Sirius Geotechnical Ltd
4245 Park Approach
Thorpe Park
Leeds
LS15 8GB
[redacted]

Mr M Thompson
Persimmon Homes Ltd
3 Hepton Court
York Road
Leeds
LS9 6PW

Date: 09th October 2023

Our ref.: C7747E/AW/10285

Dear Martin,

Re: C7747E, Lane Side Farm, Morley – Stockpile Sampling and Soil Testing

Please find below and attached, our results and conclusions arising from sampling and chemical testing of material from stockpiles and in-situ shallow soils from the site at Lane Side Farm, Morley.

1.0 Introduction

Sirius Geotechnical Ltd (Sirius) was instructed by Persimmon Homes West Yorkshire Ltd (Persimmon) to undertake a supplementary investigation and soil sampling at Lane Side Farm, Morley (hereafter referred to as 'the site').

Persimmon are in the process of developing the site for a predominantly residential end use, comprising 427 low-rise residential houses with private gardens, 23 apartments in four low-rise blocks, with associated highways and areas of soft landscaping, with a school proposed for future development. The proposed development layout is shown on Persimmon Drawing Ref. LSF-2020-002 Rev AC, dated 16th March 2023, contained within Appendix A.

The objectives of this phase of investigation were to:

- Sample four stockpiles of site won topsoil in order to assess the suitability of the material for re-use both on and off-site;
- Collect shallow soil samples from backfilled mining features identified during site enabling works and to provide commentary on the suitability of the material to be left in-situ at shallow depth within residential gardens; and,
- Excavation of shallow trial pits in order to further delineate an area of ashy made ground, identified during previous ground investigation (GI) works undertaken by Sirius, which is present within an area of proposed public open space (POS).

2.0 Previous Ground Investigation Works / Reports

Previous works undertaken at the site by Sirius, which include the areas of site in question, and the reports arising from these are listed below:

> Preliminary Investigation Report (Desk Study) of land at Lane Side Farm, Morley (ref. C5850B), dated March 2016.
>
> Geoenvironmental Appraisal Report for land at Lane Side Farm, Morley (ref. C7747/GA), dated July 2018.
>
> Supplementary Ground Gas Risk Assessment Letter Report (ref. 8591/AMG/C7747), dated 3rd September 2018.
>
> Supplementary Mining Investigation Letter Report for Lane Side Farm, Morley, Leeds (ref. C7747C/MB/9141), dated 22nd November 2019.
>
> Remediation Strategy for land off Lane Side Farm, Morley (Ref. C7747/RS), dated February 2020.
>
> Review of Sirius Ground Investigation Works for land at Lane Side Farm Morley (Ref C7747/AL/10109) dated 27th March 2023.

This letter report provides a summary of salient information contained within the above reports, relevant to the objectives of this phase of work. However, it is recommended that the above reports are referred to for further detailed information.

3.0 Background

3.1 Site Location and Description

The site is located to the southeast of Elland Road in Morley, approximately 5km southwest of Leeds City Centre. A site location plan is presented as Drawing No. C7747C/01, within Appendix A.

At the time of the investigation the site comprised an active construction site operated by Persimmon and their groundworks contractor, with the site having been stripped of topsoil and with arterial roads and sewers installed across large areas of the site.

3.2 Background to Previous Topsoil Testing Results

As part of the 2018 Sirius GI, a total of 16 samples of in-situ topsoil / reworked topsoil was tested for suite of metals, metalloids, organics and inorganics contaminants. The results of the testing found that all contaminants analysed for, with the exception of arsenic, were below the Sirius General Assessment Criteria (GAC) derived for a residential with home grown produce end use (which is considered most sensitive of the proposed end-uses).

Additional testing of further samples for arsenic was undertaken, with a total of 26 samples tested. Of the tested samples, 14 samples were recorded to contain arsenic concentrations greater than the Sirius GAC (37mg/kg), with recorded concentrations ranging between 19 and 140mg/kg.

Statistical analysis, using ProUCL, identified that the distribution of recorded arsenic concentrations within the reworked topsoil were not of normal-distributed. Therefore, the adopted Chebyshev $UCL_{0.95}$ value, for non-parametric distribution (recommended for use for non-normal distributed results within the CL:AIRE & CIEH guidance), was 61.77 mg/kg, i.e. greater than the GAC.

Therefore, additional analysis to determine the site-specific bio-accessible fraction of arsenic within soils was carried out. Testing was undertaken by Eurofins Chemtest (Chemtest), a UKAS accredited laboratory, using the Unified BARGE (Bio-Accessibility Research Group of Europe) extraction method. Testing was carried out on two samples of reworked topsoil which contained some of the higher concentrations of total arsenic recorded and are therefore considered to provide a suitably conservative representation of the reworked topsoil material present at the site.

Results of the testing indicated that the bio-accessible fraction of arsenic via the direct ingestion pathway did not exceed 2% in either of the samples tested.

Additional modelling was undertaken using the CLEA (v1.071) model to derive a site-specific assessment criteria (SSAC) for arsenic on the basis of the additional bio-accessible arsenic characterisation undertaken. Model parameters were run as for the GAC, with the exception of the relative bioavailability for arsenic in soil, which was adjusted to 0.1 (10%) based on a conservative interpretation of the findings of the site-specific bio-accessibility testing (maintaining a factor of safety of 5).

The results of the CLEA modelling showed that on the basis of the site-specific bio-accessibility adjustment a SSAC of 221mg/kg was appropriate for the assessment of arsenic within the reworked topsoil materials. Total arsenic concentrations below this level are not considered to present a significant level of risk to site end users and would be suitable to be retained in areas of private gardens or landscaping.

3.3 Background to Mining Features Identified During Topsoil Strip

A strip of the topsoil and subsoil (to a depth of c. 0.1m – 0.3m below ground level (bgl)) was undertaken across the southwest of the site in August 2022, with the resultant exposed surface inspected by a Sirius Engineer.

The inspection carried out by Sirius revealed a total of c. 490 potential mining-related features across this area, with feature diameters ranging between c. 1m and 5.4m although typically <2m in diameter (see Drawing No. C7747E/02 in Appendix A). A number of these features (c. 22 No.) were investigated by trial pits / trenches by Sirius, and were found to be present to depths of between c. 0.6m and 2.8m bgl, with the majority being less than 2m deep.

The material identified by Sirius within the suspected mining related features, was recorded to mostly comprise dark grey, predominantly granular material, including gravel of mudstone, coal and ironstone, with the surrounding soils comprising orangish-brown and light grey residual soils (mostly slightly gravelly to gravelly clay).

Analysis of cut and fill drawings for the development indicate that the majority of the plots within the area of the mining features will be raised by greater than 600mm and therefore the makeup of the garden soils will comprise placed subsoil. Locally, within the areas of Plots 99-102 and 132-135, it is understood that levels will be raised by less than 600mm and the soils within these mining features will likely be present at a depth shallower than 600mm within these gardens.

It was therefore recommended that additional soil samples should be taken from within the backfilled mining features, with chemical laboratory testing undertaken to determine suitability or otherwise of the soils to remain a shallow depth within the gardens.

3.4 Background to Localised Ashy Made Ground within TP28.

One trial pit (TP28) excavated as part of the original 2018 GI encountered ashy made ground underlying the reworked topsoil, to depths of c 1.0m bgl. The ashy made ground comprised sandy gravel of ash, and rare concrete, slag and clinker.

Chemical testing of this made ground recorded concentrations of benzo(a)pyrene and naphthalene greater than both the respective Sirius Stage 1 and Stage 2 GACs for a residential land use. A PAH double-ratio plot analysis for this sample indicates that the PAHs may be coal-derived (as opposed to indicating a potential mobile / free-phase source).

From the supplied proposed layout plan, it is understood that the area in which TP28 is located is to be developed as a linear park. It should be noted that the concentrations of PAHs recorded also exceed GAC for POS and would therefore also be considered to pose a risk to human health in such an end-use, and remedial measures would apply to this area.

It was therefore recommended that further delineation of the ashy made ground within the vicinity of TP28 be undertaken.

4.0 Fieldworks

The fieldworks forming part of this supplementary investigation were supervised by a Sirius Geoenvironmental Engineer on 31st August and 1st September 2023.

4.1 Topsoil Sampling

It is understood that a total of 36,000m^3 of topsoil is present on site of which c 33,000m^3 is currently stockpiled, with the remaining c. 3,000m^3 remaining in-situ within a former field in the north of the site. It is understood that the proposed development will require c. 20,000m^3 of topsoil to remain on site for reuse within private residential gardens and areas of POS, with the remaining topsoil requiring removal from site.

A total of four stockpiles of site won topsoil were present on site during the fieldwork, with Sirius numbering the stockpiles "*Topsoil Stockpile 1*" through to "*Topsoil Stockpile 4*". Samples were obtained by excavating into the stockpiles with a wheeled backhoe excavator. The location of the stockpiles sampled is illustrated on drawing C7747E/02 within Appendix A, with the indicative volumes of the stockpiles, as supplied by Persimmon, presented within Table 4.1 below.

Table 4.1 – Indicative volumes of topsoil stockpiles and sampling strategy

Topsoil Stockpile Number	Estimated Net Volume (m^3)	Number Of Samples Obtained
Topsoil Stockpile 1	8,242	6
Topsoil Stockpile 2	13,888	9
Topsoil Stockpile 3	4,870	3
Topsoil Stockpile 4	6,034	4

Within the northern field, two areas of topsoil remained in-situ, as detailed within drawing C7747E/02, with five shallow topsoil samples obtained, of which two were sent for chemical testing.

4.2 Mining Feature Soil Sampling

As part of the supplementary investigation works, six shallow trial trenches (BP101 – BP106) were excavated within the localities of plots 99-102 and 132-135 to target previously identified mining features and to allow sampling of the backfill material. The positioning of the trial trenches were locally constrained owing to the presence of numerous stockpiles of excavation arisings within the works area.

Where encountered, the mining features were recorded to be backfilled with a mix of grey clay, and gravel of mudstone, sandstone and ironstone. A total of 6 samples of this material were recovered at a depth of 0.5m bgl, with the sample localities presented within Drawing C7747E/02 in Appendix A.

4.3 Ashy Made Ground Delineation

A total of seven trial pits (TP201 to TP207) were excavated within an area of proposed POS to the west of the site, to target and to delineate an area of ashy made ground found within previous trial pit TP28. A copy of the supplementary trial pit logs are presented within Appendix B.

The works area was significantly constrained by the presence of a construction compound to the west and ongoing construction works to the east. An overhead electricity transmission line (ETL) was present crossing the works area with a lateral “no-dig” zone which further constrained the area that could be safely investigated.

TP201 and TP203 identified the ashy made ground at depths of between 0.3m to 0.7m and 0.3m to 0.45m bgl, respectively. The ashy made ground soils comprised sandy gravel of ash, brick, concrete and clinker. The remaining trial pits generally uncovered reworked topsoil, underlain by firm natural clays.

The trial pits which identified the ashy made ground is shown on Drawing No. C7747E/02 within Appendix A, however it should be noted that ashy made ground is understood to extend beneath the ETL and therefore accurate delineation within this area was not possible.

5.0 Summary of Laboratory Testing Results

A summary of the analytical results is given below, with results shown only where exceedances of the relevant screening criteria occurred. The full set of laboratory testing results for these works is included within Appendix C. For full details of chemical testing results obtained previously, see Sirius Report ref. C7747/GA.

For this site, it can be demonstrated that the use of benzo(a)pyrene as a surrogate marker for other genotoxic PAHs is appropriate.

For each potential contaminant of concern, analytical data were evaluated against the relevant Sirius GACs, taking account of the soil organic matter (SOM) content. For this site, measured values were compared to GACs derived for a residential with gardens end use. Source data for all GACs are provided in Appendix D of this report.

5.1 Stockpiled Topsoil

Soil samples of topsoil were tested for the following suites of determinands:

> **Sirius Soil Suite:** metals (arsenic, cadmium, chromium III and VI, copper, lead, mercury, selenium, nickel and zinc), phenol, pH and water soluble sulphate, TOC and speciated PAHs.
>
> **Asbestos ID**.

Table 5.2 below summarises the samples within which concentrations of the tested determinands exceeded the applicable GAC.

Table 5.2 - Summary of Topsoil Material Analysis - GAC Exceedances

Analyte	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (5% SOM) (mg/kg unless specified)	No. of Samples >GAC	Samples Exceeding GAC
Topsoil Stockpile 1 (TS1)					
Benzo(a)pyrene	6	0.72 – 7.0	2.2	1	TS1 – 6
Topsoil Stockpile 3 (TS3)					
Benzo(a)pyrene	3	0.41 – 3.8	2.2	1	TS3 – 2
Topsoil Stockpile 4 (TS4)					
Arsenic	4	33 - 40	37	1	TS4 - 3
Benzo(a)pyrene	4	<0.1 – 2.6	2.2	1	TS4 - 4
In situ Topsoil (F1-TS)					
Arsenic	2	31 - 41	37	1	F1-TS-1

** TOC is a measure of the total organic carbon within the material and is not a determinand that directly poses a risk to human health. These results are used primarily to determine the classification of material for removal from site to a licensed disposal facility, if required.

Arsenic

Two topsoil samples recorded arsenic concentrations greater than the relevant GAC (37mg/kg), one from Topsoil Stockpile 4 and one sample of in-situ topsoil from the northern field.

Topsoil Stockpiles 1 to 3 recorded no exceedances of arsenic.

The addition of these results to the 26 arsenic results tested previously creates a combined dataset of 50 arsenic concentration values for the site-won topsoil.

Statistical analysis was undertaken using the methods described within the CL:AIRE document "Professional Guidance : Comparing Soil Contamination Data with a Critical Concentration" for arsenic concentrations within the topsoil, including the combined data set. This analysis indicated that the 95% upper confidence level of arsenic concentrations within the topsoil is 41.7 mg/kg, greater than the relevant GAC of 37mg/kg, however this value is significantly lower than the SCAC of 221mg/kg.

It is therefore considered that the arsenic concentrations recorded within the topsoil do not present a significant level of risk to site end users, and this material would therefore be suitable for re-use on site within areas of private gardens or landscaping.

The suitability of the topsoil for export to other sites will be dependent on the assessment criteria applicable to each individual site; for example, the applicability of the SSAC for arsenic may not apply.

Benzo(a)pyrene

Three topsoil samples, one each from Topsoil Stockpiles 1, 3 and 4, recorded benzo(a)pyrene concentrations greater than the relevant Stage 1 GAC (2.2mg/kg). PAH double-ratio plot analysis for these samples indicate that the PAHs may be coal/combustion-derived (as opposed to indicating a potential mobile / free-phase source).

Topsoil Stockpile 2 recorded no exceedances of the relevant GAC for benzo(a)pyrene.

The inclusion of the additional 16 benzo(a)pyrene results, tested during the 2018 GI, creates a combined dataset of 40 benzo(a)pyrene concentration values for the site-won topsoil.

Statistical Analysis indicates that the 95% upper confidence level for benzo(a)pyrene concentrations for the topsoil is 1.77 mg/kg, less than the Stage 1 GAC of 2.2mg/kg.

It is therefore considered that benzo(a)pyrene concentrations recorded within the topsoil do not pose a significant level of risk to site end users, and this material would be suitable for re-use on site within areas of private gardens or landscaping.

5.2 Mining Features

Six samples of the backfill material excavated from the mining features were tested for the following suites of determinants:

> **Sirius Soil Suite:** metals (arsenic, cadmium, chromium III and VI, copper, lead, mercury, selenium, nickel and zinc), phenol, pH and water soluble sulphate, TOC and speciated PAHs.
>
> **Speciated TPH with BTEX and MTBE.**
>
> **Asbestos ID**.

The results confirmed that no potential contaminants were present in exceedance of the relevant GACs for a residential with gardens end use.

6.0 Conclusions

6.1 Site Won Topsoil

It is understood from Persimmon that c.20,000m^3 topsoil is proposed to be re-used on site within residential garden areas and areas of POS. YALPAG guidance[1] states that site won material should be adequately characterised prior to re-use and suggests a required sampling ratio of 1 sample per 250 m^3 of soil. However, the YALPAG document also states that relaxation of the guidelines may apply, dependent on site-specific factors, but any deviation needs to be agreed with the Local Authority.

From the recent testing of topsoil, the results obtained have proven to be relatively similar to the results obtained previously, indicating that the understanding of the chemical composition of the material is good, and therefore it is concluded that the topsoil has been adequately characterised. Furthermore, given the significantly larger volumes of topsoil involved at this site than would usually be present on development sites, the total number of sample results obtained to date (40 - 50) is high in relative terms in comparison to the number which would be taken on a smaller site. This number gives a ratio of c. 1 sample per 500 m^3 of topsoil proposed for re-use on site. Therefore, given that the above demonstrates that the topsoil has been adequately characterised, it is suggested that a reduced ratio of 1 sample in 500 m^3 is acceptable in this situation and on that basis it is considered that the sampling strategy undertaken demonstrates that the topsoil is suitable for on-site re-use in gardens/areas of soft landscaping (albeit using the SSAC previously derived for arsenic).

It should be noted that, given the timescale for completion of a large scheme such as this, the testing certificates obtained now may not necessarily be accepted by the regulators by the time the scheme ends. Therefore, some further limited testing of the site-won material may be required as the development progresses, to confirm its continuing suitability of re-use and to demonstrate good on-site soil storage practices.

It is understood that c. 16,000m^3 of topsoil located on site will not be required for use within the development, and it is assumed that this will require removal from site. The above-described characterisation of the topsoil as being suitable for re-use on this site will not automatically apply to soils going off site, as this will be undertaken under another licensing system (e.g. under an MMP). The suitability of the topsoil for import to other sites will be dependent on the assessment criteria applicable to each individual site, and for example the applicability of the SSAC for arsenic may not apply. However, notwithstanding the above, given that only marginal elevations of selected determinands have been identified, it is considered that it could be demonstrated that the topsoil is suitable for re-use off-site within proposed gardens/areas of soft landscaping. However, it is considered that further sampling/testing may provide a greater level of confidence for third parties when assessing the suitability of the topsoil for use on the receiving site, as the ultimate decision on the suitability of the material will be that of the receiving third-party.

6.2 Mining Feature Samples

The laboratory testing from six samples indicated that contaminant concentrations were below the relevant GAC's. It is therefore concluded that this material is chemically and texturally

---

[1] YALPAG, 2021. Verification Requirements for Cover Systems. Technical Guidance for Developers, Landowners and Consultants. Version 4.1, June 2021.

suitable to remain in-situ within areas of residential private gardens and POS at shallow depth beneath a 300mm layer of topsoil.

6.3 Ashy Made Ground

The investigation identified ashy made ground within two of the trial pits to the east of the ETL, with all other shallow trial pits identifying natural ground or reworked natural ground at shallow depths. The investigation area was significantly constrained owing to the presence of the overhead ETL with associated standoff/no-dig zones, the construction compound, and ongoing construction works.

Based on the above, it is therefore concluded that the western and southern extent of the ashy made ground is present under the overhead ETL. The trial pits were ashy made ground was identified are shown on C7747E/02 within Appendix A.

As recommended within the remedial strategy (ref. C7747/RS), the ashy made ground soils identified within the west of the site should be placed below areas of hardstanding (but not buildings), or beneath a suitable thickness (i.e. 600mm or 450mm) of clean cover in areas of gardens or POS, respectively.

We trust that the above is sufficient for your current requirements and that you will forward to the appropriate regulators (i.e. Local Authority and NHBC) for their approval. However, should any further information be required, please don't hesitate to contact the undersigned.

Yours sincerely,

[redacted]

Andrew Western
Senior Engineer

For and on behalf of
Sirius Geotechnical Ltd

Enc.: Appendix A. Drawings
Appendix B. Exploratory Hole Logs
Appendix C. Laboratory Test Results
Appendix D. Sirius GAC

APPENDIX A

DRAWINGS

KEY:

- - - - DENOTES 1800 HIGH CLOSE BOARDED FENCE
— DENOTES 1800 HIGH SCREEN WALL / FENCE
-·-·- DENOTES 1500 HIGH CLOSE BOARDED FENCE WITH 300 TRELLIS ATOP
++++ DENOTES 900 HIGH HOOP TOP RAILINGS
~~~~ DENOTES 600 HIGH TIMBER KNEE RAIL
— DENOTES 600 HIGH DWARF WALL
++++ DENOTES 'up to' 600 HIGH HEDGE
▬ DENOTES BENCH ON HARD STANDING SURFACE
▨ BLOCK PAVING
🟩 TURF PLANTING AREA
▨ PROPOSED TRIM TRAILS / MOWN GRASS PATHS
PT DENOTES APPROXIMATE POSITION OF STREET LIGHTING COLUMNS
LB DENOTES LIGHTING BOLLARD
○ DENOTES PROPOSED NEW TREES (Approximate postions only. Final positions subject to Landscape Masterplan).
* DENOTES AFFORDABLE HOUSING
Δ DENOTES LOCATIONS OF CHIMNEYS
⬢ FIBRENEST CABINET LOCATION
SHED DENOTES PLOTS WITHOUT GARAGES TO BE PROVIDED WITH SHEDS
▦ DENOTES PLOTS WITH SOLAR VOLTAIC PANELS
🟥 PLOTS CONSTRUCTED TO MEET M4(2) REQUIREMENTS 135 PLOTS @30%
🟦 PLOTS CONSTRUCTED TO MEET M4(3) REQUIREMENTS 9 PLOTS @ 2%

FOR FULL LANDSCAPE DETAILS SEE LANDSCAPE ARCHITECTS PLANS
PARKING SPACES TO BE 5m X 2.6m
ALL DRIVEWAYS ARE A MIN OF 5.6m LONG
SINGLE DRIVEWAYS ARE 3m WIDE (3.3m to front door if including access path)
DOUBLE DRIVEWAYS ARE 6m WIDE
6m x 3m GARAGES ARE INDICATED ON PLAN

CAR CHARGING KEY:

Ⓐ POSITION OF WALLPOD CAR CHARGING PORT (BACK WALL OF INTEGRAL/ATTACHED GARAGE)
Ⓑ POSITION OF WALLPOD CAR CHARGING PORT (EXTERNAL FRONT OF DWELLING)
Ⓒ POSITION OF WALLPOD CAR CHARGING PORT (EXTERNAL REAR OF DWELLING)
Ⓓ POSITION OF WALLPOD CAR CHARGING PORT (BACK WALL OF DETACHED GARAGE - SUBJECT TO CUSTOMER OPTING FOR POWER TO GARAGE)
Ⓔ POSITION OF FREE STANDING PILLAR CAR CHARGING POINT (PRIVATE PLOT)

CAR CHARGING TO APARTMENT PARKING AREA TO BE PROVIDED AS PER POLICY EN8

Schedule of Accommodation

Housetype	Number
Apartment Blocks 1, 2 & 3 3 Storey 6 apartments per block 18 x 2 Beds 1 Type A / 5 Type B per block	
Apartment Block 4 3/2 Storey 5 apartments per block 5x 2 Beds 1 Type A / 3 Type B / 1 Type C	
R20 Laneside (A) Bungalow 2 Bed Semi detached / Terraced House	8 No.
R20 Haldon (B) 2 Storey 2 Bed Semi-Detached/ Terrace House	35 No.
R20 Braunton (J) 2½ Storey 3 Bed Semi-Detached/ Terrace House	24 No.
R20 Danbury (C) 2 Storey 2 Bed Semi-Detached/ Terrace House	67 No.
R20 Rendlesham (D) 2 Storey 3 Bed Semi detached / Terraced House	58 No.
R20 Stafford (E) 2 Storey 3 Bed Semi detached House	21 No.
R20 Saunton (H) 2½ Storey 3 Bed Terrace House	22 No.
R20 Sherwood (F) 2 Storey 3 Bed Detached House	52 No.
R20 Charnwood Corner (G) 2 Storey 3 Bed Detached House	28 No.
R20 Charnwood (G) 2 Storey 3 Bed Detached House	4 No.
R20 Gisburn (K) 2 Storey 4 Bed Detached House	41 No.
R20 Whinfell (L) 2½ Storey 4 Bed Terrace House	20 No.
R20 Whiteleaf (N) 2 Storey 4 Bed Detached House	24 No.
R20 Selwood (T) 2 Storey 4 Bed Detached House	17 No.
R20 Greenwood (W) 2 Storey 4 Bed Detached	6 No.

Total = 450

Rev AC - CU - 16.03.23
Railings added to L.E.A.P, Trim trail shown as surfaced, Benches added around development and PV removed from Plot 2

Rev AB - HJS - 02.03.23
Proposed street lighting layout added to phase 1

Rev AA - RLS - 23.02.23 -
Additional paths added to comply with part M

Rev Z - RLS - 08.02.23 -
Emergency access details updated as per HH E16/6043/042A

Rev Y - CU - 18.01.23 -
Layout updated to reflect LCC 278 agreement, Existing stone wall to front of site to now be retained and reduced in height to 600mm

Rev X - RLS - 16.01.23 -
Trees updated as per landscape plan 93-001 revD

Rev W - CJB - 123.12.22 - Sub station size adjacent plot 396 revised

Rev V - CU - 21.11.22 - Lighting bollards added to apartment car park and L.E.A.P/ Trim trail repositioned

Rev U - HJS - 08.11.22 - Hedges added, Plots 225-231 boundaries revised

Rev T - RLS - 31.10.22 - 12.5te tonne note added plot 73 private drive

Rev S - HJS - 20.09.2022
Apartment EV Chargers moved, Cycle Stores moved over to fit EV cables in.

Rev R - CJB - 14.09.2022
Sub station relocated , FibreNest cabinet added to entrance of development, Play Area revised adjacent plot 49 and position of Tree's updated inline with Landscape Architect plans.

Rev Q - HJS - 18.08.2022
Approved Accessible Housing added to Layout.

Rev P - HJS - 20.07.2022
Removed EV Charging from VP's, Sub station size amended and PV Added

Rev N - HJS - 15.07.2022
All Drives,Parking Bays and Shared Drives changed to block paving.

Rev M - CJB - 07.07.2022
Car Charging positions revised to remote parking spaces, Play Equipment added to both linear parks. Trim trails & mown grass paths added

Rev L - CU - 16.06.2022
Footpath towards plot 182 altered to suit section 38 agreement & Block Paving removed from speed tables

Rev K - CU - 24.05.22
Proposed street lighting layout added to left edge of the development

Rev J - RLS - 03.03.22
Plot 5 handed

Rev H - CU - 03.03.22
Sales name, Handing and House type range added to plots.Schedule of accommodation updated.

Rev G - CU - 08.12.21
Main Site access & emergency access altered in line with engineers plans

Rev F - CJB - 06.09.21
Bin & Cycle storage to apartment area revised, Additional Bollards added and Footpath note to Daisy Hill Avenue amended.

Rev E - SAC - 02.08.21
Car charging added to VP's & remaining plots, Gardens checked and bin access added.

Rev D - SAC - 28.06.21
Footpath link & noted added to Harwell Road at planners request

Rev C - CJB - 11.03.21
Apartment blocks reconfigured, All semi-detached E types removed, 2.5 storey relationships revised, affordable mix updated & highway comments incorporated.

Rev B - CJB - 18.01.21
Apartment block 2 & plots 312 & 312 changed to private housetypes

Rev A - RLS - 01.12.20 - Plots 106 to 109 repositioned.

PERSIMMON
Together, we make a home

Proposed Development
LANESIDE FARM
MORLEY

PROPOSED PLANNING LAYOUT (R20)

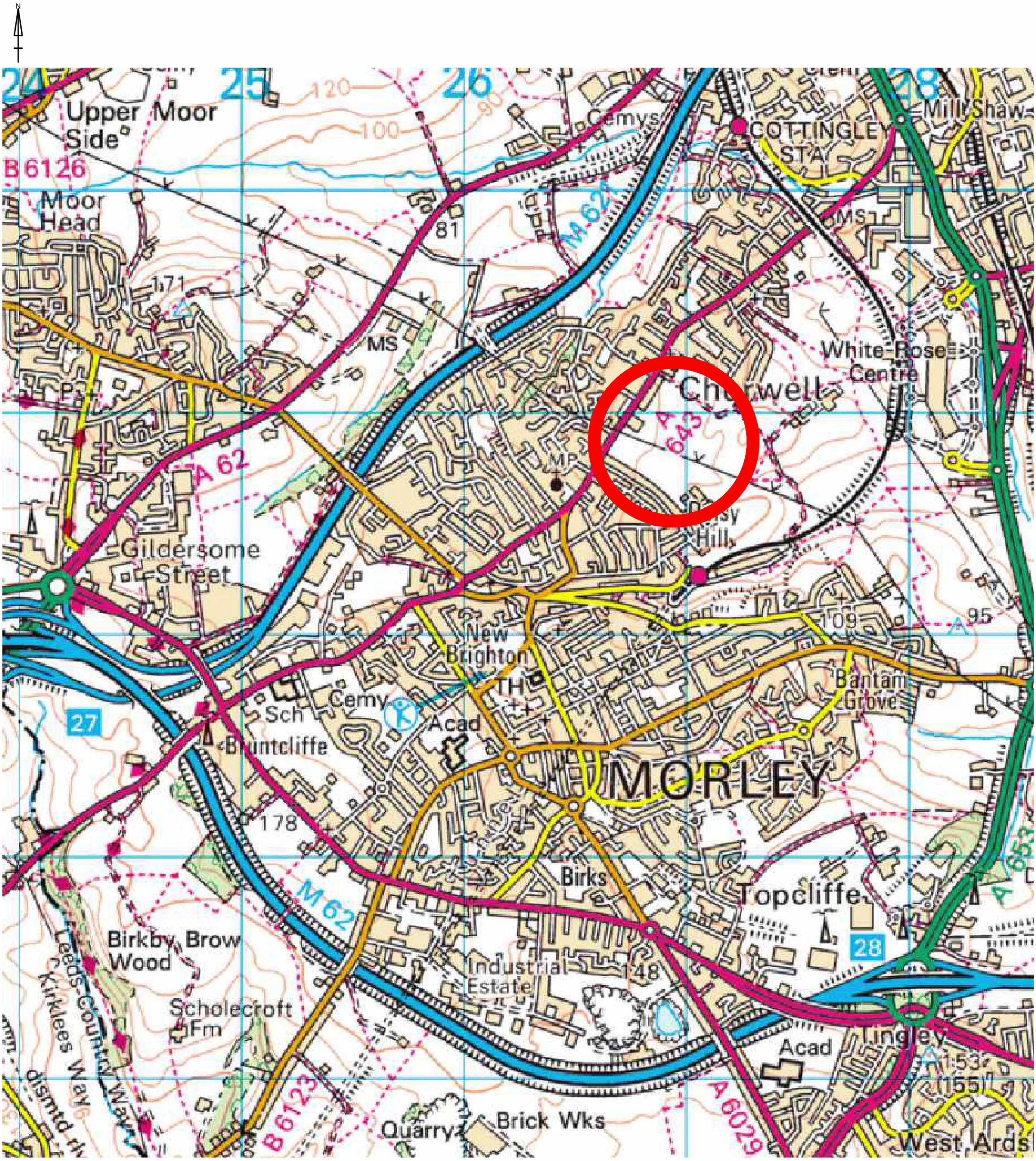
Scale 1:1000@A1

Drawing Number
LSF-2020-002
Rev AC

Drawn By CJB

Checked By SAC

MARCH 2020
~~~~



Sirius Geotechnical & Environmental Ltd, Suite 2, Russel House, Mill Road, Langley Moor, Durham DH7 8HJ. Licence No. 100042005

NOTES

○ Site Location

REVISION	
0	For information
A	>>
B	>>
C	>>
D	>>

[redacted]

sirius

CLIENT
Persimmon Homes West Yorkshire

DRAWING NO.
C7747E/01

REVISION NO.
0

SITE
Lane Side Farm, Morley

DRAWN BY
AW

APPROVED BY
AL

DRAWING TITLE
Site Location Plan

DATE
Oct 2023

SCALE
1:25,000

A4

NOTES

/ **Site Boundary**

🟥 **Topsoil Sample Location**

🟦 **Mining Feature Soil Sample Location**

🟪 **Ashy MG Delineation Trial Pit Location**

🟪 **Ashy MG Delineation Trial Pit Location (Ash Encountered)**

🟩 **Area Where Topsoil Remains In-situ**

🟨 **Investigation Contraint (Overhead Cable Standoff)**

⬜ **Investigation Constraint (Construction Compound / Construction Works)**

● **Approximate Location of Suspected Mining Feature**

Notes

1. This drawing should not be viewed in isolation from the accompanying report.
2. All exploratory hole locations are approximate and based on handheld GPS coordinates unless stated otherwise on the exploratory hole logs.
3. The locations of services shown on this drawing are approximate and are based on utility plans provided by the client. Locations of services are given for the purposes of indicating constraints to the site investigation only. Reference should be made to original utility plans and HSG47 for locating of services within the site.
4. All marked site features (including historical features, mining features (ie, opencast boundaries and mineshafts), potential contaminant constraints, and any other potential constraint or feature of note) shown on this drawing are given for indicative purposes only. This drawing should not be underlaid in isolation to determine proposed development layouts. Reference should be made to the accompanying report for commentary on the potential location of these features including coordinates if available and any further works required to locate features if required.

REVISION		BY	DATE
0	>>	>>	>>
A	>>	>>	>>
B	>>	>>	>>
C	>>	>>	>>
D	>>	>>	>>

[redacted]

sirius

CLIENT

Persimmon Homes
West Yorkshire

SITE

Lane Side Farm,
Morley

DRAWING TITLE

Exploratory Hole Location Plan

DRAWING NO. C7747E/02	REVISION NO. >>
DRAWN BY AW	APPROVED BY AL

DATE	SCALE	PAPER SIZE
September 2023	1:2,500	A3

APPENDIX B

EXPLORATORY HOLE LOGS

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.30	122.92	
				MADE GROUND - Black gravelly SAND. Sand is fine to coarse of ash. Gravel is angular to sub-rounded fine to coarse of ash, coal, clinker, and brick.	0.70	122.52	
				Firm brown / grey silty sandy CLAY. Low plasticity (field description).	0.80	122.42	
				End of trial pit at 0.80m			
			1				
			2				
			3				
			4				
			5				

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.30	122.60	
				Firm brown / grey silty sandy CLAY. Low plasticity (field description).	0.50	122.40	
				End of trial pit at 0.50m			
			1				
			2				
			3				
			4				
			5				

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.25	122.60	
				MADE GROUND - Black gravelly SAND. Sand is fine to coarse of ash. Gravel is angular to sub-rounded fine to coarse of ash, coal, clinker, and brick.	0.45	122.40	
				Firm brown / grey silty sandy CLAY. Low plasticity (field description).	0.55	122.30	

End of trial pit at 0.55m

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.25	122.42	
				Firm yellowish brown mottled orange slightly sandy CLAY. Low plasticity (field description).	0.35	122.32	
				End of trial pit at 0.35m			
			1				
			2				
			3				
			4				
			5				

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.25	122.32	
				Firm yellowish brown mottled orange slightly sandy CLAY. Low plasticity (field description).	0.35	122.22	
				End of trial pit at 0.35m			
			1				
			2				
			3				
			4				
			5				

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.30	123.16	
				MADE GROUND - Soft to firm gravelly CLAY. Low plasticity (field description). Gravel is sub-rounded to sub-angular fine to coarse of brick, sandstone and concrete.	0.80	122.66	
				End of trial pit at 0.80m			
			1				
			2				
			3				
			4				
			5				

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend
				MADE GROUND - Dark brown clayey slightly sandy slightly gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone, brick and coal.	0.20	122.16	
				Yellowish brown partially weathered SANDSTONE. Recovered as very gravelly sandy clay.	0.30	122.06	
				End of trial pit at 0.30m			
			1				
			2				
			3				
			4				
			5				

APPENDIX C

LABORATORY TEST RESULTS

eurofins
Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
[redacted]

Final Report

Report No.:	23-29658-1		
Initial Date of Issue:	18-Sep-2023		
Re-Issue Details:			
Client	Sirius Geotechnical Ltd		
Client Address:	4250 (Downstairs) Thorpe Park Park Approach Leeds West Yorkshire LS15 8GB		
Contact(s):	Andrew Lake Andrew Western		
Project	C7747E Laneside Farm, Morley		
Quotation No.:		**Date Received:**	05-Sep-2023
Order No.:	23879/C7747E/AMW	**Date Instructed:**	05-Sep-2023
No. of Samples:	30		
Turnaround (Wkdays):	5	**Results Due:**	11-Sep-2023
Date Approved:	18-Sep-2023		
Approved By:	[redacted]		
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd				**Chemtest Job No.:**	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:				**Chemtest Sample ID.:**	1697717	1697718	1697719	1697720	1697721	1697722	1697723	1697724
				Client Sample ID.:	TS1 - 1	TS1 - 2	TS1 - 3	TS1 - 4	TS1 - 5	TS1 - 6	TS2 - 1	TS2 - 2
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Date Sampled:	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023
				Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	20	18	19	19	19	17	20	21
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
pH	M	2010		4.0	8.4	8.3	8.1	8.1	8.1	8.2	7.8	7.8
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Sulphate (Total)	U	2430	%	0.010	0.12	0.17	0.12	0.14	0.17	0.15	0.11	0.091
Arsenic	M	2455	mg/kg	0.5	22	25	28	20	24	33	26	22
Cadmium	M	2455	mg/kg	0.10	0.31	0.42	0.33	0.31	0.36	0.42	0.29	0.24
Chromium	M	2455	mg/kg	0.5	77	33	27	29	37	45	30	19
Copper	M	2455	mg/kg	0.50	46	53	60	40	52	68	52	36
Mercury	M	2455	mg/kg	0.05	0.34	0.32	0.42	0.33	0.43	0.54	0.48	0.32
Nickel	M	2455	mg/kg	0.50	18	19	19	17	24	21	26	14
Lead	M	2455	mg/kg	0.50	76	90	100	62	81	120	88	64
Selenium	M	2455	mg/kg	0.25	0.94	1.1	1.3	1.1	1.3	1.0	0.99	0.95
Zinc	M	2455	mg/kg	0.50	140	130	130	100	130	150	120	91
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05								
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05								
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05								
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05								
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25								
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00								
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00								
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00								
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00								
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00								
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00								
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00								
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05								
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05								
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05								
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25								
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00								
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00								
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00								
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00								

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd	**Chemtest Job No.:**				23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:	**Chemtest Sample ID.:**				1697717	1697718	1697719	1697720	1697721	1697722	1697723	1697724
	Client Sample ID.:				TS1 - 1	TS1 - 2	TS1 - 3	TS1 - 4	TS1 - 5	TS1 - 6	TS2 - 1	TS2 - 2
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00								
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00								
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00								
Total VPH >C5-C10	U	2780	mg/kg	0.50								
Total EPH >C10-C35	U	2690	mg/kg	10.00								
Total EPH >C10-C40	N	2690	mg/kg	10.00								
Total Organic Carbon	M	2625	%	0.20	3.8	4.4	4.5	4.0	6.1	3.7	5.1	4.0
Naphthalene	M	2700	mg/kg	0.10	0.24	0.66	< 0.10	0.34	0.34	0.80	0.36	0.31
Acenaphthylene	M	2700	mg/kg	0.10	0.22	0.74	< 0.10	0.49	0.50	0.75	0.62	0.17
Acenaphthene	M	2700	mg/kg	0.10	0.14	0.71	< 0.10	0.62	0.30	1.8	0.81	0.23
Fluorene	M	2700	mg/kg	0.10	0.19	1.1	< 0.10	0.26	0.27	1.1	0.29	0.23
Phenanthrene	M	2700	mg/kg	0.10	1.4	4.4	1.1	1.6	1.9	10	1.7	0.98
Anthracene	M	2700	mg/kg	0.10	0.38	1.4	0.21	0.36	0.43	3.2	0.47	0.22
Fluoranthene	M	2700	mg/kg	0.10	2.2	4.9	1.5	2.5	2.7	15	3.3	1.5
Pyrene	M	2700	mg/kg	0.10	2.2	4.9	1.7	2.6	2.6	15	3.3	1.5
Benzo[a]anthracene	M	2700	mg/kg	0.10	1.4	3.1	1.4	2.3	1.9	8.2	3.0	1.6
Chrysene	M	2700	mg/kg	0.10	1.3	2.9	1.0	1.7	1.6	8.7	2.1	0.93
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	2.0	3.0	0.93	1.8	2.0	9.2	2.8	1.4
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	1.7	1.2	0.33	0.78	0.72	3.7	1.2	0.48
Benzo[a]pyrene	M	2700	mg/kg	0.10	2.1	2.2	0.72	1.1	1.2	7.0	1.6	0.66
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	0.61	1.4	0.43	0.86	0.93	4.5	1.2	0.50
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.19	0.61	< 0.10	0.30	< 0.10	1.2	0.37	0.16
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	0.55	1.1	0.51	0.70	0.78	4.0	2.6	0.62
Total Of 16 PAH's	M	2700	mg/kg	2.0	17	34	9.8	18	18	94	26	12
Benzene	M	2760	µg/kg	1.0								
Toluene	M	2760	µg/kg	1.0								
Ethylbenzene	M	2760	µg/kg	1.0								
m & p-Xylene	M	2760	µg/kg	1.0								
o-Xylene	M	2760	µg/kg	1.0								
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0								
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd				**Chemtest Job No.:**	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:				**Chemtest Sample ID.:**	1697725	1697726	1697727	1697728	1697729	1697730	1697731	1697732
				Client Sample ID.:	TS2 - 3	TS2 - 4	TS2 - 5	TS2 - 6	TS2 - 7	TS2 - 8	TS2 - 9	TS3 - 1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Date Sampled:	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023
				Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	22	17	12	16	19	15	13	12
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
pH	M	2010		4.0	7.9	8.1	8.4	8.0	8.0	8.0	8.0	8.1
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Sulphate (Total)	U	2430	%	0.010	0.087	0.096	0.095	0.25	0.094	0.11	0.12	0.11
Arsenic	M	2455	mg/kg	0.5	22	23	16	27	22	31	28	26
Cadmium	M	2455	mg/kg	0.10	0.28	0.29	2.2	0.36	0.34	0.58	0.37	0.40
Chromium	M	2455	mg/kg	0.5	25	50	29	27	22	39	27	65
Copper	M	2455	mg/kg	0.50	45	49	32	44	41	74	49	56
Mercury	M	2455	mg/kg	0.05	0.47	0.64	0.29	0.42	0.31	0.46	0.44	0.57
Nickel	M	2455	mg/kg	0.50	16	15	26	15	17	22	22	19
Lead	M	2455	mg/kg	0.50	76	79	46	58	71	130	86	98
Selenium	M	2455	mg/kg	0.25	0.89	0.89	1.1	1.1	1.1	1.0	1.1	0.94
Zinc	M	2455	mg/kg	0.50	89	97	100	110	120	180	140	140
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05								
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05								
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05								
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05								
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25								
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00								
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00								
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00								
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00								
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00								
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00								
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00								
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05								
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05								
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05								
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25								
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00								
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00								
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00								
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00								

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd	**Chemtest Job No.:**				23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:	**Chemtest Sample ID.:**				1697725	1697726	1697727	1697728	1697729	1697730	1697731	1697732
	Client Sample ID.:				TS2 - 3	TS2 - 4	TS2 - 5	TS2 - 6	TS2 - 7	TS2 - 8	TS2 - 9	TS3 - 1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00								
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00								
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00								
Total VPH >C5-C10	U	2780	mg/kg	0.50								
Total EPH >C10-C35	U	2690	mg/kg	10.00								
Total EPH >C10-C40	N	2690	mg/kg	10.00								
Total Organic Carbon	M	2625	%	0.20	3.9	2.8	2.4	6.7	4.6	3.1	4.9	3.3
Naphthalene	M	2700	mg/kg	0.10	0.56	0.31	< 0.10	0.76	0.30	0.37	0.35	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	0.71	0.35	< 0.10	0.88	0.56	0.47	0.49	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	0.38	0.41	< 0.10	0.40	0.28	0.44	0.24	< 0.10
Fluorene	M	2700	mg/kg	0.10	0.51	0.27	< 0.10	0.46	0.31	0.31	0.26	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	2.3	1.8	0.52	1.8	2.0	2.3	1.7	0.66
Anthracene	M	2700	mg/kg	0.10	0.45	0.39	0.10	0.30	0.46	0.53	0.35	0.16
Fluoranthene	M	2700	mg/kg	0.10	3.1	2.7	0.81	2.3	4.0	4.0	2.6	1.2
Pyrene	M	2700	mg/kg	0.10	3.1	2.8	0.96	2.4	4.1	4.2	2.3	1.1
Benzo[a]anthracene	M	2700	mg/kg	0.10	2.7	2.4	1.8	2.1	2.9	2.9	2.2	1.3
Chrysene	M	2700	mg/kg	0.10	1.9	1.6	0.54	1.5	2.3	2.4	1.6	0.68
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	2.6	2.2	1.1	2.2	2.9	2.9	2.5	1.1
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	0.91	0.94	0.61	0.74	1.1	1.1	0.82	0.45
Benzo[a]pyrene	M	2700	mg/kg	0.10	1.4	1.4	0.50	1.3	1.9	2.0	1.2	0.52
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	1.1	1.2	0.51	1.1	1.3	1.3	1.8	0.61
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.32	0.33	< 0.10	< 0.10	0.35	0.33	0.18	0.36
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	0.98	1.3	0.41	1.1	1.3	1.2	0.86	0.47
Total Of 16 PAH's	M	2700	mg/kg	2.0	23	20	7.9	19	26	27	20	8.6
Benzene	M	2760	µg/kg	1.0								
Toluene	M	2760	µg/kg	1.0								
Ethylbenzene	M	2760	µg/kg	1.0								
m & p-Xylene	M	2760	µg/kg	1.0								
o-Xylene	M	2760	µg/kg	1.0								
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0								
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd	**Chemtest Job No.:**				23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:	**Chemtest Sample ID.:**				1697733	1697734	1697735	1697736	1697737	1697738	1697739	1697740
	Client Sample ID.:				TS3 - 2	TS3 - 3	TS4 - 1	TS4 - 2	TS4 - 3	TS4 - 4	F1-TS - 1	F1-TS - 5
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	15	11	14	17	17	16	16	13
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
pH	M	2010		4.0	8.1	8.1	8.2	8.1	8.1	8.1	8.1	8.2
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Sulphate (Total)	U	2430	%	0.010	0.13	0.092	0.12	0.14	0.20	0.13	0.17	0.13
Arsenic	M	2455	mg/kg	0.5	25	22	33	35	40	33	41	31
Cadmium	M	2455	mg/kg	0.10	0.33	0.29	0.26	0.28	0.30	0.27	0.35	0.29
Chromium	M	2455	mg/kg	0.5	28	49	25	29	26	25	25	27
Copper	M	2455	mg/kg	0.50	47	42	52	74	56	52	63	52
Mercury	M	2455	mg/kg	0.05	0.48	0.44	0.50	0.67	0.60	0.54	0.59	1.2
Nickel	M	2455	mg/kg	0.50	19	18	18	24	18	18	22	19
Lead	M	2455	mg/kg	0.50	83	64	76	98	81	82	110	78
Selenium	M	2455	mg/kg	0.25	1.0	0.88	1.0	1.0	1.4	1.0	1.3	1.0
Zinc	M	2455	mg/kg	0.50	120	110	92	100	100	97	160	96
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05								
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05								
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05								
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05								
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25								
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00								
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00								
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00								
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00								
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00								
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00								
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00								
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05								
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05								
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05								
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25								
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00								
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00								
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00								
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00								

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd	**Chemtest Job No.:**				23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:	**Chemtest Sample ID.:**				1697733	1697734	1697735	1697736	1697737	1697738	1697739	1697740
	Client Sample ID.:				TS3 - 2	TS3 - 3	TS4 - 1	TS4 - 2	TS4 - 3	TS4 - 4	F1-TS - 1	F1-TS - 5
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023	31-Aug-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00								
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00								
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00								
Total VPH >C5-C10	U	2780	mg/kg	0.50								
Total EPH >C10-C35	U	2690	mg/kg	10.00								
Total EPH >C10-C40	N	2690	mg/kg	10.00								
Total Organic Carbon	M	2625	%	0.20	3.6	2.9	11	3.5	7.3	7.5	14	4.7
Naphthalene	M	2700	mg/kg	0.10	0.68	< 0.10	1.1	< 0.10	0.76	1.4	1.0	0.43
Acenaphthylene	M	2700	mg/kg	0.10	0.49	< 0.10	0.48	< 0.10	0.31	0.31	0.38	0.16
Acenaphthene	M	2700	mg/kg	0.10	1.1	< 0.10	0.43	< 0.10	0.49	0.71	0.88	0.51
Fluorene	M	2700	mg/kg	0.10	1.0	< 0.10	0.39	< 0.10	1.1	0.84	0.52	0.22
Phenanthrene	M	2700	mg/kg	0.10	7.8	0.38	1.9	0.72	1.7	4.7	1.5	0.66
Anthracene	M	2700	mg/kg	0.10	1.6	0.14	0.34	0.16	0.35	1.2	0.33	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	8.9	0.68	2.4	1.2	3.1	5.8	2.1	0.91
Pyrene	M	2700	mg/kg	0.10	8.5	0.67	2.3	1.1	2.7	6.2	2.3	0.91
Benzo[a]anthracene	M	2700	mg/kg	0.10	4.6	0.34	0.95	0.55	1.2	2.4	2.0	0.30
Chrysene	M	2700	mg/kg	0.10	4.5	0.19	2.2	0.99	2.0	4.0	2.6	0.65
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	5.2	0.56	1.4	< 0.10	1.6	3.2	1.9	1.1
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	2.0	0.25	0.46	< 0.10	0.59	1.3	0.59	0.47
Benzo[a]pyrene	M	2700	mg/kg	0.10	3.8	0.41	1.2	< 0.10	1.7	2.6	1.6	0.69
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	2.5	< 0.10	0.57	< 0.10	0.78	1.7	1.4	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.65	< 0.10	0.19	< 0.10	0.15	0.75	0.55	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	2.6	< 0.10	1.2	< 0.10	1.5	1.9	1.1	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	56	3.6	18	4.7	20	39	21	7.0
Benzene	M	2760	µg/kg	1.0								
Toluene	M	2760	µg/kg	1.0								
Ethylbenzene	M	2760	µg/kg	1.0								
m & p-Xylene	M	2760	µg/kg	1.0								
o-Xylene	M	2760	µg/kg	1.0								
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0								
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd	**Chemtest Job No.:**				23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:	**Chemtest Sample ID.:**				1697741	1697742	1697743	1697744	1697745	1697746
	Client Sample ID.:				BP01	BP02	BP03	BP04	BP05	BP06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				31-Aug-2023	31-Aug-2023	31-Aug-2023	01-Sep-2023	01-Sep-2023	01-Sep-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	15	13	14	12	19	13
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Clay	Clay	Clay	Clay	Sand
pH	M	2010		4.0	7.9	7.9	8.1	8.4	7.8	7.9
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Sulphate (Total)	U	2430	%	0.010	< 0.010	< 0.010	0.014	0.033	0.037	0.17
Arsenic	M	2455	mg/kg	0.5	1.7	3.3	3.3	5.5	5.6	7.1
Cadmium	M	2455	mg/kg	0.10	0.19	0.24	0.12	0.14	0.16	0.49
Chromium	M	2455	mg/kg	0.5	18	16	27	20	19	11
Copper	M	2455	mg/kg	0.50	27	30	42	37	29	57
Mercury	M	2455	mg/kg	0.05	0.10	0.07	0.09	0.10	0.10	0.15
Nickel	M	2455	mg/kg	0.50	47	40	60	49	34	31
Lead	M	2455	mg/kg	0.50	25	33	34	36	38	50
Selenium	M	2455	mg/kg	0.25	0.73	0.92	0.87	1.4	0.95	1.2
Zinc	M	2455	mg/kg	0.50	110	130	180	150	110	160
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0	4.0	5.5	4.2	14
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0	1.1	9.3	< 1.0	12
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	8.5	< 2.0	11
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	9.2	< 3.0	8.6
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0	5.0	32	7.2	44
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	32	< 10	44
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.5
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	2.9	3.2	< 2.0	2.1	< 2.0	3.7
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	3.5	< 2.0	3.4

Results - Soil

Project: C7747E Laneside Farm, Morley

Client: Sirius Geotechnical Ltd	**Chemtest Job No.:**				23-29658	23-29658	23-29658	23-29658	23-29658	23-29658
Quotation No.:	**Chemtest Sample ID.:**				1697741	1697742	1697743	1697744	1697745	1697746
	Client Sample ID.:				BP01	BP02	BP03	BP04	BP05	BP06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Date Sampled:				31-Aug-2023	31-Aug-2023	31-Aug-2023	01-Sep-2023	01-Sep-2023	01-Sep-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	1.9	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	5.6	< 5.0	12
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	12
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10	< 10	< 10	38	10	56
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	38	12	56
Total Organic Carbon	M	2625	%	0.20	< 0.20	0.52	0.37	0.54	2.7	7.9
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.46
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.64
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35–C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

[redacted]

APPENDIX D

SIRIUS GENERAL ASSESSMENT CRITERIA

The Sirius Group
Stage 1 Generic Assessment Criteria for Soils

Revision: 24 January 2020

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce						
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
Metals/Metalloids										
Arsenic (inorganic)	37			40			630			[1]
Cadmium	11			85			190			[2]
Chromium (III)	910			4000			8600			
Chromium (VI)	6.0			6.1			33			[3]
Copper	200			7100			68000			[4]
Lead	200			310			2300			[5]
Mercury (inorganic)	40			56			1100			[6]
Nickel	130			180			980			[7]
Selenium	250			430			12000			
Vanadium	410			1200			9000			
Zinc	450			40000			750000			[4]
Other Inorganics										
pH	<5 or >9			<5 or >9			<5 or >9			
Total Sulphate	2400			2400			2400			[8]
Water-Soluble Sulphate	0.5 g/l			0.5 g/l			0.5 g/l			[8]
Free Cyanide	34			34			1400			[9]
Organics										
PAHs										
Acenaphthene	200	490	920	2000	3600	4900	75000	92000	100000	
Acenaphthylene	170	400	760	2000	3600	4900	76000	93000	100000	
Anthracene	2300	5300	9400	30000	34000	36000	520000	540000	540000	[10]
Benzo(a)anthracene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(a)pyrene	2.1	2.1	2.2	2.3	2.3	2.3	27	27	27	[11]
Benzo(b)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(k)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(g,h,i)perylene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Chrysene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Dibenzo(a,h)anthracene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Fluoranthene	280	560	820	1500	1600	1600	23000	23000	23000	
Fluorene	170	390	730	2200	3400	4000	60000	67000	70000	
Indeno(1,2,3-c,d)pyrene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Naphthalene	1.0	2.3	4.6	1.0	2.4	4.7	110	260	510	
Phenanthrene	95	220	380	1300	1400	1500	22000	22000	23000	
Pyrene	620	1200	1900	3700	3800	3800	54000	54000	54000	
BTEX and related										
Benzene	0.063	0.13	0.24	0.16	0.30	0.38	15	28	49	
Toluene	100	240	460	370	830	1100	33000	68000	110000	
Ethylbenzene	26	62	120	34	81	110	3200	7400	14000	
Xylenes (total)	28	67	130	33	78	110	3200	7700	15000	[12]
1,2,4-trimethylbenzene	0.22	0.53	1.1	0.24	0.58	1.2	39	93	170	
Iso-propylbenzene	6.6	16	32	6.8	17	33	1300	3100	6100	
Propylbenzene	21	51	100	23	57	110	3800	9100	17000	
Styrene	6.9	16	32	21	49	93	3100	6100	9500	
TPH										
Aliphatic EC 5-6	24	41	68	24	41	68	2400	4100	6900	
Aliphatic EC >6-8	53	110	210	53	110	210	5300	11000	21000	
Aliphatic EC >8-10	13	31	61	13	31	61	1300	3100	6000	
Aliphatic EC >10-12	62	150	300	62	150	300	6100	15000	28000	
Aliphatic EC >12-16	510	1200	2300	510	1200	2300	43000	72000	85000	
Aliphatic EC >16-35	41000	70000	90000	42000	70000	90000	>1E6	>1E6	>1E6	[13]
Aromatic EC >5-7	53	110	200	150	300	538	15000	28000	48000	
Aromatic EC >7-8	100	240	460	370	820	1500	33000	68000	110000	
Aromatic EC >8-10	20	48	94	22	54	100	2200	5200	9800	
Aromatic EC >10-12	63	150	290	120	290	560	11000	22000	30000	
Aromatic EC >12-16	140	320	570	1100	1900	2200	35000	37000	37000	
Aromatic EC >16-21	260	540	840	1800	1900	1900	28000	28000	28000	
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	28000	28000	28000	
Chlorinated Organics										
Chlorobenzene	0.19	0.44	0.86	0.19	0.45	0.87	31	71	140	
Dichloromethane (DCM)	0.47	0.78	1.2	1.2	1.7	2.4	250	340	470	
1,1-dichloroethane (DCA)	1.4	2.4	4.0	1.4	2.4	4.1	260	420	690	
1,2-dichloroethane (DCA)	0.0031	0.0048	0.0076	0.0035	0.0053	0.0084	0.34	0.51	0.81	
1,1-dichloroethene (DCE)	0.15	0.26	0.45	0.15	0.26	0.46	24	43	74	
cis-1,2-dichloroethene (DCE)	0.066	0.12	0.20	0.069	0.12	0.21	14	23	38	
trans-1,2-dichloroethene (DCE)	0.11	0.21	0.38	0.12	0.22	0.39	21	37	65	
Pentachlorophenol	0.21	0.52	1.0	27	30	31	400	400	400	
1,1,1,2-tetrachloroethane	0.56	1.3	2.6	0.63	1.5	2.9	59	140	270	

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce						
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
1,1,2,2-tetrachloroethane	0.98	2.1	4.0	1.6	3.4	6.3	150	310	570	
Tetrachloroethene (PCE)	0.074	0.17	0.32	0.07	0.17	0.33	10	23	45	
Tetrachloromethane (CT)	0.011	0.024	0.046	0.011	0.024	0.046	1.6	3.6	6.9	
1,1,1-trichloroethane (TCA)	3.7	7.8	15	3.8	7.9	15	370	770	1400	
1,1,2-trichloroethane (TCA)	0.39	0.85	1.6	0.51	1.1	2.0	89	180	320	
Trichloroethene (TCE)	0.0070	0.015	0.028	0.0071	0.015	0.028	1.5	2.8	44	
Trichloromethane (CF)	0.43	0.80	1.4	0.48	0.89	53	98	170	300	
Vinyl Chloride	0.00034	0.00045	0.00062	0.00037	0.00048	0.00066	0.038	0.049	0.068	
Miscellaneous Organics										
Carbon disulphide	0.066	0.13	0.25	0.066	0.13	0.25	6.7	14	25	
Di-(2-ethylhexyl)-phthalate	290	660	1100	3900	4000	4100	85000	85000	8600	
MTBE	31	55	94	39	68	120	7400	12000	19000	
Phenol	110	190	330	420	440	440	440			[14]
Methylphenols (cresols), total	78	170	330	5600	8200	9900	160000	170000	18000	[15]
2,4-dimethylphenol (m-xylenol)	18	43	82	200	430	720	15000	23000	28000	
Other Parameters										
TOC	3% w/w			3% w/w			3% w/w			[16]
Calorific Value	2 MJ/kg			2 MJ/kg			2 MJ/kg			[17]
Asbestos	Fibres present			Fibres present			Fibres present			

All concentration-based criteria are rounded to 2 significant figures.

The criteria assume a sandy soil type, which will be conservative for the great majority of soils (including made ground) encountered on historically contaminated sites.

Except where otherwise stated, criteria have been derived by Sirius using CLEA version 1.06. Parameters for the land use cases are consistent with those given in Environment Agency (2009) “Updated Technical Background to the CLEA Model”, report SC050021/SR3 but updated (where relevant) for respiration rate, exposure frequency for dermal contact outdoors, soil adherence factors for children, and plant uptake concentration factors given in CL:AIRE (2014) and Nathanail et al., (2015). No correction has been made for the “Top Two” crop types in the Residential with Homegrown Produce land use and the criteria will therefore be conservative in this regard.

Health Criteria Values (HCVs) and (except where specifically noted) chemical property data were obtained from:
- Environment Agency Science Report SC050021 Series;
- Nathanail et al. (2015);
- CL:AIRE-AGS-EIC (2010).

Footnotes

[1] Based on oral GAC as this is the lower GAC and reflects a cancer risk many orders of magnitude greater than for inhalation.

[2] Determined for lifetime exposure. Plant uptake concentration factors applied were as given in CL:AIRE (2014). The GAC values are based on data for soils having a pH value in the range 6-8; caution should be applied in applying them at pH values <5.

[3] Both oral and inhalation HCVs are based on local toxicological effects and therefore the lowest (oral) GAC value is adopted.

[4] For the Residential with Homegrown Produce land use, the GAC values for Cu and Zn are based on potential phytotoxic effects and have been set at the maximum allowable concentrations for sewage sludge-amended soils presented in the "Sludge (Use in Agriculture) Regulations" (SI 1263/1989); these criteria may also be applied in any land use where plants are to be grown. The equivalent GAC values for human health protection in the Residential with Homegrown Produce land use are around an order of magnitude greater.

[5] The Category 4 Screening Levels for lead defined in CL:AIRE (2013) have been adopted directly to provide an acceptable basis for initial assessment of data. Where background concentrations of lead exceed the GAC value, then site-specific evaluation will be required.

[6] The SGV for mercury is based on inorganic mercury which represents the most common form encountered within the environment. This is considered appropriate for most sites as: “…the SGV for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low” (Environment Agency report SC050021/Mercury SGV). Analysis and specific assessment for elemental or methylated forms of mercury will need to be considered if historical land use or site-specific factors indicate that these forms of mercury are likely to be present.

[7] Toxicological effects by inhalation are localised, therefore the lower of the GAC values for oral and inhalation HCVs have been adopted.

[8] BRE (2005). Sulphate is not considered to pose a potential risk to human health under normal circumstances – this GAC applies to construction cases only and is set at the upper limit for DS-1 Design Sulphate Class concrete.

[9] GAC calculated for acute risk. Further information can be provided upon request.

[10] The genotoxic PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene) are routinely assessed using benzo(a)pyrene as a surrogate (HPA (2010) “Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)”, version 5). Separate information on this approach is provided.

[11] Calculated using a 'minimum risk' oral index dose derived from the application of a 10,000x safety factor to the BMD10 presented in CL:AIRE (2014) for benzo(a)pyrene as a surrogate marker and the inhalation index dose specified in CL:ARE (2014) and Nathanail *et al* . (2015). As a conservative measure, the GAC is based on combined exposure pathways to account for systemic carcinogenic effects. Further information on the derivation can be provided upon request.

[12] For screening purposes, a single GAC has been set for total xylene. This is the lowest of the values calculated for the three individual xylene isomers.

[13] “No GAC” indicates that no value has been specified for this land use as the TDSI cannot be exceeded at achievable soil concentrations.

[14] 440mg/kg is the minimum concentration that is protective for direct skin contact with phenol (See Environment Agency SR050021/Phenol SGV) and is adopted where GACs for chronic exposure are higher.

[15] For screening purposes, a single GAC has been set for total methylphenol. This is the lowest of the values calculated for the three individual methylphenol isomers.

[16] The Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the ‘Inert’ waste threshold and should be considered as for information purposes only.

[17] ICRCL (1986) Guidance Note 61/84, 2nd Edition, Notes on the Fire Hazards of Contaminated Land. Calorific value is not an indication of direct human health risk but may be useful in assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.