

Ref DP/SEJ/20040/LET/GE82

NHBC Ref: 223174

15 February 2024

Mr M Baldwin
Countryside Properties
i10 Railway Drive
Wolverhampton
WV1 1LH



Dear Mark

Clean Cover Validation, Plots 580 to 589 – Drakelow Park, Burton-Upon-Trent

In accordance with the proposals made in the Travis Baker Geo-Environmental (TBGE) Remediation Strategy and Verification Plans (Ref: SEJ/20040/LET/GE28A, dated 30 May 2023 to cover plots 558-587, 601-624, 761-821 and 834-836), this letter documents the placement of a clean cover system, comprising a minimum 600mm thickness of suitably clean topsoil and subsoil beneath the garden areas of Plots 580 to 589.

Samples of the imported topsoil were collected from stockpiles in August and September 2023 prior to placement of the respective materials to Plots 580 to 589. Samples of the subsoil were taken from the garden areas prior to the placement of the topsoil for laboratory analysis. A Travis Baker engineer attended site on 9 February 2024 to verify that a suitable clean cover had been placed.

Inspection pits were dug by hand in the rear garden areas of Plots 580 and 589. This revealed:

- Plot 581 – 150mm imported topsoil and 850mm imported subsoil
- Plot 582 – 200mm imported topsoil and 600mm imported subsoil
- Plot 587 – 350mm imported topsoil and 250mm imported subsoil

Photographs showing the placed cover materials are included as Appendix 1.

Chemical laboratory testing was undertaken by i2 Analytical, to UKAS and MCERTS accreditation where applicable in order to confirm that the levels of contamination are suitable for placement in garden areas. The results of analysis of topsoil samples are contained in i2 reports reference 23-49610, dated 14 August 2023 and 23-56383, dated 20 September 2023. The results of analysis of subsoil samples are contained in i2 report reference 23-71301-2B, dated 7 December 2023.

The results of testing of the topsoil and subsoil have also been compared to the compliance criteria in Appendix 4. The results of all of the tested determinants were below the respective compliance criteria.

The foregoing thus demonstrates that a sufficient thickness of suitably clean cover material has been provided to the garden areas of Plots 580 to 589

13 November 2023

We trust the above and attached are satisfactory, however, if you have any queries please do not hesitate to contact us.

Yours sincerely,



Daniel Potts

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Reviewed by

Sam Johnson
Associate Director

Encs

Appendix 1 – Photographs showing placed clean cover materials

Appendix 2 – Chemical laboratory test results (topsoil)

Appendix 3 – Chemical laboratory test results (subsoil)

Appendix 4 – Proposed validation tests and compliance criteria for clean cover topsoil and subsoil



APPENDICES

APPENDIX 1
Photographs showing placed clean cover material



View of inspection pit in the rear garden of Plot 581



Depth of pit at Plot 581, proving 1000mm-thickness of clean cover system placed



View of inspection pit in the rear garden on 582



Depth of pit at Plot 582, proving 800mm-thickness of clean cover system placed



View of inspection pit in the rear garden of Plot 587



Depth of pit at Plot 581, proving 600mm-thickness of clean cover system placed

APPENDIX 2
Chemical laboratory test results (topsoil)

Daniel Potts

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e: reception@i2analytical.com

Analytical Report Number : 23-56383

Project / Site name:	Drakelow, Burton-On-Trent	Samples received on:	13/09/2023
Your job number:	20040	Samples instructed on/ Analysis started on:	13/09/2023
Your order number:	3571G	Analysis completed by:	20/09/2023
Report Issue Number:	1	Report issued on:	20/09/2023
Samples Analysed:	3 soil samples		

Izabela Wójcik
Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 23-56383
Project / Site name: Drakelow, Burton-On-Trent
Your Order No: 3571G

Lab Sample Number				2810623	2810624	2810625
Sample Reference				TS2-S10	TS2-S11	TS2-S12
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				12/09/2023	12/09/2023	12/09/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	16	14
Total mass of sample received	kg	0.001	NONE	0.7	0.7	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7	6.3	6.7
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0569	0.0343	0.071

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.2	0.15	0.17
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.34	0.31	0.32
Pyrene	mg/kg	0.05	MCERTS	0.31	0.3	0.28
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.15	0.15	0.14
Chrysene	mg/kg	0.05	MCERTS	0.21	0.21	0.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.2	0.24	0.19
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.11	0.09	0.07
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.18	0.17	0.15
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA 16 PAHs	mg/kg	0.8	ISO 17025	1.7	1.62	1.52
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	19	19
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.5	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	23	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	45	56	50
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	190	62
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	32	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	140	130

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

Analytical Report Number : 23-56383

Project / Site name: Drakelow, Burton-On-Trent

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2810623	TS2-S10	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2810624	TS2-S11	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.
2810625	TS2-S12	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 23-56383

Project / Site name: Drakelow, Burton-On-Trent

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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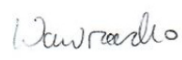
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Analytical Report Number : 23-49610

Project / Site name:	Drakelow Burton On Trent	Samples received on:	07/08/2023
Your job number:	20040	Samples instructed on/ Analysis started on:	07/08/2023
Your order number:	3593G	Analysis completed by:	14/08/2023
Report Issue Number:	1	Report issued on:	14/08/2023
Samples Analysed:	5 soil samples		


Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-49610
Project / Site name: Drakelow Burton On Trent
Your Order No: 3593G

Lab Sample Number				2773746	2773747	2773748	2773749	2773750
Sample Reference				TS2-S1	TS2-S2	TS2-S3	TS2-S4	TS2-S5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				04/08/2023	04/08/2023	04/08/2023	04/08/2023	04/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	10	10	9.6	10	11
Total mass of sample received	kg	0.001	NONE	0.5	0.8	0.7	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	IZJ	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	6.7	7.1	7	6.7
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0472	0.017	0.0252	0.0183	0.019

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.08	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.13	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.17	0.11	0.78	0.18	0.1
Anthracene	mg/kg	0.05	MCERTS	0.05	< 0.05	0.2	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.38	0.32	0.88	0.34	0.28
Pyrene	mg/kg	0.05	MCERTS	0.37	0.26	0.73	0.29	0.25
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.2	0.14	0.34	0.14	0.12
Chrysene	mg/kg	0.05	MCERTS	0.17	0.14	0.29	0.15	0.13
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.28	0.21	0.32	0.18	0.19
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.09	0.06	0.21	0.11	0.07
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.19	0.13	0.31	0.15	0.12
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.12	0.11	0.18	0.1	0.08
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	0.11	0.21	0.12	0.1

Total PAH

Speciated Total EPA 16 PAHs	mg/kg	0.8	ISO 17025	2.17	1.59	4.77	1.76	1.44
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	20	19	14	18
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.8	0.7	0.4	1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	97	25	24	20	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	52	55	54	44	53
Lead (aqua regia extractable)	mg/kg	1	MCERTS	59	62	61	48	57
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	33	31	26	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	140	140	110	130

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

Analytical Report Number : 23-49610

Project / Site name: Drakelow Burton On Trent

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2773746	TS2-S1	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2773747	TS2-S2	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2773748	TS2-S3	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2773749	TS2-S4	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2773750	TS2-S5	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 23-49610

Project / Site name: Drakelow Burton On Trent

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

APPENDIX 3
Chemical laboratory test results (subsoil)

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Analytical Report Number : 23-71301-2B

Replaces Analytical Report Number: 23-71301, issue no. 1
Report format change.
Split Report As Requested By Client.

Project / Site name:	Drakelow, Burton-On-Trent	Samples received on:	24/11/2023
Your job number:	20040	Samples instructed on/ Analysis started on:	24/11/2023
Your order number:	PKG20197	Analysis completed by:	01/12/2023
Report Issue Number:	2B	Report issued on:	07/12/2023
Samples Analysed:	6 soil samples		



Signed:

Joanna Szwagrzak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-71301

Project / Site name: Drakelow, Burton-On-Trent

Your Order No: PKG20197

Lab Sample Number				2891001	2891002	2891003	2891004	2891006
Sample Reference				Plot 574	Plot 577	Plot 583	Plot 588	Plot 594
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.40	0.40	0.30	0.30
Date Sampled				23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	6.5
Moisture Content	%	0.01	NONE	13	18	18	16	15
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KWB	KWB	KWB	KWB	KWB

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8	8	8	8
Water Soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.249	0.195	0.177	0.164	0.143

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.36	0.58	0.43	0.39	0.33
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.05	0.09	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.08	0.14	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.42	0.61	0.1	0.06	0.05
Anthracene	mg/kg	0.05	MCERTS	0.13	0.12	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.71	0.52	0.14	0.08	0.05
Pyrene	mg/kg	0.05	MCERTS	0.64	0.43	0.12	0.07	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.32	0.19	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.36	0.18	0.06	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.42	0.2	0.09	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.17	0.09	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.34	0.16	0.06	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.18	0.09	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.2	0.09	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	4.41	3.49	1.01	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	31	25	33	25
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	1.1	1.4	0.6	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	53	44	46	48
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	38	22	16	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	29	24	24	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	33	26	29	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	88	130	90	90	86

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

Analytical Report Number: 23-71301

Project / Site name: Drakelow, Burton-On-Trent

Your Order No: PKG20197

Lab Sample Number				2891007
Sample Reference				Plot 596
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				23/11/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	27
Moisture Content	%	0.01	NONE	16
Total mass of sample received	kg	0.001	NONE	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KWB

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2
Water Soluble SO ₄ 10ml extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.212

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.37
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.22
Anthracene	mg/kg	0.05	MCERTS	0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.24
Pyrene	mg/kg	0.05	MCERTS	0.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.08
Chrysene	mg/kg	0.05	MCERTS	0.09
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.11
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.08
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.5
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	32
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100

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



Analytical Report Number : 23-71301
Project / Site name: Drakelow, Burton-On-Trent

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2891001	Plot 574	None Supplied	0.5	Brown clay and sand with gravel.
2891002	Plot 577	None Supplied	0.4	Brown clay and sand with gravel.
2891003	Plot 583	None Supplied	0.4	Brown clay and sand with gravel.
2891004	Plot 588	None Supplied	0.3	Brown clay and sand with gravel.
2891006	Plot 594	None Supplied	0.3	Brown clay and sand with stones.
2891007	Plot 596	None Supplied	0.3	Brown clay and sand with gravel and stones.

Analytical Report Number : 23-71301
Project / Site name: Drakelow, Burton-On-Trent

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

APPENDIX 4
Proposed validation tests and compliance criteria for clean cover topsoil and subsoil

APPENDIX 3 – DRAKELOW, BURTON-UPON-TRENT
Proposed Validation Tests and Compliance Criteria for Top Soil / Sub Soil

Determinant	Compliance criterion (mg/kg)	Source
Arsenic	37	C4SL (residential with homegrown produce)
Cadmium	22	C4SL (residential with homegrown produce)
Chromium (total)	630	S4UL (residential with homegrown produce)
Lead	200	C4SL (residential with homegrown produce)
Mercury (inorganic)	40	S4UL (residential with homegrown produce)
Selenium	250	S4UL (residential with homegrown produce)
Copper	2400	S4UL (residential with homegrown produce)
Nickel	180	S4UL (residential with homegrown produce)
Zinc	3700	S4UL (residential with homegrown produce)
Boron	290	S4UL (residential with homegrown produce)
Acenaphthene	210	S4UL (residential with homegrown produce)
Acenaphthylene	170	S4UL (residential with homegrown produce)
Anthracene	2,400	S4UL (residential with homegrown produce)
Benzo(a)anthracene	7.2	S4UL (residential with homegrown produce)
Benzo(a)pyrene	2.2	S4UL (residential with homegrown produce)
Benzo(a)pyrene	5	S4UL (residential with homegrown produce)
Benzo(b)fluoranthene	2.6	S4UL (residential with homegrown produce)
Benzo(ghi)perylene	320	S4UL (residential with homegrown produce)
Benzo(k)fluoranthene	77	S4UL (residential with homegrown produce)
Chrysene	15	S4UL (residential with homegrown produce)
Dibenzo(ah)anthracene	0.24	S4UL (residential with homegrown produce)
Fluoranthene	280	S4UL (residential with homegrown produce)
Fluorene	170	S4UL (residential with homegrown produce)
Indeno(123-cd)pyrene	27	S4UL (residential with homegrown produce)
Naphthalene	2.3	S4UL (residential with homegrown produce)
Phenanthrene	95	S4UL (residential with homegrown produce)
Pyrene	620	S4UL (residential with homegrown produce)
TPH (aliphatic C ₅ -C ₆)	42	S4UL (residential with homegrown produce)
TPH (aliphatic C ₆ -C ₈)	100	S4UL (residential with homegrown produce)
TPH (aliphatic C ₈ -C ₁₀)	27	S4UL (residential with homegrown produce)
TPH (aliphatic C ₁₀ -C ₁₂)	130	S4UL (residential with homegrown produce)
TPH (aliphatic C ₁₂ -C ₁₆)	1,100	S4UL (residential with homegrown produce)
TPH (aliphatic C ₁₆ -C ₃₅)	65,000	S4UL (residential with homegrown produce)
TPH (aliphatic C ₃₅ -C ₄₀)	65,000	S4UL (residential with homegrown produce)
TPH (aromatic C ₅ -C ₇)	70	S4UL (residential with homegrown produce)
TPH (aromatic C ₇ -C ₈)	130	S4UL (residential with homegrown produce)
TPH (aromatic C ₈ -C ₁₀)	34	S4UL (residential with homegrown produce)
TPH (aromatic C ₁₀ -C ₁₂)	74	S4UL (residential with homegrown produce)
TPH (aromatic C ₁₂ -C ₁₆)	140	S4UL (residential with homegrown produce)
TPH (aromatic C ₁₆ -C ₂₁)	260	S4UL (residential with homegrown produce)
TPH (aromatic C ₂₁ -C ₃₅)	1,100	S4UL (residential with homegrown produce)
TPH (aromatic C ₃₅ -C ₄₀)	1,100	S4UL (residential with homegrown produce)

Benzene	0.87	S4UL (residential with homegrown produce)
Toluene	130	S4UL (residential with homegrown produce)
Ethylbenzene	47	S4UL (residential with homegrown produce)
m&p-Xylene	59	S4UL (residential with homegrown produce)
o-xylene	56	S4UL (residential with homegrown produce)
Asbestos	<0.001% *	Derived 'in house' by TBGE

Notes:

C4SL = Category 4 Screening Level (DEFRA, 2014)

S4UL = Suitable 4 Use Level (LQM and CIEH, 2015).

Values assume a soil organic matter (SOM) content of 1%, where applicable.

* If asbestos fibres are positively identified at <0.001%, further sampling may be necessary to verify that the test result is not indicative of more substantial contamination in the immediate locality.