

VERIFICATION REPORT
PLOTS 1-6, 13-14, 17-23, 28-29 & 54-55
BARTONS RISE, HAVANT
HAMPSHIRE, PO9 5FF
on behalf of
VISTRY SOUTHERN

Report:	VERIFICATION REPORT
Site:	PLOTS 1-6, 13-14, 17-23, 28-29 & 54-55, BARTONS RISE, HAVANT, HAMPSHIRE, PO9 5FF
Client:	VISTRY SOUTHERN
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AMENDMENT RECORD

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1.0 INTRODUCTION

1.1 General

In line with the remedial strategy for the site, Geo-Environmental Services Limited ('Geo-Environmental') was instructed by Vistry Southern ('the Client') to prepare a Verification Report to compile the relevant information in relation to the residential development for Plots 1-6, 13-14, 17-23, 28-29 & 54-55, Bartons Rise, Havant, Hampshire, PO9 5FF, herein referred to as 'the site' (see Figure 1).

The site has previously been subject to a Phase I and Phase II intrusive investigation undertaken and reported by Geo-Environmental, ref GE15054/GIR/NOV15 dated November 2015. Following the completion of this investigation, the Remediation Strategy was developed for the site by Geo-Environmental, ref. GE15735/RMS/JUL16, dated July 2016.

This report details and compiles information provided by Vistry Southern, and independent verification works undertaken by Geo-Environmental in relation to the Topsoil and subsoil installed within the rear gardens of Plots 1-6, 13-14, 17-23, 28-29 & 54-55. It should be noted that at the time of the 2019 and 2022 inspections all inspected plots were completed and occupied by residents.

This report relates specifically to Plots 1-6, 13-14, 17-23, 28-29 & 54-55 and sets out the works undertaken to provide independent verification of the risk mitigation measures incorporated into the development to protect the development and end users thereof. This report provides final validation for works undertaken in relation to the installation and independent inspection and validation of remedial measures within Plots 1-6, 13-14, 17-23, 28-29 & 54-55 in relation to soft landscaping validation only. At the time of reporting, private gardens and areas of soft landscaping on further plots required further independent verification inspection works and will be validated within a separate verification (or an updated) report in due course, although some element of inspection works to date in relation to these Plots may be present here for information only at this stage.

Although this report refers to the constructed dwellings by plot number, each plot has a postal address. The postal address for each plot covered by this verification report is shown below in Table 1.1.

Plot Number	Postal Address
1-6	9 – 14 Henry Cormick House, Lynch Close, PO9 5FE
13	1 Harrison Way, Havant, PO9 5FD
14	3 Harrison Way, Havant, PO9 5FD
17	22 Garrett Close, Havant, PO9 5FD
18	20 Garrett Close, Havant, PO9 5FD
19	2 Harrison Way, Havant, PO9 5FD
20	4 Harrison Way, Havant, PO9 5FD
21	6 Harrison Way, Havant, PO9 5FD
22	8 Harrison Way, Havant, PO9 5FD
23	10 Harrison Way, Havant, PO9 5FD
28	14 Harrison Way, Havant, PO9 5FD
29	12 Harrison Way, Havant, PO9 5FD
54	8 Lynch Close, Havant, PO9 5FE
55	7 Lynch Close, Havant, PO9 5FE

Table 1.1 Plot numbers with associated Postal Address

1.2 Objectives

A desk study and investigation undertaken by Geo-Environmental identified the presence of potential hazards and, through a risk assessment process, a series of pollutant linkages were identified which required action to mitigate or otherwise reduce the risk. The Remediation Method Statement (RMS) for site set out the proposed remedial works to be undertaken to support its development for a residential end use.

This Verification Report (VR) presents the details and findings of inspection visits undertaken throughout the construction period by Geo-Environmental and/or to compile data provided by the Client with respect to Plots 1-6, 13-14, 17-23, 28-29 & 54-55 in relation to soils in order to demonstrate that the soil risk mitigation measures were implemented within these specific plots.

1.3 Planning Permission

It is understood that a planning application has been approved for the site by Havant Borough Council under Planning Reference APP/14/00863. The following planning conditions have been attached to the application which relate to the remediation and validation of land contamination on the site.

25. If, during development, contamination not previously identified on site is found to be present, no further development (unless otherwise agreed in writing by the Local Planning Authority) shall be undertaken until a report has been submitted to and approved by the Local Planning Authority that details how that contamination is to be dealt with. Unless otherwise agreed in writing with the Local Planning Authority, all works outlined in the submitted report shall be adhered to.

Reason: Having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011); Contamination may be present at the site as a result of both previous & current land uses (&/or activities) at the site that could pose a risk to future site occupiers.

26. No occupation of any part of the permitted development shall take place until a verification report has been submitted to and approved in writing by the Local Planning Authority.
The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan and must demonstrate that site remediation criteria have been met. It shall also include any plan identified as being necessary for longer-term monitoring of pollutant linkages (a "long-term monitoring and maintenance plan"), including provision for maintenance and contingency action. The long-term monitoring and maintenance plan shall be implemented as approved."

Reason: Having due regard to policies and proposals E1 of the Hampshire County Structure plan 1996-2011 (Review), and DM10 of the Havant Borough Adopted Core Strategy (2011); Contamination may be present at the site as a result of both previous & current land uses (&/or activities) at the site that could pose a risk to future site occupiers.

2.0 BACKGROUND

This Validation Report has been produced in order to demonstrate that the works required and presented within the Remediation Method Statement (RMS) for the site have been carried out in relation to Plots 1-6, 13-14, 17-23, 28-29 & 54-55. The RMS for the site was developed following the investigation of the site undertaken by Geo-Environmental comprising a Phase I and Phase II report presented within the Ground Investigation Report by Geo-Environmental (ref. GE15054/GIR/NOV15, November 2015). Whilst a summary of these reports is presented below, reference should be made to the complete reports for further details.

2.1 Proposed Site Use

The development comprises a residential estate including detached and semi-detached residential dwellings with private gardens, access roads, parking, communal soft landscaping and associated infrastructure.

2.2 Investigation and Assessment

At the time of the intrusive investigation works, the site comprised an approximately rectangular parcel of land which had been the subject of several and consecutive uses including a lawn mower repair shop, houses, dog grooming/hydrotherapy pool, dog kennels and fields/paddocks.

The ground conditions beneath the site comprised a mantle of Made Ground and/or Topsoil overlying a succession of gravelly clay soils (Head Deposits) and predominantly clay soils of the London Clay Formation.

Investigation and testing of soils on site identified contaminant concentrations of concern within the Made Ground at WS2 that were indicated to be unsuitable for re-use within residential gardens and associated soft landscaping. The assessment presented in GE15054/GIR/NOV15, included a statistical assessment of the full dataset of analytical results which led to the identification of WS2 as a localised area requiring further action. The recent review and revision of the soil contamination assessment is summarised in Section 4 of this report.

The intrusive investigation also identified the presence of asbestos within Made Ground sampled from WS5.

The investigations undertaken also considered and assessed ground gas and controlled waters contamination. In neither case was a requirement for remedial action identified to protect human health, the development, controlled waters or other receptors.

2.3 Conceptual Site Model

The conceptual site model (CSM) developed as part of the various phases of intrusive investigation and risk assessment undertaken for the site identified particular hazards, or potential hazards which were considered to require intervention (remediation) to mitigate the risk of harm.

2.4 Approach for Remediation, Monitoring and Validation

Remediation works were proposed to break the pathways of identified sources of contamination to receptors. The aim of the remediation was not necessarily to remove all contamination from the site but to provide betterment and to reduce the identified risk to an acceptable level with respect to relevant receptors, e.g. human health, the built environment and controlled waters.

3.0 SOILS

3.1 End Users (Shallow Soils)

With reference to the Ground Investigation Report (GE15054-GIR-NOV15) and the Remediation Method Statement (GE15735-RMS-JUL16) undertaken by Geo-Environmental. The Tier 1 contamination assessment identified several locations where reported concentrations were either elevated or exceeded the Tier 1 screening criteria within the Made Ground encountered across the site. No concentrations of concern were identified within the Topsoil or naturally occurring subsoil and thus no specific remedial measures are considered to be warranted in relation to these soil types.

Where Made Ground soils were to remain in-situ beneath a soil cover, the formation should be covered by a geotextile separator to prevent mixing of soil types and overlain by a high visibility geogrid mesh to inhibit excavation.

An example of the recommended cover system for the garden areas underlain by Made Ground soils is shown below:



Schematic 1 Topsoil and subsoil cover system where Made Ground is present beneath gardens

It should be noted that the eastern boundary of the development included no-dig zones associated with tree protection orders and these portions of gardens were to be separated from the main garden areas by a retaining wall. In these no-dig zones, there was no scope to undertake a reduced dig to remove any Made Ground soils, if present, and as such it was proposed to install a geogrid mesh and separate geotextile separator fabric on the existing ground surface and place a cover of Topsoil over the mesh. A target cover thickness of 300mm of Topsoil would generally be required but this was subject to such a cover thickness being achievable within the fixed development level limits and not adversely affecting the protected vegetation. The 'no-dig' restriction would continue to apply for the occupation phase of the development and thus the provision of a clean cover, geogrid mesh barrier and geotextile separator are considered to prevent end users coming into contact with soils beneath this cover.

An example of the recommended cover system for use in no-dig areas is provided below:



Schematic 2 Soil cover system in tree protection 'No-dig' zone

Table 3.1 summarises the recommended remedial solution as stated in the Remediation Method Statement on a Plot by Plot basis.

Plot	Level change (m)	Remediation strategy
1-6	-0.1 to -0.3	Amenity soft landscaping only. Install separator and geogrid mesh over formation and Topsoil cover.
7	-0.7 to -0.4	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
8	-0.4 to 0	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
9	-0.5	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
10	+0.6 to +0.8	Install soil cover system as per Schematic 1 if Made Ground is present.
11	+0.7	Install soil cover system as per Schematic 1 if Made Ground is present.
12	+0.6 to +0.4	Install soil cover system as per Schematic 1 if Made Ground is present.
13	+0.5 to +1.0	Install soil cover system as per Schematic 1 if Made Ground is present.
14	+0.5	Install soil cover system as per Schematic 1 if Made Ground is present.
15	+0.9 to +1.0	Install soil cover system as per Schematic 1 if Made Ground is present.
16	+0.7	Install soil cover system as per Schematic 1 if Made Ground is present.
17	-0.5 to -0.7	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
18	-0.5 to -0.9	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
19	-0.2	Reduced dig and install soil cover system as per Schematic 1 if Made Ground is present at/beneath the exposed formation.
20	-0.2 to -0.4	Reduced dig and install soil cover system as per Schematic 1 if Made Ground is present at/beneath the exposed formation.
21	-0.5 to -0.1	Reduced dig and install soil cover system as per Schematic 1 if Made Ground is present at/beneath the exposed formation.
22	-0.2 to -0.3	Reduced dig and install soil cover system as per Schematic 1 if Made Ground is present at/beneath the exposed formation.



Plot	Level change (m)	Remediation strategy
23	-0.1 to -0.4	Reduced dig and install soil cover system as per Schematic 1 if Made Ground is present at/beneath the exposed formation.
24	-0.4	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
25	-0.4 to -0.5	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
26	-1.0	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
27	-0.7 to -1.0	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
28	-0.1 to -0.8	Reduced dig to remove Made Ground. Place subsoil (if required) and Topsoil to achieve development level.
29	+0.3 to +0.5	Install soil cover system as per Schematic 1 if Made Ground is present.
30-37	Variable	Reduced dig to remove Made Ground from main garden areas. Place subsoil (if required) and Topsoil to achieve development level. Apply Schematic 2 soil cover in any 'no-dig' zone.
38-55	Variable	In previously undeveloped area where Made Ground is not anticipated. Watching brief and discovery strategy to remain in place.

Table 3.1 Summary of ground level variations by plot (from existing to finished development level)

In areas where no remedial action was required, or where Topsoil was to be placed directly on to subsoil, a minimum thickness of 150mm of suitable Topsoil was recommended.

It is understood from the Client that Topsoil and subsoil were imported to site for use within the completed rear garden areas across the site. Further reference to the importation of materials to site is provided in Section 4.

4.0 IMPORTATION OF MATERIALS

The chain of custody (COC) delivery certificates for Topsoil and subsoil materials imported into site for use across the site were provided to Geo-Environmental by the Client in the form of a tabulated spreadsheet provided by the ground works contractor (Raymond Brown) a copy of this table is presented within Appendix A. It should be noted that the soil cover system comprised the import and placement of both subsoil and Topsoil within Plots 1-6, 13-14, 17-23, 28-29 & 54-55.

Pre-import analysis of some of this imported material has also been provided by Vistry Southern. Copies of these pre-import test results are included within Appendix B.

Independent sampling and analysis of the imported materials was undertaken by Geo-Environmental in November 2022 within a selection of plots. It should be noted that this independent sampling was undertaken following the occupation of the entire development site. Therefore, a sampling strategy was agreed, with the Local Authority Environmental Health Officer, prior to sampling works being undertaken to provide general coverage of the site.

Although material tracking information has not been provided for this imported material, Geo-Environmental was provided within Building Control sign off dates for plots by Vistry Southern. It has been assumed that materials would have been imported in batches and installed within rear garden areas with the same sign off dates. Figure 6 shows the Building Control sign off dates for plots and how plots have been grouped together with the same sign off date.

The results of the independent validation analysis testing are presented in Appendix G and detailed and discussed within Section 5 of this report.



5.0 INSPECTION/VALIDATION (SOILS)

An engineer from Geo-Environmental visited the site during construction works, and on several occasions upon completion of the works once the site had been occupied, details of which are reported herein.

5.1 Validation Inspection of Reduced Dig (Plots 13-16 & 24-27)

The inspection/validation works to inspect the reduced dig works undertaken to enable the installation of the cover systems installed within the rear garden areas and soft landscaping area associated with Plots 13-16 & 24-27 was undertaken by a Geo-Environmental Engineer on 10th May 2017. The site photographs are presented in Appendix C.

At the time of the visit a reduced dig had been undertaken within the rear garden areas of Plots 13-16 and 24-27. The reduced dig area was noted to extend across the entire proposed rear garden of these plots. The depth of the reduced dig was noted to be a consistent level.

5.2 Topsoil and subsoil placement (Plots 7-10 & 19-23)

The inspection/validation works of the cover systems installed within the rear garden areas was undertaken by a Geo-Environmental Engineer on 10th May 2017.

Inspection comprised nine shallow hand pits (Plots 7-10 & 19-23), which were excavated by the Engineer from Geo-Environmental. The location of the inspection pits excavated is presented on Figure 3 and photographs taken during this inspection visit are presented in Appendix C, which confirm the depth of the installed Topsoil and subsoil within the cover system installed. It should be noted that the turf and the soil likely associated with the turf placement had not been laid within any of the areas of soft landscaping at the time of the inspection.

The inspection confirmed that within the inspection pits within Plots 7-10, a deter-to-dig geotextile type high visibility membrane was present along with a geo-grid beneath the subsoil. Subsoil was found to be c.300mm in thickness and Topsoil was found to be c.300mm in thickness with the total soil cover found to be 600mm in thickness within all the inspected areas in Plots 7-10.

In Plots 19-23 the inspection confirmed that Topsoil of at least 300mm in thickness was installed over subsoil. Made Ground was not present within these garden areas following a site strip/reduced dig works, as such gardens were completed within subsoil and Topsoil. Table 5.1 below summarises the encountered soil cover per plot.

Plot	Soil cover system installed	Comments
7	0.3m Topsoil and 0.3m subsoil placed.	Deter to dig and geogrid placed over formation prior to soil cover placement.
8	0.3m Topsoil and >0.3m subsoil placed.	
9	0.3m Topsoil and 0.3m subsoil placed.	
10	0.3m Topsoil and 0.3m subsoil placed.	
19	Topsoil placed to at least 0.3m thick over subsoil	Whilst the RMS indicated a soil cover system over Made Ground for these plots, no Made Ground was present following the site strip and reduced dig works so gardens were completed with subsoil and a final cover of topsoil.
20	Topsoil placed to at least 0.3m thick over subsoil	
21	Topsoil placed to at least 0.3m thick over subsoil	
22	Topsoil placed to at least 0.3m thick over subsoil	
23	Topsoil placed to at least 0.3m thick over subsoil	

Table 5.1 Summary of encountered soil cover during validation visit on 10th May 2017



5.3 Topsoil and subsoil placement (Plots 1-6, 13-14, 17-18, 25-29, 31, 33, & 36-37)

The inspection/validation of the cover system thickness installed within the rear garden areas of Plots 1-6, 13-14, 17-18, 25-29, 31, 33 & 36-37, was undertaken by Geo-Environmental Engineers on 7th and 8th March 2019.

Inspection comprised seventeen shallow hand pits which were excavated by Engineers from Geo-Environmental. The location of the inspection pits excavated is presented on Figure 4, photographs are presented in Appendix D, which confirm the depth of the installed Topsoil and subsoil within the cover system installed, and exploratory logs are presented in Appendix E. It should be noted that all inspected plots were occupied at the time of the inspection, as such inspection pits were undertaken where access was available.

The inspection confirmed the following within each of the hand pits undertaken:

Plot	Cover Depth (mm)	Geo-Grid	Membrane	Natural Strata	RMS Recommendation
1-6 (HP01)	Topsoil – 200	Yes	Yes	-	150mm Topsoil over subsoil
1-6 (HP02)	Topsoil – 150	Yes	Yes	-	150mm Topsoil over subsoil
1-6 (HP03)	Topsoil - 200	No	No	Yes	150mm Topsoil over subsoil
13 (HP06)	Topsoil – 300 Subsoil – 250	Yes	Yes	-	300mm Topsoil over 300mm subsoil
14 (HP07)	Topsoil – 300 Subsoil - 300	Yes	Yes	-	300mm Topsoil over 300mm subsoil
17 (HP05)	Topsoil – 150	No	No	Yes	150mm Topsoil over subsoil
18 (HP04)	Topsoil – 150	No	No	Yes	150mm Topsoil over subsoil
25 (HP11)	Topsoil – 400	No	No	Subsoil	150mm Topsoil over subsoil
26 (HP17)	Topsoil – 400	No	No	Yes	150mm Topsoil over subsoil
27 (HP16)	Topsoil – 300	No	No	Yes	150mm Topsoil over subsoil
28 (HP08)	Topsoil – 250	No	No	Yes	150mm Topsoil over subsoil
29 (HP18)	Topsoil – 300	No	No	Yes	150mm Topsoil over subsoil
31 (HP15)	Topsoil – 250	No	Yes	-	300mm Topsoil with Geo-grid (root zones) or 150mm Topsoil over subsoil
33 (HP10)	Topsoil – 300	No	Yes	-	300mm Topsoil with Geo-grid (root zones) or 150mm Topsoil over subsoil
36 (HP14)	Topsoil – 300	No	No	Yes	150mm Topsoil over subsoil
37 (HP12)	Topsoil – 200	No	No	Yes	150mm Topsoil over subsoil
37 (HP13)	Topsoil – 200	No	No	Yes	150mm Topsoil over subsoil

Table 5.2 Summary of encountered soil cover during validation visits on 7th and 8th March 2019

5.4 Topsoil and subsoil placement (Plots 1-6, 14, 17-18, 21, 28, 54)

Further inspection/validation of the cover systems installed within the rear garden areas of Plots 1-6, 14, 17-18, 21, 28 & 54, was undertaken by Geo-Environmental Engineers on 9th, 10th and 16th November 2022. The exploratory hole logs with photographs are presented in Appendix F.

Inspection comprised seven shallow hand pits, which were excavated by Engineers from Geo-Environmental. The location of the inspection pits excavated is presented on Figure 3 and the sampling strategy for the works was agreed with Havant Borough Council Environmental Health Officer ahead of attending site. Exploratory hole logs with photographs are presented in Appendix F, which confirm the depth of the installed Topsoil and subsoil within



the cover system installed within inspection pit locations, along with soil logs of the material encountered. It should be noted that all inspected plots were occupied at the time of the inspection, as such inspection pits were undertaken where access was available.

The inspection confirmed the following within each of the hand pits undertaken:

Plot	Cover Depth (mm)	Sampled?	RMS Recommendation
1-6 (TS01)	Topsoil – 150 Geo-Grid beneath	Yes	150mm Topsoil over subsoil
14 (TS07)	Topsoil – 250	Yes	300mm Topsoil over 300mm subsoil
17 (TS05)	Topsoil – 150 over subsoil	Yes	150mm Topsoil over subsoil
18 (TS08)	Topsoil – 100 over subsoil	Yes	150mm Topsoil over subsoil
21 (TS03)	Topsoil – 300 Geo-Grid beneath	Yes	150mm Topsoil over subsoil
28 (TS06)	Topsoil – 100 over subsoil	Yes	150mm Topsoil over subsoil
54 (TS04)	Topsoil – 150 over subsoil	Yes	150mm Topsoil over subsoil

Table 5.3 Summary of encountered soil cover during validation visits on 9th, 10th and 16th November 2022

It is noted that some of the thicknesses measured on specific plots varied between the two visits and it is anticipated that this reflects factors such as increased footfall, plot specific activities and the like following occupation rather than a thickness deficiency at the time of soil placement.

5.5 Topsoil and subsoil analysis of laboratory test results

A total of fourteen soil samples recovered from the hand pits excavated in the rear garden areas of both the Topsoil and subsoil in Plots 1-6, 14, 17-18, 21, 28 & 54, were submitted for testing for a suite of commonly occurring brownfield contaminants and asbestos screening.

The laboratory test results are presented within Appendix G.

The results of the analyses were compared to the Suitable for Use (S4UL) Levels for 'private gardens with home-grown produce' (representative of the proposed development end use), and the soil import criteria presented within the Remediation Strategy for the site, which are summarised in Table 5.4 below:

Determinand	Soil Screening Value (mg/kg)	Sample Max. Conc. (mg/kg)	Below Screening Value?
Arsenic	37	24.7	Yes
Cadmium	11	<0.5	Yes
Chromium (Total)	130	107	Yes
Copper	2400	47	Yes
Hexavalent Chromium	6	<0.8	Yes
Lead	200	130	Yes
Mercury (inorganic)	40	<0.5	Yes
Nickel	180	37.3	Yes
Selenium	250	<1.0	Yes
Vanadium	410	80.5	Yes
Zinc	3700	161	Yes
Benzo(a)pyrene	4.95	0.9	Yes
Naphthalene	2.3	<0.1	Yes
Benzo(b)fluoranthene	2.6	0.6	Yes



Determinand	Soil Screening Value (mg/kg)	Sample Max. Conc. (mg/kg)	Below Screening Value?
Dibenz(a,h)anthracene	0.24	0.1	Yes
Total Petroleum Hydrocarbons	110	57.2	Yes

Table 5.4 Summary of chemical analyses

The results indicated that all of the determinand concentrations were below the limiting concentrations set within the Remediation Method Statement. All samples were submitted for asbestos screening and returned with no asbestos fibres identified.

In addition, the results of the speciated hydrocarbon analyses were all returned as either below the laboratory detection limits or below their respective human health screening values for the proposed end use.

A further fourteen validation samples were submitted for a physical and nutrient testing suite. The results of the soils tested were compared to the Table 1 from BS3882:2015 entitled 'Specification for Topsoil'. The results are summarised in Table 5.5 below:

Parameters	Limits for Multipurpose Topsoil	Sample Range	Within acceptable Limits?
<u>Maximum Coarse Fragment Content (%)</u> Stones >2mm Stones > 20mm Stones >50mm	30 10 0	16 – 53 <1 <1	Exceedance of the >2mm stones threshold
<u>Mass loss on ignition %</u> Clay 5% to 20%	3 to 20	3.11 – 7.96	Yes
Soil pH	5.5 to 8.5	7.4 – 11.4	Exceedance of the upper pH threshold, average is 8.8
<u>Plant nutrient content</u> Total nitrogen % Extractable phosphate mg/l Extractable potassium mg/l Extractable magnesium mg/l	>0.15 16 to 140 121 to 1500 51 to 600	0.15 – 0.29 116 - 151 149 – 434 56 - 569	Slight exceedance of the phosphate threshold, average 137mg/l
Carbon:nitrogen ratio	<20:1	15:4 – 18:9	Yes
Electrical conductivity µS·cm	<3300	1660 - 1960	Yes
<u>Potentially Phytotoxic Elements</u> Zn mg/kg Cu mg/kg Ni mg/kg	<200 <135 <110	67.7 – 161 23 – 47 8.9 – 37.3	Yes
<u>Visible contaminants</u> % m/m ...of which plastics	<0.5 <0.25	<0.01 <0.01	Yes

Table 5.5 Summary of BS3832 Topsoil Analysis

The results demonstrate that the soils analysed are generally in accordance with BS3882:2015 Multipurpose Topsoil, with the exception of an exceedance of the 2mm stones threshold, slight exceedance of the upper pH limit, although the average pH is compliant with Low Fertility Topsoil, and a slight exceedance of the Phosphate upper threshold, with the average compliant with Multipurpose Topsoil. It should be noted that the soils were sampled and tested whilst all of the properties were occupied, with the works completed and the properties having been occupied for some time. The tested soils are considered suitable for landscaping purposes.

6.0 DISCOVERY STRATEGY

A discovery strategy remained in place throughout the development works on this site. Geo-Environmental has not been made aware of any discoveries having been made to date in relation to the site or these plots unless detailed within this report and thus the strategy, as set out in the RMS did not require enacting.

7.0 VERIFICATION

In accordance with the Client's instruction, Geo-Environmental undertook independent validation inspections. The risk mitigation measures in relation to remedial measures for Plots 1-6, 13-14, 17-23, 28-29 & 54-55 clean cover system as detailed herein, have been inspected and were considered to comply with the requirements of the Remediation Method Statement at the point of inspection or defects otherwise noted and subsequently rectified and plots re-inspected (where required). Further validation work in relation to other plots on the site will be reported via an updated report or under separate cover in due course.

The inspection of the installed soil cover system was undertaken by Geo-Environmental via the excavation of a number of hand pits. There was no visual evidence on any of these plots to indicate that the areas remote from the pits undertaken were likely to differ significantly from the areas where the pits had been excavated for inspection. However, the confirmation of the presence of a geotextile membrane, the confirmation of depth and composition of subsoil and Topsoil has only been independently verified by Geo-Environmental within these hand pit locations and in relation to the samples analysed. It has been assumed that these hand pits are representative of the imported soils within the soft landscaping areas of Plots 1-6, 13-14, 17-23, 28-29 & 54-55.

Geo-Environmental can only verify the installation of a cover system at the locations and depths inspected at the time of inspections. Geo-Environmental accepts no liability for areas that have not been directly inspected or works that have subsequently been undertaken on the site following our inspection visit(s) that may in any way alter or affect the validation works inspected and reported herein.

As agreed with the Environmental Health Officer at Havant Borough Council during the meeting on 9th May 2023, this report has been drafted and relates solely to Plots 1-6, 13-14, 17-23, 28-29 & 54-55, allowing for the discharge of conditions in relation to these plots only at this stage. Validation works with respect to the soil cover system installed within other plots (Plots 7-12, 15-16, 24-27, & 30-53) will be presented under separate cover in due course in line with further discussions and liaison with the Havant Borough Council EHO in line with the approach discussed and agreed within the meeting on 9th May 2023.

This report remains the property of Geo-Environmental and the Client has no rights to, or reliance upon this document or supporting documents until such time as payment has been received in full for all invoices for works undertaken in connection with this report.

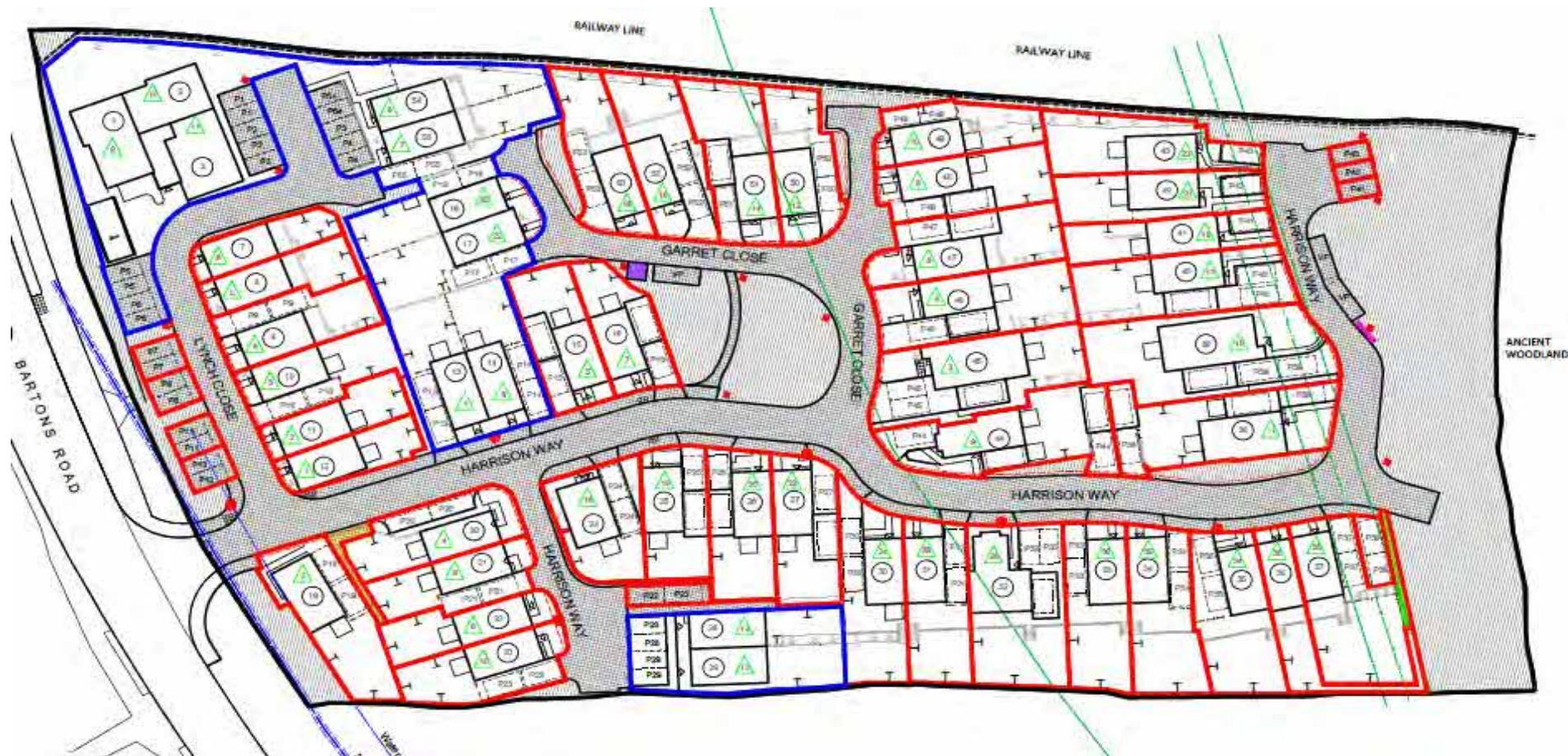
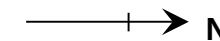


FIGURES

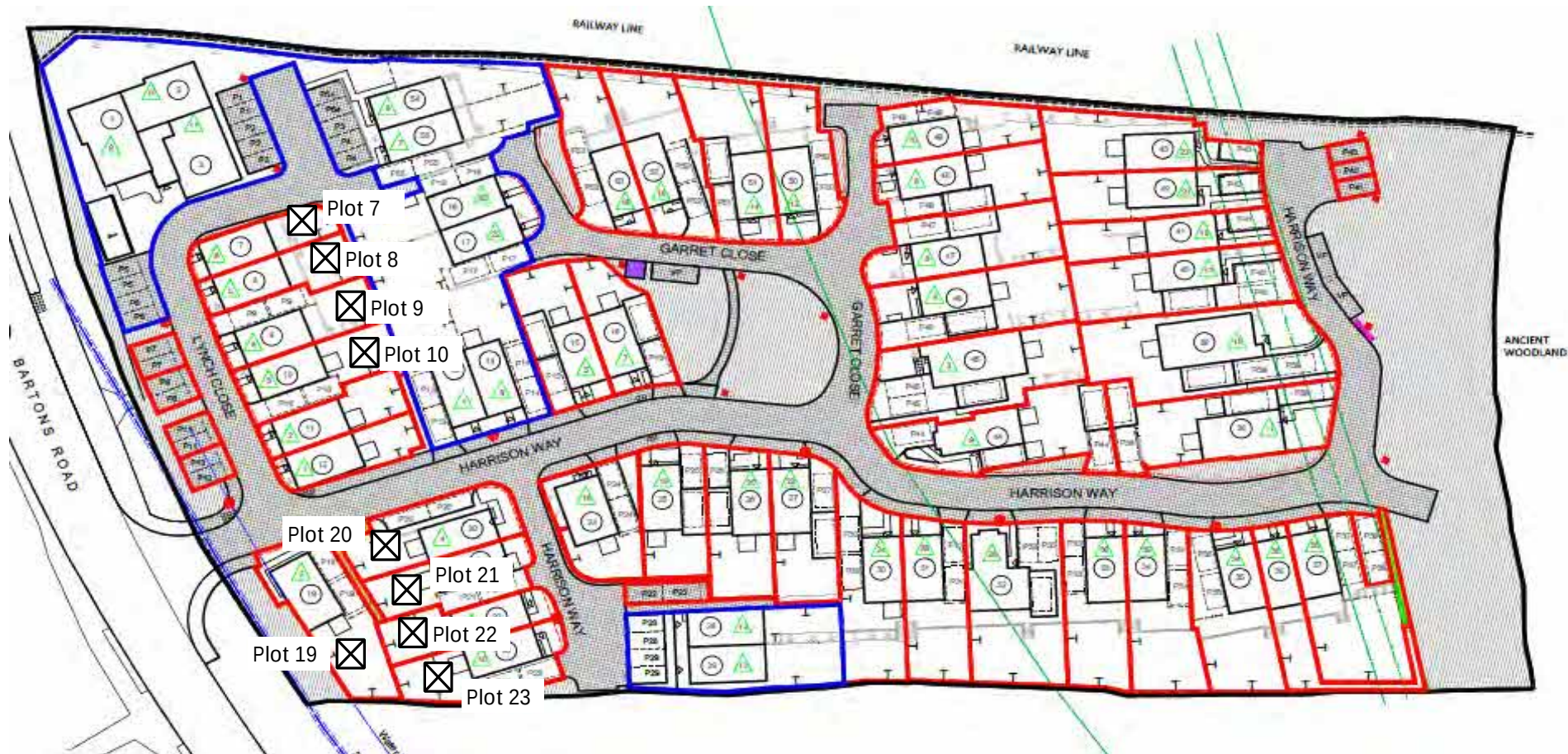
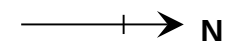




Project:	Bartons Rise, Havant			Title	Site Location Plan	
Client:	Vistry Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE21752	Revision:	0			
Drawn:	FG	Date:	07/06/2023			
Figure:	1	Scale:	Not To Scale			



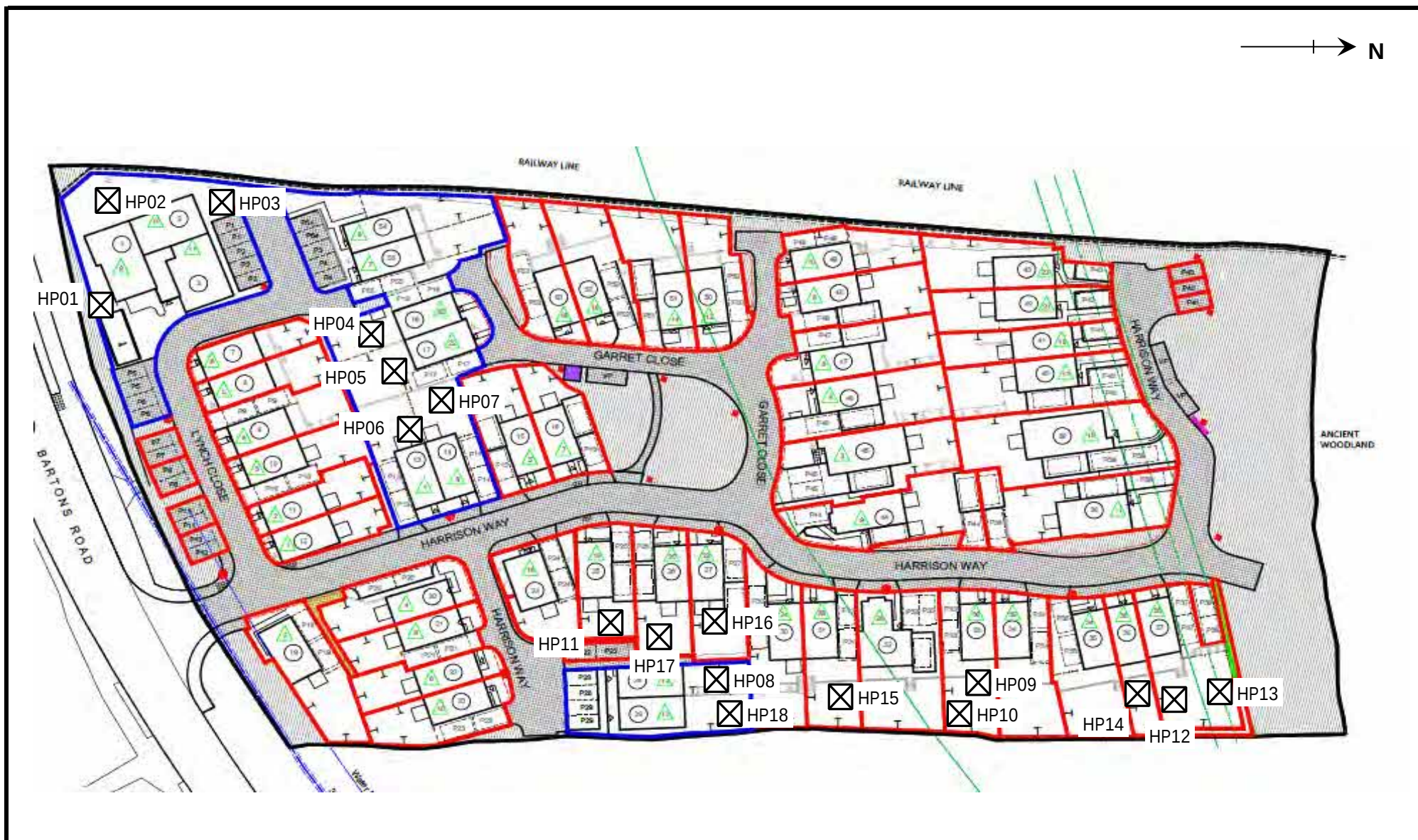
Project:	Bartons Rise, Havant			Title	Development Layout	
Client:	Vistry Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE21752	Revision:	0			
Drawn:	FG	Date:	07/06/2023			
Figure:	2	Scale:	Not To Scale			



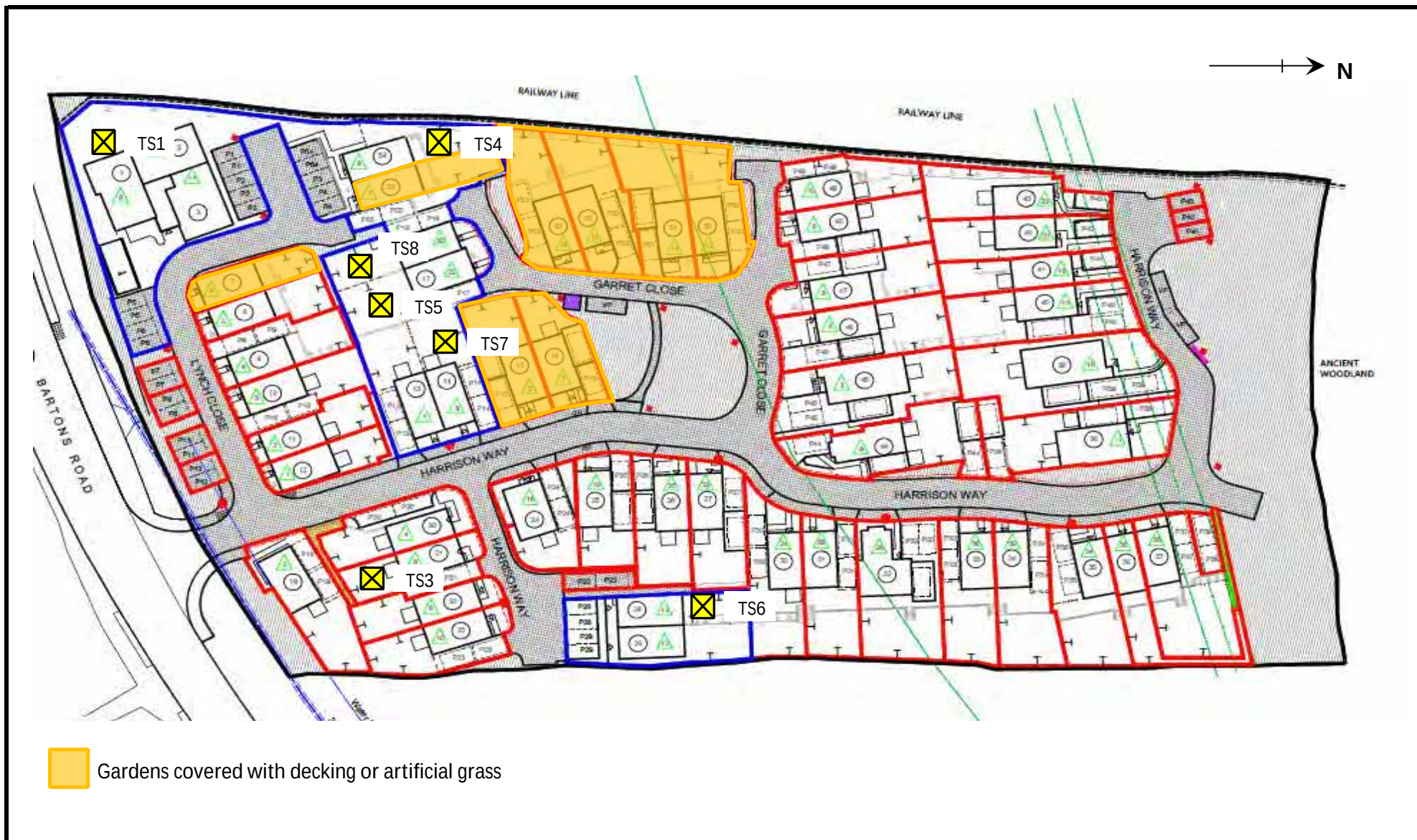
Project: Bartons Rise, Havant		Title: Validation Sample Location Plan (May 2017)	
Client: Vistry Southern		Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net	
Ref No: GE21752	Revision: 0		
Drawn: FG	Date: 13/05/2017		
Figure: 3	Scale: Not To Scale		



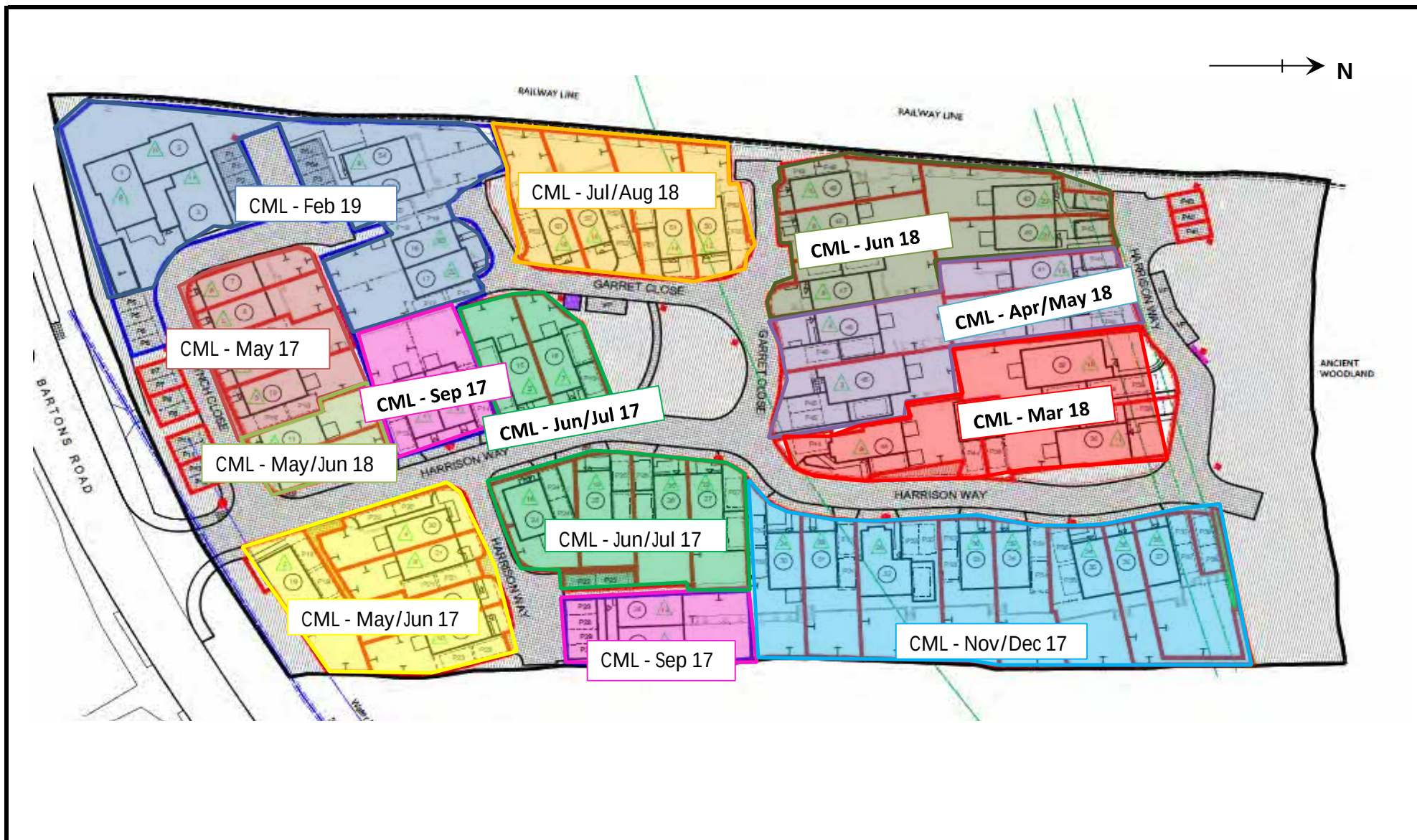
Geo-Environmental



Project:	Bartons Rise, Havant			Title	Validation Sample Location Plan (March 2019)	
Client:	Vistry Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net  Geo-Environmental		
Ref No:	GE21752	Revision:	0			
Drawn:	FG	Date:	08/03/2019			
Figure:	4	Scale:	Not To Scale			



Project: Bartons Rise, Havant		Title: Validation Sample Location Plan (November 2022)	
Client: Vistry Southern		Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net	
Ref No: GE21752	Revision: v3		
Drawn: WP/FG	Date: 11/11/2022		
Figure: 5	Scale: Not To Scale		
		 Geo-Environmental	



Project:	Bartons Rise, Havant			Title	Building Control sign off dates	
Client:	Vistry Southern			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net	 Geo-Environmental	
Ref No:	GE21752	Revision:	1			
Drawn:	FG	Date:	04/04/2023			
Figure:	6	Scale:	Not To Scale			



APPENDIX A

Topsoil/Subsoil Delivery Records Spreadsheet



Ticket	Ext ref	Quarry	Company	Customer	Customer order	Reg	Haulier	Material	Date and Time	Weight	
Material: BS3882 20mm Screened Soil											
	924458	350226	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/KN/0289	WR64VRW	BS3882 20mm Screened Soil	6/21/17 7:20:00	18,860.00	
	924459	350227	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/KN/0289	WR64VRW	BS3882 20mm Screened Soil	6/21/17 11:12:00	18,980.00	
	924461	350228	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/KN/0289	WR64VRW	BS3882 20mm Screened Soil	6/21/17 15:49:00	18,800.00	
	925247	350244	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203 / KN / 0291	WR64VRW	BS3882 20mm Screened Soil	6/28/17 7:20:00	19,100.00	
	926490	348209	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203 / KN / 0298	WR64VRW	BS3882 20mm Screened Soil	7/7/17 7:20:00	19,000.00	
	962506	357156	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	.	WR64VRW	BS3882 20mm Screened Soil	2/7/18 11:34:00	19,040.00	
	979032	359532	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	.	WR64VRW	BS3882 20mm Screened Soil	5/9/18 7:20:00	18,900.00	
	981949	02904	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	.	WOODMACE 1	WOODMACE PLANT LIMITED	5/15/18 7:20:00	18,500.00	
	1010872	383031	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/ER/1028	WU65NRK	BS3882 20mm Screened Soil	11/2/18 8:44:00	18,700.00	
	1015288	383435	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203 / ER / 0140	WR64VRW	BS3882 20mm Screened Soil	11/22/18 12:43:00	19,240.00	
	1018067	401355	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203 / ER / 0148	WR64VRW	BS3882 20mm Screened Soil	12/4/18 15:36:00	19,120.00	
	1020888	401386	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/ER/0155	WR64VRW	BS3882 20mm Screened Soil	12/14/18 7:20:00	18,740.00	
	1024565	397646	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/ER/0160	WR64VRT	BS3882 20mm Screened Soil	1/10/19 7:20:00	19,100.00	
	1024566	397647	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/ER/0160	WR64VRT	BS3882 20mm Screened Soil	1/10/19 11:12:00	18,900.00	
	1026659	400797	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/ER/0167	WR64VRU	BS3882 20mm Screened Soil	1/21/19 7:20:00	18,980.00	
	1026660	400799	Eco Hurn	DIS	P. J. Brown (Construction) Ltd	G203/ER/0167	WR64VRU	BS3882 20mm Screened Soil	1/21/19 12:08:00	18,820.00	
					Total for BS3882 20mm Screened Soil					302,780.00	
Material: BS3882 Screened Soil											
	925251	350247	Rookery	WS	P. J. Brown (Construction) Ltd	G203 / KN / 0291	WR64VRW	BS3882 Screened Soil	6/28/17 14:49:00	19,180.00	
	940917	352599	Rookery	WS	P. J. Brown (Construction) Ltd	g203-rm0452	WX17 WXF	BS3882 Screened Soil	10/10/17 7:44:00	18,200.00	
	942811	336882	Rookery	WS	P. J. Brown (Construction) Ltd	G203 / ER / 0458	WX17 WXC	BS3882 Screened Soil	10/18/17 7:19:00	18,540.00	
	942854	336883	Rookery	WS	P. J. Brown (Construction) Ltd	G203 / ER / 0458	WX17 WXC	BS3882 Screened Soil	10/18/17 9:15:00	18,920.00	
	944582	54827	Rookery	WS	P. J. Brown (Construction) Ltd	G203 / ER / 0458	SIBLEY	Sibley Material Movements Ltd	10/23/17 7:20:00	19,840.00	
	943963	351952	Rookery	WS	P. J. Brown (Construction) Ltd	G203 / ER / 0458	WX17 WXC	BS3882 Screened Soil	10/24/17 7:49:00	18,700.00	
	945300	351927	Rookery	WS	P. J. Brown (Construction) Ltd	BARTON ROAD	WX17 WXF	BS3882 Screened Soil	10/31/17 8:58:00	18,760.00	
	945417	351929	Rookery	WS	P. J. Brown (Construction) Ltd	BARTON ROAD	WX17 WXF	BS3882 Screened Soil	10/31/17 11:32:00	19,700.00	
	952570	368743	Rookery	WS	P. J. Brown (Construction) Ltd	G203	WU65NRK	BS3882 Screened Soil	12/1/17 9:46:00	19,020.00	
	952571	368744	Rookery	WS	P. J. Brown (Construction) Ltd	G203	WU65NRK	BS3882 Screened Soil	12/1/17 11:28:00	19,020.00	
	983567	359340	Rookery	WS	P. J. Brown (Construction) Ltd	Barton Road	WX17 WXC	BS3882 Screened Soil	6/6/18 10:16:00	19,140.00	
	984795	232650	Rookery	WS	P. J. Brown (Construction) Ltd	Barton Road	WALTET 2	Waltet Materials Limited	6/7/18 9:02:00	19,320.00	
	985170	362988	Rookery	WS	P. J. Brown (Construction) Ltd	.	WU65NRE	BS3882 Screened Soil	6/13/18 10:56:00	19,200.00	
	985171	362989	Rookery	WS	P. J. Brown (Construction) Ltd	.	WU65NRE	BS3882 Screened Soil	6/13/18 13:23:00	19,200.00	
	985172	362990	Rookery	WS	P. J. Brown (Construction) Ltd	.	WU65NRE	BS3882 Screened Soil	6/13/18 15:05:00	19,200.00	
	1006188	2837	Rookery	WS	P. J. Brown (Construction) Ltd	g203/er/0110	MX10BCF	Minerals & Materials (UK) Ltd	9/27/18 9:16:00	17,680.00	
	1005120	379706	Rookery	WS	P. J. Brown (Construction) Ltd	G203/ER/0116	WU65NRL	BS3882 Screened Soil	10/3/18 8:42:00	17,960.00	
					Total for BS3882 Screened Soil					321,580.00	



APPENDIX B

Topsoil/Subsoil Pre-import Analysis





TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Justin Dampney
Eco Sustainable Solutions Ltd
Chapel Lane
Parley
Christchurch
Dorset BH6 5AD

18th May 2017
Our Ref: TOHA/17/7144/2/SS
Your Ref: 86PPW

Dear Sirs

Topsoil Analysis Report: Parley –15-20mm Enriched Soil

We have completed the analysis of the soil sample recently submitted, referenced *15-20mm Enriched Soil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation for testing or waste designation purposes, especially after the topsoil has left the Eco Sustainable Solutions site.

SAMPLE EXAMINATION

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous LOAMY SAND, with a weakly developed, fine to medium granular structure*. The sample was slightly stony with stones up to 24mm in size and contained occasional organic fines and woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis (sand, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The stone content of the sample was low and, as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.8). This pH value would be considered suitable for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1: Notes 3 and 4*, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with home grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline loamy sand with a weakly-developed structure and low stone content. The sample was adequately supplied with organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided the physical condition of the soil is satisfactory and plant species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, seeding and turfing.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

RECOMMENDATIONS

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015*.

Further guidance on the management, preparation and handling of soils is provided in the DEFRA publication *Construction code of practice for the sustainable use of soils on construction sites*.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully


Ruth Flower
BSc
Graduate Soil Scientist


Laura Hathaway-Jenkins
BSc MSc EngD MSoilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Eco Sustainable Solutions Ltd
Project:	Parley
Job:	Topsoil Analysis - BS3882:2015
Date:	18/05/2017
Job Ref No:	TOHA/17/7144/2/SS

Sample Reference		
		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	---	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benz(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos	ND/D	ISO 17025
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LS = LOAMY SAND

Visual Examination

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous LOAMY SAND with a weakly developed, fine to medium granular structure. The sample was slightly stony with stones up to 24mm in size and contained occasional organic fines and woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

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15-20mm Enriched Soil

8
11
81
LS
12
1
0

7.8
1104
2807
5.7
6.0
0.24
15
37
618
103

5
0.2
9.7
< 4.0
28
40
< 0.3
6
< 1.0
80
1
< 1
< 1

< 0.05
< 0.05
< 0.05
< 0.05
0.26
< 0.05
0.57
0.46
0.30
0.32
0.39
0.2
0.28
0.2
< 0.05
0.28
3.3

< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 8.0
50
57
< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 10
35
43

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Not-detected

Ruth Flower
BSc
Graduate Soil Scientist



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Justin Dampney
Eco Sustainable Solutions Ltd
Chapel Lane
Parley
Christchurch
Dorset BH6 5AD

13th July 2017
Our Ref: TOHA/17/7225/2/SS
Your Ref: 212PPW

Dear Sirs

Topsoil Analysis Report: Parley – 15-20mm Enriched Soil

We have completed the analysis of the soil sample recently submitted, referenced *15-20mm Enriched Soil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation for testing or waste designation purposes, especially after the topsoil has left the Eco Sustainable Solutions site.

SAMPLE EXAMINATION

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous LOAMY SAND with a weakly developed, fine to medium granular structure*. The sample was slightly stony and contained frequent woody fragments and organic fines. No unusual odours, deleterious materials, roots or rhizomes or pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis (sand, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The stone content of the sample was low and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.8). This pH value would be considered suitable for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with home grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline, slightly calcareous loamy sand with a weakly-developed structure and low stone content. The sample was adequately supplied with organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample **would** be considered suitable for general landscape purposes provided species with a wide pH tolerance or **those known** to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015*.

Further guidance on the management, preparation and handling of soils is provided in the DEFRA publication *Construction code of practice for the sustainable use of soils on construction sites*, 2009.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Ruth Flower
BSc
Graduate Soil Scientist



Ceri Spears
BSc MSc MSoilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Eco Sustainable Solutions Ltd
Project:	Parley
Job:	Topsoil Analysis - BS3882:2015
Date:	13/07/2017
Job Ref No:	TOHA/17/7225/2/SS

Sample Reference		
		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	--	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benz(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos	ND/D	ISO 17025
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15-20mm Enriched Soil

6
8
86
LS
9
0
0

7.8
1081
2676
6.3
5.3
0.16
19
31
451
77

6
< 0.2
9.6
< 4.0
27
48
< 0.3
7.1
< 1.0
63
0.7
< 1
< 1

< 0.05
< 0.05
< 0.05
< 0.05
0.34
< 0.05
0.52
0.43
0.27
0.22
0.29
0.18
0.27
0.18
< 0.05
0.23
2.9

< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 8.0
39
44
< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 10
23
30

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Not-detected

LS = LOAMY SAND

Visual Examination

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous LOAMY SAND with a weakly developed, fine to medium granular structure. The sample was slightly stony and contained frequent woody fragments and organic fines. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Ruth Flower
BSc
Graduate Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with

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TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Patryk Wylecial
Eco Sustainable Solutions Ltd
Chapel Lane
Parley
Christchurch
Dorset BH6 5AD

20th February 2018
Our Ref: TOHA/18/7483/2/SS
Your Ref: 909PPW

Dear Sirs

Topsoil Analysis Report: Parley – 15-20mm Enriched Soil

We have completed the analysis of the soil sample recently submitted, referenced *15-20mm Enriched Soil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation for planning or waste designation purposes, especially after the topsoil has left the Eco Sustainable Solutions Site.

SAMPLE EXAMINATION

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous, LOAMY SAND with a weakly developed, fine to medium sub-angular structure*. The sample was moderately stony and contained occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

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ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis (sand, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The stone content of the sample was moderate and, as such, stones are unlikely to constitute a limitation for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.1). This pH value would be considered suitable for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with home grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, slightly calcareous loamy sand with a weakly developed structure and moderate stone content. The sample contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample **would be considered** suitable for general landscape purposes provided species with a wide pH tolerance or **those known** to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The topsoil was also fully compliant with the requirements of the **British Standard** for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015*.

Further guidance on the management, preparation and handling of soils is provided in the DEFRA publication *Construction code of practice for the sustainable use of soils on construction sites*, 2009.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Matthew Heins
BSc (Hons)
Soil Scientist



Laura Hathaway-Jenkins
BSc MSc EngD MISOilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Eco Sustainable Solutions Ltd
Project:	Parley
Job:	Topsoil Analysis - BS3882:2015
Date:	20/02/2018
Job Ref No:	TOHA/18/7483/2/SS

Sample Reference		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	--	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benz(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos	ND/D	ISO 17025
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LS = LOAMY SAND

Visual Examination

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous, LOAMY SAND with a weakly developed, fine to medium sub-angular structure. The sample was moderately stony and contained occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

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15-20mm Enriched Soil

8
8
84
LS
14
2
0

8.1
1188
2684
5.0
7.7
0.27
17
45
563
94

7
0.2
28
< 4.0
28
87
< 0.3
13
< 1.0
100
2.7
< 1
< 1

< 0.05
< 0.05
< 0.05
< 0.05
0.34
0.13
1.10
1.00
0.65
0.64
1.10
0.47
0.87
0.49
< 0.05
0.46
7.2

< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 8.0
41
45
< 0.001
< 0.001
< 0.001
2.3
5.6
22
92
120

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Not-detected

Matthew Heins
BSc (Hons)
Soil Scientist



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Justin Dampney
Eco Sustainable Solutions Ltd
Chapel Lane
Parley
Christchurch
Dorset BH6 5AD

11th May 2018
Our Ref: TOHA/18/7580/2/SS
Your Ref: 1178PPW

Dear Sirs

Topsoil Analysis Report: Parley – 15-20mm Enriched Soil

We have completed the analysis of the soil sample recently submitted, referenced *15-20mm Enriched Soil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation for planning or waste designation purposes, especially after the topsoil has left the Eco Sustainable Solutions Site.

SAMPLE EXAMINATION

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous, SANDY LOAM with a weakly developed, medium to coarse granular structure*. The sample was slightly stony and contained organic fines and woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis (sand, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *sandy loam* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The stone content of the sample was moderate and, as such, stones are unlikely to constitute a limitation for general landscape purposes. However, it may be prudent to reduce a proportion of the larger stones by raking, picking, burying or screening, should the soil be used for amenity grass areas or sports pitches.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.9). This pH value would be considered suitable for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1: Notes 3 and 4*, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with home grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a "fine, non-saline, slightly calcareous sandy loam with a weakly developed structure and moderate stone content. The sample contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample **would be** considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The topsoil was fully compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

RECOMMENDATIONS

Stone Removal

To reduce the stone content for *informal* and *formal recreation* end uses (Annex A.4 of *BS3882:2015*), it may be prudent to remove a portion of the larger stones (>20mm) by intensive picking, raking, burying or screening prior to seeding or turfing.

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, respreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

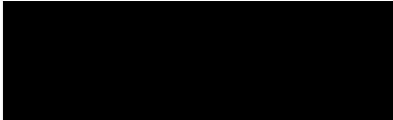
It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015*.

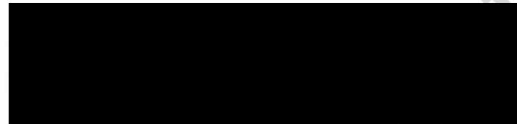
Further guidance on the management, preparation and handling of soils is provided in the DEFRA publication *Construction code of practice for the sustainable use of soils on construction sites*, 2009.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Matthew Heins
BSc (Hons)
Soil Scientist



Laura Hathaway-Jenkins
BSc MSc EngD MISOilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Eco Sustainable Solutions Ltd
Project:	Parley
Job:	Topsoil Analysis - BS3882:2015
Date:	11/05/2018
Job Ref No:	TOHA/18/7580/2/SS

Sample Reference		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	--	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benz(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos	ND/D	ISO 17025
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SL = SANDY LOAM

Visual Examination

The sample was described as a very dark grey (Munsell colour 10YR 3/1), moist, friable, slightly calcareous, SANDY LOAM with a weakly developed, medium to coarse granular structure. The sample was slightly stony and contained organic fines and woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

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15-20mm Enriched Soil

10
12
78
SL
16
6
0

7.9
1126
2838
5.9
8.3
0.29
17
73
1007
125

5
< 0.2
21
< 4.0
24
58
0.3
8
< 1.0
94
2.4
< 1
< 1

< 0.05
< 0.05
< 0.05
< 0.05
0.24
0.22
0.68
0.65
0.31
0.32
0.53
0.12
0.35
0.19
< 0.05
0.25
3.9

< 0.001
< 0.001
< 0.001
< 1.0
2.2
8.5
60
71
< 0.001
< 0.001
< 1.0
9.1
27
120
150

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Not-detected

Matthew Heins
BSc (Hons)
Soil Scientist

TEST REPORT

Raymond Brown Minerals & Recycling
Lee Lane
Nursling
SO16 0AD

Certificate No.	117/3301
Date received	15/05/17
Ref.	RB/117/3301

1st June 2017

Re. Analysis of a Soil Sample Ref. R100-1133

Customer Reference		R100-1133	Multipurpose Topsoil		Specific purpose/ Acidic		Specific purpose/ Low Fertility		Specific purpose/ Calcareous	
MSS Reference		117-3301	Limits	Complies	Limits	Complies	Limits	Complies	Limits	Complies
Moisture	%	15	-	-	-	-	-	-	-	-
CN Ratio	C/N	14.8/1	<20:1	Y	<20:1	Y	<20:1	Y	<20:1	Y
Clay Content	%	13	5-35	Y	5-35	Y	5-35	Y	5-35	Y
Visible Contaminants >2 mm	%	0	<0.5	Y	<0.5	Y	<0.5	Y	<0.5	Y
Electrical Conductivity (Topsoil)	µS/cm	2300	-	-	-	-	-	-	-	-
Silt Content	%	19	0-65	Y	0-65	Y	0-65	Y	0-65	Y
Visible Contaminants Plastics	%	0	<0.5	Y	<0.5	Y	<0.5	Y	<0.5	Y
Sand Content	%	68	30-85	Y	30-85	Y	30-85	Y	30-85	Y
Visible Contaminants Man-Made Sharps	%	0	0	Y	0	Y	0	Y	0	Y
Soil Texture Class		Sandy Loam								
pH		7.5	5.5-8.5	Y	3.5-5.5	N	3.5-9.0	Y	7.5-9	Y
Stones >2mm	%	30	0-30	Y	0-30	Y	0-30	Y	0-30	Y
Stones >20mm	%	< 0.020	0-10	Y	0-10	Y	0-10	Y	0-10	Y
Stones >50mm	%	< 0.020	0	Y	0	Y	0	Y	0	Y
Nitrogen (Total)	%	0.31	≥0.15	Y	≥0.15	Y	<0.1	N	≥0.15	Y
Carbonate	%	<0.10	-		-		-		<1	Y
Extractable Potassium	mg/l	320	121-900	Y	121-900	Y	<120	N	121-900	Y
Extractable Magnesium	mg/l	95	51-600	Y	51-600	Y	<600	Y	51-600	Y
Available Calcium	mg/l	3000								
Available Sodium	mg/l	65	<15%	Y	<15%	Y	<15%	Y	<15%	Y
Extractable Phosphorus	mg/l	72	16-100	Y	16-100	Y	<15	N	16-100	Y
Copper (Nitric Acid)	mg/kg	20	<200	Y	<200	Y	<200	Y	<200	Y
Nickel (Nitric Acid)	mg/kg	6.2	<110	Y	<110	Y	<110	Y	<110	Y
Zinc (Nitric Acid)	mg/kg	50	<300	Y	<300	Y	<300	Y	<300	Y
Loss on Ignition	%	7.8	3-20	Y	3-30	Y	1-10	Y	3-30	Y

Reported by: J Fursman
Position: Director
For/on behalf of Marchwood Scientific Services Ltd.



APPENDIX C

Photographic Records (Plots 7-12 & 19-27)





Plate 1 Plot 7 geo-grid and membrane beneath subsoil



Plate 2 Plot 7 confirmation of soil cover depth



Plate 3 Plot 8 confirmation of soil cover depth

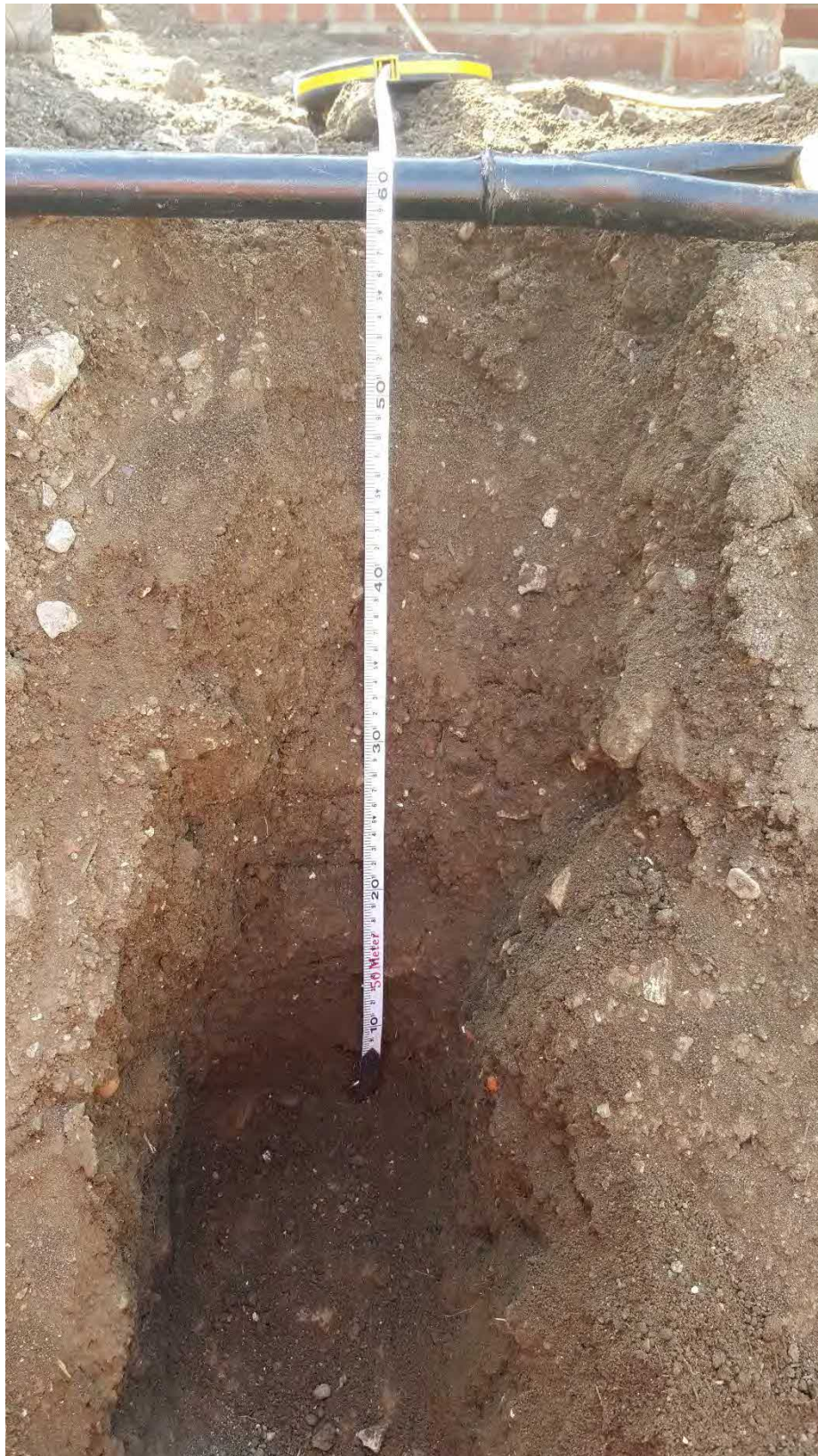


Plate 4 Plot 9 confirmation of soil cover depth



Plate 5 Plot 10 geo-grid and membrane beneath subsoil



Plate 6 Plot 10 confirmation of soil cover depth

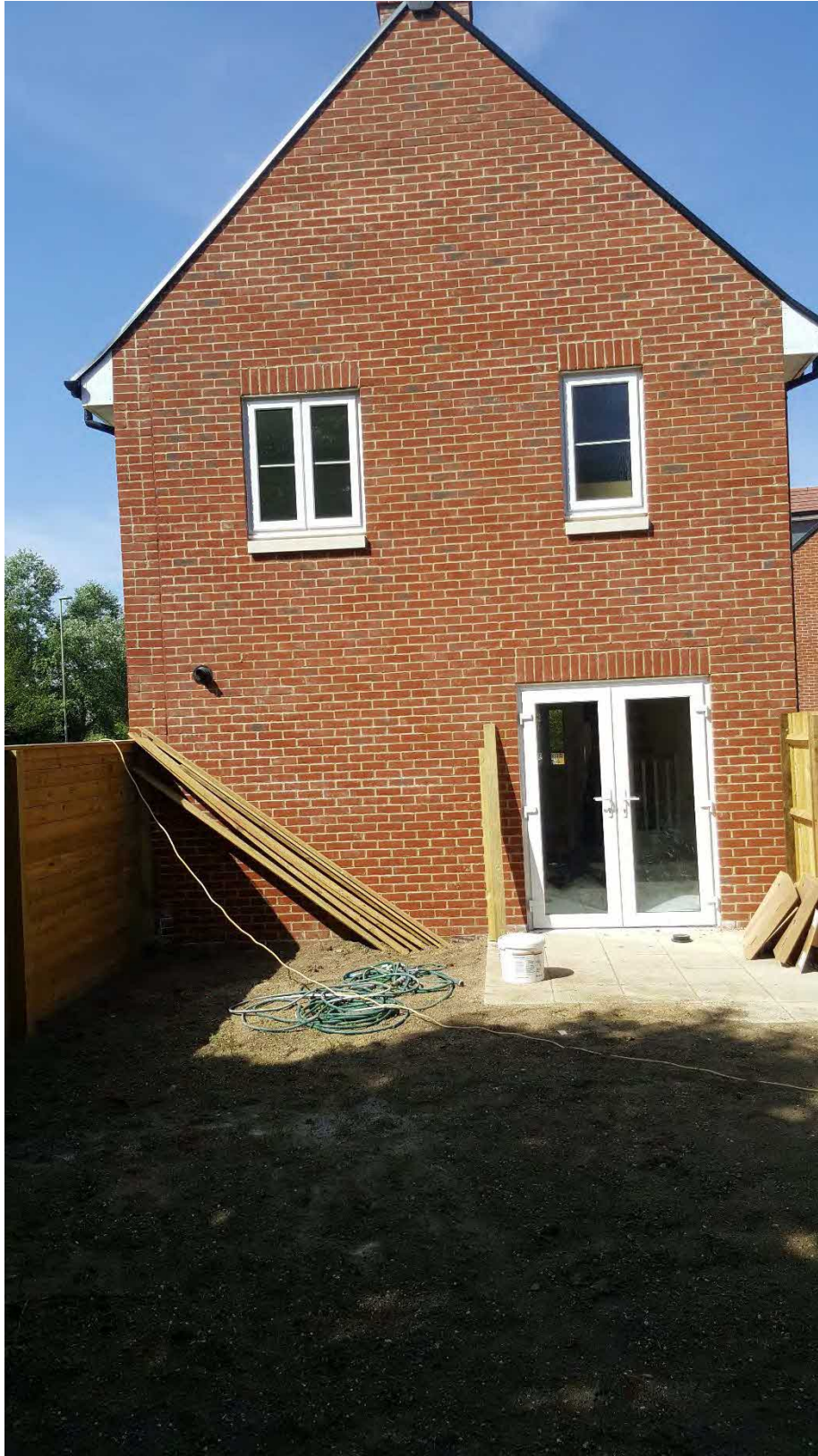


Plate 7 View of rear garden area of Plot 19

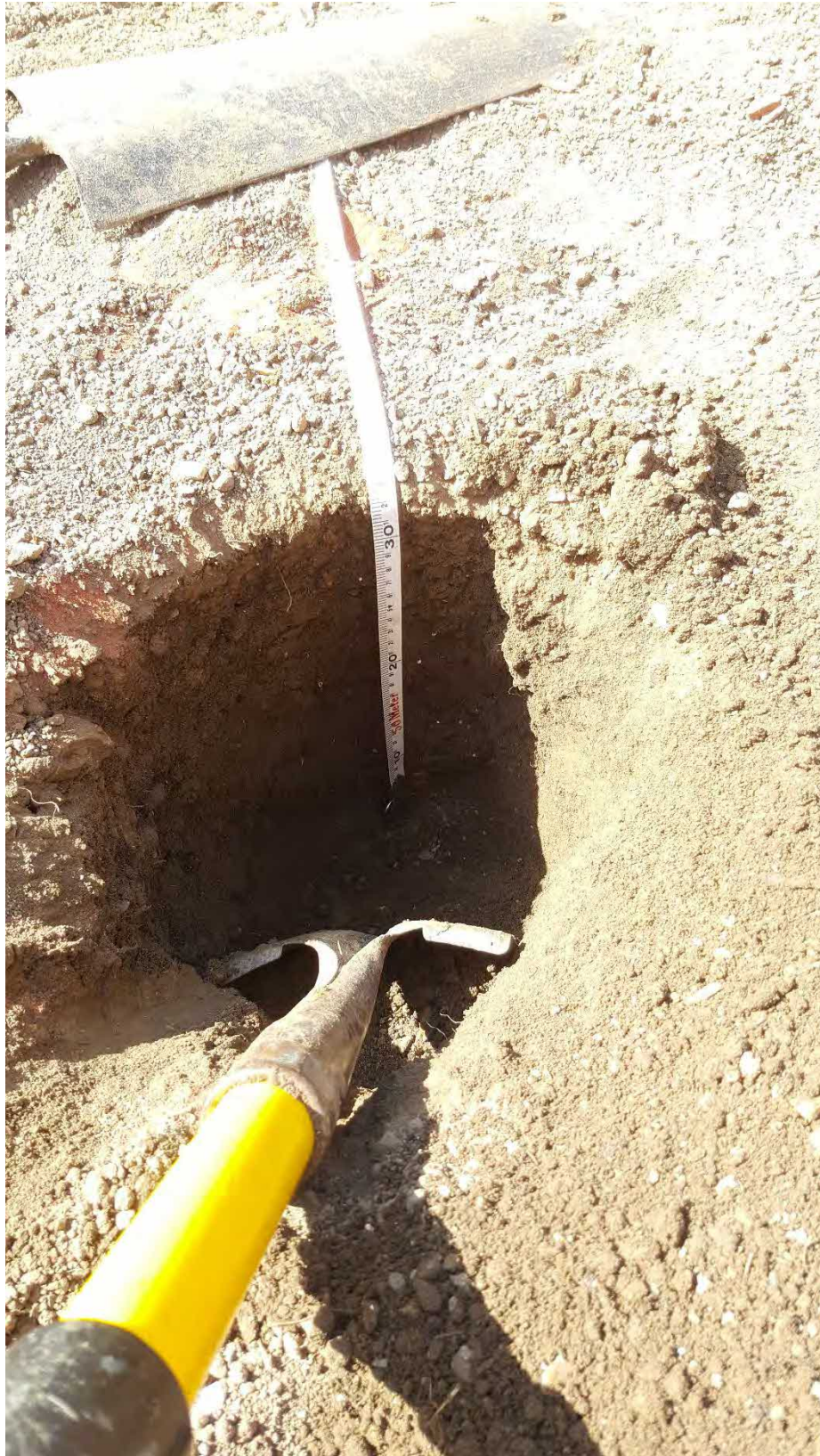


Plate 8 Plot 19 confirmation of soil cover depth



Plate 9 View of rear garden area of Plot 20



Plate 10 Plot 20 confirmation of soil cover depth



Plate 11 View of the rear garden area of Plot 21



Plate 12 Plot 21 confirmation of soil cover depth

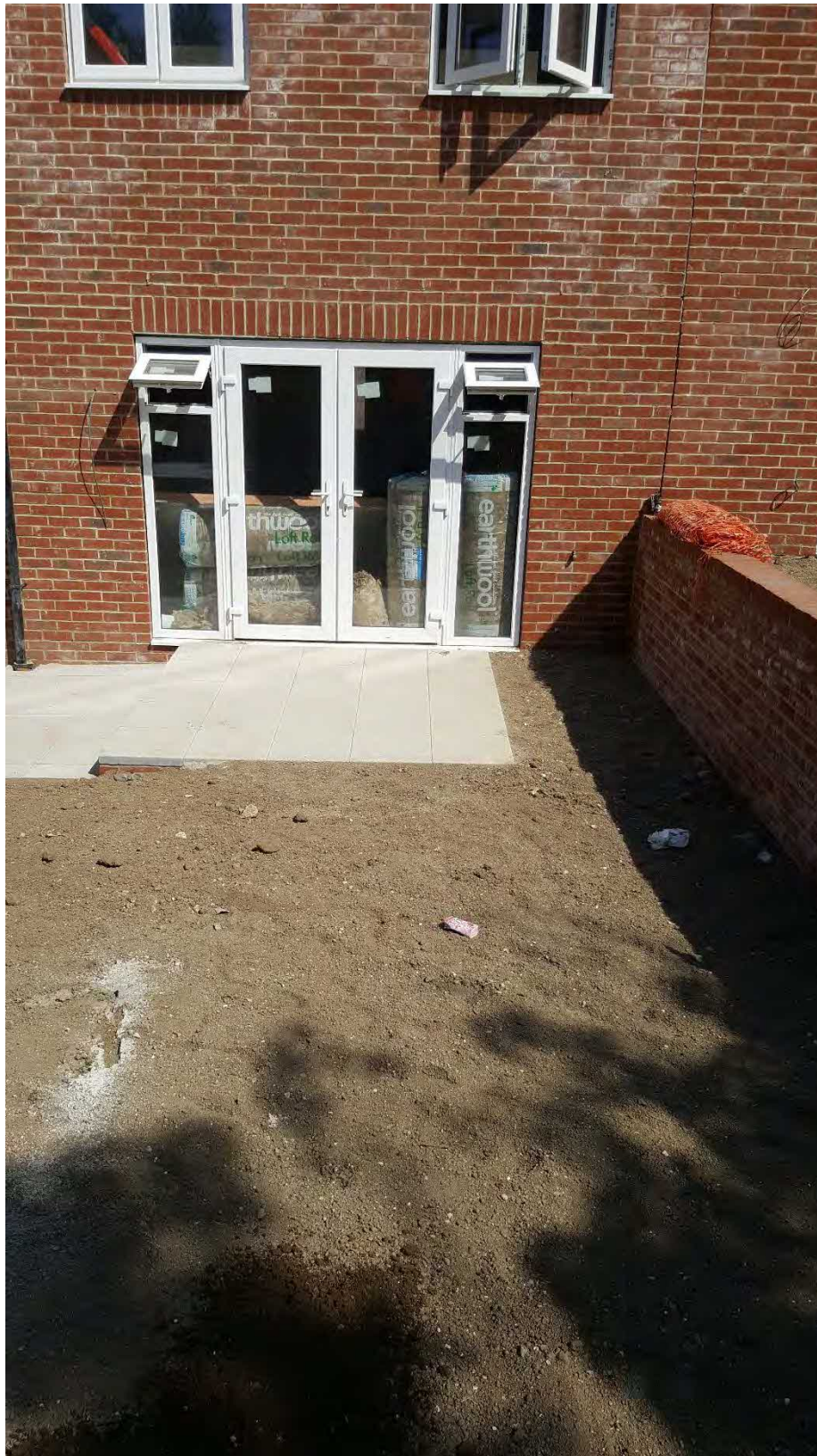


Plate 13 View of the rear garden of Plot 22



Plate 14 Plot 22 confirmation of soil cover depth



Plate 15 View of rear garden of Plot 23



Plate 16 Plot 23 confirmation of soil cover depth



Plate 17 Plot 24 reduce dig and installation of Topsoil



Plate 18 Reduced dig undertaken across Plots 13-16



Plate 19 Completed rear garden areas of Plots 20-23



Plate 20 Reduced dig undertaken across Plots 24-27



Plate 21 Reduced dig undertaken across Plots 24-27



Plate 22 Reduced dig undertaken across Plots 24-27

APPENDIX D

Photographic Records (Plots 1-6, 13-14, 17-18, 25-29, 31, 33, & 36-37)





Plate 1 Plot 1-6 Pit between flats and Bartons Road



Plate 2 Plot 1-6 Pit between flats and railway cutting boundary



Plate 3 Plot 1-6 Pit beside parking to rear of flats



Plate 4 Plot 13



Plate 5 Plot 14



Plate 6 Plot 17



Plate 7 Plot 18 Geogrid beneath Subsoil and Topsoil



Plate 8 Plot 18 Topsoil



Plate 9 Plot 25



Plate 10 Plot 26



Plate 11 Plot 27



Plate 12 Plot 28



Plate 13 Plot 29



Plate 14 Plot 31



Plate 15 Plot 33



Plate 16 Plot 36



Plate 17 Plot 37



Plate 18 Plot 37

APPENDIX E

Exploratory Hole Logs (Plots 1-6, 13-14, 17-18, 25-29, 31, 33, & 36-37)



Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.20	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.15	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.20	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.10	
				0.35	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.15	
				0.35	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.30)	
				0.30	
				0.55	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.30)	
				0.30	
				(0.30)	
				0.60	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.25 0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.30) 0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.40) 0.40 0.50	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.20 0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.20 0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.30) 0.30 0.35	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				0.25	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.30) 0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.40) 0.40 0.45	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
				(0.30) 0.30 0.35	



APPENDIX F

Exploratory Hole Logs with Photos (Plots 1-6, 14, 18-19, 21, 28, 54)



Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.10	ES1			0.15	
0.30	ES2			0.30	

Samples & In Situ Testing					Strata Details
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.10	ES1			0.14	
0.30	ES2			0.39	

Samples & In Situ Testing					Strata Details
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.10	ES1			(0.30)	
				0.30	
0.50	ES2			0.50	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.10	ES1			0.15	
0.30	ES2			0.40	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.20	ES1			0.15	
0.45	ES2			0.40 0.50	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.10	ES1			0.10	
0.30	ES2			0.20	
				0.30	

Samples & In Situ Testing						Strata Details							
Depths		Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend							
0.20		ES1			0.25								
0.45		ES2			0.45								

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.05	ES1			0.10	
0.30	ES2			0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.20	ES1			0.20	
0.40	ES2			0.35 0.45	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.05	ES1			0.10	
0.20	ES2			0.30	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.20	ES1			(0.30)	
				0.30	
0.45	ES2			0.45	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.10	ES1			(0.30)	
0.40	ES2			0.30 0.40	

Samples & In Situ Testing			Strata Details		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend
0.20	ES1			0.20	
0.35	ES2			0.35	

[illegible]



APPENDIX G

Independent Geochemical Laboratory Test Results





Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618

cs@elab-uk.co.uk
info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 22-44702

Issue: 1

Date of Issue: 29/11/2022

Contact: Will Purslow

Customer Details: GESL
Unit 7
Danworth Farm
Hurstpierpoint
West Sussex BN6 9GL

Quotation No: Q22-02720

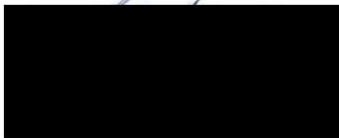
Order No: PO-5928

Customer Reference: GE21022

Date Received: 15/11/2022

Date Approved: 29/11/2022

Details: Bartons Rise, Havant

Approved by: 

Tim Reeve, Quality Officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 22-44702, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
301815	TS - FG 0.10	09/11/2022	15/11/2022		
301816	TS01 0.10	09/11/2022	15/11/2022	Silty loam	
301817	TS01 0.30	09/11/2022	15/11/2022	Sandy silty loam	
301818	TS03 0.10	09/11/2022	15/11/2022	Silty loam	
301819	TS03 0.50	09/11/2022	15/11/2022	Sandy silty loam	
301820	TS04 0.10	09/11/2022	15/11/2022	Sandy silty loam	
301821	TS04 0.30	09/11/2022	15/11/2022	Silty loam	
301822	TS05 0.20	09/11/2022	15/11/2022	Sandy silty loam	
301823	TS05 0.45	09/11/2022	15/11/2022	Silty clayey loam	
301824	TS06 0.10	09/11/2022	15/11/2022	Sandy silty loam	
301825	TS06 0.30	09/11/2022	15/11/2022	Silty clayey loam	
301826	TS07 0.20	09/11/2022	15/11/2022	Sandy silty loam	
301827	TS07 0.45	09/11/2022	15/11/2022	Silty loam	
301828	TS08 0.05	09/11/2022	15/11/2022	Sandy silty loam	
301829	TS08 0.30	09/11/2022	15/11/2022	Sandy silty loam	
301830	TS09 0.20	09/11/2022	15/11/2022	Sandy silty loam	
301831	TS09 0.40	09/11/2022	15/11/2022	Silty clayey loam	
301832	TS10 0.05	09/11/2022	15/11/2022	Sandy silty loam	
301833	TS10 0.20	09/11/2022	15/11/2022	Silty loam	
301834	TS11 0.20	09/11/2022	15/11/2022	Sandy silty loam	
301835	TS11 0.45	09/11/2022	15/11/2022	Silty loam	
301836	TS12 0.10	09/11/2022	15/11/2022	Sandy silty loam	
301837	TS12 0.40	09/11/2022	15/11/2022	Sandy silty loam	
301838	TS13 0.20	09/11/2022	15/11/2022	Sandy silty loam	
301839	TS13 0.35	09/11/2022	15/11/2022	Sandy silty loam	
301840	TS14 0.10	09/11/2022	15/11/2022	Silty loam	
301841	TS14 0.40	09/11/2022	15/11/2022	Silty loam	
301842	TS-POS 0.10	09/11/2022	15/11/2022		
301843	TS-POS 0.30	09/11/2022	15/11/2022		



2683



Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301816	301817	301818	301819	301820	301821	301822	301823	301824
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS01	TS01	TS03	TS03	TS04	TS04	TS05	TS05	TS06
Sample Depth (m)	0.10	0.30	0.10	0.50	0.10	0.30	0.20	0.45	0.10
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
Soil sample preparation parameters												
Moisture Content	N	%	0.1	26.8	12.1	18.9	15.0	15.7	14.3	15.5	21.0	16.8
Material removed	N	%	0.1	< 0.1	31.5	31.3	39.8	33.1	39.1	37.9	37.0	29.7
Description of Inert material removed	N		0	None	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Metals												
Arsenic	M	mg/kg	1	9.7	10.0	10.8	8.7	12.0	9.3	12.8	9.0	9.4
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	31.5	37.8	102	36.9	50.7	29.6	42.9	102	32.8
Copper	M	mg/kg	5	34.3	42.6	47.0	35.5	43.6	34.5	24.5	40.4	25.3
Lead	M	mg/kg	5	73.3	130	129	89.6	98.1	79.2	33.5	111	64.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	17.3	17.1	21.2	14.4	23.7	14.6	15.9	15.5	12.7
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	30.7	27.9	33.6	33.4	46.8	27.9	64.9	31.1	28.3
Zinc	M	mg/kg	5	109	129	138	113	140	115	67.7	107	83.4
Anions												
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40	138	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.02	0.07	< 0.02	0.04	0.02	0.11	0.09	0.05	0.03
Inorganics												
Carbonate	N	%	0.1	4.7	8.2	3.2	4.8	5.3	7.2	7.7	3.4	6.5
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.05	0.08	0.05	0.07	0.04	0.09	0.27	0.05	0.05
Water Soluble Boron	N	mg/kg	0.5	0.9	1.1	1.0	1.0	0.9	1.1	1.0	1.2	1.0

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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301816	301817	301818	301819	301820	301821	301822	301823	301824
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS01	TS01	TS03	TS03	TS04	TS04	TS05	TS05	TS06
Sample Depth (m)	0.10	0.30	0.10	0.50	0.10	0.30	0.20	0.45	0.10
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
Miscellaneous												
Electrical Conductivity (CaSO4 extract)	N	uS/cm	50	1770	1770	1710	1780	1720	1840	1770	1660	1790
Carbon Nitrogen Ratio	N	ratio	0.1	16.0895	n/t	17.6728	n/t	15.4671	n/t	18.9725	n/t	17.7898
Loss on Ignition	M	%	0.01	7.96	3.11	4.48	3.59	5.60	3.60	6.18	3.43	4.51
pH	M	pH units	0.1	7.4	9.3	8.5	8.4	8.3	8.8	11.4	9.3	8.8
Density	N	g/ml	0	1.15	1.16	1.13	1.22	1.22	1.10	1.13	1.14	1.14
Soil Organic Matter	U	%	0.1	n/t	1.8	n/t	2.3	n/t	2.2	n/t	1.6	n/t
Total Carbon	N	%	0.01	4.6	n/t	2.6	n/t	3.2	n/t	3.6	n/t	2.6
Total Organic Carbon	N	%	0.01	2.4	0.80	1.6	1.3	2.0	1.1	2.2	0.69	1.4
Total Nitrogen	N	%	0.01	0.29	n/t	0.15	n/t	0.21	n/t	0.19	n/t	0.15
Extractable Potassium	N	mg/l	20	434	244	220	257	291	354	170	215	429
Extractable Magnesium	N	mg/l	20	104	56	97	93	90	129	100	245	134
Extractable Phosphate	N	mg/l	1	137	n/t	116	n/t	149	n/t	142	n/t	151
Extractable Calcium	N	mg/l	20	n/t	5710	n/t	5160	n/t	5640	n/t	6380	n/t
Extractable Sodium	N	mg/l	20	n/t	28	n/t	34	n/t	24	n/t	33	n/t
Sand content	NS	%	1	55	47	43	37	54	52	64	32	63
Silt content	NS	%	1	31	35	39	42	32	32	24	41	25
Clay content	NS	%	1	15	18	19	21	14	16	12	27	12
Stones > 2mm	NS	%	1	29	44	16	53	29	28	21	25	24
Stones > 20mm	NS	%	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Stones > 50mm	NS	%	1	< 1	n/t	< 1	n/t	< 1	n/t	< 1	n/t	< 1
Stones > 75mm	NS	%	1	n/t	< 1	n/t	< 1	n/t	< 1	n/t	< 1	n/t
Total Visible Contaminants	N	%	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Plastics	N	%	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sharps	N	n/kg	0	0	0	0	0	0	0	0	0	0

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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301816	301817	301818	301819	301820	301821	301822	301823	301824
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS01	TS01	TS03	TS03	TS04	TS04	TS05	TS05	TS06
Sample Depth (m)	0.10	0.30	0.10	0.50	0.10	0.30	0.20	0.45	0.10
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
Phenols												
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons												
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	0.2	0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.3	0.3	0.2	0.5	0.2	0.4	0.6	< 0.1	0.2
Pyrene	M	mg/kg	0.1	0.2	0.3	0.2	0.4	0.2	0.3	0.5	< 0.1	0.2
Benzo(a)anthracene	M	mg/kg	0.1	0.1	0.2	< 0.1	0.2	0.1	0.2	0.3	< 0.1	0.1
Chrysene	M	mg/kg	0.1	0.2	0.2	0.1	0.3	0.1	0.2	0.3	< 0.1	0.2
Benzo(b)fluoranthene	M	mg/kg	0.1	0.3	0.2	< 0.1	0.3	0.2	0.2	0.4	< 0.1	0.2
Benzo(k)fluoranthene	M	mg/kg	0.1	0.3	0.2	< 0.1	0.3	0.2	0.2	0.6	< 0.1	0.2
Benzo(a)pyrene	M	mg/kg	0.1	0.3	0.3	< 0.1	0.3	0.2	0.2	0.5	< 0.1	0.2
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	0.2	0.1	< 0.1	0.2	0.1	0.2	0.3	< 0.1	0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.3	0.2	< 0.1	0.2	0.1	0.2	0.5	< 0.1	0.1
Total PAH(16)	M	mg/kg	0.4	2.4	2.1	0.6	3.0	1.5	2.4	4.1	< 0.4	1.6



Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301816	301817	301818	301819	301820	301821	301822	301823	301824
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS01	TS01	TS03	TS03	TS04	TS04	TS05	TS05	TS06
Sample Depth (m)	0.10	0.30	0.10	0.50	0.10	0.30	0.20	0.45	0.10
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
BTEX												
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	U	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG												
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	2.7	< 1.0	< 1.0	1.7	1.6	< 1.0	2.9	< 1.0
>C35-C40 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	1.2	3.5	< 1.0	< 1.0	2.1	2.2	< 1.0	3.5	< 1.0
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic (EH_2D_AR)	M	mg/kg	1	6.8	8.8	1.6	< 1.0	8.7	12.0	2.4	11.3	2.9
>C35-C40 Aromatic (EH_2D_AR)	M	mg/kg	1	2.2	2.8	< 1.0	< 1.0	3.1	4.9	< 1.0	3.9	< 1.0
Total aromatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	10.4	12.6	2.3	1.2	12.6	18.3	3.5	16.2	4.4
Total petroleum hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_Total)	N	mg/kg	1	11.5	16.1	2.6	1.3	14.6	20.5	4.0	19.7	4.9



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Results Summary

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ELAB Reference	301825	301826	301827	301828	301829	301830	301831	301832	301833
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS06	TS07	TS07	TS08	TS08	TS09	TS09	TS10	TS10
Sample Depth (m)	0.30	0.20	0.45	0.05	0.30	0.20	0.40	0.05	0.20
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
Soil sample preparation parameters												
Moisture Content	N	%	0.1	21.3	16.2	17.3	17.2	15.1	17.1	18.8	15.7	14.8
Material removed	N	%	0.1	< 0.1	25.2	35.4	29.9	40.6	23.8	41.5	12.6	37.2
Description of Inert material removed	N		0	None	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Metals												
Arsenic	M	mg/kg	1	24.7	7.1	11.2	7.2	10.9	9.6	13.0	6.2	10.2
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	107	16.5	34.2	24.2	62.5	2340	1430	52.9	62.8
Copper	M	mg/kg	5	34.0	23.0	32.6	25.2	43.7	174	122	20.8	60.3
Lead	M	mg/kg	5	37.3	59.4	75.4	55.9	93.1	208	139	43.9	92.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.3	< 0.5
Nickel	M	mg/kg	5	37.3	8.9	20.5	10.5	20.4	113	90.1	7.5	20.4
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	80.5	18.2	45.4	24.8	48.6	30.5	62.0	23.4	38.5
Zinc	M	mg/kg	5	87.3	75.4	117	88.1	161	151	146	56.8	135
Anions												
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.04	0.02	0.04	< 0.02	0.09	0.02	0.04	< 0.02	0.08
Inorganics												
Carbonate	N	%	0.1	0.3	2.9	6.2	3.5	6.6	2.4	6.2	0.5	7.1
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	5	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%	0.02	0.03	0.04	0.06	0.03	0.10	0.05	0.07	0.03	0.09
Water Soluble Boron	N	mg/kg	0.5	0.7	0.9	1.1	1.0	1.4	0.7	1.0	0.8	1.1

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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301825	301826	301827	301828	301829	301830	301831	301832	301833
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS06	TS07	TS07	TS08	TS08	TS09	TS09	TS10	TS10
Sample Depth (m)	0.30	0.20	0.45	0.05	0.30	0.20	0.40	0.05	0.20
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
Miscellaneous												
Electrical Conductivity (CaSO4 extract)	N	uS/cm	50	1710	1720	1700	1740	1960	1710	1710	1750	1800
Carbon Nitrogen Ratio	N	ratio	0.1	n/t	17.1561	n/t	18.4581	n/t	20.6114	n/t	17.3706	n/t
Loss on Ignition	M	%	0.01	4.92	5.80	4.00	6.68	4.03	4.98	4.08	3.56	3.17
pH	M	pH units	0.1	8.6	8.4	8.8	8.3	8.9	8.4	8.4	8.1	8.4
Density	N	g/ml	0	1.18	1.15	1.20	1.26	1.23	1.27	1.14	1.20	1.16
Soil Organic Matter	U	%	0.1	0.9	n/t	2.7	n/t	2.6	n/t	2.1	n/t	2.3
Total Carbon	N	%	0.01	n/t	3.4	n/t	3.9	n/t	2.9	n/t	2.1	n/t
Total Organic Carbon	N	%	0.01	0.41	1.9	1.3	2.4	1.3	1.6	0.99	1.2	1.0
Total Nitrogen	N	%	0.01	n/t	0.20	n/t	0.21	n/t	0.14	n/t	0.12	n/t
Extractable Potassium	N	mg/l	20	323	149	256	198	451	175	238	170	225
Extractable Magnesium	N	mg/l	20	569	67	132	94	185	62	124	77	125
Extractable Phosphate	N	mg/l	1	n/t	127	n/t	138	n/t	72	n/t	117	n/t
Extractable Calcium	N	mg/l	20	7970	n/t	5840	n/t	6650	n/t	6100	n/t	5510
Extractable Sodium	N	mg/l	20	102	n/t	< 20	n/t	25	n/t	< 20	n/t	36
Sand content	NS	%	1	10	75	39	71	44	58	39	63	48
Silt content	NS	%	1	38	17	40	20	37	28	40	25	35
Clay content	NS	%	1	53	8	21	9	19	14	21	13	17
Stones > 2mm	NS	%	1	23	23	47	25	42	17	44	12	41
Stones > 20mm	NS	%	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Stones > 50mm	NS	%	1	n/t	< 1	n/t	< 1	n/t	< 1	n/t	< 1	n/t
Stones > 75mm	NS	%	1	< 1	n/t	< 1	n/t	< 1	n/t	< 1	n/t	< 1
Total Visible Contaminants	N	%	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Plastics	N	%	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sharps	N	n/kg	0	0	0	0	0	0	0	0	0	0



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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301825	301826	301827	301828	301829	301830	301831	301832	301833
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS06	TS07	TS07	TS08	TS08	TS09	TS09	TS10	TS10
Sample Depth (m)	0.30	0.20	0.45	0.05	0.30	0.20	0.40	0.05	0.20
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
Phenols												
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons												
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4	0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	0.2	0.1	0.2	0.8	0.4	0.2	0.2	0.2
Pyrene	M	mg/kg	0.1	< 0.1	0.2	0.1	0.2	0.7	0.4	0.1	0.2	0.2
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.1	< 0.1	< 0.1	0.4	0.2	< 0.1	0.1	0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	0.5	0.3	< 0.1	0.1	0.2
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	0.6	0.4	< 0.1	0.1	0.2
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1	0.7	0.3	< 0.1	0.1	0.2
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	0.9	0.3	< 0.1	0.1	0.2
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	0.6	0.3	< 0.1	< 0.1	0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1	0.6	0.3	< 0.1	< 0.1	0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	2.1	< 0.4	0.6	6.6	3.2	0.4	1.2	1.6



Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301825	301826	301827	301828	301829	301830	301831	301832	301833
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS06	TS07	TS07	TS08	TS08	TS09	TS09	TS10	TS10
Sample Depth (m)	0.30	0.20	0.45	0.05	0.30	0.20	0.40	0.05	0.20
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD									
BTEX												
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	U	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG												
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	1.1	< 1.0	2.2	6.6	1.2	1.9	< 1.0	1.8
>C35-C40 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	< 1.0	1.5	< 1.0	3.0	8.2	1.7	2.6	< 1.0	2.7
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.9	4.7	< 1.0	< 1.0	1.1
>C21-C35 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	6.9	1.7	13.9	35.5	15.6	7.9	2.9	8.7
>C35-C40 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	2.4	< 1.0	5.7	10.0	< 1.0	3.4	1.0	1.8
Total aromatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	1.3	10.1	2.5	21.0	49.0	21.7	12.1	4.3	12.5
Total petroleum hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_Total)	N	mg/kg	1	1.4	11.5	2.8	23.9	57.2	23.4	14.7	5.2	15.2



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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301834	301835	301836	301837	301838	301839	301840	301841
Customer Reference								
Sample ID								
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS11	TS11	TS12	TS12	TS13	TS13	TS14	TS14
Sample Depth (m)	0.20	0.45	0.10	0.40	0.20	0.35	0.10	0.40
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD								
Soil sample preparation parameters											
Moisture Content	N	%	0.1	21.1	17.5	18.1	16.8	24.8	16.5	18.1	15.2
Material removed	N	%	0.1	14.3	36.6	32.8	41.7	23.8	36.9	41.1	44.7
Description of Inert material removed	N		0	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Metals											
Arsenic	M	mg/kg	1	12.1	9.8	12.3	11.5	6.3	8.1	6.8	6.8
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	mg/kg	0.5	1.8	1.3	1.5	0.9	< 0.5	< 0.5	0.7	0.6
Chromium	M	mg/kg	5	14600	9630	6950	3370	175	177	56.5	37.6
Copper	M	mg/kg	5	909	599	528	267	41.3	49.8	32.4	15.8
Lead	M	mg/kg	5	843	569	531	299	69.4	55.9	79.0	31.0
Mercury	M	mg/kg	0.5	0.6	< 0.5	0.5	2.1	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	606	396	358	188	17.9	22.6	17.7	17.1
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	30.0	26.2	36.8	41.1	28.6	35.5	26.5	26.9
Zinc	M	mg/kg	5	371	254	347	243	98.5	97.1	181	74.3
Anions											
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.04	0.06	0.04	0.07	0.03	0.05	< 0.02	< 0.02
Inorganics											
Carbonate	N	%	0.1	6.9	6.0	7.2	7.6	1.3	5.8	4.0	8.9
Elemental Sulphur	M	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	3	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO ₄)	U	%	0.02	0.10	0.08	0.07	0.11	0.07	0.10	0.05	0.04
Water Soluble Boron	N	mg/kg	0.5	1.4	1.3	0.9	0.9	0.8	1.1	0.7	0.6

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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301834	301835	301836	301837	301838	301839	301840	301841
Customer Reference								
Sample ID								
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS11	TS11	TS12	TS12	TS13	TS13	TS14	TS14
Sample Depth (m)	0.20	0.45	0.10	0.40	0.20	0.35	0.10	0.40
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD								
Miscellaneous											
Electrical Conductivity (CaSO4 extract)	N	uS/cm	50	1580	1650	1680	1740	1740	2400	2360	1630
Carbon Nitrogen Ratio	N	ratio	0.1	22.8658	n/t	21.1802	n/t	17.3118	n/t	15.0795	n/t
Loss on Ignition	M	%	0.01	9.11	7.62	6.65	4.38	3.55	3.17	5.82	2.94
pH	M	pH units	0.1	8.3	8.2	8.4	8.6	8.3	8.5	8.3	8.4
Density	N	g/ml	0	1.19	1.18	1.19	1.23	1.19	1.19	1.20	1.15
Soil Organic Matter	U	%	0.1	n/t	4.3	n/t	3.1	n/t	2.2	n/t	1.8
Total Carbon	N	%	0.01	5.3	n/t	3.9	n/t	2.1	n/t	3.4	n/t
Total Organic Carbon	N	%	0.01	3.6	3.0	2.6	1.8	1.2	1.0	2.3	0.89
Total Nitrogen	N	%	0.01	0.23	n/t	0.18	n/t	0.12	n/t	0.22	n/t
Extractable Potassium	N	mg/l	20	276	260	378	258	158	184	333	114
Extractable Magnesium	N	mg/l	20	75	62	116	101	126	161	98	50
Extractable Phosphate	N	mg/l	1	58	n/t	72	n/t	49	n/t	116	n/t
Extractable Calcium	N	mg/l	20	n/t	5520	n/t	5990	n/t	5350	n/t	4880
Extractable Sodium	N	mg/l	20	n/t	36	n/t	54	n/t	41	n/t	23
Sand content	NS	%	1	66	39	47	40	59	38	15	10
Silt content	NS	%	1	23	39	35	39	27	39	55	59
Clay content	NS	%	1	11	22	18	21	14	23	31	31
Stones > 2mm	NS	%	1	20	35	36	28	5	20	28	44
Stones > 20mm	NS	%	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Stones > 50mm	NS	%	1	< 1	n/t	< 1	n/t	< 1	n/t	< 1	n/t
Stones > 75mm	NS	%	1	n/t	< 1	n/t	< 1	n/t	< 1	n/t	< 1
Total Visible Contaminants	N	%	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Plastics	N	%	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sharps	N	n/kg	0	0	0	0	0	0	0	0	0

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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301834	301835	301836	301837	301838	301839	301840	301841
Customer Reference								
Sample ID								
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS11	TS11	TS12	TS12	TS13	TS13	TS14	TS14
Sample Depth (m)	0.20	0.45	0.10	0.40	0.20	0.35	0.10	0.40
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD								
Phenols											
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons											
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	0.5	< 0.1	0.8	0.2	< 0.1	0.7	1.6	0.2
Anthracene	M	mg/kg	0.1	0.1	< 0.1	0.3	< 0.1	< 0.1	0.2	0.2	< 0.1
Fluoranthene	M	mg/kg	0.1	1.0	0.3	2.4	0.6	< 0.1	1.0	3.9	0.6
Pyrene	M	mg/kg	0.1	0.9	0.3	2.2	0.5	< 0.1	0.8	3.4	0.5
Benzo(a)anthracene	M	mg/kg	0.1	0.4	0.2	1.1	0.3	< 0.1	0.4	1.5	0.2
Chrysene	M	mg/kg	0.1	0.4	0.2	1.4	0.4	< 0.1	0.4	1.8	0.2
Benzo(b)fluoranthene	M	mg/kg	0.1	0.6	0.2	1.3	0.3	< 0.1	0.4	1.9	0.2
Benzo(k)fluoranthene	M	mg/kg	0.1	0.7	0.2	1.3	0.3	< 0.1	0.4	2.0	0.3
Benzo(a)pyrene	M	mg/kg	0.1	0.7	0.2	1.6	0.4	< 0.1	0.5	2.2	0.3
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	0.4	0.2	0.9	0.3	< 0.1	0.3	1.3	0.2
Dibenzo(a,h)anthracene	M	mg/kg	0.1	0.1	< 0.1	0.2	0.2	< 0.1	< 0.1	0.2	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.4	0.2	0.8	0.3	< 0.1	0.2	1.2	0.2
Total PAH(16)	M	mg/kg	0.4	6.4	2.1	14.6	4.0	< 0.4	6.0	21.5	3.0



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Results Summary

Report No.: 22-44702, issue number 1

ELAB Reference	301834	301835	301836	301837	301838	301839	301840	301841
Customer Reference								
Sample ID								
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TS11	TS11	TS12	TS12	TS13	TS13	TS14	TS14
Sample Depth (m)	0.20	0.45	0.10	0.40	0.20	0.35	0.10	0.40
Sampling Date	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	Codes	Units	LOD								
BTEX											
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	U	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG											
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_2D_AL)	M	mg/kg	1	2.3	< 1.0	1.5	< 1.0	< 1.0	5.4	< 1.0	< 1.0
>C35-C40 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	3.0	< 1.0	2.3	< 1.0	< 1.0	7.3	< 1.0	< 1.0
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_2D_AR)	M	mg/kg	1	1.8	< 1.0	1.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic (EH_2D_AR)	M	mg/kg	1	15.6	2.8	16.3	1.4	< 1.0	28.9	4.8	1.6
>C35-C40 Aromatic (EH_2D_AR)	M	mg/kg	1	4.3	< 1.0	5.9	< 1.0	< 1.0	16.6	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	22.7	4.0	24.5	1.9	< 1.0	47.3	6.9	2.2
Total petroleum hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_Total)	N	mg/kg	1	25.7	4.5	26.8	2.3	< 1.0	54.5	7.6	2.3



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Results Summary

Report No.: 22-44702, issue number 1

Asbestos Results

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

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
301816	0.10	TS01	Brown sandy soil, stones, concrete, glass, organics	No asbestos detected	n/t	n/t	n/t	n/t
301817	0.30	TS01	Brown sandy soil, stones, concrete, glass, ceramics, organics	No asbestos detected	n/t	n/t	n/t	n/t
301818	0.10	TS03	Brown sandy soil, stones, concrete, brick, clinker, glass, ceramics, organics	No asbestos detected	n/t	n/t	n/t	n/t
301819	0.50	TS03	Brown sandy soil, stones, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
301820	0.10	TS04	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301821	0.30	TS04	Brown sandy soil, stones, concrete, brick, clinker, glass, ceramics, organics	No asbestos detected	n/t	n/t	n/t	n/t
301822	0.20	TS05	Brown sandy soil, stones, concrete, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301823	0.45	TS05	Brown sandy soil, stones, concrete, brick, clinker, ceramics, organics	No asbestos detected	n/t	n/t	n/t	n/t



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Results Summary

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Asbestos Results

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Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
301824	0.10	TS06	Brown sandy soil, stones, brick, clinker, glass, organics	No asbestos detected	n/t	n/t	n/t	n/t
301825	0.30	TS06	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301826	0.20	TS07	Brown sandy soil, stones, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301827	0.45	TS07	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301828	0.05	TS08	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301829	0.30	TS08	Brown sandy soil, stones, concrete, brick, clinker, glass, organics	No asbestos detected	n/t	n/t	n/t	n/t
301830	0.20	TS09	Brown sandy soil, stones, clinker, glass, organics	No asbestos detected	n/t	n/t	n/t	n/t
301831	0.40	TS09	Brown sandy soil, stones, concrete, brick, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301832	0.05	TS10	Brown sandy soil, stones, concrete, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t



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Results Summary

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Asbestos Results

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Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
301833	0.20	TS10	Brown sandy soil, stones, concrete, brick, clinker, ceramics, wood	No asbestos detected	n/t	n/t	n/t	n/t
301834	0.20	TS11	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301835	0.45	TS11	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301836	0.10	TS12	Brown sandy soil, stones, concrete, brick, clinker, glass, organics	No asbestos detected	n/t	n/t	n/t	n/t
301837	0.40	TS12	Brown sandy soil, stones, concrete, brick, clinker, ceramics, organics	No asbestos detected	n/t	n/t	n/t	n/t
301838	0.20	TS13	Brown sandy soil, stones, glass, organics	No asbestos detected	n/t	n/t	n/t	n/t
301839	0.35	TS13	Brown sandy soil, stones, concrete, brick, clinker, glass	No asbestos detected	n/t	n/t	n/t	n/t
301840	0.10	TS14	Brown sandy soil, stones, clinker, organics	No asbestos detected	n/t	n/t	n/t	n/t
301841	0.40	TS14	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 22-44702, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Acid neutralisation capacity	N	Air dried sample	18/11/2022		
Extractable cations - BS3882	N	Air dried sample	18/11/2022		ICPMS
Visible Contaminants	N		17/11/2022		
Sulphide	N	As submitted sample	22/11/2022	109	Colorimetry
Hexavalent chromium	N	As submitted sample	17/11/2022	110	Colorimetry
pH	M	Air dried sample	19/11/2022	113	Electromeric
Electrical conductivity of soil	N	Air dried sample.	21/11/2022	114	Electromeric
Acid Soluble Sulphate	U	Air dried sample	18/11/2022	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	18/11/2022	118	ICPMS
Phenols in solids	N	As submitted sample	17/11/2022	121	HPLC
Elemental Sulphur	M	Air dried sample	17/11/2022	122	HPLC
Loss on ignition at 450 deg C	M	Air dried sample	21/11/2022	129	Gravimetry
PAH (GC-FID)	M	As submitted sample	17/11/2022	133	GC-FID
Extr. Phos	N	Air dried sample	18/11/2022	140	ICPMS
Water soluble anions	M	Air dried sample	17/11/2022	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	21/11/2022	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	21/11/2022	181	GC-MS
BTEX in solids	M	As submitted sample	21/11/2022	181A	GC-MS
Water soluble boron	N	Air dried sample	17/11/2022	202	Colorimetry
Total cyanide	M	As submitted sample	17/11/2022	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	18/11/2022	210	IR
TPH CWG soil by gc-gc	M	As submitted sample	16/11/2022	271	
Asbestos identification	U	Air dried sample	21/11/2022	280	Microscopy
Soil organic matter	U	Air dried sample	22/11/2022	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

Report No.: 22-44702, issue number 1

Key

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

Deviation Codes

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

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

Sample Retention and Disposal

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

TPH Classification - HWOL Acronym System

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



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 22-44818

Issue: 1

Date of Issue: 01/12/2022

Contact: Will Purslow

Customer Details: GESL
Unit 7
Danworth Farm
Hurstpierpoint
West Sussex BN6 9GL

Quotation No: Q22-02720

Order No: PO-5928

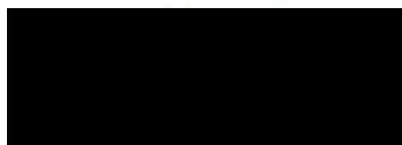
Customer Reference: GE21022

Date Received: 21/11/2022

Date Approved: 01/12/2022

Details: Bartons Rise, Havant

Approved by:



Tim Reeve, Quality Officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 22-44818, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
302391	TS02 0.10	16/11/2022	21/11/2022	Silty loam	
302392	TS02 0.30	16/11/2022	21/11/2022	Silty loam	

Results Summary

Report No.: 22-44818, issue number 1

ELAB Reference	302391	302392
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TS02	TS02
Sample Depth (m)	0.10	0.30
Sampling Date	16/11/2022	16/11/2022

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Moisture Content	N	%	0.1	16.7	18.0
Material removed	N	%	0.1	7.5	10.4
Description of Inert material removed	N		0	Stones	Stones/Clinker
Metals					
Arsenic	M	mg/kg	1	9.0	10.4
Beryllium	U	mg/kg	1	< 1.0	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	19.6	23.9
Copper	M	mg/kg	5	28.7	36.2
Lead	M	mg/kg	5	92.7	138
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	14.1	15.9
Selenium	M	mg/kg	1	< 1.0	< 1.0
Vanadium	M	mg/kg	5	25.4	31.1
Zinc	M	mg/kg	5	111	128
Anions					
Water Soluble Chloride	M	mg/kg	40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.03	0.04
Inorganics					
Carbonate	N	%	0.1	4.5	5.3
Elemental Sulphur	M	mg/kg	20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Acid Soluble Sulphate (SO ₄)	U	%	0.02	0.05	0.07
Water Soluble Boron	N	mg/kg	0.5	0.7	1.1
Miscellaneous					
Electrical Conductivity (CaSO ₄ extract)	N	uS/cm	50	2060	2070
Carbon Nitrogen Ratio	N	ratio	0.1	21.5420	n/t
Loss on Ignition	M	%	0.01	4.16	4.75
pH	M	pH units	0.1	10.0	9.4
Density	N	g/ml	0	1.24	1.19
Soil Organic Matter	U	%	0.1	n/t	2.9
Total Carbon	N	%	0.01	2.4	n/t
Total Organic Carbon	N	%	0.01	1.2	1.5
Total Nitrogen	N	%	0.01	0.11	n/t
Extractable Potassium	N	mg/l	20	237	254
Extractable Magnesium	N	mg/l	20	78	95
Extractable Phosphate	N	mg/l	1	46	n/t
Extractable Calcium	N	mg/l	20	n/t	4890
Extractable Sodium	N	mg/l	20	n/t	21
Sand content	NS	%	1	46	42
Silt content	NS	%	1	33	37
Clay content	NS	%	1	21	22
Stones > 2mm	NS	%	1	19	18
Stones > 20mm	NS	%	1	< 1	< 1
Stones > 50mm	NS	%	1	< 1	n/t
Stones > 75mm	NS	%	1	n/t	< 1
Total Visible Contaminants	N	%	0.01	< 0.01	< 0.01
Plastics	N	%	0.01	< 0.01	< 0.01
Sharps	N	n/kg	0	0	0

Results Summary

Report No.: 22-44818, issue number 1

ELAB Reference	302391	302392
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TS02	TS02
Sample Depth (m)	0.10	0.30
Sampling Date	16/11/2022	16/11/2022

Determinand	Codes	Units	LOD		
Phenols					
Total Phenols	N	mg/kg	6	< 6	< 6
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	0.4	1.3
Anthracene	M	mg/kg	0.1	< 0.1	0.6
Fluoranthene	M	mg/kg	0.1	1.2	5.4
Pyrene	M	mg/kg	0.1	1.1	4.1
Benzo(a)anthracene	M	mg/kg	0.1	0.5	3.3
Chrysene	M	mg/kg	0.1	0.5	3.6
Benzo(b)fluoranthene	M	mg/kg	0.1	1.0	5.3
Benzo(k)fluoranthene	M	mg/kg	0.1	0.8	3.5
Benzo(a)pyrene	M	mg/kg	0.1	0.8	4.4
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	0.5	2.9
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.6
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.5	2.7
Total PAH(16)	M	mg/kg	0.4	7.6	38.0
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0
MTBE	U	ug/kg	10	< 10.0	< 10.0
TPH CWG					
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_2D_AL)	M	mg/kg	1	2.2	1.8
>C35-C40 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	3.1	2.6
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic (EH_2D_AR)	M	mg/kg	1	9.9	12.2
>C35-C40 Aromatic (EH_2D_AR)	M	mg/kg	1	4.5	8.1
Total aromatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	15.9	21.8
Total petroleum hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_Total)	N	mg/kg	1	19.0	24.4



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Results Summary

Report No.: 22-44818, issue number 1

Asbestos Results

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Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
302391	0.10	TS02	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t
302392	0.30	TS02	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 22-44818, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Acid neutralisation capacity	N	Air dried sample	22/11/2022		
Extractable cations - BS3882	N	Air dried sample	22/11/2022		ICPMS
Visible Contaminants	N		22/11/2022		
Sulphide	N	As submitted sample	28/11/2022	109	Colorimetry
Hexavalent chromium	N	As submitted sample	22/11/2022	110	Colorimetry
pH	M	Air dried sample	22/11/2022	113	Electromeric
Electrical conductivity of soil	N	Air dried sample.	22/11/2022	114	Electromeric
Acid Soluble Sulphate	U	Air dried sample	24/11/2022	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	23/11/2022	300	ICPMS
Phenols in solids	N	As submitted sample	22/11/2022	121	HPLC
Elemental Sulphur	M	Air dried sample	22/11/2022	122	HPLC
Loss on ignition at 450 deg C	M	Air dried sample	23/11/2022	129	Gravimetry
PAH (GC-FID)	M	As submitted sample	23/11/2022	133	GC-FID
Extr. Phos	N	Air dried sample	22/11/2022	140	ICPMS
Water soluble anions	M	Air dried sample	22/11/2022	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	23/11/2022	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	23/11/2022	181	GC-MS
BTEX in solids	M	As submitted sample	23/11/2022	181A	GC-MS
Water soluble boron	N	Air dried sample	22/11/2022	202	Colorimetry
Total cyanide	M	As submitted sample	24/11/2022	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	23/11/2022	210	IR
TPH CWG soil by gc-gc	M	As submitted sample	21/11/2022	271	
Asbestos identification	U	Air dried sample	28/11/2022	280	Microscopy
Soil organic matter	U	Air dried sample	22/11/2022	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

Report No.: 22-44818, issue number 1

Key

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

Deviation Codes

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

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

Sample Retention and Disposal

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

TPH Classification - HWOL Acronym System

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