at: Land to the East Side of Stonehouse Farm Barn, Handcross Road, Plummers Plain, Horsham, West Sussex, RH13 6NZ**
**National Grid Reference: TQ 22692 28232**
**Geology: Made Ground, Upper Tunbridge Wells Sand**

## 1 Authority

Our authority for carrying out this work is contained in a copy of our Project Order Form, which was completed and returned by Phillipa Hallett, on behalf of The Hunter Group, dated 9 October 2024.

## 2 Background and Objectives

Hunter Group have purchased Stonehouse Farm, with a view to retaining the majority of the land as open fields, or planting woodland, as part of a Habitat Management and Monitoring Plan (HMMP), under the government's Biodiversity Net Gain (BNG) strategy. It is understood that as part of the improvement of the site for wildlife, works may be required along the southern bank of the stream which runs through the centre of the farm.

It is understood that waste material (including building waste and demolition rubble) was historically imported and deposited in a number of areas across the farm, including to the east, the west and south sides of a large modern barn, located on the west side of the site.

It is also understood that a barn on the west side of the site is proposed to be retained, and possibly utilised as a green waste compost processing facility.

Part of the site, comprising the land to the immediate south of the stream, and the stockpiles to the west of the barn, have previously been the subject of intrusive site investigation works, undertaken by ourselves in January 2024, as detailed in our letters ref. ER/SKT/AM/J15630/20240925.let and SKT/LDM/J15630(Rev. 1), dated January 2024, to which the reader is referred.

The object of this investigation was to investigate the land to the side of the barn (east side), in order to determine the nature and extent of the material which has been deposited

## 3 Scope

This letter report presents our exploratory hole logs, laboratory test results and our interpretation of these data. As with any site there may be differences in soil conditions between exploratory hole positions.

Any contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Limited believes are reliable. Nevertheless, Southern Testing Laboratories Limited cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of The Hunter Group and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

Recommendations contained in this report may not be appropriate to alternative development schemes.

## 4 Site Setting

The site is located on the north side of the B2110 Handcross Road, approximately 3.5 km southwest of the village of Handcross. The approximate National Grid Reference of the site is TQ 22692 28232. The site location is indicated on the enclosed Figure 1.

The area subject to this investigation (referred to from here as 'the site'), comprised the western margin of a field, located on the east side of a large barn. See enclosed Figure 2 for details.

### 4.1 Geology

The British Geological Survey Map No. 302 (1972) indicated that the site geology consists of Tunbridge Wells Sand. The Nuthurst Fault is shown running along the stream, with the Weald Clay, which overlies the Tunbridge Wells Sand, shown to the north.

#### Tunbridge Wells Sand Formation

The Tunbridge Wells Sand Formation comprises part of the Lower Cretaceous Wealden Group and consists predominantly of fine to medium grained sandstone, siltstone and silty sand rhythms with finely bedded mudstones and thin limestones.

In the western High Weald (between Haywards Heath and Tunbridge Wells) the formation can be divided into three, the informally named Lower and Upper Tunbridge Wells Sand and the intervening Grinstead Clay Member. The succession commences with rhythmically bedded sandstones, siltstones and mudstones of the lower part of the Lower Tunbridge Wells Sand which pass up into the massive sandstones of the Ardingly Sandstone Member. These are overlain by the finely-bedded mudstones, mudstones and silty mudstones with subordinate clay ironstones and shelly limestones of the Grinstead Clay Member. This clay member is itself locally divided into upper and lower parts by the cross-bedded fine sandstone of the Cuckfield Stone Bed. Above the Grinstead Clay Member, the Upper Tunbridge Wells Sand comprises a generally more argillaceous rhythmic succession, including mudstones, siltstones and silty sandstones.

Outside the western High Weald the Grinstead Clay Member is not recognisable and the succession is mapped as undivided Tunbridge Wells Sand Formation. There are a number of minor non-sequences or disconformities throughout the succession and a possible significant gap at the top of the formation that removes much of the Upper Tunbridge Wells Sand.

An important feature of the sandstone is that it is subject to "cambering". On and near steep hill slopes cracks and fissures have been formed because of movement in the underlying Wadhurst Clay. These are usually in two directions, parallel to, and at right angles to, the line of the escarpment, and range from a few mm wide, to a metre wide, or more. The fissures are often infilled with silt but are occasionally open (voids).

## 4.2 Hydrology and Hydrogeology

The sandstone within the Tunbridge Wells Sand is classified as a Secondary A aquifer, with soils of a high vulnerability, whilst the clay bands form unproductive strata. The site is not situated on or within the vicinity of a ground water source protection zone. Therefore, the groundwater beneath the site would not be considered to be particularly vulnerable.

The stream along the northern boundary of the area under investigation is unnamed. It flows in a westerly direction, forming a tributary to Golding's Stream, which itself flows west, into the River Arun. The stream is would be considered at potential risk from contaminated runoff and leachate arising from the site.

## 4.3 Site Investigation Works

A representative from Southern Testing attended site on the 22 October 2024, to undertaken an intrusive investigation of the soils adjacent to and east of the existing agricultural barn building. The area subject to investigation is shown on the enclosed Figure 2.

At the time of the site works, the area to the east of the barn comprised rough grass, the surface of which was uneven and boggy, with some areas of standing water.

## 4.4 Soils as Found

A series of four machine excavated trial holes were dug, to the immediate east of the barn.

The soils encountered are described in detail in the enclosed exploratory hole logs, but in general comprised a covering of topsoil or Made Ground over Tunbridge Wells Sand. A summary is given below.

| Depth (mbgl) | Thickness (m) | Soil Type | Description |
|---|---|---|---|
| GL - 0.15/2.2 | 0.5-2.2 | MADE GROUND | Soft brown silty CLAY with fine to coarse angular to sub-angular flint, brick, concrete, occasional, ceramic tile, carpet, roof slate, concrete fragments and road surfacing. |
| 0.15/2.2 – >2.4 | 2.4+ | silty/fine sandy CLAY | Firm to stiff brown-grey mottled silty/fine sandy CLAY. |

Evidence of possible contamination, in the form of Made Ground, was encountered in all of the trial holes. Photographs showing these soils are enclosed. No visual or olfactory evidence of any petroleum hydrocarbon or other organic chemical contamination was noted, and no suspected asbestos containing materials were observed.

Groundwater was encountered as follows; a slow groundwater seep was noted in TP13 at 0.4mbgl, and TP15 at 0.6mbgl.

## 5 Laboratory Test Results

The analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA model[i], provides a methodology for quantitative assessment of the long-term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

In the absence of any published SGVs for certain substances, Southern Testing have derived or adopted Tier 1 screening values for initial assessment of the soil, based on available current UK guidance including the LQM/CIEH S4UL's[ii] and CL:AIRE Soil Generic Assessment Criteria[iii]. In addition, in 2014, DEFRA[iv] published the results of a research programme to develop screening values to assist decision making under Part 2A of the Environmental Protection Act. Category 4 screening levels have been published for a number of substances, with reference to human health risk only. This guidance includes revisions of the CLEA exposure parameters, presenting parameters for public open space land use scenarios, and also of the toxicological approach. The screening levels represent a low risk scenario, based on a 'Low Level of Toxicological Concern' rather than the 'Minimal Risk' of CLEA, and the analytical results of this investigation may be considered relative to these levels.

The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them. Their validity should be confirmed at the time of site development.

Laboratory test certificates are enclosed, with a summary of the test data provided below.

### *Made Ground*

Four samples of the Made Ground, from depths of 0.15mbgl to 1mbgl were subject to laboratory analysis for a range of common contaminants.

It is understood that this part of the site is to remain as open land, or possibly planted as woodland. There are no generic tier 1 screening values which apply directly to such a land use. Therefore, given the relatively low concentrations of contaminants present in the samples, the most stringent Tier 1 screening values, for a residential land use including the consumption of home-grown produce have been used for comparative purposes as an initial screening tool.

| Contaminants | Units | Range | Mean | Tier 1 Screening Values Residential with home-grown produce consumption |
|---|---|---|---|---|
| Asbestos Containing Material | / | None detected | | No asbestos containing materials (ACMs) or loose fibres. |
| Arsenic (As) [2][1] | mg/kg | 11-14 | 13 | 37 |
| Cadmium (Cd) [2] | mg/kg | 0.3-0.8 | 0.53 | 11 |
| Trivalent Chromium (CrIII)* [2] | mg/kg | 22-27 | 24 | 910 |
| Hexavalent Chromium (CrVI) [2] | mg/kg | <1.8 | 1.8 | 6 |
| Lead (Pb) [3] | mg/kg | 47 – 170 | 101 | 200 |
| Mercury (Hg) [1,2,7] | mg/kg | <0.3 | 0.3 | 7.6-11 |
| Selenium (Se) [2] | mg/kg | <1.0 | <1.0 | 250 |
| Nickel (Ni) [2,4] | mg/kg | 17 – 20 | 18 | 130 |
| Copper (Cu) [2,4] | mg/kg | 22 – 41 | 33 | 2,400 |
| Zinc (Zn) [2,4] | mg/kg | 85 – 240 | 149 | 3,700 |
| Phenol [1,2] | mg/kg | <1.0 | <1.0 | 120-380 |
| Benzo[a]pyrene [1,5] | mg/kg | 0.5 – 9 | 4.1 | 1.7-2.4 |
| Naphthalene [1,2] | mg/kg | <0.05 – 0.21 | 0.1 | 2.3-13 |
| Total Cyanide (CN) [6] | mg/kg | <1.0 | <1.0 | / |
| Acidity (pH values) | Units | 7.3 – 8.8 | 8 | / |
| Soil Organic Matter | % | 3.2 – 5.3 | 3.9 | / |

** Assumed as Total Cr minus CrVI*

The concentrations of potential contaminants in Made Ground are generally below the Tier 1 screening values for a Residential land use including home-grown produce consumption. The concentrations of potentially phytotoxic metals (copper, nickel and zinc) are also well below the values given in the British Standards for Topsoil and Subsoil (BS3882:2015 and BS8601:2013 respectively).

Levels of PAH compounds (benzo(a)pyrene) would be considered elevated for a residential setting, in one instance, (TP16 @ 0.2mbgl 9mg/kg), however, as the site is not to be used for residential purposes this would be classed as low risk.

[1] Where ranges of values are given for organic contaminants the screening value is dependent on the Soil +Organic Matter.

[2] LQM/CIEH S4UL (2014). Copyright Land Quality Management Ltd. reproduced with permission; Publication Number S4UL 3116. All rights reserved.

[3] C4SL (DEFRA 2014).

[4] Copper, Zinc and Nickel may have phototoxic effects at the given concentrations. Alternative criteria should be adopted for importation of Topsoil or other soils for cultivation. BS3882:2015 and BS8601:2013 suggest values of 200 to 300mg/kg for Zn, 100 to 200mg/kg for Cu, and 60 to 110mg/kg for Ni, for topsoil and subsoil, depending on pH.

[5] Based on the Surrogate Marker approach and modelled using the modified exposure parameters of C4SL but retaining 'minimal risk' HCV.

[6] Screening criteria derived on a site specific basis if test results indicate.

[7] S4UL for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present. Lower concentrations apply for elemental Mercury.

No asbestos containing materials, or loose fibres of asbestos, were detected by the laboratory in the soil samples that were subject to analysis.

No significant concentrations of petroleum hydrocarbons were recorded in the samples.

## 6 Discussion

It is understood that it is proposed to undertake improvement works across the land as a whole, belonging to Stonehouse Farm, with a view to retaining the majority of the fields as open land, or planting woodland, as part of a Habitat Management and Monitoring Plan (HMMP), under the government's Biodiversity Net Gain (BNG) strategy.

### 6.1 Deposited Material (Made Ground)

The trial holes excavated to the east side of the barn indicated that the imported material has been placed to depths of between 0.15mbgl to 2.2mbgl, with the depth of the material placed becoming deeper from north to south, in keeping with the anticipated natural topography of the area. The Made Ground layer is 0.15m – 2.2m thick, and was seen to be overlying the natural Tunbridge Wells Sand materials.

Above this, the Made Ground comprised re-worked soft brown silty clay with variable amounts of anthropogenic material, including flint, brick, concrete, occasional wood, plastic, ceramic tile, concrete fragments and road surfacing. It appears that this material had been loose tipped, with no obvious signs of any compaction being undertaken, or laying of different materials.

With the exception of the presence of anthropogenic material, no visual or olfactory evidence of potential contamination, such as asbestos containing material, petroleum hydrocarbons or other odorous or stained materials were found during the intrusive works. Laboratory analysis of selected samples of the Made Ground recorded low concentrations of the potential contaminants tested for, which (in the absence of any applicable generic screening values for the type of land use proposed for the site) were well below the most stringent tier 1 screening values. No asbestos containing materials, or loose asbestos fibres, were detected by the laboratory.

## 7 Conclusions

The intrusive investigation works, and subsequent laboratory analysis of selected samples undertaken along the western side of the field to the east of the barn, has not identified any significant contamination within this material. However, it should be noted that given the significant volume of material deposited across the site, and its unknown origin, it is possible that more onerous contamination could be present in discreet pockets.

If you have any queries or we can be of further assistance, please do not hesitate to contact us.

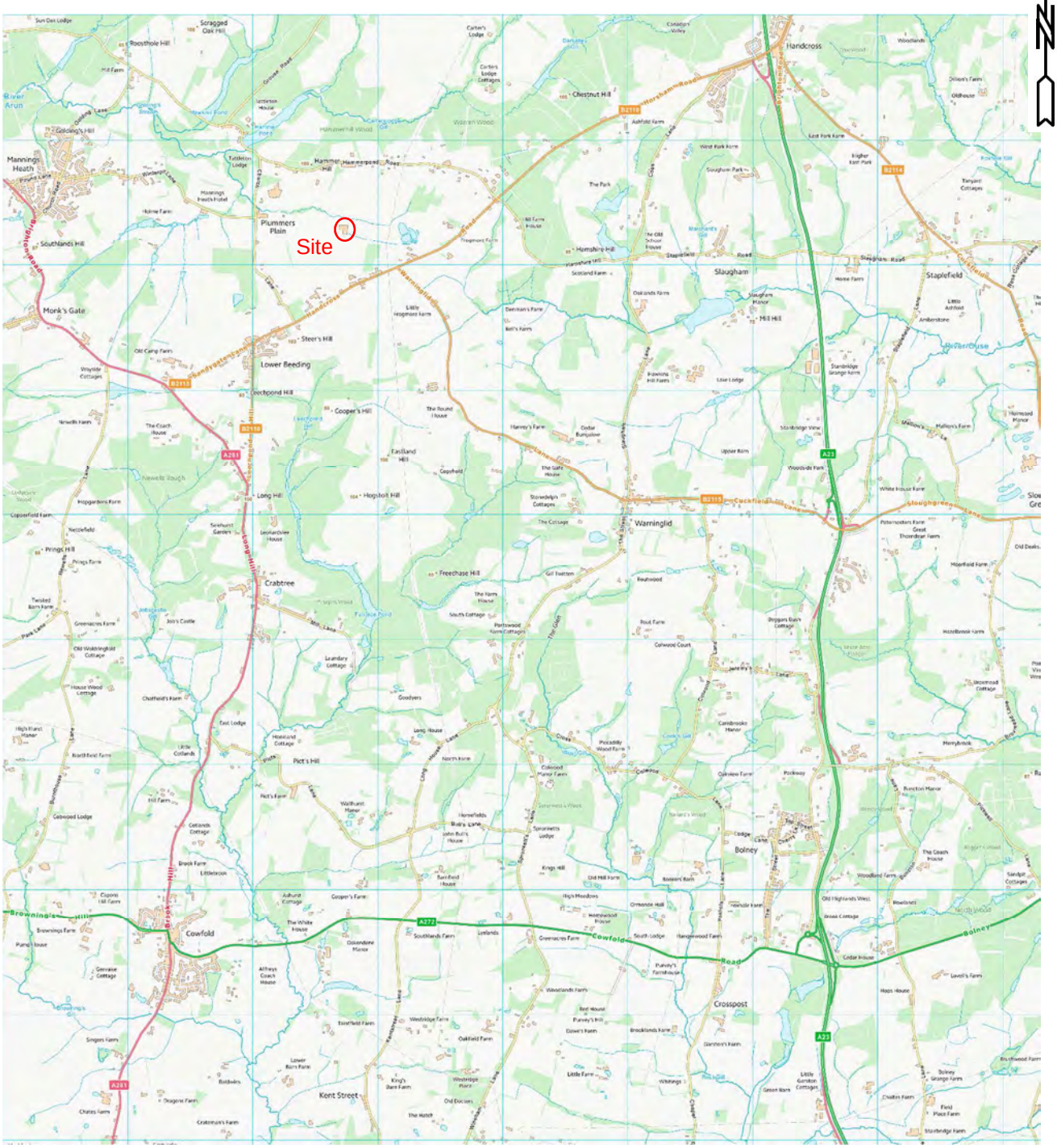
Yours faithfully,

**Eliza Richardson BSc (Hons) ARSM MSc FGS**
For and on behalf of
Southern Testing Laboratories Limited
DDI: 01342 333 160
Email: erichardson@southerntesting.co.uk

Encs

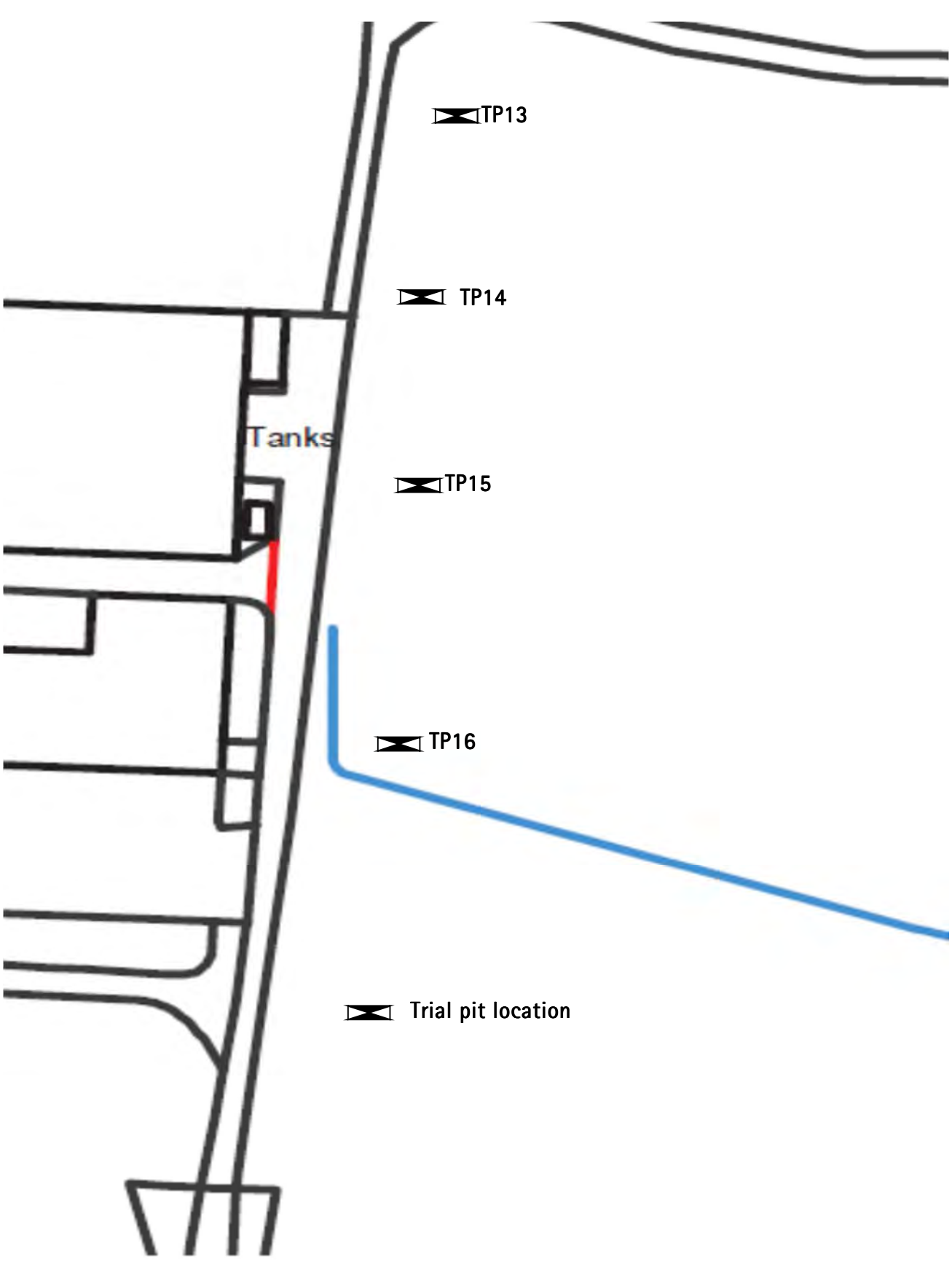
Figure 1 – Site location
Figure 2 – Site plan & trial hole locations
Photographs
Exploratory hole logs
Laboratory test certificates

[i] Environment Agency, "Updated technical background to the CLEA model," 2009.
[ii] C. Nathanail, C. McCaffrey, A. Gillett and R. &. N. J. Ogden, "The LQM/CIEH S4ULs for Human Health Risk Assessment," Land Quality Press, Nottingham, 2015.
[iii] EIC/AGS/CL:AIRE, "Soil Generic Assessment Criteria for Human Health Risk Assessment," 2010
[iv] DEFRA, "SP1010 Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination," 2014






| | | | |
|---|---|---|---|
| Site: | Land to the East Side of Stonehouse Farm, Handcross Road, Plummers Plain, RH13 6NZ | Project ID | J15856 |
| Figure 1 | Site Location Plan | Date: | 11/2024 |




NB: Positions of trial pits are only indicative unless dimensioned

| | | | |
|---|---|---|---|
| Site: | Land east of Stonehouse Farm Barn, Handcross Rd, Plummers Plain, RH13 6NZ | STL: J15856 | Fig No: 2 |
| Date: | November 2024 | Trial hole location Plan – Not to Scale | |

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult

# Land to the East Side of Stonehouse Farm Barn, Horsham

Plate 1: North to valley.

Plate 2: Looking south up slope.

Plate 3: West boundary.

Plate 4: South east side of site.

Plate 5: West to barn.

Plate 6: North west corner.

| Land to the East Side of Stonehouse Farm Barn, Horsham | |
|---|---|
|  |  |
| Plate 7: North. | Plate 8: East. |
|  |  |
| Plate 9: South east. | Plate 10: West to barn. |

# Land to the East Side of Stonehouse Farm Barn, Horsham

Plate 1: TP13.

Plate 2: TP13 arisings.

Plate 3: TP13 arisings.

Plate 4: TP13 arisings.

Plate 5: TP13 arisings.

Plate 6: TP14.

| Land to the East Side of Stonehouse Farm Barn, Horsham | |
|---|---|
|  |  |
| Plate 7: TP14 arisings. | Plate 8: TP14 arisings. |
|  |  |
| Plate 9: TP15. | Plate 10: TP15 arisings. |
|  | |
| Plate 11: TP16. | |

| Southern Testing ST Consult | Start - End Date: | Project ID: | Hole Type: | TP13 |
|---|---|---|---|---|
| | | J15856 | TP | Sheet 1 of 1 |

| Client: | | Co-ordinates: | Level (m AOD) | Logger: |
|---|---|---|---|---|
| | | | | er |
| Project Name: | Land East of Stonecross Farm | Location: | Stonecross Farm, Hand Cross, RH13 | |

| Samples and Insitu Testing | | | Level (m AOD) | Thickness (m) | Legend | Depth (m bgl) | Stratum Description |
|---|---|---|---|---|---|---|---|
| Depth (m bgl) | Type | Results | | | | | |
| | | | | (0.10) | | 0.10 | Soft dark brown silty fine sandy CLAY with rootlets Made Ground |
| 1.00 | ES | | | (2.00) | | | Soft brown silty fine sandy CLAY with occasional to some fine to coarse angular gravel of concrete, brick, occasional tile and chalk Made Ground |
| | | | | (0.10) | | 2.10 | Soft dark brown silty CLAY with decayed plant matter (former topsoil) |
| | | | | (0.05) | | 2.20 | Soft to firm brown fissured silty fine sandy CLAY |
| | | | | | | 2.25 | Pit terminated at 2.25m |

1 2 3 4

| Pit Dimension (m) | | Pit Stability: | stable | Water Strikes | | |
|---|---|---|---|---|---|---|
| | | Weather: | | Depth (m) | Date/Time | Remarks |
| Width: | 0.60 | Remarks: | | 0.40 | 22/10/2024 00:00:00 | very slow |
| Length: | 2.50 | 0.4mbgl very slow seepage of groundwater | | | | |
| Depth: | 2.25 | | | | | |

| Status: | | Log Print Date and Time: | 11/11/2024 09:30 | Log Approved By: | |
|---|---|---|---|---|---|

| Southern Testing ST Consult | Start - End Date: | Project ID: | Hole Type: | TP14 |
|---|---|---|---|---|
| | | J15856 | TP | Sheet 1 of 1 |

| Client: | | Co-ordinates: | Level (m AOD) | Logger: |
|---|---|---|---|---|
| | | | | er |
| Project Name: | Land East of Stonecross Farm | Location: | Stonecross Farm, Hand Cross, RH13 | |

| Samples and Insitu Testing | | | Level (m AOD) | Thickness (m) | Legend | Depth (m bgl) | Stratum Description |
|---|---|---|---|---|---|---|---|
| Depth (m bgl) | Type | Results | | | | | |
| | | | | (0.20) | | 0.20 | Soft brown / dark brown silty CLAY with rootlets Made Ground |
| 0.80 | ES | | | (1.10) | | | Soft brown silty fine sandy CLAY with occasional fine to coarse angular gravel of brick and concrete, plastic noted Made Ground |
| 1.40 | HP | UCS(kPa)=290 | | (0.20) | | 1.30<br>1.50 | Soft to firm brown with grey mottling fissured silty fine sandy CLAY<br>Pit terminated at 1.50m |

| Pit Dimension (m) | | Pit Stability: | stable | Water Strikes | | |
|---|---|---|---|---|---|---|
| | | Weather: | | Depth (m) | Date/Time | Remarks |
| Width: | 0.60 | Remarks: | | | | |
| Length: | 2.50 | | | | | |
| Depth: | 1.50 | | | | | |

| Status: | | Log Print Date and Time: | 11/11/2024 09:30 | Log Approved By: | |
|---|---|---|---|---|---|

| Southern Testing ST Consult | Start - End Date: | Project ID: | Hole Type: | TP15 |
|---|---|---|---|---|
| | | J15856 | TP | Sheet 1 of 1 |

| Client: | | Co-ordinates: | Level (m AOD) | Logger: |
|---|---|---|---|---|
| | | | | ER |
| Project Name: | Land East of Stonecross Farm | Location: | Stonecross Farm, Hand Cross, RH13 | |

| Samples and Insitu Testing | | | Level (m AOD) | Thickness (m) | Legend | Depth (m bgl) | Stratum Description |
|---|---|---|---|---|---|---|---|
| Depth (m bgl) | Type | Results | | | | | |
| 0.15 | ES | | | (0.25) | | 0.25 | Soft dark brown silty CLAY with rootlets Made Ground |
| 0.40 | HP | UCS(kPa)=170 | | (0.45) | | | Soft to firm brown with grey mottling fissured silty fine sandy CLAY |
| 0.60 | HP | UCS(kPa)=150 | | | | 0.70 | Pit terminated at 0.70m |

| Pit Dimension (m) | | Pit Stability: | stable | Water Strikes | | |
|---|---|---|---|---|---|---|
| | | Weather: | | Depth (m) | Date/Time | Remarks |
| Width: | 0.60 | Remarks: | | 0.60 | 22/10/2024 00:00:00 | very slow |
| Length: | 2.40 | 0.6mbgl slow seepage of groundwater | | | | |
| Depth: | 0.60 | | | | | |

| Status: | | Log Print Date and Time: | 11/11/2024 09:30 | Log Approved By: | |
|---|---|---|---|---|---|

| Southern Testing ST Consult | Start - End Date: | Project ID: | Hole Type: | TP16 |
|---|---|---|---|---|
| | | J15856 | TP | Sheet 1 of 1 |

| Client: | | Co-ordinates: | Level (m AOD) | Logger: |
|---|---|---|---|---|
| | | | | er |
| Project Name: | Land East of Stonecross Farm | Location: | Stonecross Farm, Hand Cross, RH13 | |

| Samples and Insitu Testing | | | Level (m AOD) | Thickness (m) | Legend | Depth (m bgl) | Stratum Description |
|---|---|---|---|---|---|---|---|
| Depth (m bgl) | Type | Results | | | | | |
| 0.20 | ES | | | (0.40) | | 0.40 | Soft brown silty fine sandy CLAY with occasional fine to coarse angular gravel of chalk, brick and concrete Made Ground |
| | | | | (0.30) | | 0.70 | Firm brown grey mottled fissured silty CLAY |
| | | | | | | | Pit terminated at 0.70m |

| Pit Dimension (m) | | Pit Stability: | stable | Water Strikes | | |
|---|---|---|---|---|---|---|
| | | Weather: | | Depth (m) | Date/Time | Remarks |
| Width: | 0.60 | Remarks: | | | | |
| Length: | 2.40 | | | | | |
| Depth: | 0.70 | | | | | |

| Status: | | Log Print Date and Time: | 11/11/2024 09:30 | Log Approved By: | |
|---|---|---|---|---|---|

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# Analytical Report Number : 24-049439

| | | | |
|---|---|---|---|
| Project / Site name: | Land East Side of Stonehouse Farm Barn Horsham | Samples received on: | 23/10/2024 |
| Your job number: | J15856 | Samples instructed on / Analysis started on: | 23/10/2024 |
| Your order number: | J15856-1 | Analysis completed by: | 06/11/2024 |
| Report Issue Number: | 1 | Report issued on: | 06/11/2024 |
| Samples Analysed: | 4 soil samples | | |

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-049439
Project / Site name: Land East Side of Stonehouse Farm Barn Horsham
Your Order No: J15856-1

| Lab Sample Number | | | | 356662 | 356663 | 356664 | 356665 |
|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP13 | TP14 | TP15 | TP16 |
| Sample Number | | | | ES | ES | ES | ES |
| Depth (m) | | | | 1.00 | 0.80 | 0.15 | 0.20 |
| Date Sampled | | | | 22/10/2024 | 22/10/2024 | 22/10/2024 | 22/10/2024 |
| Time Taken | | | | 0930 | 1000 | 1030 | 1100 |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 18 | 16 | 20 | 13 |
| Total mass of sample received | kg | 0.1 | NONE | 0.1 | 0.1 | 0.1 | 0.1 |
| **Asbestos** | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | SPU | SPU | SPU | SPU |
| **General Inorganics** | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 7.9 | 8.8 | 7.3 | 8.1 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 1200 | 980 | 610 | 78 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.576 | 0.488 | 0.305 | 0.0391 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 576 | 488 | 305 | 39.1 |
| Sulphide | mg/kg | 1 | MCERTS | 8.6 | 1.4 | 3 | 1.6 |
| Organic Matter (automated) | % | 0.1 | MCERTS | 3.2 | 3.5 | 5.3 | 3.7 |
| **Total Phenols** | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.06 | 0.09 | 0.21 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.11 | 0.6 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 2 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 2.4 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.27 | 0.41 | 0.7 | 18 |
| Anthracene | mg/kg | 0.05 | MCERTS | 0.11 | 0.12 | 0.19 | 5.7 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.87 | 1.2 | 2.2 | 25 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.83 | 1.1 | 2 | 20 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.41 | 0.64 | 0.98 | 9.7 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.53 | 0.77 | 1.3 | 9.7 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.59 | 0.97 | 1.5 | 11 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.32 | 0.48 | 0.73 | 4.6 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.5 | 0.78 | 1.2 | 9 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.3 | 0.45 | 0.65 | 4.4 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.12 | 0.13 | 0.95 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.33 | 0.51 | 0.74 | 4.7 |
| **Total PAH** | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 5.05 | 7.62 | 12.3 | 127 |

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| Lab Sample Number | | | | 356662 | 356663 | 356664 | 356665 |
|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP13 | TP14 | TP15 | TP16 |
| Sample Number | | | | ES | ES | ES | ES |
| Depth (m) | | | | 1.00 | 0.80 | 0.15 | 0.20 |
| Date Sampled | | | | 22/10/2024 | 22/10/2024 | 22/10/2024 | 22/10/2024 |
| Time Taken | | | | 0930 | 1000 | 1030 | 1100 |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | | |
| **Heavy Metals / Metalloids** | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 12 | 11 | 13 | 14 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 1.6 | 2 | 1.9 | 1.1 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.5 | 0.3 | 0.8 | 0.5 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | < 1.8 | < 1.8 | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 27 | 24 | 23 | 22 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 26 | 22 | 41 | 41 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 47 | 58 | 170 | 130 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | 17 | 20 | 17 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 43 | 37 | 37 | 39 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 140 | 85 | 240 | 130 |
| **Petroleum Hydrocarbons** | | | | | | | |
| TPH Total >EC6 - EC40 $_{EH\_CU+HS\_1D\_TOTAL}$ | mg/kg | 10 | NONE | < 10 | < 10 | 31 | 190 |
| Petroleum Range Organics (EC6 - EC10) $_{HS\_1D\_TOTAL}$ | mg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH (EC10 - EC40) $_{EH\_CU\_1D\_TOTAL}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | 31 | 190 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 356662 | TP13 | ES | 1 | Brown clay and loam with gravel |
| 356663 | TP14 | ES | 0.8 | Brown clay and loam with gravel and vegetation |
| 356664 | TP15 | ES | 0.15 | Brown loam and sand with gravel and vegetation |
| 356665 | TP16 | ES | 0.2 | Brown loam and sand with gravel and vegetation |

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Asbestos identification in Soil | Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques | In-house method based on HSG 248, 2021 | A001B | D | ISO 17025 |
| Organic matter (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method) | In-house method | L009B | D | MCERTS |
| Sulphide in soil | Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode | In-house method | L010-PL | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically (up to 30°C) | In-house method | L019B | W | NONE |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight | In-house method based on British Standard Methods and MCERTS requirements. | L019B | D | NONE |
| Metals in soil by ICP-OES | Determination of metals in soil by aqua-regia digestion followed by ICP-OES | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil | L038B | D | MCERTS |
| Boron, water soluble, in soil | Determination of water soluble boron in soil by hot water extract followed by ICP-OES | In-house method based on Second Site Properties version 3 | L038B | D | MCERTS |
| Sulphate, water soluble, in soil (16hr extraction) | Sulphate, water soluble, in soil (16hr extraction) | In-house method | L038B | D | MCERTS |
| Speciated PAHs and/or Semi-volatile organic compounds in soil | Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS | In-house method based on USEPA 8270 | L064B | D | MCERTS |
| Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS | In-house method | L076B/L088-PL | D/W | MCERTS |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry | In-house method | L080-PL | W | MCERTS |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080-PL | W | MCERTS |
| Total cyanide in soil | Determination of total cyanide by distillation followed by colorimetry | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080-PL | W | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement | In-house method | L099-PL | D | MCERTS |

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions |
|---|---|
| HS | Headspace Analysis |
| MS | Mass spectrometry |
| FID | Flame Ionisation Detector |
| GC | Gas Chromatography |
| EH | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU | Clean-up - e.g. by Florisil®, silica gel |
| 1D | GC - Single coil/column gas chromatography |
| 2D | GC-GC - Double coil/column gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics |
| AR | Aromatics |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_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 |

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution