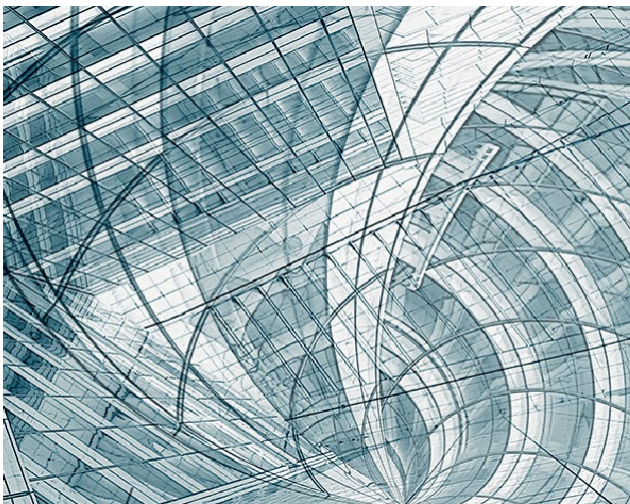




Hollybank Cottage, Holly Bank, Muswell Hill

Verification Report

JSW Consultants

GB727A-VR-AUG-2023

Verification Report

Holly Bank Cottage, Holly Bank, Muswell Hill

1. Introduction

GB Card & Partners (GBCP) has been commissioned by JSW Consultants (JSW) (on behalf of Hollybanks LLP) (the Client) to provide a Verification Report to support the discharge of planning conditions for the development at Holly Bank Cottage, Holly Bank, Muswell Hill (the site).

2. Background

The development at Holly Bank Cottage is understood to have been completed in June 2020. Prior to the development, a ground investigation was completed and the subsequent report¹ identified localised concentrations of lead, beryllium and polycyclic aromatic hydrocarbons (PAH) above generic assessment criteria (GAC) for residential use with plant uptake. As such, the report recommended excavation of 600mm of existing soils and placement of a cover system to mitigate potential risks to future site users to comprise the following:

- A geotextile and/or mesh layer at the base of the excavation.
- 150mm thick layer of gap graded concrete (5-75mm) or the like;
- A second geotextile layer; and
- 450mm thick layer of clean certified topsoil.

GB Card + Partners

Dixcart House
Addlestone Road
Bourne Business Park
Addlestone
KT15 2LE

T +44 (0) 2037 959990
E info@gbcardandpartners.com

gbcardandpartners.com

Managing Director: Dr Geoffrey B Card
BSc PhD CEng FICE Eurlng CGeol FGS CSci
Registered in England and Wales No. 7453462.
Registered office at Dixcart House, Addlestone Road,
Bourne Business Park, Addlestone, KT15 2LE.

¹ Site Analytical Services Limited (2017). Report on a Ground Investigation, Hollybanks, Muswell Hill, London, N19 3TN. Ref: 17/27180. October 2017.



The report also recommended that barrier pipe was used for potable water supply.

The Local Authority has reviewed information provided by the Client to facilitate discharge of condition 3 of the approved planning permission HGY/2023/0562. The Local Authority has requested the following information to support discharge of condition 3:

1. Evidence of verification sampling of the imported topsoil including chemical analysis results and photographs to confirm cover system depth of the soft landscaped areas; and
2. Confirmation from the Water Supplier that appropriate pipe has been installed.

3. Verification

The following sections set out the verification activities undertaken by GBCP and the information provided by the Client.

4. Cover system verification

Verification of the capping material placed in the accessible gardens and soft landscaped areas of the site was undertaken by GBCP on 11 July 2023. The verification locations are shown on a plan in Appendix A and discussed in the following sections.

4.1 Capping layer construction

The capping layer thicknesses observed at each verification location are detailed in Table 1 with photographs from the site visit included in Appendix B.

Table 1: Capping layer thickness

Verification location	Date inspected	Topsoil thickness (mm)	Reworked natural soils thickness (mm)
V01	11/07/23	200	450
V02	11/07/23	200	500
V03	11/07/23	350	330



The soils encountered at the verification locations were as follows:

V01

Topsoil (0.0m – 0.20m bgl): Brown gravelly clayey SAND. Sand is fine to coarse. Gravel is subrounded to rounded fine and medium flint.

Reworked soils (0.20m – 0.45m bgl): Orangish brown gravelly clayey SAND. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint with occasional concrete and brick fragments.

Reworked natural soils (0.45m – 0.65m bgl): Brownish grey gravelly SAND/CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint and occasional brick fragments.

V02

Turf (0.00m – 0.10m bgl).

Topsoil (0.10m – 0.20m bgl): Light brown clayey gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine and medium flints. With frequent roots.

Reworked soils (0.20m – 0.70m bgl): Brown grey gravelly clayey SAND. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint and occasional brick fragments. Occasional 2 to 3mm thick clay bands throughout.

V03

Bark coverings (0.00m – 0.05m bgl).

Topsoil (0.05m – 0.35m bgl): Dark brown slightly gravelly clayey SAND. Sand is fine to coarse. Gravel is subrounded to subangular fine and medium flint/ bark.

Natural soils (0.35m – 0.68m bgl): Soft light grey gravelly CLAY. Gravel is subangular to subrounded fine and medium flint.



No geotextile layer of 150mm gap graded concrete layer were encountered within the verification locations. Photographs have been previously provided to the Local Authority showing installation of a black membrane in areas of soft landscaping which are likely to have been installed below the depths of the verification pits.

As the capping layer has not been constructed in strict accordance with the requirements of the previous report, additional samples were collected from reworked and natural soils in order to provide additional data to assess the quality of the underlying soils.

4.2 Chemical testing

The chemical testing of verification samples was undertaken by DETS which is a United Kingdom Accreditation Service (UKAS) and the Environment Agency's Monitoring Certification Scheme (MCERTS) accredited laboratory for the selected suite of analysis. Samples were tested for metals, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), phenols, cyanide and asbestos. The laboratory reports are included in Appendix C.

The chemical test results were screened against the GAC which are included in Appendix D. The GAC for residential plant uptake were used in the screening assessment with a soil organic matter (SOM) of 2.5% as a conservative measure as the SOM ranged between 3.60% and 8.60%

Concentrations of all analytes were reported below the GAC with a single exception. Lead was reported at 382mg/kg which is above the GAC of 200mg/kg in the sample of reworked material from V02 at 0.40m bgl. The topsoil sample from the same verification location at 0.10m bgl reported lead below the adopted GAC. As such, there is not considered to be an unacceptable risk from surface soils to human health and the topsoil for planting is suitable for the intended use with a thickness of 350mm over the underlying natural soils. All concentrations of other analytes were below the laboratory limit of detection and/or GAC indicating that this single exceedance is localised and not representative of the material beneath soft landscaped areas.

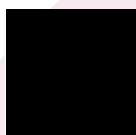
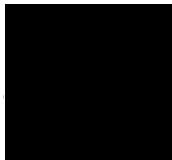


5. Barrier pipe installation

Information previously provided by the Client to the Local Authority confirms that appropriate barrier pipes were sourced from Thames Water with photographs to show that barrier pipes have been installed at the site. GBCP did not inspect the installation of the water supply pipes but there is sufficient information to demonstrate that this work was undertaken in accordance with the previous report and will be signed off by Thames Water.

6. Conclusion

The verification inspection by GBCP together with the information supplied by the Client confirms that the outstanding items relating to condition 3 of the approved planning permission HGY/2023/0562 have been addressed. It is considered that following the installation of remedial measures, the site poses no abnormal risk to future occupants and users of the development.

Author		Author		Checked	
	Anna Smaje Engineer <i>BSc FGS</i>		Kerry Jones Principal Consultant <i>BSc MEnvSc</i>		Laura Bacon Director <i>BSc CGeol EurGeol FGS RoGEP</i>

Appendices

Appendix A – Trial hole location plan

Appendix B – Site photographs

Appendix C – Laboratory results

Appendix D – Soil screening assessment

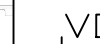
Appendix A

Trial hole location plan





KEY



Verification trial pit location



NOTES

Base drawing provided to GB Card and Partners by the Client.

DO NOT SCALE



GB Card & Partners Limited
23 Southernhay West
Exeter
Devon EX1 1PR
01392 790020
info@gbcardandpartners.com

PROJECT			
GB727A - Holly Bank Cottage Verification			
DRAWING TITLE			
Garden verification trial pit locations			
CLIENT			
JSW Consultants			
STATUS			
FINAL			
DRAWN	HP	DATE	04/08/2023
CHECKED	BMG	SCALE	1:200 @ A3
APPROVED	KJ		
DRAWING NUMBER		REVISION	
GB727A-DWG-001		0	

Appendix B

Site photographs





Photo 1: V01 Inspection Pit



Photo 2: V02 Inspection Pit



Photo 3: V03 Inspection Pit

Fig. No.: **Figure 1**

Figure: **Photosheet**

Project ref.: **GB/727A**

Project: **Hollybank Verification**

Notes:

Dwg No.: **GB727A-001** Rev: **0**

Drn: **AS** Chk: **KJ** Date: **11/07/23**

Appendix C

Laboratory results





Kerry Jones
GB Card and Partners
Dixcart House
Addlestone Road
Bourne Buisness Park
Addlestone
KT15 2LE

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

DETS Report No: 23-09327

Site Reference: Holly Bank Cottage

Project / Job Ref: GB727A

Order No: GB727A/KJ

Sample Receipt Date: 18/07/2023

Sample Scheduled Date: 18/07/2023

Report Issue Number: 1

Reporting Date: 25/07/2023

Authorised by:



Kevin Old
Operations Director

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: 23-09327	Date Sampled	11/07/23	11/07/23	11/07/23	11/07/23	11/07/23
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Holly Bank Cottage	TP / BH No	V01	V02	V03	V03	V03
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: GB727A/KJ	Depth (m)	0.40	0.40	0.30	0.40	0.60
Reporting Date: 25/07/2023	DETS Sample No	664694	664697	664698	664699	664700

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.0	7.8	7.8	8.0	8.4
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	1541	1439	1074	987	999
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.15	0.14	0.11	0.10	0.10
Organic Matter (SOM)	%	< 0.1	MCERTS	4.7	8.6	8	4.6	4.4
Arsenic (As)	mg/kg	< 2	MCERTS	7	22	8	8	9
Barium (Ba)	mg/kg	< 2.5	MCERTS	64	126	55	55	59
Beryllium (Be)	mg/kg	< 0.5	MCERTS	< 0.5	0.9	< 0.5	< 0.5	0.6
W/S Boron	mg/kg	< 1	NONE	1.1	1.5	1.6	1.1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3	0.4	0.2	0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	12	20	13	15	18
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	25	61	29	21	25
Lead (Pb)	mg/kg	< 3	MCERTS	49	382	66	40	53
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	9	17	8	12	15
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	23	37	23	30	36
Zinc (Zn)	mg/kg	< 3	MCERTS	79	196	90	62	68
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	4.4	2.4	< 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: 23-09327	Date Sampled	11/07/23	11/07/23	11/07/23	11/07/23	11/07/23
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Holly Bank Cottage	TP / BH No	V01	V02	V03	V03	V03
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: GB727A/KJ	Depth (m)	0.40	0.40	0.30	0.40	0.60
Reporting Date: 25/07/2023	DETS Sample No	664694	664697	664698	664699	664700

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.16	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.24	0.47	0.13	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	0.22	0.44	0.13	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.15	0.30	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	0.14	0.27	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.17	0.32	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.16	0.34	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.26	< 0.1	< 0.1	< 0.1
Coronene	mg/kg	< 0.1	NONE	< 0.1	0.15	< 0.1	< 0.1	< 0.1
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	1.4	< 1	< 1	< 1
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	2	< 1	< 1	< 1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	2.8	< 1.6	< 1.6	< 1.6
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	2.9	< 1.7	< 1.7	< 1.7



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



Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 23-09327	Date Sampled	11/07/23	11/07/23	11/07/23	11/07/23	11/07/23
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Holly Bank Cottage	TP / BH No	V01	V02	V03	V03	V03
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: GB727A/KJ	Depth (m)	0.40	0.40	0.30	0.40	0.60
Reporting Date: 25/07/2023	DETS Sample No	664694	664697	664698	664699	664700

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	3	< 3	< 3	< 3
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	67	< 10	< 10	< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	70	< 21	< 21	< 21
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42	70	< 42	< 42	< 42



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: 23-09327	Date Sampled	11/07/23	11/07/23	11/07/23	11/07/23	11/07/23
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Holly Bank Cottage	TP / BH No	V01	V02	V03	V03	V03
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: GB727A/KJ	Depth (m)	0.40	0.40	0.30	0.40	0.60
Reporting Date: 25/07/2023	DETS Sample No	664694	664697	664698	664699	664700

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



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



Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 23-09327	
GB Card and Partners	
Site Reference: Holly Bank Cottage	
Project / Job Ref: GB727A	
Order No: GB727A/KJ	
Reporting Date: 25/07/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
664694	V01	None Supplied	0.40	13.6	Black loamy sand with stones and concrete
664697	V02	None Supplied	0.40	14.5	Black loamy sand with stones and brick
664698	V03	None Supplied	0.30	24.5	Black loamy sand with stones and vegetation
664699	V03	None Supplied	0.40	19.4	Brown sandy clay with stones
664700	V03	None Supplied	0.60	27.1	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

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: 23-09327

GB Card and Partners

Site Reference: Holly Bank Cottage

Project / Job Ref: GB727A

Order No: GB727A/KJ

Reporting Date: 25/07/2023

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
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



List of HWOL Acronyms and Operators
DETS Report No: 23-09327
GB Card and Partners
Site Reference: Holly Bank Cottage
Project / Job Ref: GB727A
Order No: GB727A/KJ
Reporting Date: 25/07/2023

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 - 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 - 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 - Aliphatic C5 - C34 - HS_1D_MS+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 - C35 - 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 - C35 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS



Kerry Jones
GB Card and Partners
Dixcart House
Addlestone Road
Bourne Buisness Park
Addlestone
KT15 2LE

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

DETS Report No: 23-09383

Site Reference: Holly Bank Cottage

Project / Job Ref: GB727A

Order No: GB727A/KJ

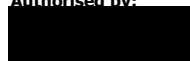
Sample Receipt Date: 19/07/2023

Sample Scheduled Date: 19/07/2023

Report Issue Number: 1

Reporting Date: 26/07/2023

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: 23-09383	Date Sampled	11/07/23	11/07/23	11/07/23		
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Holly Bank Cottage	TP / BH No	V01	V01	V02		
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: GB727A/KJ	Depth (m)	0.20	0.60	0.10		
Reporting Date: 26/07/2023	DETS Sample No	664899	664900	664901		

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		
pH	pH Units	N/a	MCERTS	7.7	9.9	7.3		
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1		
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	1242	2465	606		
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.12	0.25	0.06		
Organic Matter (SOM)	%	< 0.1	MCERTS	8.4	3.6	8		
Arsenic (As)	mg/kg	< 2	MCERTS	10	8	8		
Barium (Ba)	mg/kg	< 2.5	MCERTS	84	99	53		
Beryllium (Be)	mg/kg	< 0.5	MCERTS	0.5	< 0.5	< 0.5		
W/S Boron	mg/kg	< 1	NONE	1.4	< 1	< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3	< 0.2	< 0.2		
Chromium (Cr)	mg/kg	< 2	MCERTS	15	13	10		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	41	24	24		
Lead (Pb)	mg/kg	< 3	MCERTS	84	57	50		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	10	11	7		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Vanadium (V)	mg/kg	< 1	MCERTS	26	24	17		
Zinc (Zn)	mg/kg	< 3	MCERTS	113	64	70		
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)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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: 23-09383	Date Sampled	11/07/23	11/07/23	11/07/23		
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Holly Bank Cottage	TP / BH No	V01	V01	V02		
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: GB727A/KJ	Depth (m)	0.20	0.60	0.10		
Reporting Date: 26/07/2023	DETS Sample No	664899	664900	664901		

Determinand	Unit	RL	Accreditation	(n)			
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	0.39	< 0.1	< 0.1	
Fluorene	mg/kg	< 0.1	MCERTS	0.43	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	5.69	< 0.1	0.15	
Anthracene	mg/kg	< 0.1	MCERTS	1.62	< 0.1	< 0.1	
Fluoranthene	mg/kg	< 0.1	MCERTS	6.55	0.18	0.38	
Pyrene	mg/kg	< 0.1	MCERTS	5.52	0.17	0.34	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	2.77	0.12	0.23	
Chrysene	mg/kg	< 0.1	MCERTS	2.45	0.11	0.27	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	2.39	0.17	0.38	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.75	< 0.1	< 0.1	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	2.04	0.14	0.26	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.97	< 0.1	0.19	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.23	< 0.1	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.79	< 0.1	0.19	
Coronene	mg/kg	< 0.1	NONE	0.24	< 0.1	< 0.1	
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	11.6	< 1	1.3	
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	23.6	< 1	1.7	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	32.6	< 1.6	2.4	
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	32.8	< 1.7	2.4	

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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



Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 23-09383	Date Sampled	11/07/23	11/07/23	11/07/23		
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Holly Bank Cottage	TP / BH No	V01	V01	V02		
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: GB727A/KJ	Depth (m)	0.20	0.60	0.10		
Reporting Date: 26/07/2023	DETS Sample No	664899	664900	664901		

Determinand	Unit	RL	Accreditation	(n)			
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 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	3	< 3	< 3	
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 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	< 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	4	< 2	< 2	
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	27	< 3	< 3	
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	34	< 10	< 10	
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	65	< 21	< 21	
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	68	< 42	< 42	

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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: 23-09383	Date Sampled	11/07/23	11/07/23	11/07/23		
GB Card and Partners	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Holly Bank Cottage	TP / BH No	V01	V01	V02		
Project / Job Ref: GB727A	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: GB727A/KJ	Depth (m)	0.20	0.60	0.10		
Reporting Date: 26/07/2023	DETS Sample No	664899	664900	664901		

Determinand	Unit	RL	Accreditation	(n)			
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	

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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



Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 23-09383	
GB Card and Partners	
Site Reference: Holly Bank Cottage	
Project / Job Ref: GB727A	
Order No: GB727A/KJ	
Reporting Date: 26/07/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
664899	V01	None Supplied	0.20	13.4	Black loamy sand with stones and concrete
664900	V01	None Supplied	0.60	7.5	Brown sandy gravel with stones and concrete
664901	V02	None Supplied	0.10	17.7	Brown loamy sand with stones and vegetation

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/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: 23-09383

GB Card and Partners

Site Reference: Holly Bank Cottage

Project / Job Ref: GB727A

Order No: GB727A/KJ

Reporting Date: 26/07/2023

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
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



List of HWOL Acronyms and Operators
DETS Report No: 23-09383
GB Card and Partners
Site Reference: Holly Bank Cottage
Project / Job Ref: GB727A
Order No: GB727A/KJ
Reporting Date: 26/07/2023

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 - 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 - 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 - Aliphatic C5 - C34 - HS_1D_MS+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 - C35 - 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 - C35 - 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 screening assessment



[illegible]

Text in bold = Detection above LOD Red = GAC exceedance	Residential with homegrown produce: SOM 2.5%	V01 0.20	V01 0.40	V01 0.60	V02 0.10	V02 0.40	V03 0.30	V03 0.40	V03 0.60
SOM %		8.4	4.7	3.6	8.0	8.6	8.00	4.6	4.4
Chrysene	22	2.45	0.14	0.11	0.27	0.27	< 0.1	<0.1	<0.1
Dibenzo(ah)anthracene	0.28	0.23	<0.1	<0.1	<0.1	< 0.1	< 0.1	<0.1	<0.1
Fluoranthene	560	6.55	0.24	0.18	0.38	0.47	0.13	<0.1	<0.1
Fluorene	400	5.69	<0.1	<0.1	<0.1	< 0.1	<0.1	<0.1	<0.1
Indeno(123-cd)pyrene	36	0.97	<0.1	<0.1	0.19	0.2	<0.1	<0.1	<0.1
Naphthalene	5.6	<0.1	<0.1	<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	220	5.69	0.16	<0.1	<0.1	0.15	<0.1	<0.1	<0.1
Pyrene	1200	5.52	0.22	0.17	0.34	0.44	0.13	<0.1	<0.1



Shaping the future of engineering



**GB Card
Partners**

CONSULTING ENGINEERS

GB Card + Partners Limited

Dixcart House
Addlestone Road
Surrey
KT15 2LE

T +44 (0) 2037 959990
E info@gbcardandpartners.com

gbcardandpartners.com