**Site:** **Chain Road, Blackley**
**Plots:** **7-12**
**Date:** **March 2024**

# 1 INTRODUCTION

LK Consult (LKC) has been appointed by Great Places Housing Group to validate the remedial works in the gardens at the development at Chain Road, Blackley.

This validation report concerns Plots 7-9 comprising houses with private rear gardens and front gardens. The shared front garden of Plots 11-12 is very limited and unlikely to be used excessively by receptors.

The requirement for remedial works across the site arose as a result of previous site investigations and risk assessments carried out by LKC (ref. CL-602-LKC 21 1026-03, dated October 2021).

The remediation requirements were as follows:

i) Private Houses: Removal of made ground and raise levels, as required, with suitably chemically validated soil. Minimum 150mm nominal topsoil layer required.
ii) Apartment Block: Provision of minimum 450mm thick 'clean' cover system, nominally comprising 300mm of subsoil plus 150mm of topsoil underlain by a suitable geotextile membrane or by 100mm physical break layer (MOT).
iii) Chemical analysis of any site won or imported material for use in garden or landscaped areas.

Gas protection measures were required. Validation of the gas protection measures has been provided under separate cover.

Chemical validation of all imported materials to be used on site is required. Imported soils are to be accompanied by a certificate of analysis and source details. A summary of the required imported material sampling requirements are presented in Table 1-1.

| Material Type | Source | Suite of Analysis | Sampling Rate (min. 3 per source) * | | |
|---|---|---|---|---|---|
| | | | Garden | Landscape | Other ** |
| Topsoil / subsoil / Fill material | Greenfield | Suite A | 200m$^3$ | 200m$^3$ | 200m$^3$ |
| | Remediated | Suite A / B dependent upon original SI | 100m$^3$ | 150m$^3$ | 200m$^3$ |
| | Brownfield / Unknown | Suite B | 50m$^3$ | 150m$^3$ | 200m$^3$ |
| Quarried Fill | First Generation i.e. quarried sand (subsoil) or stone (break layer) | No testing is required. Certification of material provenance is required. | | | |

Table 1-1: Sampling requirements for imported soils.

**Notes:**
**Suite A** - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.
**Suite B** - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.
*Minimum sampling rate of 3 samples per source.

# 2 CAPPING LAYER MATERIAL VALIDATION

Removal of Made Ground

Any reworked topsoil / made ground should be removed from the garden areas of the private houses. LKC have been provided with transfer notes which show removal of the made ground from site. These are provided in Appendix A.

LKC also collected photographic evidence that the made ground had been removed to natural strata beneath. This is discussed in Section 3.

Topsoil

Approximately 80m$^3$ of topsoil was imported to site.

The topsoil was sampled at a conservative rate of 1 sample per 50m$^3$ (minimum of three samples) in line with the remedial requirements. LKC collected 3no. samples for testing.

The certificate for the imported topsoil and chemical analysis certificates are provided in Appendix B.

Subsoil

Approximately 15m$^3$ of subsoil was imported to site. The subsoil was sampled at a conservative rate of 1 sample per 50m$^3$ (minimum of three samples) in line with the remedial requirements. LKC collected 3no. samples for testing.

The certificate for the imported subsoil and chemical analysis certificates are provided in Appendix C.

Soil Risk Assessment

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs).
- LQM Suitable 4 Use Levels (S4ULs).

C4SLs were published in 2013[1,2]. The recent change to the contaminated land guidance has changed the evaluation of risk from 'minimal' (referred to as Health Criteria values (HCVs))[3] used to generate Soil Guideline Values (SGVs) to 'low' (referred to as Lowest Level of Toxicological Concern (LLTCs)). The policy companion document and supporting letter by Defra, dated 3rd September 2014, states that C4SLs 'could be used under the planning regime, as well as within Part 2A'. Based on these comments LKC considers the justifications and assumptions used to generate 'low' risk are suitable for the planning regime.

Where no C4SLs have been generated LKC will use the LQM S4ULs[4]. Similar assumptions and land uses to C4SLs have been used. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions[5,6,7,8].

[1] Defra (2014). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Policy Companion Document."
[2] CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."
[3] EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.
[4] LQM (2014). "The LQM/CIEH S4ULs for Human Health Risk Assessment."
[5] EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.
[6] EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.
[7] EA (2008). "A Review of Body Weight and Height Data used within the Contaminated Land Exposure Assessment Model (CLEA)." Project SC050021/Technical Review 1.
[8] EA (2009). "Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values." Science report SC050021/SR7.

An assessment of the data should be undertaken to confirm B(a)P is a suitable surrogate marker by assessing the ratios of carcinogenic PAHs to B(a)P. However, as the majority of the PAHs were recorded as less than detection limits, the assessment could not be undertaken.

The proposed development is for residential houses with gardens, therefore the assessment criteria for residential with plant uptake has been used.

All criteria have been generated using the CLEA V1.06/07 model[9] based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

Appropriate screening values are presented in Appendix D.

The analytical results have been compared to the relevant assessment criteria and no elevated contaminants were identified. Therefore, the imported soil is considered suitable for use in the cover system.

## 3 COVER SYSTEM DEPTH IN REAR GARDEN AREAS

This report concerns private houses, therefore a minimum of 150mm imported topsoil is required in all gardens for Plots 7-12 onto natural strata.

Photographs are provided in Appendix E and the observations are summarised below.

| Location | Total Depth (mm) | Evidence of Natural Strata at Base (Y/N) | Required Minimum Topsoil Depth (mm) | Pass (✓) or Fail (x) |
|---|---|---|---|---|
| Plot 7-8 Shared Front | 640 | Y | 150 | ✓ |
| Plots 9-10 Sharee Front | 760 | Y | 150 | ✓ |
| Plot 11-12 Shared Front | 150 | Y | 150 | ✓ |
| Plot 7 Rear | 480 | Y | 150 | ✓ |
| Plot 8 Rear | 360 | Y | 150 | ✓ |
| Plot 9 Rear | 530 | Y | 150 | ✓ |
| Plot 10 Rear | 300 | Y | 150 | ✓ |
| Plot 11 Rear | 200 | Y | 150 | ✓ |
| Plot 12 Rear | 200 | Y | 150 | ✓ |

Table 3-1: Cover system construction.

## 4 UNEXPECTED CONTAMINATION

LKC understand that no unexpected contamination was encountered during development works.

## 5 CONCLUSIONS

LKC has completed the validation of the imported topsoil and 150mm cover, and conclude that, in the places inspected, chemically suitable material has been laid to a minimum 150mm.

[9] EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.

| Report Prepared By: | Report Reviewed By: |
|---|---|
| **Hannah Moss** | **Rosie Cummings** |
| **Senior Geo-Environmental Consultant** | **Principal Geo-Environmental Consultant** |

**Enc:**

**Appendix A: Waste Transfer Notes**
**Appendix B: Imported Topsoil Certificates and Certificate of Analysis - Topsoil**
**Appendix C: Imported Subsoil Certificates and Certificate of Analysis - Topsoil**
**Appendix D: Soil Validation Criteria**
**Appendix E: Plot Photographs**

## Disclaimer

This report has been prepared by LKC who have exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant experienced in preparing reports of a similar scope. However, to the extent that the report is based on or relies upon information contained in records, reports or other materials provided to LKC which have not been independently produced or verified, LKC gives no warranty, representation or assurance as to the accuracy or completeness of such information.

This report is issued on the condition that LKC will not be held liable for any loss arising from ground conditions between sampling points (i.e. boreholes/trial pits/hand augers/surface samples) which have not been shown by the sampling points or related testing carried out during the investigation, nor for any loss arising from conditions below the maximum depth of the investigation, or for any works done to the garden areas following the date of inspection. Opinions on such conditions, where given, are for general guidance only.

Other works including *inter alia* hotspot removal, drainage, soil texture, permitting, invasive species management and geotechnical requirements are out with this scope and should be dealt with by others.

This report is prepared solely for the benefit of Great Places Housing Group. It may not be relied upon by, or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full. Those using this information in subsequent assessments or evaluations do so at their own risk.

# Appendix A – Waste Transfer Notes

# DHI Excavations Ltd

**Collection / Delivery Note**

**Bulk Excavation • Demolition • Aggregates • Soils • Grab Hire • Tipper Hire**

11 - 13 Church Street, Farnworth, Bolton. BL4 8AG
Tel: 0161 794 4550 • fax: 0161 790 8088 • mobile; 07921 833673
Email: enquiries@dhiexcavations.co.uk Web: www.dhiexcavations.co.uk

No: 365589

Date: 23·10·23

WCL No: CB/DU181466 SIC CODE:

Customer: CALDWELL

Location: CHAIN RD BLACKLEY M/CR

Vehicle Reg: PN19 HRK Driver Name: LEE

| Vehicle Type: | 8W TIPPER | | 6W GRAB | | 8W GRAB | | OTHER | |
|---|---|---|---|---|---|---|---|---|
| | | ✓ | | | | | | |

Material: NON HAZ MUCK

Weight: Weight: TONNE / KG

Gross: 1X8 ✓ LOAD COL

Tare:

Net:

EWC Code:

DELAYS OR WAITING TIME

ARR DEP HR

REASON FOR DELAY:

Daywork: Hours Worked: Travel Time: Total Time:

Consignee Signature:

Time:

Print Name:

Conditions of Sale: it is essential that all written particulars entered above should be carefully checked by the consignee since this delivery note, once signed by the consignee represents formal acceptance of the material in good order and condition and subsequent complaints cannot be accepted. All complaints whether in respect of material or circumstance of delivery must be made to the driver of the vehicle and confirmed in writing direct to the company immediately

# DHI Excavations Ltd

**Bulk Excavation • Demolition • Aggregates • Soils • Grab Hire • Tipper Hire**

11 - 13 Church Street, Farnworth, Bolton. BL4 8AG
Tel: 0161 794 4550 • fax: 0161 790 8088 • mobile; 07921 833673
Email: enquiries@dhiexcavations.co.uk Web: www.dhiexcavations.co.uk

**Collection / Delivery Note**

No: 366647

Date: 16-10-23

WCL No: CB/DU181466 SIC CODE:

Customer: CALDWELLS

Location: CHAIN RD BLACKLEY

Vehicle Reg: PN19 HRK Driver Name: LEE

| Vehicle Type: | | | | | | OTHER | |
|---|---|---|---|---|---|---|---|
| | 8W TIPPER | ✓ | 6W GRAB | | 8W GRAB | | |

Material: INERT MOCK

Weight: Weight: TONNE / KG

Gross: 1X8W LOAD

Tare:

Net:

EWC Code:

DELAYS OR WAITING TIME

ARR _____ DEP _____ HR

REASON FOR DELAY:

Daywork: Hours Worked: Travel Time: Total Time:

Consignee Signature: T Pickford Time:

Print Name: T Pickford

Conditions of Sale: it is essential that all written particulars entered above should be carefully checked by the consignee since this delivery note, once signed by the consignee represents formal acceptance of the material in good order and condition and subsequent complaints cannot be accepted. All complaints whether in respect of material or circumstance of delivery must be made to the driver of the vehicle and confirmed in writing direct to the company immediately

# DHI Excavations Ltd

**Collection / Delivery Note**

**Bulk Excavation • Demolition • Aggregates • Soils • Grab Hire • Tipper Hire**

11 - 13 Church Street, Farnworth, Bolton. BL4 8AG
Tel: 0161 794 4550 • fax: 0161 790 8088 • mobile; 07921 833673
Email: enquiries@dhiexcavations.co.uk Web: www.dhiexcavations.co.uk

No: 366649

Date: 16.10.23

WCL No: CB/DU181466 SIC CODE:

Customer: CALDWELLS

Location: CHAIN RD BLACKLEY/ PNR HRK

Vehicle Reg: Driver Name: LEE

| Vehicle Type: | 8W TIPPER | ✓ | 6W GRAB | | 8W GRAB | | OTHER | |
|---|---|---|---|---|---|---|---|---|

Material: INERT MUCK

Weight: Weight: TONNE / KG

Gross: 1X8W LOAD

Tare:

Net:

EWC Code:

DELAYS OR WAITING TIME

_____ ARR _____ DEP _____ HR

REASON FOR DELAY:

Daywork: Hours Worked: Travel Time: Total Time:

Consignee Signature: Time:

Print Name: Jim Burke

Conditions of Sale: it is essential that all written particulars entered above should be carefully checked by the consignee since this delivery note, once signed by the consignee represents formal acceptance of the material in good order and condition and subsequent complaints cannot be accepted. All complaints whether in respect of material or circumstance of delivery must be made to the driver of the vehicle and confirmed in writing direct to the company immediately

# Appendix B – Imported Topsoil Certificates and Certificates of Analysis

Hannah Moss
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

**Derwentside Environmental Testing Services Ltd**
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
**t:** 01622 850410

# DETS Report No: 23-12355

| | |
|---|---|
| **Site Reference:** | Chain Road, Blackley |
| **Project / Job Ref:** | LKC 21 1026 |
| **Order No:** | LKC211026-HM |
| **Sample Receipt Date:** | 04/10/2023 |
| **Sample Scheduled Date:** | 04/10/2023 |
| **Report Issue Number:** | 1 |
| **Reporting Date:** | 11/10/2023 |

**Authorised by:**

Ela Mysiara
Quality Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

**DETS Ltd**
**Unit 1, Rose Lane Industrial Estate**
**Rose Lane**
**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| **Soil Analysis Certificate** | | | | | | |
|---|---|---|---|---|---|---|
| **DETS Report No: 23-12355** | **Date Sampled** | 03/10/23 | 03/10/23 | 03/10/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Chain Road, Blackley** | **TP / BH No** | TS101 | TS102 | TS103 | | |
| **Project / Job Ref: LKC 21 1026** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC211026-HM** | **Depth (m)** | 0.00 - 0.60 | 0.00 - 0.60 | 0.00 - 0.60 | | |
| **Reporting Date: 11/10/2023** | **DETS Sample No** | 678271 | 678272 | 678273 | | |

| **Determinand** | **Unit** | **RL** | **Accreditation** | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos Screen (S) | N/a | N/a | **ISO17025** | Not Detected | Not Detected | Not Detected | | |
| pH | pH Units | N/a | **MCERTS** | 6.6 | 7.2 | 7.3 | | |
| Total Cyanide | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | | |
| Free Cyanide | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | | |
| W/S Sulphate as $SO_4$ (2:1) | mg/l | < 10 | **MCERTS** | 45 | 80 | 59 | | |
| W/S Sulphate as $SO_4$ (2:1) | g/l | < 0.01 | **MCERTS** | 0.04 | 0.08 | 0.06 | | |
| Organic Matter (SOM) | % | < 0.1 | **MCERTS** | 8.2 | 3.4 | 4.1 | | |
| Arsenic (As) | mg/kg | < 2 | **MCERTS** | 13 | 8 | 8 | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | | |
| Cadmium (Cd) | mg/kg | < 0.2 | **MCERTS** | < 0.2 | < 0.2 | < 0.2 | | |
| Chromium (Cr) | mg/kg | < 2 | **MCERTS** | 12 | 11 | 11 | | |
| Chromium (hexavalent) | mg/kg | < 2 | NONE | < 2 | < 2 | < 2 | | |
| Copper (Cu) | mg/kg | < 4 | **MCERTS** | 41 | 28 | 27 | | |
| Lead (Pb) | mg/kg | < 3 | **MCERTS** | 70 | 58 | 56 | | |
| Mercury (Hg) | mg/kg | < 1 | **MCERTS** | < 1 | < 1 | < 1 | | |
| Nickel (Ni) | mg/kg | < 3 | **MCERTS** | 12 | 11 | 11 | | |
| Selenium (Se) | mg/kg | < 2 | **MCERTS** | < 2 | < 2 | < 2 | | |
| Vanadium (V) | mg/kg | < 1 | **MCERTS** | 22 | 16 | 15 | | |
| Zinc (Zn) | mg/kg | < 3 | **MCERTS** | 60 | 50 | 49 | | |
| Total Phenols (monohydric) | mg/kg | < 2 | NONE | < 2 | < 2 | < 2 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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**Maidstone**
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**Tel : 01622 850410**

| Soil Analysis Certificate - Speciated PAHs | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DETS Report No: 23-12355** | **Date Sampled** | 03/10/23 | 03/10/23 | 03/10/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Chain Road, Blackley** | **TP / BH No** | TS101 | TS102 | TS103 | | |
| **Project / Job Ref: LKC 21 1026** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC211026-HM** | **Depth (m)** | 0.00 - 0.60 | 0.00 - 0.60 | 0.00 - 0.60 | | |
| **Reporting Date: 11/10/2023** | **DETS Sample No** | 678271 | 678272 | 678273 | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | 0.19 | 0.30 | 1.01 | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | 0.34 | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | 0.32 | 0.48 | 2.10 | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | 0.32 | 0.44 | 1.82 | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | 0.16 | 0.75 | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | 0.23 | 0.27 | 0.78 | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | 0.29 | 0.32 | 0.71 | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | 0.13 | 0.13 | 0.26 | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | 0.22 | 0.24 | 0.53 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | 0.15 | 0.16 | 0.30 | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | 0.15 | 0.16 | 0.26 | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | 2 | 2.7 | 8.9 | | |

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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|---|---|---|---|---|---|---|
| **DETS Report No: 23-12355** | **Date Sampled** | 03/10/23 | 03/10/23 | 03/10/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Chain Road, Blackley** | **TP / BH No** | TS101 | TS102 | TS103 | | |
| **Project / Job Ref: LKC 21 1026** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC211026-HM** | **Depth (m)** | 0.00 - 0.60 | 0.00 - 0.60 | 0.00 - 0.60 | | |
| **Reporting Date: 11/10/2023** | **DETS Sample No** | 678271 | 678272 | 678273 | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aliphatic >C5 - C6 : HS_1D_MS_AL | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Aliphatic >C6 - C8 : HS_1D_MS_AL | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | | |
| Aliphatic >C8 - C10 : EH_CU_1D_AL | mg/kg | < 2 | MCERTS | 12 | < 2 | < 2 | | |
| Aliphatic >C10 - C12 : EH_CU_1D_AL | mg/kg | < 2 | MCERTS | 18 | < 2 | < 2 | | |
| Aliphatic >C12 - C16 : EH_CU_1D_AL | mg/kg | < 3 | MCERTS | 23 | < 3 | < 3 | | |
| Aliphatic >C16 - C21 : EH_CU_1D_AL | mg/kg | < 3 | MCERTS | 5 | < 3 | < 3 | | |
| Aliphatic >C21 - C34 : EH_CU_1D_AL | mg/kg | < 10 | MCERTS | 20 | < 10 | < 10 | | |
| Aliphatic >C34 - C44 | mg/kg | < 10 | NONE | < 10 | < 10 | < 10 | | |
| Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL | mg/kg | < 21 | NONE | 78 | < 21 | < 21 | | |
| Aromatic >C5 - C7 : HS_1D_MS_AR | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Aromatic >C7 - C8 : HS_1D_MS_AR | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | | |
| Aromatic >C8 - C10 : EH_CU_1D_AR | mg/kg | < 2 | MCERTS | 3 | < 2 | < 2 | | |
| Aromatic >C10 - C12 : EH_CU_1D_AR | mg/kg | < 2 | MCERTS | 10 | < 2 | < 2 | | |
| Aromatic >C12 - C16 : EH_CU_1D_AR | mg/kg | < 2 | MCERTS | 18 | < 2 | < 2 | | |
| Aromatic >C16 - C21 : EH_CU_1D_AR | mg/kg | < 3 | MCERTS | 4 | < 3 | < 3 | | |
| Aromatic >C21 - C35 : EH_CU_1D_AR | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | | |
| Aromatic >C35 - C44 | mg/kg | < 10 | NONE | < 10 | < 10 | < 10 | | |
| Aromatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AR | mg/kg | < 21 | NONE | 36 | < 21 | < 21 | | |
| Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Total | mg/kg | < 42 | NONE | 114 | < 42 | < 42 | | |

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**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| Soil Analysis Certificate - BTEX / MTBE | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DETS Report No: 23-12355** | **Date Sampled** | 03/10/23 | 03/10/23 | 03/10/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Chain Road, Blackley** | **TP / BH No** | TS101 | TS102 | TS103 | | |
| **Project / Job Ref: LKC 21 1026** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC211026-HM** | **Depth (m)** | 0.00 - 0.60 | 0.00 - 0.60 | 0.00 - 0.60 | | |
| **Reporting Date: 11/10/2023** | **DETS Sample No** | 678271 | 678272 | 678273 | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Benzene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Toluene : HS_1D_MS | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | | |
| Ethylbenzene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| p & m-xylene : HS_1D_MS | ug/kg | < 2 | MCERTS | 5 | 5 | 4 | | |
| o-xylene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| MTBE : HS_1D_MS | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | | |

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**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| Soil Analysis Certificate - Sample Descriptions | |
|---|---|
| **DETS Report No: 23-12355** | |
| **LK Consult Limited** | |
| **Site Reference: Chain Road, Blackley** | |
| **Project / Job Ref: LKC 21 1026** | |
| **Order No: LKC211026-HM** | |
| **Reporting Date: 11/10/2023** | |

| DETS Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|---|---|---|---|---|---|
| 678271 | TS101 | None Supplied | 0.00 - 0.60 | 22 | Black loamy sand with vegetation |
| 678272 | TS102 | None Supplied | 0.00 - 0.60 | 16.3 | Black sandy clay with stones |
| 678273 | TS103 | None Supplied | 0.00 - 0.60 | 15.7 | Black loamy sand |

*Moisture content is part of procedure E003 & is not an accredited test*
Insufficient Sample I/S
Unsuitable Sample U/S

**DETS Ltd**
**Unit 1, Rose Lane Industrial Estate**
**Rose Lane**
**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

**Soil Analysis Certificate - Methodology & Miscellaneous Information**

**DETS Report No: 23-12355**
**LK Consult Limited**
**Site Reference: Chain Road, Blackley**
**Project / Job Ref: LKC 21 1026**
**Order No: LKC211026-HM**
**Reporting Date: 11/10/2023**

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|---|---|---|---|---|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 – C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Fraction Organic Carbon (FOC) | Determination of TOC by combustion analyser. | E027 |
| Soil | D | Organic Matter (SOM) | Determination of TOC by combustion analyser. | E027 |
| Soil | D | TOC (Total Organic Carbon) | Determination of TOC by combustion analyser. | E027 |
| Soil | AR | Exchangeable Ammonium | Determination of ammonium by discrete analyser. | E029 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

**D Dried**
**AR As Received**

**DETS Ltd**
**Unit 1, Rose Lane Industrial Estate**
**Rose Lane**
**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| **List of HWOL Acronyms and Operators** |
|---|
| **DETS Report No: 23-12355** |
| **LK Consult Limited** |
| **Site Reference: Chain Road, Blackley** |
| **Project / Job Ref: LKC 21 1026** |
| **Order No: LKC211026-HM** |
| **Reporting Date: 11/10/2023** |

| **Acronym** | **Description** |
|---|---|
| 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 |
| 2D | GC-GC - Double coil gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics only |
| AR | Aromatics only |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted |
| _ | Operator - underscore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total |

| Det - Acronym |
|---|
| Benzene - HS_1D_MS |
| Ethylbenzene - HS_1D_MS |
| MTBE - HS_1D_MS |
| TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL |
| TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL |
| TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL |
| TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL |
| TPH CWG - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL |
| TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL |
| TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL |
| TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL |
| TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR |
| TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR |
| TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR |
| TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR |
| TPH CWG - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR |
| TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR |
| TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR |
| TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR |
| TPH CWG - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total |
| Toluene - HS_1D_MS |
| m & p-xylene - HS_1D_MS |
| o-Xylene - HS_1D_MS |

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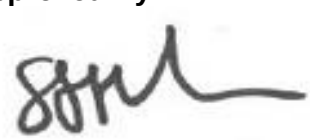
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 22-45650-1 |
| **Initial Date of Issue:** | 05-Dec-2022 |
| **Client** | LK Consult |
| **Client Address:** | Unit 29 Eton Business Park<br>Eton Hill Road<br>Radcliffe<br>Manchester<br>Lancashire<br>M26 2ZS |
| **Contact(s):** | Contaminated Land<br>Rachel Peart |
| **Project** | LKC 22 1481 Maghull, Liverpool |

| | | | |
|---|---|---|---|
| **Quotation No.:** | | **Date Received:** | 28-Nov-2022 |
| **Order No.:** | LKC221481-RP | **Date Instructed:** | 28-Nov-2022 |
| **No. of Samples:** | 10 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 02-Dec-2022 |
| **Date Approved:** | 05-Dec-2022 | | |

**Approved By:**



**Details:** Stuart Henderson, Technical Manager

# Results - Soil

**Project: LKC 22 1481 Maghull, Liverpool**

| **Client: LK Consult** | | **Chemtest Job No.:** | | | 22-45650 | 22-45650 | 22-45650 | 22-45650 | 22-45650 | 22-45650 | 22-45650 | 22-45650 | 22-45650 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: | | **Chemtest Sample ID.:** | | | 1553629 | 1553630 | 1553631 | 1553632 | 1553633 | 1553634 | 1553635 | 1553636 | 1553637 |
| Order No.: LKC221481-RP | | Client Sample Ref.: | | | TS101 | TS102 | TS103 | TS104 | TS105 | TS106 | TS107 | TS108 | TS109 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 | 24-Nov-2022 |
| | | Asbestos Lab: | | | DURHAM | 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 | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 25 | 24 | 25 | 23 | 21 | 25 | 24 | 25 | 25 |
| Soil Colour | N | 2040 | | N/A | Black | Black | Black | Black | Black | Black | Black | Brown | Black |
| Other Material | N | 2040 | | N/A | Roots | Roots | Stones and Roots | Roots and Stones | Stones and Roots | Stones and Roots | Stones and Roots | Roots | Stones and Roots |
| Soil Texture | N | 2040 | | N/A | Sand | Sand | Sand | Sand | Sand | Sand | Sand | Sand | Sand |
| pH | M | 2010 | | 4.0 | 6.8 | 6.8 | 6.7 | 6.8 | 6.8 | 6.8 | 6.7 | 6.6 | 6.6 |
| 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 | < 0.010 |
| Arsenic | M | 2455 | mg/kg | 0.5 | 12 | 11 | 19 | 11 | 9.1 | 13 | 19 | 11 | 12 |
| Cadmium | M | 2455 | mg/kg | 0.10 | 0.28 | 0.23 | 2.0 | 0.24 | 0.12 | 0.22 | 0.26 | < 0.10 | 0.20 |
| Chromium | M | 2455 | mg/kg | 0.5 | 16 | 14 | 23 | 14 | 12 | 16 | 20 | 15 | 16 |
| Copper | M | 2455 | mg/kg | 0.50 | 39 | 36 | 60 | 36 | 30 | 41 | 54 | 37 | 42 |
| Mercury | M | 2455 | mg/kg | 0.05 | 0.23 | 0.22 | 0.43 | 0.26 | 0.22 | 0.30 | 0.36 | 0.33 | 0.29 |
| Nickel | M | 2455 | mg/kg | 0.50 | 16 | 16 | 24 | 15 | 13 | 17 | 21 | 15 | 17 |
| Lead | M | 2455 | mg/kg | 0.50 | 79 | 78 | 120 | 81 | 71 | 88 | 110 | 79 | 88 |
| Selenium | M | 2455 | mg/kg | 0.25 | 0.55 | 0.46 | 3.2 | 0.53 | < 0.25 | 0.37 | 0.53 | < 0.25 | 0.30 |
| Vanadium | U | 2455 | mg/kg | 0.5 | 20 | 19 | 28 | 17 | 16 | 20 | 25 | 18 | 20 |
| Zinc | M | 2455 | mg/kg | 0.50 | 59 | 54 | 85 | 55 | 48 | 61 | 80 | 55 | 61 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Organic Matter | M | 2625 | % | 0.40 | 4.0 | 19 | 4.0 | 4.0 | 3.5 | 3.6 | 4.7 | 4.8 | 4.3 |
| Naphthalene | M | 2800 | mg/kg | 0.10 | 0.37 | 0.37 | 0.34 | 0.26 | 0.34 | 0.14 | 0.33 | 0.31 | 0.32 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.36 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.24 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | M | 2800 | mg/kg | 0.10 | 0.23 | 0.24 | < 0.10 | 0.18 | < 0.10 | 2.1 | 0.34 | 0.12 | < 0.10 |
| Anthracene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.34 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | M | 2800 | mg/kg | 0.10 | 0.36 | 0.38 | 0.30 | 0.37 | 0.21 | 1.4 | 0.45 | 0.25 | 0.36 |
| Pyrene | M | 2800 | mg/kg | 0.10 | 0.40 | 0.27 | 0.28 | 0.31 | 0.17 | 1.2 | 0.55 | 0.30 | 0.23 |
| Benzo[a]anthracene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.40 | 0.29 | < 0.10 | < 0.10 |
| Chrysene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.36 | 0.26 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.29 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.32 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | 7.2 | 2.2 | < 2.0 | < 2.0 |

# Results - Soil

**Project: LKC 22 1481 Maghull, Liverpool**

| **Client: LK Consult** | | | **Chemtest Job No.:** | | 22-45650 |
|---|---|---|---|---|---|
| Quotation No.: | | | **Chemtest Sample ID.:** | | 1553638 |
| Order No.: LKC221481-RP | | | Client Sample Ref.: | | TS110 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 24-Nov-2022 |
| | | | Asbestos Lab: | | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| ACM Type | U | 2192 | | N/A | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 24 |
| Soil Colour | N | 2040 | | N/A | Black |
| Other Material | N | 2040 | | N/A | Roots, Wood and Stones |
| Soil Texture | N | 2040 | | N/A | Sand |
| pH | M | 2010 | | 4.0 | 6.8 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | < 0.010 |
| Arsenic | M | 2455 | mg/kg | 0.5 | 13 |
| Cadmium | M | 2455 | mg/kg | 0.10 | 0.28 |
| Chromium | M | 2455 | mg/kg | 0.5 | 15 |
| Copper | M | 2455 | mg/kg | 0.50 | 43 |
| Mercury | M | 2455 | mg/kg | 0.05 | 0.27 |
| Nickel | M | 2455 | mg/kg | 0.50 | 17 |
| Lead | M | 2455 | mg/kg | 0.50 | 94 |
| Selenium | M | 2455 | mg/kg | 0.25 | 0.45 |
| Vanadium | U | 2455 | mg/kg | 0.5 | 20 |
| Zinc | M | 2455 | mg/kg | 0.50 | 73 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 |
| Organic Matter | M | 2625 | % | 0.40 | 5.5 |
| Naphthalene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluorene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Phenanthrene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Anthracene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluoranthene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Pyrene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[a]anthracene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Chrysene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[b]fluoranthene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[k]fluoranthene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[a]pyrene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | M | 2800 | mg/kg | 0.10 | < 0.10 |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 |

# 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 |
| 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. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | 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-MS |

## 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:
customerservices@chemtest.com

# Appendix C – Imported Subsoil Certificates and Certificates of Analysis

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 23/08244
**Issue Number:** 1 **Date:** 23 August, 2023

**Client:**
Betts Geo Environmental
Old Marsh Farm Barns
Welsh Road
Sealand
Flintshire
UK
CH5 2LY

**Project Manager:** Betts Geolab/Marc Fawcett
**Project Name:** Shevinston Triangle
**Project Ref:** 23CSA001
**Order No:** BG5112
**Date Samples Received:** 16/08/23
**Date Instructions Received:** 17/08/23
**Date Analysis Completed:** 23/08/23

**Approved by:**

Richard Wong
Client Manager

**Envirolab Job Number: 23/08244**

**Client Project Name: Shevinston Triangle**

**Client Project Ref: 23CSA001**

| Lab Sample ID | 23/08244/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | SS1 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 16-Aug-23 | | | | | | | | | |
| Sample Type | SOIL - ES | | | | | | | | | |
| Sample Matrix Code | 5AE | | | | | | | | | |
| % Stones >10mm$_A$ | 4.8 | | | | | | | % w/w | 0.1 | A-T-044 |
| pH$_D$$^{M\#}$ | 8.23 | | | | | | | pH | 0.01 | A-T-031s |
| Sulphate (water sol 2:1)$_D$$^{M\#}$ | 0.09 | | | | | | | g/l | 0.01 | A-T-026s |
| Organic Matter$_D$$^{M\#}$ | 1.0 | | | | | | | % w/w | 0.1 | A-T-032s |
| Arsenic$_D$$^{M\#}$ | 2 | | | | | | | mg/kg | 1 | A-T-024s |
| Cadmium$_D$$^{M\#}$ | <0.5 | | | | | | | mg/kg | 0.5 | A-T-024s |
| Copper$_D$$^{M\#}$ | 10 | | | | | | | mg/kg | 1 | A-T-024s |
| Chromium (hexavalent)$_D$ | <1 | | | | | | | mg/kg | 1 | A-T-040s |
| Lead$_D$$^{M\#}$ | 7 | | | | | | | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | | | | | | | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 16 | | | | | | | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <1 | | | | | | | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 30 | | | | | | | mg/kg | 5 | A-T-024s |
| VPH total (>C5-C10) | <1.00 | | | | | | | mg/kg | 1 | Calc-stone+mois |

**Envirolab Job Number: 23/08244**

**Client Project Name: Shevinston Triangle**

**Client Project Ref: 23CSA001**

| Lab Sample ID | 23/08244/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | SS1 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 16-Aug-23 | | | | | | | | | |
| Sample Type | SOIL - ES | | | | | | | | | |
| Sample Matrix Code | 5AE | | | | | | | | | |
| **Asbestos in Soil (inc. matrix)** | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | | | | | | | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | | | | | | | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | | | | | | | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | | | | | | | | | A-T-045 |

**Envirolab Job Number: 23/08244**

**Client Project Name: Shevinston Triangle**

**Client Project Ref: 23CSA001**

| Lab Sample ID | 23/08244/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | SS1 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 16-Aug-23 | | | | | | | | | |
| Sample Type | SOIL - ES | | | | | | | | | |
| Sample Matrix Code | 5AE | | | | | | | | | |
| **PAH-16MS** | | | | | | | | | | |
| Acenaphthene$_{A}^{M\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-019s |
| Acenaphthylene$_{A}^{M\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-019s |
| Anthracene$_{A}^{M\#}$ | <0.02 | | | | | | | mg/kg | 0.02 | A-T-019s |
| Benzo(a)anthracene$_{A}^{M\#}$ | 0.09 | | | | | | | mg/kg | 0.04 | A-T-019s |
| Benzo(a)pyrene$_{A}^{M\#}$ | 0.09 | | | | | | | mg/kg | 0.04 | A-T-019s |
| Benzo(b)fluoranthene$_{A}^{M\#}$ | 0.09 | | | | | | | mg/kg | 0.05 | A-T-019s |
| Benzo(ghi)perylene$_{A}^{M\#}$ | <0.05 | | | | | | | mg/kg | 0.05 | A-T-019s |
| Benzo(k)fluoranthene$_{A}^{M\#}$ | <0.07 | | | | | | | mg/kg | 0.07 | A-T-019s |
| Chrysene$_{A}^{M\#}$ | 0.11 | | | | | | | mg/kg | 0.06 | A-T-019s |
| Dibenzo(ah)anthracene$_{A}$ | <0.04 | | | | | | | mg/kg | 0.04 | A-T-019s |
| Fluoranthene$_{A}^{M\#}$ | 0.18 | | | | | | | mg/kg | 0.08 | A-T-019s |
| Fluorene$_{A}^{M\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-019s |
| Indeno(123-cd)pyrene$_{A}^{M\#}$ | 0.07 | | | | | | | mg/kg | 0.03 | A-T-019s |
| Naphthalene $_{A}^{M\#}$ | <0.03 | | | | | | | mg/kg | 0.03 | A-T-019s |
| Phenanthrene$_{A}^{M\#}$ | 0.06 | | | | | | | mg/kg | 0.03 | A-T-019s |
| Pyrene$_{A}^{M\#}$ | 0.18 | | | | | | | mg/kg | 0.07 | A-T-019s |
| Total PAH-16MS$_{A}$ | 0.87 | | | | | | | mg/kg | 0.01 | A-T-019s |

**Envirolab Job Number: 23/08244**

**Client Project Name: Shevinston Triangle**

**Client Project Ref: 23CSA001**

| Lab Sample ID | 23/08244/1 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | SS1 | | | | | | | | | |
| Depth to Top | | | | | | | | | | |
| Depth To Bottom | | | | | | | | | | |
| Date Sampled | 16-Aug-23 | | | | | | | | | |
| Sample Type | SOIL - ES | | | | | | | | | |
| Sample Matrix Code | 5AE | | | | | | | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A^{M\#}$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A^{M\#}$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A^{M\#}$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A^{M\#}$ | 2 | | | | | | | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 2 | | | | | | | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A^{M\#}$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A^{M\#}$ | 3 | | | | | | | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 3 | | | | | | | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 6 | | | | | | | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| MTBE$_A^{\#}$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |

## Report Notes

**General**
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **six weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and Interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

**Key**

| | |
|---|---|
| Superscript "#" | Accredited to ISO 17025 |
| Superscript "M" | Accredited to MCertS |
| Superscript "U" | Individual result not accredited |
| None of the above symbols | Analysis unaccredited |
| Subscript "A" | Analysis performed on as-received Sample |
| Subscript "D" | Analysis performed on the dried sample, crushed to pass 2mm sieve. |
| Subscript "^" | Analysis has dependant options against results. Details appear in the comments of your Sample receipt |
| IS | Insufficient Sample for analysis |
| US | Unsuitable Sample for analysis |
| NDP | No Determination Possible |
| NAD | No Asbestos Detected |
| N/A | Not applicable |

**Asbestos**
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing, and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

**Assigned Matrix Codes**

| | | | | | |
|---|---|---|---|---|---|
| 1 | SAND | 6 | CLAY/LOAM | A | Contains Stones |
| 2 | LOAM | 7 | OTHER | B | Contains Construction Rubble |
| 3 | CLAY | 8 | Asbestos Bulk (Only Asbestos ID accredited) | C | Contains visible hydrocarbons |
| 4 | LOAM/SAND | 9 | Incinerator Ash (some Metals accredited) | D | Contains glass / metal |
| 5 | SAND/CLAY | | | E | Contains roots / twigs |
| **Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.** | | | | | |

**Soil Chemical Analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH by method A-T-007:**
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

**EPH CWG (method A-T-055) from TPH CWG:**
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

**Electrical Conductivity of water by method A-T-037:**
Results greater than 12900µS/cm @ 25$^{o}$C / 11550µS/cm @ 20$^{o}$C fall outside the accreditation range and as such are unaccredited.

Please contact your client manager if you require any further information.

# Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Betts Geo Environmental, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, UK, CH5 2LY

**Project:** Shevinston Triangle

**Clients Project No:** 23CSA001

**Project No:** 23/08244

**Date Received:** 17/08/2023 (am)

**Cool Box Temperatures (°C):** 17.2

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples 5 ± 3°C), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 23/08244/1 |
|---|---|
| Client Sample No | |
| Client Sample ID/Depth | SS1 |
| Date Sampled | 16/08/23 |
| A-T-019s | 22/08/2023 |
| A-T-022s | 22/08/2023 |
| A-T-024s | 22/08/2023 |
| A-T-026s | 22/08/2023 |
| A-T-031s | 23/08/2023 |
| A-T-032s | 22/08/2023 |
| A-T-040s | 22/08/2023 |
| A-T-044 | 22/08/2023 |
| A-T-045 | 21/08/2023 |
| A-T-055s | 22/08/2023 |
| Calc-As Recd | 22/08/2023 |
| Calc-stone+mois | 22/08/2023 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

Hannah Moss
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

**Derwentside Environmental Testing Services Ltd**
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
**t:** 01622 850410

# DETS Report No: 23-08379

| | |
|---|---|
| **Site Reference:** | Moston Campus |
| **Project / Job Ref:** | LKC 23 1327 |
| **Order No:** | LKC 23 1327-HM |
| **Sample Receipt Date:** | 28/06/2023 |
| **Sample Scheduled Date:** | 28/06/2023 |
| **Report Issue Number:** | 1 |
| **Reporting Date:** | 05/07/2023 |

**Authorised by:**

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

**DETS Ltd**
**Unit 1, Rose Lane Industrial Estate**
**Rose Lane**
**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| **Soil Analysis Certificate** | | | | | | |
|---|---|---|---|---|---|---|
| **DETS Report No: 23-08379** | **Date Sampled** | 22/06/23 | 22/06/23 | 22/06/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Moston Campus** | **TP / BH No** | SS101 | SS102 | SS103 | | |
| **Project / Job Ref: LKC 23 1327** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC 23 1327-HM** | **Depth (m)** | None Supplied | None Supplied | None Supplied | | |
| **Reporting Date: 05/07/2023** | **DETS Sample No** | 660179 | 660180 | 660181 | | |

| **Determinand** | **Unit** | **RL** | **Accreditation** | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos Screen (S) | N/a | N/a | **ISO17025** | Not Detected | Not Detected | Not Detected | | |
| pH | pH Units | N/a | **MCERTS** | 7.4 | 8.0 | 7.7 | | |
| Total Cyanide | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | | |
| Free Cyanide | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | | |
| W/S Sulphate as $SO_4$ (2:1) | mg/l | < 10 | **MCERTS** | 73 | 104 | 38 | | |
| W/S Sulphate as $SO_4$ (2:1) | g/l | < 0.01 | **MCERTS** | 0.07 | 0.10 | 0.04 | | |
| Organic Matter (SOM) | % | < 0.1 | **MCERTS** | 1.1 | 1.2 | 1 | | |
| Arsenic (As) | mg/kg | < 2 | **MCERTS** | 6 | 6 | 6 | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | < 1 | < 1 | | |
| Cadmium (Cd) | mg/kg | < 0.2 | **MCERTS** | < 0.2 | < 0.2 | < 0.2 | | |
| Chromium (Cr) | mg/kg | < 2 | **MCERTS** | 14 | 13 | 15 | | |
| Chromium (hexavalent) | mg/kg | < 2 | NONE | < 2 | < 2 | < 2 | | |
| Copper (Cu) | mg/kg | < 4 | **MCERTS** | 11 | 10 | 11 | | |
| Lead (Pb) | mg/kg | < 3 | **MCERTS** | 8 | 7 | 7 | | |
| Mercury (Hg) | mg/kg | < 1 | **MCERTS** | < 1 | < 1 | < 1 | | |
| Nickel (Ni) | mg/kg | < 3 | **MCERTS** | 14 | 12 | 15 | | |
| Selenium (Se) | mg/kg | < 2 | **MCERTS** | < 2 | < 2 | < 2 | | |
| Vanadium (V) | mg/kg | < 1 | **MCERTS** | 17 | 16 | 17 | | |
| Zinc (Zn) | mg/kg | < 3 | **MCERTS** | 30 | 28 | 29 | | |
| Total Phenols (monohydric) | mg/kg | < 2 | NONE | < 2 | < 2 | < 2 | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|---|---|---|---|---|---|---|
| **DETS Report No: 23-08379** | **Date Sampled** | 22/06/23 | 22/06/23 | 22/06/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Moston Campus** | **TP / BH No** | SS101 | SS102 | SS103 | | |
| **Project / Job Ref: LKC 23 1327** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC 23 1327-HM** | **Depth (m)** | None Supplied | None Supplied | None Supplied | | |
| **Reporting Date: 05/07/2023** | **DETS Sample No** | 660179 | 660180 | 660181 | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | < 1.6 | < 1.6 | | |

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

| Soil Analysis Certificate - TPH LQM Banded | | | | | | |
|---|---|---|---|---|---|---|
| **DETS Report No: 23-08379** | **Date Sampled** | 22/06/23 | 22/06/23 | 22/06/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Moston Campus** | **TP / BH No** | SS101 | SS102 | SS103 | | |
| **Project / Job Ref: LKC 23 1327** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC 23 1327-HM** | **Depth (m)** | None Supplied | None Supplied | None Supplied | | |
| **Reporting Date: 05/07/2023** | **DETS Sample No** | 660179 | 660180 | 660181 | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aliphatic >C5 - C6 : HS_1D_MS_AL | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Aliphatic >C6 - C8 : HS_1D_MS_AL | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | | |
| Aliphatic >C8 - C10 : EH_CU_1D_AL | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Aliphatic >C10 - C12 : EH_CU_1D_AL | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Aliphatic >C12 - C16 : EH_CU_1D_AL | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | | |
| Aliphatic >C16 - C35 : EH_CU_1D_AL | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | | |
| Aliphatic >C35 - C44 : EH_CU_1D_AL | mg/kg | < 10 | NONE | < 10 | < 10 | < 10 | | |
| Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL | mg/kg | < 30 | NONE | < 30 | < 30 | < 30 | | |
| Aromatic >C5 - C7 : HS_1D_MS_AR | mg/kg | < 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Aromatic >C7 - C8 : HS_1D_MS_AR | mg/kg | < 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | | |
| Aromatic >C8 - C10 : EH_CU_1D_AR | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Aromatic >C10 - C12 : EH_CU_1D_AR | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Aromatic >C12 - C16 : EH_CU_1D_AR | mg/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Aromatic >C16 - C21 : EH_CU_1D_AR | mg/kg | < 3 | MCERTS | < 3 | < 3 | < 3 | | |
| Aromatic >C21 - C35 : EH_CU_1D_AR | mg/kg | < 10 | MCERTS | < 10 | < 10 | < 10 | | |
| Aromatic >C35 - C44 : EH_CU_1D_AR | mg/kg | < 10 | NONE | < 10 | < 10 | < 10 | | |
| Aromatic (>C5 - C44) : HS_1D_MS+EH_CU_1D_AR | mg/kg | < 30 | NONE | < 30 | < 30 | < 30 | | |
| Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Total | mg/kg | < 60 | NONE | < 60 | < 60 | < 60 | | |

**DETS Ltd**
**Unit 1, Rose Lane Industrial Estate**
**Rose Lane**
**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|---|---|---|---|---|---|---|
| **DETS Report No: 23-08379** | **Date Sampled** | 22/06/23 | 22/06/23 | 22/06/23 | | |
| **LK Consult Limited** | **Time Sampled** | None Supplied | None Supplied | None Supplied | | |
| **Site Reference: Moston Campus** | **TP / BH No** | SS101 | SS102 | SS103 | | |
| **Project / Job Ref: LKC 23 1327** | **Additional Refs** | None Supplied | None Supplied | None Supplied | | |
| **Order No: LKC 23 1327-HM** | **Depth (m)** | None Supplied | None Supplied | None Supplied | | |
| **Reporting Date: 05/07/2023** | **DETS Sample No** | 660179 | 660180 | 660181 | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Benzene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| Toluene : HS_1D_MS | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | | |
| Ethylbenzene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| p & m-xylene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| o-xylene : HS_1D_MS | ug/kg | < 2 | MCERTS | < 2 | < 2 | < 2 | | |
| MTBE : HS_1D_MS | ug/kg | < 5 | MCERTS | < 5 | < 5 | < 5 | | |

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| Soil Analysis Certificate - Sample Descriptions | |
|---|---|
| DETS Report No: 23-08379 | |
| LK Consult Limited | |
| Site Reference: Moston Campus | |
| Project / Job Ref: LKC 23 1327 | |
| Order No: LKC 23 1327-HM | |
| Reporting Date: 05/07/2023 | |

| DETS Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|---|---|---|---|---|---|
| 660179 | SS101 | None Supplied | None Supplied | 11.8 | Light brown sandy clay |
| 660180 | SS102 | None Supplied | None Supplied | 11.9 | Light brown sandy clay |
| 660181 | SS103 | None Supplied | None Supplied | 11.6 | Light brown sandy clay with stones |

*Moisture content is part of procedure E003 & is not an accredited test*
Insufficient Sample I/S
Unsuitable Sample U/S

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**Soil Analysis Certificate - Methodology & Miscellaneous Information**

**DETS Report No: 23-08379**
**LK Consult Limited**
**Site Reference: Moston Campus**
**Project / Job Ref: LKC 23 1327**
**Order No: LKC 23 1327-HM**
**Reporting Date: 05/07/2023**

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|---|---|---|---|---|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 – C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Fraction Organic Carbon (FOC) | Determination of TOC by combustion analyser. | E027 |
| Soil | D | Organic Matter (SOM) | Determination of TOC by combustion analyser. | E027 |
| Soil | D | TOC (Total Organic Carbon) | Determination of TOC by combustion analyser. | E027 |
| Soil | AR | Exchangeable Ammonium | Determination of ammonium by discrete analyser. | E029 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

**D Dried**
**AR As Received**

**DETS Ltd**
**Unit 1, Rose Lane Industrial Estate**
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**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

| **List of HWOL Acronyms and Operators** |
|---|
| **DETS Report No: 23-08379** |
| **LK Consult Limited** |
| **Site Reference: Moston Campus** |
| **Project / Job Ref: LKC 23 1327** |
| **Order No: LKC 23 1327-HM** |
| **Reporting Date: 05/07/2023** |

| **Acronym** | **Description** |
|---|---|
| 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 |
| 2D | GC-GC - Double coil gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics only |
| AR | Aromatics only |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted |
| _ | Operator - underscore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total |

| Det - Acronym |
|---|
| Benzene - HS_1D_MS |
| Ethylbenzene - HS_1D_MS |
| MTBE - HS_1D_MS |
| TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR |
| TPH LQM - Aliphatic >C10 - C12 - EH_CU_1D_AL |
| TPH LQM - Aliphatic >C12 - C16 - EH_CU_1D_AL |
| TPH LQM - Aliphatic >C16 - C35 - EH_CU_1D_AL |
| TPH LQM - Aliphatic >C35 - C44 - EH_CU_1D_AL |
| TPH LQM - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL |
| TPH LQM - Aliphatic >C5 - C6 - HS_1D_MS_AL |
| TPH LQM - Aliphatic >C6 - C8 - HS_1D_MS_AL |
| TPH LQM - Aliphatic >C8 - C10 - EH_CU_1D_AL |
| TPH LQM - Aromatic >C10 - C12 - EH_CU_1D_AR |
| TPH LQM - Aromatic >C12 - C16 - EH_CU_1D_AR |
| TPH LQM - Aromatic >C21 - C35 - EH_CU_1D_AR |
| TPH LQM - Aromatic >C35 - C44 - EH_CU_1D_AR |
| TPH LQM - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR |
| TPH LQM - Aromatic >C5 - C7 - HS_1D_MS_AR |
| TPH LQM - Aromatic >C7 - C8 - HS_1D_MS_AR |
| TPH LQM - Aromatic >C8 - C10 - EH_CU_1D_AR |
| TPH LQM - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total |
| Toluene - HS_1D_MS |
| m & p-xylene - HS_1D_MS |
| o-Xylene - HS_1D_MS |

# Appendix D - Soil Validation Criteria

# Generic Assessment Criteria Values

LK CONSULT

| | Contaminant | SOM | Res + | Res - | Allot. | Comm. | $^{POS}$resi | $^{POS}$park | Source |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Inorganic Arsenic | N/A | 37 | 40 | 49 | 640 | 79 | 168 | DEFRA C4SL |
| | Beryllium | N/A | 1.7 | 1.7 | 35 | 12 | 2.2 | 63 | LQM S4UL |
| | Boron | N/A | 290 | 11,000 | 45 | 240,000 | 21,000 | 46,000 | LQM S4UL |
| | Cadmium | N/A | 26 | 149 | 4.9 | 410 | 220 | 880 | DEFRA C4SL |
| | Chromium (III) | N/A | 910 | 910 | 18,000 | 8,600 | 1,500 | 33,000 | LQM S4UL |
| | Chromium (VI) | N/A | 21.0 | 21.0 | 170.0 | 49 | 23.0 | 250 | DEFRA C4SL |
| | Copper | N/A | 2,400 | 7,100 | 520 | 68,000 | 12,000 | 44,000 | LQM S4UL |
| | Lead | N/A | 200 | 310 | 80 | 2,330 | 630 | 1,300 | DEFRA C4SL |
| | Elemental Mercury | N/A | 1.2 | 1.2 | 21 | 58 (25.8) $^{vap}$ | 16 | 30 (25.8) $^{vap}$ | LQM S4UL |
| | Inorganic Mercury | N/A | 40 | 56 | 19 | 1,100 | 120 | 240 | LQM S4UL |
| | Methylmercury | N/A | 11 | 15 | 6.0 | 320 | 40 | 68 | LQM S4UL |
| | Nickel | N/A | 180 | 180 | 230 | 980 | 230 | 3,400 | LQM S4UL |
| | Selenium | N/A | 250 | 430 | 88 | 12,000 | 1,100 | 1,800 | LQM S4UL |
| | Vanadium | N/A | 410 | 1,200 | 91 | 9,000 | 2,000 | 5,000 | LQM S4UL |
| | Zinc | N/A | 3,700 | 40,000 | 620 | 730,000 | 81,000 | 170,000 | LQM S4UL |
| Polycyclic Aromatic Hydrocarbons (PAHs) | Acenaphthene | 1% | 210 | 3,000 (57.1) $^{sol}$ | 34 | 84,000 (57.0) $^{sol}$ | 15,000 | 29,000 | LQM S4UL |
| | | 2.5% | 510 | 4,700 (141) $^{sol}$ | 85 | 97,000 (141) $^{sol}$ | 15,000 | 30,000 | LQM S4UL |
| | | 6% | 1,100 | 6,000 (336) $^{sol}$ | 200 | 100,000 | 15,000 | 30,000 | LQM S4UL |
| | Acenaphthylene | 1% | 170 | 2,900 (86.1) $^{sol}$ | 28 | 83,000 (86.1) $^{sol}$ | 15,000 | 29,000 | LQM S4UL |
| | | 2.5% | 420 | 4,600 (212) $^{sol}$ | 69 | 97,000 (212) $^{sol}$ | 15,000 | 30,000 | LQM S4UL |
| | | 6% | 920 | 6,000 (506) $^{sol}$ | 160 | 100,000 | 15,000 | 30,000 | LQM S4UL |
| | Anthracene | 1% | 2,400 | 31,000 (1.17) $^{vap}$ | 380 | 520,000 | 74,000 | 150,000 | LQM S4UL |
| | | 2.5% | 5,400 | 35,000 | 950 | 540,000 | 74,000 | 150,000 | LQM S4UL |
| | | 6% | 11,000 | 37,000 | 2,200 | 540,000 | 74,000 | 150,000 | LQM S4UL |
| | Benz(a)anthracene | 1% | 7.2 | 11 | 2.9 | 170 | 29 | 49 | LQM S4UL |
| | | 2.5% | 11 | 14 | 6.5 | 170 | 29 | 56 | LQM S4UL |
| | | 6% | 13 | 15 | 13 | 180 | 29 | 62 | LQM S4UL |
| | Benzo(a)pyrene (only) | 1% | 5.0 | 5.3 | 5.70 | 77 | 10.0 | 21 | DEFRA C4SL |
| | | 2.5% | 5.0 | 5.3 | 5.70 | 77 | 10.0 | 21 | DEFRA C4SL |
| | | 6% | 5.0 | 5.3 | 5.70 | 77 | 10.0 | 21 | DEFRA C4SL |
| | Benzo(a)pyrene (surrogate marker Coal Tar) | 1% | 0.8 | 1.2 | 0.32 | 15 | 2.2 | 4 | LQM S4UL |
| | | 2.5% | 1.0 | 1.2 | 0.67 | 15 | 2.2 | 5 | LQM S4UL |
| | | 6% | 1.1 | 1.2 | 1.20 | 15 | 2.2 | 5 | LQM S4UL |
| | Benzo(b)fluoranthene | 1% | 2.6 | 3.9 | 0.99 | 44 | 7.1 | 13 | LQM S4UL |
| | | 2.5% | 3.3 | 4.0 | 2.1 | 44 | 7.2 | 15 | LQM S4UL |
| | | 6% | 3.7 | 4.0 | 3.9 | 45 | 7.2 | 16 | LQM S4UL |
| | Benzo(ghi)perylene | 1% | 320 | 360 | 290 | 3,900 | 640 | 1,400 | LQM S4UL |
| | | 2.5% | 340 | 360 | 470 | 4,000 | 640 | 1,500 | LQM S4UL |
| | | 6% | 350 | 360 | 640 | 4,000 | 640 | 1,600 | LQM S4UL |
| | Benzo(k)fluoranthene | 1% | 77 | 110 | 37 | 1,200 | 190 | 370 | LQM S4UL |
| | | 2.5% | 93 | 110 | 75 | 1,200 | 190 | 410 | LQM S4UL |
| | | 6% | 100 | 110 | 130 | 1,200 | 190 | 440 | LQM S4UL |
| | Chrysene | 1% | 15 | 30 | 4.1 | 350 | 57 | 93 | LQM S4UL |
| | | 2.5% | 22 | 31 | 9.4 | 350 | 57 | 110 | LQM S4UL |
| | | 6% | 27 | 32 | 19 | 350 | 57 | 120 | LQM S4UL |
| | Dibenzo(ah)anthracene | 1% | 0.24 | 0.31 | 0.14 | 3.5 | 0.57 | 1.1 | LQM S4UL |
| | | 2.5% | 0.28 | 0.32 | 0.27 | 3.6 | 0.58 | 1.3 | LQM S4UL |
| | | 6% | 0.3 | 0.32 | 0.43 | 3.6 | 0.58 | 1.4 | LQM S4UL |
| | Fluoranthene | 1% | 280 | 1,500 | 52 | 23,000 | 3,100 | 6,300 | LQM S4UL |
| | | 2.5% | 560 | 1,600 | 130 | 23,000 | 3,100 | 6,300 | LQM S4UL |
| | | 6% | 890 | 1,600 | 290 | 23,000 | 3,100 | 6,400 | LQM S4UL |
| | Fluorene | 1% | 170 | 2,800 (36.0) $^{sol}$ | 27 | 63,000 (30.9) $^{sol}$ | 9,900 | 20,000 | LQM S4UL |
| | | 2.5% | 400 | 3,800 (76.5) $^{sol}$ | 67 | 68,000 | 9,900 | 20,000 | LQM S4UL |
| | | 6% | 860 | 4,500 (183) $^{sol}$ | 160 | 71,000 | 9,900 | 20,000 | LQM S4UL |
| | Indeno(123-cd)pyrene | 1% | 27 | 45 | 9.5 | 500 | 82 | 150 | LQM S4UL |
| | | 2.5% | 36 | 46 | 21 | 510 | 82 | 170 | LQM S4UL |
| | | 6% | 41 | 46 | 39 | 510 | 82 | 180 | LQM S4UL |
| | Naphthalene | 1% | 2.3 $^{f}$ | 2.3 $^{f}$ | 4.1 $^{f}$ | 190 $^{f}$ (76.4) $^{sol}$ | 4,900 $^{f}$ | 1,200 $^{f}$ (76.4) $^{sol}$ | LQM S4UL |
| | | 2.5% | 5.6 $^{f}$ | 5.6 $^{f}$ | 10 $^{f}$ | 460 $^{f}$ (183) $^{sol}$ | 4,900 $^{f}$ | 1,900 $^{f}$ (183) $^{sol}$ | LQM S4UL |
| | | 6% | 13 $^{f}$ | 13 $^{f}$ | 24 $^{f}$ | 1,100 $^{f}$ (432) $^{sol}$ | 4,900 $^{f}$ | 3,000 | LQM S4UL |
| | Phenanthrene | 1% | 95 | 1,300 (36.0) $^{sol}$ | 15 | 22,000 | 3,100 | 6,200 | LQM S4UL |
| | | 2.5% | 220 | 1,500 | 38 | 22,000 | 3,100 | 6,200 | LQM S4UL |
| | | 6% | 440 | 1,500 | 90 | 22,000 | 3,100 | 6,300 | LQM S4UL |
| | Pyrene | 1% | 620 | 3,700 | 110 | 54,000 | 7,400 | 15,000 | LQM S4UL |
| | | 2.5% | 1,200 | 3,800 | 270 | 54,000 | 7,400 | 15,000 | LQM S4UL |
| | | 6% | 2,000 | 3,800 | 620 | 54,000 | 7,400 | 15,000 | LQM S4UL |
| | Coal Tar (B(a)P as surrogate marker) | 1% | 0.79 | 1.2 | 0.32 | 15 | 2.2 | 4.4 | LQM S4UL |
| | | 2.5% | 0.98 | 1.2 | 0.67 | 15 | 2.2 | 4.7 | LQM S4UL |
| | | 6% | 1.1 | 1.2 | 1.2 | 15 | 2.2 | 4.8 | LQM S4UL |

| | Contaminant | SOM | Res + | Res - | Allot. | Comm. | POSresi | POSpark | Source |
|---|---|---|---|---|---|---|---|---|---|
| BTEX Compounds | Benzene | 1% | 0.087 | 0.38 | 0.017 | 27 | 72 | 90 | LQM S4UL |
| | | 2.5% | 0.17 | 0.70 | 0.034 | 47 | 72 | 100 | LQM S4UL |
| | | 6% | 0.37 | 1.4 | 0.075 | 90 | 73 | 110 | LQM S4UL |
| | Toluene | 1% | 130 | 880 (869) vap | 22 | 56,000 (869) vap | 56,000 | 87,000 (869) vap | LQM S4UL |
| | | 2.5% | 290 | 1,900 | 51 | 110,000 (1,920) vap | 56,000 | 95,000 (1,920) vap | LQM S4UL |
| | | 6% | 660 | 3,900 | 120 | 180,000 (4,360) vap | 56,000 | 100,000 (4,360) | LQM S4UL |
| | Ethylbenzene | 1% | 47 | 83 | 16 | 5,700 (518) vap | 24,000 | 17,000 (518) vap | LQM S4UL |
| | | 2.5% | 110 | 190 | 39 | 13,000 (1,220) vap | 24,000 | 22,000 (1,220) vap | LQM S4UL |
| | | 6% | 260 | 440 | 91 | 27,000 (2,840) vap | 25,000 | 27,000 (2,840) vap | LQM S4UL |
| | o-xylene | 1% | 60 | 88 | 28 | 6,600 (478) sol | 41,000 | 17,000 (478) sol | LQM S4UL |
| | | 2.5% | 140 | 210 | 67 | 15,000 (1,120) sol | 42,000 | 24,000 (1,120) sol | LQM S4UL |
| | | 6% | 330 | 480 | 160 | 33,000 (2,620) sol | 43,000 | 33,000 (2,620) sol | LQM S4UL |
| | m-xylene | 1% | 59 | 82 | 31 | 6,200 (625) vap | 41,000 | 17,000 (625) vap | LQM S4UL |
| | | 2.5% | 140 | 190 | 74 | 14,000 (1,470) vap | 42,000 | 24,000 (1,470) vap | LQM S4UL |
| | | 6% | 320 | 450 | 170 | 31,000 (3,460) vap | 43,000 | 32,000 (3,460) vap | LQM S4UL |
| | p-xylene | 1% | 56 | 79 | 29 | 5,900 (576) sol | 41,000 | 17,000 (576) sol | LQM S4UL |
| | | 2.5% | 130 | 180 | 69 | 14,000 (1,350) sol | 42,000 | 23,000 (1,350) sol | LQM S4UL |
| | | 6% | 310 | 430 | 160 | 30,000 (3,170) sol | 43,000 | 31,000 (3,170) sol | LQM S4UL |
| Petroleum Hydrocarbons | **Aliphatic** | | | | | | | | |
| | EC 5-6 | 1% | 42 | 42 | 730 | 3,200 (304) sol | 570,000(304)sol | 95,000 (304) sol | LQM S4UL |
| | EC>6-8 | 1% | 100 | 100 | 2,300 | 7,800 (144) sol | 600,000 | 150,000 (144) sol | LQM S4UL |
| | EC>8-10 | 1% | 27 | 27 | 320 | 2,000 (78) sol | 13,000 | 14,000 (78) vap | LQM S4UL |
| | EC>10-12 | 1% | 130 (48) vap | 130 (48) vap | 2,200 | 9,700 (48) sol | 13,000 | 21,000 (48) vap | LQM S4UL |
| | EC>12-16 | 1% | 1,100 (24) sol | 1,100 (24) sol | 11,000 | 59,000 (24) sol | 13,000 | 25,000 (24) sol | LQM S4UL |
| | EC>16-35 | 1% | 65,000 (8.48) | 65,000 (8.48) f,sol | 260,000 f | 160,000 f | 250,000 f | 450,000 f | LQM S4UL |
| | EC>35-44 | 1% | 65,000 (8.48) | 65,000 (8.48) f,sol | 260,000 f | 160,000 f | 250,000 f | 450,000 f | LQM S4UL |
| | **Aliphatic** | | | | | | | | |
| | EC 5-6 | 2.5% | 78 | 78 | 1,700 | 5,900 (558) sol | 590,000 | 130,000 (558) sol | LQM S4UL |
| | EC>6-8 | 2.5% | 230 | 230 | 5,600 | 17,000 (322) sol | 610,000 | 220,000 (322) sol | LQM S4UL |
| | EC>8-10 | 2.5% | 65 | 65 | 770 | 4,800 (190) vap | 13,000 | 18,000 (190) vap | LQM S4UL |
| | EC>10-12 | 2.5% | 330 (118) vap | 330 (118) vap | 4,400 | 23,000 (118) vap | 13,000 | 23,000 (118) vap | LQM S4UL |
| | EC>12-16 | 2.5% | 2,400 (59) sol | 2,400 (59) sol | 13,000 | 82,000 (59) sol | 13,000 | 25,000 (59) sol | LQM S4UL |
| | EC>16-35 | 2.5% | 92,000 (21) | 92,000 (21) f,sol | 270,000 f | 1,700,000 f | 250,000 f | 480,000 f | LQM S4UL |
| | EC>35-44 | 2.5% | 92,000 (21) | 92,000 (21) f,sol | 270,000 f | 1,700,000 f | 250,000 f | 480,000 f | LQM S4UL |
| | **Aliphatic** | | | | | | | | |
| | EC 5-6 | 6% | 160 | 160 | 3,900 | 12,000 (1,150) sol | 600,000 | 180,000 (1,150) | LQM S4UL |
| | EC>6-8 | 6% | 530 | 530 | 13,000 | 40,000 (736) sol | 620,000 | 320,000 (736) sol | LQM S4UL |
| | EC>8-10 | 6% | 150 | 150 | 1,700 | 11,000 (451) vap | 13,000 | 21,000 (451) vap | LQM S4UL |
| | EC>10-12 | 6% | 760 (283) vap | 760 (283) vap | 7,300 | 47,000 (283) vap | 13,000 | 24,000 (283) vap | LQM S4UL |
| | EC>12-16 | 6% | 4,300 (142) sol | 4,400 (142) sol | 13,000 | 90,000 (142) sol | 13,000 | 26,000 (142) sol | LQM S4UL |
| | EC>16-35 | 6% | 110,000 f | 110,000 f | 270,000 f | 1,800,000 f | 250,000 f | 490,000 f | LQM S4UL |
| | EC>35-44 | 6% | 110,000 f | 110,000 f | 270,000 f | 1,800,000 f | 250,000 f | 490,000 f | LQM S4UL |
| | **Aromatic** | | | | | | | | |
| | EC5-7(benzene as non- | 1% | 70 | 370 | 13 | 26,000 (1,220) sol | 56,000 | 76,000 (1,220) sol | LQM S4UL |
| | EC>7-8(toluene) | 1% | 130 | 860 | 22 | 56,000 (869) vap | 56,000 | 87,000 (869) vap | LQM S4UL |
| | EC>8-10 | 1% | 34 | 47 | 8.6 | 3,500 (613) vap | 5,000 | 7,200 (613) vap | LQM S4UL |
| | EC>10-12 | 1% | 74 | 250 | 13 | 16,000 (364) sol | 5,000 | 9,200 (364) sol | LQM S4UL |
| | EC>12-16 | 1% | 140 | 1,800 | 23 | 36,000 (169 ) sol | 5,100 | 10,000 | LQM S4UL |
| | EC>16-21 | 1% | 260 f | 1,900 f | 46 f | 28,000 f | 3,800 f | 7,600 f | LQM S4UL |
| | EC>21-35 | 1% | 1,100 f | 1,900 f | 370 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | EC>35-44 | 1% | 1,100 f | 1,900 f | 370 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | **Aromatic** | | | | | | | | |
| | EC5-7(benzene as non- | 2.5% | 140 | 690 | 27 | 46,000 (2,260) sol | 56,000 | 84,000 (2,260) sol | LQM S4UL |
| | EC>7-8(toluene) | 2.5% | 290 | 1,800 | 51 | 110,000 (1,920) sol | 56,000 | 95,000 (1,920) sol | LQM S4UL |
| | EC>8-10 | 2.5% | 83 | 110 | 21 | 8,100 (1,500) vap | 5,000 | 8,500 (1,500) vap | LQM S4UL |
| | EC>10-12 | 2.5% | 180 | 590 | 31 | 28,000 (899) sol | 5,000 | 9,700 (899) sol | LQM S4UL |
| | EC>12-16 | 2.5% | 330 | 2,300 (419) sol | 57 | 37,000 | 5,100 | 10,000 | LQM S4UL |
| | EC>16-21 | 2.5% | 540 f | 1,900 f | 110 f | 28,000 f | 3,800 f | 7,700 f | LQM S4UL |
| | EC>21-35 | 2.5% | 1,500 f | 1,900 f | 820 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | EC>35-44 | 2.5% | 1,500 f | 1,900 f | 820 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | **Aromatic** | | | | | | | | |
| | EC5-7(benzene as non- | 6% | 300 | 1,400 | 57 | 86,000 (4,710) sol | 56,000 | 92,000 (4,710) sol | LQM S4UL |
| | EC>7-8(toluene) | 6% | 660 | 3,900 | 120 | 180,000 (4,360) vap | 56,000 | 100,000 (4,360) | LQM S4UL |
| | EC>8-10 | 6% | 190 | 270 | 51 | 17,000 (3,580) vap | 5,000 | 9,300 (3,580) vap | LQM S4UL |
| | EC>10-12 | 6% | 380 | 1,200 | 4 | 34,000 (2,150) sol | 5,000 | 10,000 | LQM S4UL |
| | EC>12-16 | 6% | 660 | 2,500 | 130 | 38,000 | 5,100 | 10,000 | LQM S4UL |
| | EC>16-21 | 6% | 930 f | 1,900 f | 260 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | EC>21-35 | 6% | 1,700 f | 1,900 f | 1,600 f | 28,000 f | 3,800 f | 7,900 f | LQM S4UL |
| | EC>35-44 | 6% | 1,700 f | 1,900 f | 1,600 f | 28,000 f | 3,800 f | 7,900 f | LQM S4UL |
| | Aliphatic +Aromatic >EC44 | 1% | 1,600 f | 1,900 f | 1,200 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | | 2.5% | 1,800 f | 1,900 f | 2,100 f | 28,000 f | 3,800 f | 7,800 f | LQM S4UL |
| | | 6% | 1,900 f | 1,900 f | 3,000 f | 28,000 f | 3,800 f | 7,900 f | LQM S4UL |

| | Contaminant | SOM | Res + | Res - | Allot. | Comm. | $^{POS}$resi | $^{POS}$park | Source |
|---|---|---|---|---|---|---|---|---|---|
| Chloalkanes and Alkenes & Explosives | 1,2 Dichloroethane (DCA) | 1% | 0.0071 | 0.0092 | 0.0046 | 0.67 | 29 | 21 | LQM S4UL |
| | | 2.5% | 0.0110 | 0.0130 | 0.0083 | 0.97 | 29 | 24 | LQM S4UL |
| | | 6% | 0.0190 | 0.0230 | 0.0160 | 1.7 | 29 | 28 | LQM S4UL |
| | 1,1,1 Trichloroethane (TCA) | 1% | 8.8 | 9.0 | 48 | 660 | 140,000 | 57,000 (1,425) [vap] | LQM S4UL |
| | | 2.5% | 18 | 18 | 110 | 1,300 | 140,000 | 76,000 (2,915) [vap] | LQM S4UL |
| | | 6% | 39 | 40 | 240 | 3,000 | 140,000 | 100,000 (6,392) | LQM S4UL |
| | 1,1,2,2-Tetrachloroethanes (PCA) | 1% | 1.6 | 3.9 | 0.41 | 270 | 1,400 | 1,800 | LQM S4UL |
| | | 2.5% | 3.4 | 8.0 | 0.89 | 550 | 1,400 | 2,100 | LQM S4UL |
| | | 6% | 7.5 | 17 | 2.0 | 1,100 | 1,400 | 2,300 | LQM S4UL |
| | 1,1,1,2-Tetrachloroethanes (PCA) | 1% | 1.2 | 1.5 | 0.79 | 110 | 1,400 | 1,500 | LQM S4UL |
| | | 2.5% | 2.8 | 3.5 | 1.9 | 250 | 1,400 | 1,800 | LQM S4UL |
| | | 6% | 6.4 | 8.2 | 4.4 | 560 | 1,400 | 2,100 | LQM S4UL |
| | Tetrachloroethene (PCE) | 1% | 0.31 | 0.32 | 2.00 | 24 | 3,200 | 1400 | DEFRA C4SL |
| | | 2.5% | 0.70 | 0.71 | 4.8 | 55 | 3,300 | 1900 | DEFRA C4SL |
| | | 6% | 1.60 | 1.60 | 11.0 | 130 | 3,400 | 2,500 | DEFRA C4SL |
| | Tetrachloromethane (carbon tetrachloride) | 1% | 0.03 | 0.03 | 0.45 | 2.9 | 890 | 190 | LQM S4UL |
| | | 2.5% | 0.06 | 0.06 | 1.0 | 6.3 | 920 | 270 | LQM S4UL |
| | | 6% | 0.13 | 0.13 | 2.4 | 14 | 950 | 400 | LQM S4UL |
| | Trichloroethene (TCE) | 1% | 0.009 | 0.010 | 0.032 | 0.7 | 76.0 | 41.0 | DEFRA C4SL |
| | | 2.5% | 0.020 | 0.020 | 0.072 | 1.5 | 78.0 | 51.0 | DEFRA C4SL |
| | | 6% | 0.043 | 0.045 | 0.160 | 3.4 | 79.0 | 69.0 | DEFRA C4SL |
| | cis 1,2-dichloroethene | 1% | 0.46 | 0.50 | 0.890 | 38 | 3,800 | 2,000 | DEFRA C4SL |
| | | 2.5% | 0.78 | 0.84 | 1.70 | 64 | 3,800 | 2,400 | DEFRA C4SL |
| | | 6% | 1.50 | 1.60 | 3.60 | 120 | 3,900 | 3,100 | DEFRA C4SL |
| | Trichloromethane (chloroform) | 1% | 0.91 | 1.2 | 0.42 | 99 | 2,500 | 2,600 | LQM S4UL |
| | | 2.5% | 1.7 | 2.1 | 0.83 | 170 | 2,500 | 2,800 | LQM S4UL |
| | | 6% | 3.4 | 4.2 | 1.7 | 350 | 2,500 | 3,100 | LQM S4UL |
| | Trans-1,2 Dichloroethene | 1% | 0.9 | 0.9 | 3.7 | 69 | 13,000 | 5,600 | DEFRA C4SL |
| | | 2.5% | 1.6 | 1.7 | 7.5 | 120 | 13,000 | 7,000 | DEFRA C4SL |
| | | 6% | 3.3 | 3.4 | 16.0 | 260 | 13,000 | 9,100 | DEFRA C4SL |
| | Chloroethene (vinyl chloride) | 1% | 0.006 | 0.015 | 0.0017 | 1.1E+00 | 7.8 | 18.0 | DEFRA C4SL |
| | | 2.5% | 0.010 | 0.019 | 0.0031 | 1.4E+00 | 7.8 | 19.0 | DEFRA C4SL |
| | | 6% | 0.017 | 0.029 | 0.0058 | 2.20 | 7.8 | 19.0 | DEFRA C4SL |
| | 2,4,6-Trinitritoluene (TNT) | 1% | 1.6 | 65 | 0.24 | 1,000 | 130 | 260 | LQM S4UL |
| | | 2.5% | 3.7 | 66 | 0.58 | 1,000 | 130 | 270 | LQM S4UL |
| | | 6% | 8.1 | 66 | 1.4 | 1,000 | 130 | 270 | LQM S4UL |
| | RDX | 1% | 120 | 13,000 | 17 | 210,000 | 26,000 | 49,000 (18.7) [sol] | LQM S4UL |
| | | 2.5% | 250 | 13,000 | 38 | 210,000 | 26,000 | 51,000 | LQM S4UL |
| | | 6% | 540 | 13,000 | 85 | 210,000 | 27,000 | 53,000 | LQM S4UL |
| | HMX | 1% | 5.7 | 6,700 | 0.86 | 110,000 | 13,000 | 23,000 (0.35) [vap] | LQM S4UL |
| | | 2.5% | 13 | 6,700 | 1.9 | 110,000 | 13,000 | 23,000 (0.39) [vap] | LQM S4UL |
| | | 6% | 26 | 6,700 | 3.9 | 110,000 | 13,000 | 24,000 (0.48) [vap] | LQM S4UL |
| Pesticides | Aldrin | 1% | 5.7 | 7.3 | 3.2 | 170 | 18 | 30 | LQM S4UL |
| | | 2.5% | 6.6 | 7.4 | 6.1 | 170 | 18 | 31 | LQM S4UL |
| | | 6% | 7.1 | 7.5 | 9.8 | 170 | 18 | 31 | LQM S4UL |
| | Dieldrin | 1% | 0.97 | 7.0 | 0.17 | 170 | 18 | 30 | LQM S4UL |
| | | 2.5% | 2.0 | 7.3 | 0.41 | 170 | 18 | 30 | LQM S4UL |
| | | 6% | 3.5 | 7.4 | 0.96 | 170 | 18 | 31 | LQM S4UL |
| | Atrazine | 1% | 3.3 | 610 | 0.5 | 9,300 | 1,200 | 2,300 | LQM S4UL |
| | | 2.5% | 7.8 | 620 | 1.2 | 9,400 | 1,200 | 2,400 | LQM S4UL |
| | | 6% | 17.4 | 620 | 2.7 | 9,400 | 1,200 | 2,400 | LQM S4UL |
| | Dichlorvos | 1% | 3.2E-02 | 6.4 | 4.9E-03 | 140 | 16 | 26 | LQM S4UL |
| | | 2.5% | 6.6E-02 | 6.5 | 1.0E-02 | 140 | 16 | 26 | LQM S4UL |
| | | 6% | 0.14 | 6.6 | 2.2E-02 | 140 | 16 | 27 | LQM S4UL |
| | Endosulfanns (2 isomers) | 1% | 7.4 | 160 (3.0E-03) [vap] | 1.2 | 5,600 (3.0E-03) [vap] | 1,200 | 2,300 | LQM S4UL |
| | | 2.5% | 18 | 280 (7.0E-03) [vap] | 2.9 | 7,400 (7.0E-03) [vap] | 1,200 | 2,400 | LQM S4UL |
| | | 6% | 41 | 410 (1.6E-02) [vap] | 6.8 | 8,400 (1.6E-02) [vap] | 1,200 | 2,500 | LQM S4UL |
| | Hexachlorocyclohexane (3 isomers), inc Lindane | 1% | 8.5E-02 | 3.7 | 1.3E-02 | 65 | 8.1 | 15 | LQM S4UL |
| | | 2.5% | 0.2 | 3.8 | 3.2E-02 | 65 | 8.1 | 15 | LQM S4UL |
| | | 6% | 0.46 | 3.8 | 7.7E-02 | 65 | 8.1 | 16 | LQM S4UL |
| Chlorobenzenes | Chlorobenzene | 1% | 0.46 | 0.46 | 5.9 | 56 | 11,000 | 1,300 (675) [sol] | LQM S4UL |
| | | 2.5% | 1.0 | 1.0 | 14 | 130 | 13,000 | 2,000 (1,520) [sol] | LQM S4UL |
| | | 6% | 2.4 | 2.4 | 32 | 290 | 14,000 | 2,900 | LQM S4UL |
| | Dichlorobenzenes (3 isomers) | 1% | 23 | 24 | 94 | 2,000 (571) [sol] | 90,000 | 24,000 (571) [sol] | LQM S4UL |
| | | 2.5% | 55 | 57 | 230 | 4,800 (1,370) [sol] | 95,000 | 36,000 (1,370) [sol] | LQM S4UL |
| | | 6% | 130 | 130 | 540 | 11,000 (3,240) [sol] | 98,000 | 51,000 (3,270) [sol] | LQM S4UL |
| | Trichlorobenzenes (3 isomers) | 1% | 2.6 | 2.6 | 55 | 220 | 15,000 | 1,700 (318) [vap] | LQM S4UL |
| | | 2.5% | 6.4 | 6.4 | 140 | 530 | 17,000 | 2,600 (786) [vap] | LQM S4UL |
| | | 6% | 15 | 15 | 320 | 1,300 | 19,000 | 4,000 (1,880) [vap] | LQM S4UL |
| | Tetrachlorobenzenes (3 isomers) | 1% | 0.66 | 0.75 | 0.38 | 49 (39.4) [vap] | 78 | 110 (39) [vap] | LQM S4UL |
| | | 2.5% | 1.6 | 1.9 | 0.90 | 120 (98.1) [vap] | 79 | 120 | LQM S4UL |
| | | 6% | 3.7 | 4.3 | 2.2 | 240 (235) [vap] | 79 | 130 | LQM S4UL |
| | Pentachlorobenzene | 1% | 5.8 | 19 | 1.2 | 640 (43.0) [sol] | 100 | 190 | LQM S4UL |
| | | 2.5% | 12 | 30 | 3.1 | 770 (107) [sol] | 100 | 190 | LQM S4UL |
| | | 6% | 22 | 38 | 7.0 | 830 | 100 | 190 | LQM S4UL |
| | Hexachlorobenzene | 1% | 1.8 (0.20) [vap] | 4.1 (0.20) [vap] | 0.47 | 110 (0.20) [vap] | 16 | 30 | LQM S4UL |
| | | 2.5% | 3.3 (0.50) [vap] | 5.7 (0.50) [vap] | 1.1 | 120 | 16 | 30 | LQM S4UL |
| | | 6% | 4.9 | 6.7 (1.2) [vap] | 2.5 | 120 | 16 | 30 | LQM S4UL |

| | Contaminant | SOM | Res + | Res - | Allot. | Comm. | POSresi | POSpark | Source |
|---|---|---|---|---|---|---|---|---|---|
| Chlorophenol | Chlorophenols (4 congeners) | 1% | 0.87 [g] | 94 | 0.13 [g] | 3,500 | 620 | 1,100 | LQM S4UL |
| | | 2.5% | 2.0 | 150 | 0.30 | 4,000 | 620 | 1,100 | LQM S4UL |
| | | 6% | 4.5 | 210 | 0.70 | 4,300 | 620 | 1,100 | LQM S4UL |
| | Pentachlorophenol | 1% | 0.22 | 27 (16.4) [vap] | 3.0E-02 | 400 | 60 | 110 | LQM S4UL |
| | | 2.5% | 0.52 | 29 | 8.0E-02 | 400 | 60 | 120 | LQM S4UL |
| | | 6% | 1.2 | 31 | 0.19 | 400 | 60 | 120 | LQM S4UL |
| Others | Carbon Disulphide | 1% | 0.14 | 0.14 | 4.8 | 11 | 11,000 | 1,300 | LQM S4UL |
| | | 2.5% | 0.29 | 0.29 | 10 | 22 | 11,000 | 1,900 | LQM S4UL |
| | | 6% | 0.62 | 0.62 | 23 | 47 | 11,000 | 2,700 | LQM S4UL |
| | Hexachlorobutadiene | 1% | 0.29 | 0.32 | 0.25 | 31 | 25 | 48 | LQM S4UL |
| | | 2.5% | 0.7 | 0.78 | 0.61 | 66 | 25 | 50 | LQM S4UL |
| | | 6% | 1.6 | 1.8 | 1.4 | 120 | 25 | 51 | LQM S4UL |
| | Phenol | 1% | 280 | 750 | 66 | 760 [dir] (31,000) | 760 [dir] (11,000) | 760 [dir] (8,600) | LQM S4UL |
| | | 2.5% | 550 | 1,300 | 140 | 1,500 [dir] (35,000) | 1,500 [dir] (11,000) | 1,500 [dir] (9,700) | LQM S4UL |
| | | 6% | 1,100 | 2,300 | 280 | 3,200 [dir] (37,000) | 3,200 [dir] (11,000) | 3,200 [dir] (11,000) | LQM S4UL |

sol/vap = solubility/vapour limit (potenitally use if free product identified, although highly conservative)
f=naphthalene is based on comparison of inhalation exposure with TDI(inhal) for localised effect
f = oral, dermal and inhalation exposures compared to oral HCV
dir = S4ULs based on threshold protective of direct skin contact with phenol )brackets long term exposure for illustration purposes)
g = derived based on 2,3,4-tetrachlorophenol

# Appendix E – Plot Photographs

**Photograph 1**
Evidence of removal of made ground to natural underlying clay

| | |
|---|---|
| | **Photograph 2:**<br>View showing shared front garden of Plots 7-8. |
| <br><br> | **Photograph 3**<br>Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in shared front garden areas (Plots 7-8) over natural strata. |
| | **Photograph 4:**<br>View showing shared front garden (Plots 9-10). |

| | |
|---|---|
| | **Photograph 5:**<br>Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in shared front garden areas (Plots 9-10). |
| | **Photograph 6:**<br>View showing shared front garden (Plots 11-12). |

**Photograph 7:**
Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in shared front garden areas (Plots 11-12) over natural strata.

| | |
|---|---|
| | **Photograph 8:**<br>Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 7) over natural strata. |
| | **Photograph 9:**<br>View showing rear garden (Plot 7). |

**Photograph 10:**
Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 8) over natural strata.

**Photograph 11:**
View showing rear garden (Plot 8).

**Photograph 12:**
Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 9).

**Photograph 13:**
View showing rear garden (Plot 9 ).

**Photograph 14:**
Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 10) over natural strata.

**Photograph 15:**
View showing rear garden (Plot 10).

**Photograph 16:**
Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 11) over natural strata.

| | |
|---|---|
| | |
| | **Photograph 16:**<br>View showing rear garden (Plot 11). |
| <br> | **Photograph 17:**<br>Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 12). |

| | |
|---|---|
| | **Photograph 18:**<br>View showing rear garden (Plot 12). |
| | **Photograph 19:**<br>Evidence of suitably chemically validated topsoil with a minimum of 150mm growing medium in garden areas (Plot 12). |

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