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23rd December 2021

Ref: A11057/211222/L1

Rafal Chodkowski
Berkley Homes (Oxford and Chiltern) Ltd
Berkley House
Farnham Lane
Farnham Royal
SL2 3RQ

By Email only: Rafal.Chodkowski@berkeleygroup.co.uk

Dear Rafal,

RE: Kenavon Drive, Reading - Validation of Clean Cover System within the E2 area

Please find attached Omnia Report A11057/211222/L1 detailing the results of the validation works undertaken within areas of soft landscaping within the E2 area of the above site, in support of Reading Borough Council planning application Ref. 170509.

If you have any questions, please do not hesitate to contact us.

Yours sincerely,



Archie Bunney BSc (Hons) MSc FGS
Graduate Geo-environmental Consultant



Grace Larcombe
Senior Geo-environmental Consultant

Attachments:

- Attachment 1: Limitations
- Attachment 2: Site Figures
- Attachment 3: Exploratory Hole Logs
- Attachment 4: Topsoil Supply Certificates
- Attachment 5: Photographs
- Attachment 6: Chemical Testing Results
- Attachment 7: Origin of GAC Values

VALIDATION REPORT

Site Address	Kenavon Drive, Reading, Berkshire RG1 3HS
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1.0 Objectives & Terms of Reference

The objective of this report is to provide a Tier 1 human health risk assessment of near-surface soil samples recovered from areas of soft landscaping within the E2 area of the above site. Phase E2 is presented in the site plan provided by the client, reference O.446.ARC.001, included as Figure 2.0 within Attachment 2. Validation will be undertaken through on-site observations and chemical testing of soil samples, as set out within the Omnia Phase 2 report (reference: A11057/2.0) and Remediation Method Statement (RMS) (reference: A11057/3.1).

A site location plan is included as Figure 1.0 within Attachment 2. The proposed site layout is included as Figure 2.0 in Attachment 2.

2.0 Background

At present the development at Kenavon Drive, Reading is ongoing with areas of soft landscaping within the E2 area requiring validation. At the time of the site visits, the topsoil had been placed, however turf or planting had yet to be positioned.

With reference to Figure 4.0 within Attachment 2, the areas of soft landscaping within the E2 area which require validation are:

- the north-easternmost area between the apartment building and Kenavon Drive (Areas A27, A28, and A29 - and in front of apartments A84, A97, and A98 - on Figure 2.0 in Attachment 2);
- four (4no.) planters on what will be known as Caraway Street (Areas A10, A11, A12, and A13 on Figure 2.0 in Attachment 2); and
- several small areas of soft landscaping in front of the north-western corner of the apartment building, facing what will be known as Caraway Street (in front of apartments A85, A86, A87, A88, A89, and A90 on Figure 2.0 in Attachment 2).

The Phase 2 report (reference: A11057/2.0, dated March 2019) indicated the presence of elevated concentrations of asbestos; heavy metals (arsenic, beryllium, and lead); Polycyclic Aromatic Hydrocarbons (PAHs); and Total Petroleum Hydrocarbons (TPH) in near-surface soils across the site.

The subsequent RMS (reference: A11057/3.1) stipulated that impacted soils within all areas of proposed soft landscaping were excavated to a minimum depth of 300mm below finished ground level. Following removal, a clean cover system comprising 300mm of clean, chemically suitable soils should be emplaced and underlain by a marker layer in the form of a high-visibility geotextile membrane. Sampling frequency was at 1 per 1:150m³ with a minimum of 3no. per source.

Three (3no.) site visits were undertaken between the 8th of October 2021 and the 20th of December 2021 by an Omnia representative. Seven (7no.) hand dug pits were advanced to depths ranging from 0.40m bgl to 0.70m bgl with five (5no.) soil samples taken for chemical testing. It was noted at the time of the initial validation works some areas of the planting was incomplete and required additional placement of topsoil. As a result, in order to facilities the tight schedule of the client, the client was asked to provide photographic records that a geotextile membrane had been paced with the correct thickness of topsoil.

2.1 Soil Capping System

The agreed RMS (A11057/3.1) stipulated that a clean cover system and high-visibility geotextile should be implemented within all areas of soft landscaping to act as a marker layer and to mitigate the risk from identified contaminants in the underlying soils and to render the pollution pathway inactive.

The RMS stipulated cover system thicknesses as described in Table 2.1 below:

Table 2.1 - Cover System Details

Material	Minimum Depth (mm bgl)
Topsoil Growing Medium	300
High-Visibility Geotextile Marker	300
Tree Pits	900

Omnia collected a total of five (5no.) validation samples from areas of soft landscaping over a total of three (3no.) site visits.

3.0 Scope of works

3.1 Soil Capping System

The scope of works comprised the validation of all soft landscaped areas through the advancement of hand excavated pits to minimum depths of 300mm bgl at a frequency of 1 per 1:150m³ with a minimum of 3no. per source, to confirm the removal of impacted soils to the specified depth, placement of the high-visibility geotextile and to retrieve samples from the emplaced topsoil. These samples were submitted for laboratory analysis for assessment of their chemical suitability, as specified within Section 4.0 of the RMS (A11057/3.1).

4.0 Site Work and Observations – Soil Capping System

4.1 Site Visits

Visit One – 08/10/2021

The first site visit was undertaken on the 8th of October 2021 by a consultant from Omnia. At the time of the site visit; topsoil, turf, and planting had been placed within Areas A27-A29 and in front of apartments A84, A97, and A98. However, topsoil had not been placed within Areas A10-A12, nor within the soft landscaping in front of apartments A85-A88. The concreting and stonework around the edges of Areas A10-A12 had also not been finished.

During the site visit, two (2no.) hand-excavated pits (E2-HP101 and E2-HP102) were advanced to depths ranging from 0.40m bgl to 0.55m bgl. These were utilised to confirm the thickness of the topsoil and to confirm the presence of a high-visibility geotextile at the specified depth, as well as to collect topsoil samples. Of these, one (1no.) soil sample was scheduled for chemical laboratory analysis. Photographs of the areas of soft landscaping inspected during the first site visit are included within Attachment 5.

Visit Two – 25/11/2021

The second site visit was undertaken on the 25th of November 2021 by a consultant from Omnia. At the time of the site visit; topsoil had been placed within the Planters (Areas A10-A12).

During the site visit, three (3no.) hand-excavated pits (E2-HP103, E2-HP104, E2-HP105) were advanced to depths ranging from 0.65m bgl to 0.70m bgl. These were utilised to confirm the thickness of the topsoil and to confirm the presence of a high-visibility geotextile at the specified depth, as well as to collect topsoil samples. Of these, two (2no.) soil samples were scheduled for chemical laboratory analysis. Photographs of the proposed areas of soft landscaping inspected during the second site visit are included within Attachment 5.

At the time of the second visit not all areas of soft landscaping were complete. As a result, the client was asked to provide evidence that a geotextile membrane and the correct amount of topsoil had been laid in the remaining areas of soft landscaping in front of apartments A85-A88.

Photographs showing the emplaced cover system within these areas of proposed soft landscaping were provided to Omnia by the client on 29/11/2021.

Laboratory testing of soil samples collected from emplaced soils within areas of soft landscaping showed one (1no.) exceedance of the assessment criteria for arsenic. This was rectified by the excavation and replacement of the topsoil within the planter A12. As the soils in the exceeded location were excavated and replaced, the sample for HP105 will not be considered further in this validation report. Therefore, a further visit was undertaken to sample the replaced topsoil.

Visit Three – 20/12/2021

The third site visit was undertaken on the 10th of December 2021 by a consultant from Omnia. At the time of the site visit topsoil had been replaced within Area A12 and materials within planter A13 had been placed.

During the site visit, two (2no.) hand-excavated pits (E2-HP201 to E2-HP202) were advanced to depths ranging from 0.60m bgl to 0.70m bgl. These were to confirm the thickness of the topsoil and to confirm the presence of a high-visibility geotextile at the specified depth, as well as to collect topsoil samples. Of these, two (2no.) soil samples were scheduled for chemical laboratory analysis. Photographs of the areas of soft landscaping inspected during the third site visit are included within Attachment 5.

Validation pit locations are presented as Figure 3.0 in Attachment 2.

4.2 Ground Conditions Encountered

A total of seven (7no.) hand-excavated pits were advanced to depths between 0.40m bgl and 0.70m bgl, as shown in Figure 2.0 in Attachment 2. The soil conditions encountered are detailed on the logs, presented as Attachment 2, and summarised below:

Topsoil

Topsoil was found within all seven (7no.) exploratory hole locations and generally consisted of grass overlying dark orangeish/yellowish brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional organic matter. Gravel is fine and medium, sub-angular to rounded flint.

Topsoil was encountered from ground level to a maximum depth of 0.70m bgl.

The topsoil and geotextile depth for the areas of soft landscaping are summarised in Table 4.1 below.

Table 4.1 - Measured Topsoil Thicknesses & Geotextile Membrane Depths

Visit Date	Visit One 8/10/2021		Visit Two 25/11/2021			Photograph provided by client 29/11/2021	Visit Three 20/12/2021	
Validation Location	E2-HP101	E2-HP102	E2-HP103	E2-HP104	E2-HP105	E2-HP106	E2-HP201	E2-HP202
Topsoil Thickness (mm)	400	550	650	650	700	650	700	600
Geotextile Membrane Depth (mm bgl)	400	550	650	650	700	650	700	600
Validation Pass/Fail	<u>Pass</u>	<u>Pass</u>	<u>Pass</u>	<u>Pass</u>	<u>Pass</u>	<u>Pass</u>	<u>Pass</u>	<u>Pass</u>

As can be seen from Table 4.1 above, the thicknesses of topsoil placed, together with the depth of emplacement of the high-visibility geotextile meet or exceed the requirements set out within the RMS.

Supply certificates confirming the suitability of the material brought to site are included as Attachment 4.

A photographic record, including client provided photographs, of the validation pits showing confirmation of the capping system thickness is presented as Attachment 5.

4.3 Laboratory Analysis

Soil samples collected were submitted for testing. These samples were submitted to Element Materials Technology under UKAS accreditation for analysis comprising:

- CLEA Metals;
- Banded Polycyclic Aromatic Hydrocarbons (PAHs);
- Banded Total Petroleum Hydrocarbons (TPH);
- Asbestos Fibres in Soil;
- Soluble Sulphate;
- pH;
- Phenols; and,
- Total Cyanide.

Laboratory results are presented as Attachment 6.

4.4 Tier 1 Human Health Risk Assessment

The analytical results have been directly compared to the validation criteria set out in Table 5.2 of the Omnia Remediation Method Statement (ref: A11057v3.1). This comparison is detailed within Table 4.2 overleaf for the four (4no.) samples tested (E2-HP101, E2-HP102, E2-HP201 and E2-HP202). The origin of the Tier 1 screening values is presented as Attachment 7.

Table 4.2 - Summary of Inorganic & Hydrocarbon Toxicity Assessment for a Residential End Use with Home Grown Produce

Determinant	Units	GAC	n	MC	Location of Exceedance	Pathway	Assessment
Metals							
Arsenic	mg/kg	37	4	9	N/A	1	No Further Action
Beryllium	mg/kg	1.7	4	1.1	N/A	1	No Further Action
Cadmium	mg/kg	11	4	0.4	N/A	2	No Further Action
Chromium (III)	mg/kg	910	4	62.2	N/A	1	No Further Action
Chromium (VI)	mg/kg	6	4	<0.3	N/A	2	No Further Action
Copper	mg/kg	2,400	4	43	N/A	2	No Further Action
Lead	mg/kg	200	4	33	N/A	1	No Further Action
Mercury	mg/kg	40	4	<0.1	N/A	1	No Further Action
Nickel	mg/kg	180	4	44.1	N/A	1,2	No Further Action
Selenium	mg/kg	250	4	1	N/A	1,2	No Further Action
Zinc	mg/kg	3,700	4	99	N/A	2	No Further Action
General Inorganics							
Asbestos	%	NAD	4	NAD	N/A	5	No Further Action
Total Cyanide *	mg/kg	50	4	0.8	N/A	1	No Further Action
Organics							
General Organics							
Phenol	mg/kg	280	4	<0.15	N/A	2	No Further Action
PAH							
Naphthalene	mg/kg	2.3	4	<0.04	N/A	2	No Further Action
Acenaphthylene	mg/kg	170	4	<0.03	N/A	2	No Further Action
Acenaphthene	mg/kg	210	4	<0.05	N/A	2	No Further Action
Fluorene	mg/kg	170	4	<0.04	N/A	2	No Further Action
Phenanthrene	mg/kg	95	4	0.08	N/A	2	No Further Action
Anthracene	mg/kg	2,400	4	<0.04	N/A	2	No Further Action
Fluoranthene	mg/kg	280	4	0.19	N/A	1,2	No Further Action
Pyrene	mg/kg	620	4	0.15	N/A	1,2	No Further Action
Benzo(a)Anthracene	mg/kg	7.2	4	0.08	N/A	1	No Further Action
Chrysene	mg/kg	15	4	0.08	N/A	1	No Further Action
Benzo(b)Fluoranthene	mg/kg	2.6	4	0.1	N/A	1	No Further Action
Benzo(k)Fluoranthene	mg/kg	77	4	0.04	N/A	1	No Further Action
Benzo(a)Pyrene	mg/kg	2.2	4	0.06	N/A	1	No Further Action
Indeno(123-cd)Pyrene	mg/kg	27	4	0.06	N/A	1	No Further Action
Dibenzo(ah)Anthracene	mg/kg	0.24	4	<0.04	N/A	1	No Further Action
Benzo(ghi)Perylene	mg/kg	320	4	0.05	N/A	1	No Further Action
Banded TPH							
TPH EC 5-6**	mg/kg	42	4	<0.1	N/A	4	No Further Action
TPH EC >6-8**	mg/kg	100	4	<0.1	N/A	4	No Further Action
TPH EC >8-10**	mg/kg	27	4	<5	N/A	4	No Further Action
TPH EC> 10-12**	mg/kg	74	4	<10	N/A	2	No Further Action
TPH EC> 12-16**	mg/kg	140	4	12	N/A	2	No Further Action
TPH EC> 16-21**	mg/kg	260	4	86	N/A	1	No Further Action
TPH EC> 21-35**	mg/kg	1,100	4	594	N/A	1	No Further Action
TPH EC> 35-44**	mg/kg	1,100	4	42	N/A	1	No Further Action

Notes

Main Exposure Pathways: 1 = Ingestion of Soil & Indoor Dust, 2 = Consumption of Homegrown Produce & Attached Soil; 3 = Dermal Contact (Indoor & Outdoor); 4 = Inhalation of Vapour (Indoor & Outdoor); 5 = Inhalation of Dust (Indoor & Outdoor), 6 = Inhalation of Fibres.

Notes (continued)

Abbreviations: GAC = General Assessment Criteria, n = number of samples, MC = Maximum Concentration

* Total cyanide Tier 1 GAC is taken from the Dutch Intervention Value (2010) for complex cyanide.

** The Tier 1 GAC for the banded hydrocarbon fraction is derived from the CIEH/S4UL assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. OEC has utilised the lowest of the aliphatic and aromatic chain lengths in order to adopt a conservative approach, which is considered satisfactory for the protection of human health.

Laboratory results were also compared to the BS3882:2015 phytotoxic screening criteria and are summarised in Table 4.3 below.

Table 4.3 – BS3882:2015 Chemical Suitability Criteria for Potentially Phytotoxic Elements

Determinant	Units	pH >7.0	No	MC	Assessment
Copper	mg/kg	<300	4	43	No Further Action
Nickel	mg/kg	<200	4	44.1	No Further Action
Zinc	mg/kg	<110	4	99	No Further Action

With reference to Tables 4.2 and 4.3, it can be seen that all recorded concentrations comply with the adopted screening level for the protection of Human Health and the phytotoxic suitability criteria.

The laboratory results are presented within Attachment 6 with the origin of the Tier 1 screening values presented in Attachment 7.

4.5 Discussion

Laboratory testing of soil samples collected from emplaced soils and replaced soils within areas of soft landscaping (E2-HP101, E2-HP102, E2-HP201 and E2-HP202) did not show any exceedances of the assessment criteria set out within the agreed RMS (A11057/3.1). The topsoil is therefore considered to be suitable for use as a clean capping system within areas of communal soft landscaping.

The validation in areas of soft landscaping undertaken by Omnia, as shown in Table 4.1, confirms that the thickness of the installed clean cover system complies with Section 4.0 of the agreed RMS (A11057/3.1).

5.0 Conclusion

Based on the findings of this topsoil validation, which consisted of verifying topsoil thickness, the presence of – and depth to – a geotextile membrane, and chemical testing of soil samples; the topsoil present within the E2 area conforms to the specifications established within Section 4.0 of the agreed RMS (A11057/3.1).

It is therefore considered that areas of soft landscaping do not have the potential to present a significant risk to human health and comply with the specifications established within the RMS, and that the areas are suitable for the proposed end use.

END OF REPORT

Attachment 1

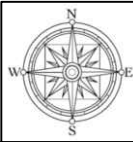
Limitations

-
1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between OE Ltd and the Client as indicated in Section 1.2.
 2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.
 3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination, which are enforced, by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
 4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
 5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
 6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
 7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
 8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
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 10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.
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Attachment 2

Figures

Key



Approximate Site Location



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Job Title:	Client:	Project No:	Date:	Drawing Title:
Kenavon Drive, Reading	Berkeley Homes	A11057	22/12/2021	Figure 1.0 - Site Location Plan
		Drawn By:	Authorised By:	
		A. Bunney	G. Larcombe	
		Scale:	Notes:	
		1sq = 1km3	OS Licence: 100058169	

Key



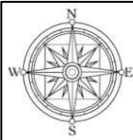
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Job Title: Kenavon Drive, Reading	Client: Berkeley Homes	Project No: A11057	Date: 21/04/2021	Drawing Title: Figure 2.0 - Proposed Site Layout
		Drawn By: JC	Authorised By: TM	
		Scale: NTS	Notes:	

Key

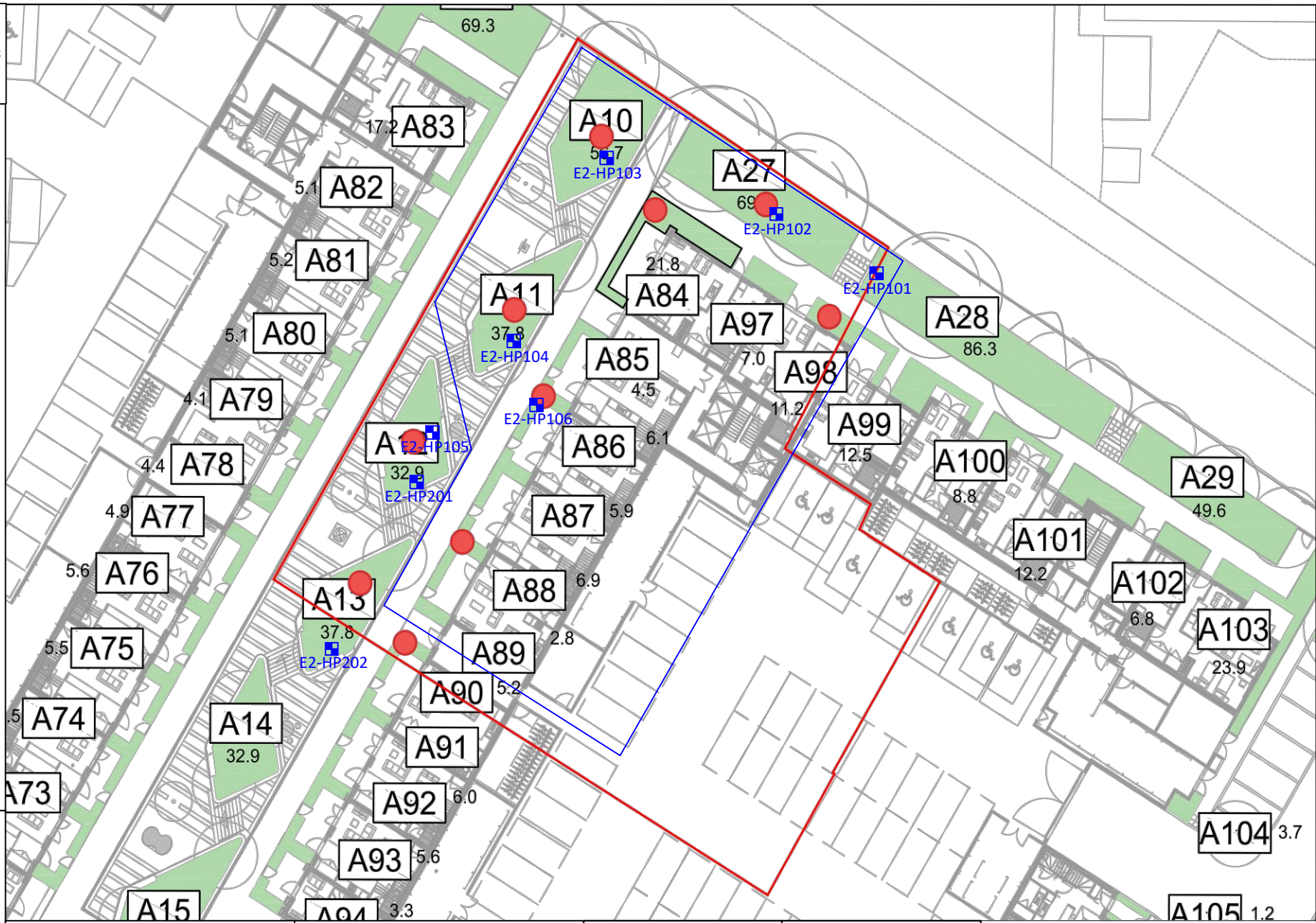


- Original Block E2 validation area
- Revised Block E2 validation area (email from C. Dragos to G. Larcombe, dated 29/11/21)
- Approximate Hand Dug Pit Location
■ E2-HP101

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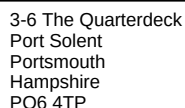


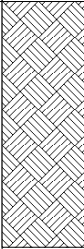
Job Title: Kenavon Drive, Reading	Client: Berkeley Homes	Project No: A11057 Drawn By: A. Bunney Scale: Not to scale	Date: 22/12/2021 Authorised By: G. Larcombe Notes:	Drawing Title: Figure 3.0 - Validation Pit Locations
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Attachment 3
Exploratory Hole Logs

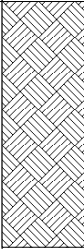
 3-6 The Quarterdeck Port Solent Portsmouth Hampshire PO6 4TP				Trial Pit Log				Trialpit No E2-HP101 Sheet 1 of 1	
Project Name: Kenavon Drive, Reading				Project No. A11057		Co-ords: - Level:		Date 08/10/2021	
Location: Reading, RG1 3HS						Dimensions (m): 0.2 0.2		Scale 1:20	
Client: Berkeley Homes (Western) Ltd						Depth 0.40		Logged AB	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.10 - 0.40	ES		0.40			Grass overlying dark orangeish yellowish brown slightly clayey slightly gravelly fine to coarse SAND with occasional organic matter. Gravel is fine and medium sub-angular to rounded flint. (TOPSOIL)		
							End of pit at 0.40 m		
Remarks: Cleared by Cable Avoidance Tool. No groundwater encountered.									
Stability: Stable									



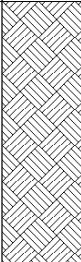


 3-6 The Quarterdeck Port Solent Portsmouth Hampshire PO6 4TP				Trial Pit Log				Trialpit No E2-HP103 Sheet 1 of 1	
Project Name: Kenavon Drive, Reading				Project No. A11057		Co-ords: - Level:		Date 25/11/2021	
Location: Reading, RG1 3HS						Dimensions (m): 0.2 0.2		Scale 1:20	
Client: Berkeley Homes (Western) Ltd						Depth 0.65		Logged AB	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.00 - 0.65	ES		0.65			Dark orangeish brown slightly clayey slightly gravelly fine to coarse SAND with occasional organic matter. Gravel is fine and medium sub-angular to rounded flint. (TOPSOIL)		
							End of pit at 0.65 m		
1 2 3 4									
Remarks: Cleared by Cable Avoidance Tool. No groundwater encountered.									
Stability: Stable									

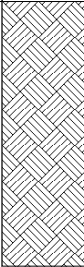


 3-6 The Quarterdeck Port Solent Portsmouth Hampshire PO6 4TP				Trial Pit Log				Trialpit No E2-HP104 Sheet 1 of 1	
Project Name: Kenavon Drive, Reading				Project No. A11057		Co-ords: - Level:		Date 25/11/2021	
Location: Reading, RG1 3HS						Dimensions (m): 0.2 0.2		Scale 1:20	
Client: Berkeley Homes (Western) Ltd						Depth 0.65		Logged AB	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.00 - 0.65	ES		0.65			Dark orangeish brown slightly clayey slightly gravelly fine to coarse SAND with occasional organic matter. Gravel is fine and medium sub-angular to sub-rounded flint. (TOPSOIL)		
							End of pit at 0.65 m		
1 2 3 4									
Remarks: Cleared by Cable Avoidance Tool. No groundwater encountered.									
Stability: Stable									

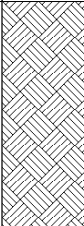


 3-6 The Quarterdeck Port Solent Portsmouth Hampshire PO6 4TP				Trial Pit Log				Trialpit No E2-HP105 Sheet 1 of 1	
Project Name: Kenavon Drive, Reading				Project No. A11057		Co-ords: - Level:		Date 25/11/2021	
Location: Reading, RG1 3HS						Dimensions (m): 0.2 0.2		Scale 1:20	
Client: Berkeley Homes (Western) Ltd						Depth 0.70		Logged AB	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.00 - 0.70	ES		0.70			Dark orangeish brown slightly clayey slightly gravelly fine to coarse SAND with occasional organic matter. Gravel is fine and medium sub-angular to sub-rounded flint. (TOPSOIL)		
							----- End of pit at 0.70 m -----		
Remarks: Cleared by Cable Avoidance Tool. No groundwater encountered.									
Stability: Stable									



 3-6 The Quarterdeck Port Solent Portsmouth Hampshire PO6 4TP				Trial Pit Log				Trialpit No E2-HP201 Sheet 1 of 1	
Project Name: Kenavon Drive, Reading				Project No. A11057		Co-ords: - Level:		Date 20/12/2021	
Location: Reading, RG1 3HS						Dimensions (m):		Scale 1:20	
Client: Berkeley Homes (Western) Ltd						Depth 0.70		Logged AB	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.00 - 0.70	ES		0.70			Dark orangeish brown slightly clayey slightly gravelly fine to coarse SAND with occasional organic matter. Gravel is fine and medium angular to sub-rounded flint, sandstone, and wood. (TOPSOIL)		
							End of pit at 0.70 m		
1 2 3 4									
Remarks: Cleared by Cable Avoidance Tool. No groundwater encountered.									
Stability: Stable									



 3-6 The Quarterdeck Port Solent Portsmouth Hampshire PO6 4TP				Trial Pit Log				Trialpit No E2-HP202 Sheet 1 of 1	
Project Name: Kenavon Drive, Reading				Project No. A11057		Co-ords: - Level:		Date 20/12/2021	
Location: Reading, RG1 3HS						Dimensions (m): 0.2 0.2		Scale 1:20	
Client: Berkeley Homes (Western) Ltd						Depth 0.60		Logged AB	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.00 - 0.60	ES		0.60			Dark orangeish brown slightly clayey slightly gravelly fine to coarse SAND with occasional organic matter. Gravel is fine and medium angular to sub-rounded flint and sandstone. (TOPSOIL)		
							End of pit at 0.60 m		
Remarks: Cleared by Cable Avoidance Tool. No groundwater encountered.									
Stability: Stable									



Attachment 4

Topsoil Import Tickets and Topsoil Certificates

Attachment 5

Photographs

	
E2-HP101 (8/10/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>	E2-HP102 (8/10/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>
	
E2-HP103 (25/11/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>	E2-HP104 (25/11/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>

	
E2-HP105 (25/11/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>	E2-HP106 (29/11/2021) Membrane Check and Depth Check Site-provided photograph <u>PASS</u>
	
E2-HP201 (20/12/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>	E2-HP202 (20/12/2021) Membrane Check and Depth Check (300mm topsoil) <u>PASS</u>



Photograph showing the condition of Area A10 during the first site visit on 8/10/2021, looking northwards. The concreting and stonework around the edges of these areas had not been fully completed, with the interiors containing Made Ground, various construction materials, and a portable cement mixer.



Photograph showing the condition of Area A11 during the first site visit on 8/10/2021, looking southwards. The concreting and stonework around the edges of these areas had not been fully completed, with the interiors containing Made Ground and various construction materials.

Attachment 6
Chemical Testing Results

Omnia
3-6 The Quarterdeck
Port Solent
Portsmouth
PO6 4TP



Attention : Jonah Cook
Date : 18th October, 2021
Your reference : A11057
Our reference : Test Report 21/16129 Batch 1
Location : Kenavon Drive Reading
Date samples received : 14th October, 2021
Status : Final Report
Issue : 1

Two samples were received for analysis on 14th October, 2021 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

A handwritten signature in black ink, appearing to read 'B. Leslie'.

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook
EMT Job No: 21/16129

Solids: V=60g VOC jar. J=250g glass jar. T=plastic tub

Please see attached notes for all abbreviations and acronyms

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook
EMT Job No: 21/16129

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/16129

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 21/16129

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/16129

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

Omnia
3-6 The Quarterdeck
Port Solent
Portsmouth
PO6 4TP

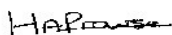


Attention :	Jonah Cook
Date :	3rd December, 2021
Your reference :	A11057
Our reference :	Test Report 21/18843 Batch 1
Location :	Kenavon Drive Reading
Date samples received :	27th November, 2021
Status :	Final Report
Issue :	1

Three samples were received for analysis on 27th November, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook
EMT Job No: 21/18843

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	3-4	5-6											
Sample ID	E2-HP104	E2-HP105											
Depth	0.00-0.65	0.00-0.70											
COC No / misc													
Containers	V J	V J											
Sample Date	25/11/2021	25/11/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/11/2021	27/11/2021											
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic #	8.8	38.3									<0.5	mg/kg	TM30/PM15
Barium #	30	30									<1	mg/kg	TM30/PM15
Beryllium	0.5	0.5									<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	<0.1									<0.1	mg/kg	TM30/PM15
Chromium #	44.1	38.8									<0.5	mg/kg	TM30/PM15
Copper #	13	12									<1	mg/kg	TM30/PM15
Lead #	21	21									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	12.7	12.6									<0.7	mg/kg	TM30/PM15
Selenium #	<1	1									<1	mg/kg	TM30/PM15
Vanadium	30	37									<1	mg/kg	TM30/PM15
Water Soluble Boron #	2.3	2.0									<0.1	mg/kg	TM74/PM32
Zinc #	46	46									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.08	0.08									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.19	0.15									<0.03	mg/kg	TM4/PM8
Pyrene #	0.15	0.13									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.08	0.07									<0.06	mg/kg	TM4/PM8
Chrysene #	0.08	0.06									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.14	0.10									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.06	0.05									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.06	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.05	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	0.9	0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.10	0.07									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.04	0.03									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	101									<0	%	TM4/PM8
EPH >C8-C10 (EH_1D_Total) #	<5	<5									<5	mg/kg	TM5/PM8
EPH >C10-C12 (EH_1D_Total) #	<10	<10									<10	mg/kg	TM5/PM8
EPH >C12-C16 (EH_1D_Total) #	12	<10									<10	mg/kg	TM5/PM8
EPH >C16-C21 (EH_1D_Total) #	86	64									<10	mg/kg	TM5/PM8
EPH >C21-C35 (EH_1D_Total) #	594	498									<10	mg/kg	TM5/PM8
EPH >C35-C44 (EH_1D_Total)	17	15									<10	mg/kg	TM5/PM8
EPH >C8-C44 (EH_1D_Total)	709	577									<30	mg/kg	TM5/PM8
GRO (>C4-C6)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook
EMT Job No: 21/18843

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: Omnia
Reference: A11057
Location: Kenavon Drive Reading
Contact: Jonah Cook

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18843

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 21/18843

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
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TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/18843

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

Omnia
3-6 The Quarterdeck
Port Solent
Portsmouth
PO6 4TP



Attention :	Jonah Cook
Date :	23rd December, 2021
Your reference :	A11057
Our reference :	Test Report 21/20391 Batch 1
Location :	Kenavon ?Drive, Reading
Date samples received :	21st December, 2021
Status :	Final Report
Issue :	1

Two samples were received for analysis on 21st December, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Omnia
Reference: A11057
Location: Kenavon ?Drive, Reading
Contact: Jonah Cook
EMT Job No: 21/20391

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-2	3-4											
Sample ID	HP201	HP202											
Depth	0.00-0.70	0.00-0.60											
COC No / misc													
Containers	V J	V J											
Sample Date	20/12/2021	20/12/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	21/12/2021	21/12/2021											
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic #	8.7	7.0									<0.5	mg/kg	TM30/PM15
Barium #	35	73									<1	mg/kg	TM30/PM15
Beryllium	0.6	1.1									<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	0.4									<0.1	mg/kg	TM30/PM15
Chromium #	51.5	55.6									<0.5	mg/kg	TM30/PM15
Copper #	16	43									<1	mg/kg	TM30/PM15
Lead #	20	33									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	13.0	44.1									<0.7	mg/kg	TM30/PM15
Selenium #	1	1									<1	mg/kg	TM30/PM15
Vanadium	34	20									<1	mg/kg	TM30/PM15
Water Soluble Boron #	2.8	1.2									<0.1	mg/kg	TM74/PM32
Zinc #	51	99									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.05	0.07									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.12	0.13									<0.03	mg/kg	TM4/PM8
Pyrene #	0.11	0.11									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.08	0.08									<0.06	mg/kg	TM4/PM8
Chrysene #	0.07	0.07									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.11	0.11									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.05	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.08	0.08									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	0.03									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	95									<0	%	TM4/PM8
EPH >C8-C10 (EH_1D_Total) #	<5	<5									<5	mg/kg	TM5/PM8
EPH >C10-C12 (EH_1D_Total) #	<10	<10									<10	mg/kg	TM5/PM8
EPH >C12-C16 (EH_1D_Total) #	<10	<10									<10	mg/kg	TM5/PM8
EPH >C16-C21 (EH_1D_Total) #	26	36									<10	mg/kg	TM5/PM8
EPH >C21-C35 (EH_1D_Total) #	375	434									<10	mg/kg	TM5/PM8
EPH >C35-C44 (EH_1D_Total)	33	42									<10	mg/kg	TM5/PM8
EPH >C8-C44 (EH_1D_Total)	434	512									<30	mg/kg	TM5/PM8
GRO (>C4-C6)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12

Client Name: Omnia
Reference: A11057
Location: Kenavon ?Drive, Reading
Contact: Jonah Cook
EMT Job No: 21/20391

Solids: V=60g VOC jar. J=250g glass jar. T=plastic tub

Please see attached notes for all abbreviations and acronyms

Client Name: Omnia
Reference: A11057
Location: Kenavon ?Drive, Reading
Contact: Jonah Cook

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: Omnia
Reference: A11057
Location: Kenavon ?Drive, Reading
Contact: Jonah Cook

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/20391

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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REPORTS FROM THE SOUTH AFRICA LABORATORY

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HWOL ACRONYMS AND OPERATORS USED

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#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/20391

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
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TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

Attachment 7
Origin of GAC Values

Determinant	Unit	GAC	Exposure Pathway	Origin of Risk Assessment Value
Metals				
Arsenic	mg/kg	37	1	LQM CIEH Suitable for Use Levels (S4UL) 2015- Inorganic Arsenic
Beryllium	mg/kg	1.7	1	LQM CIEH Suitable for Use Levels (S4UL) 2015
Boron	mg/kg	290	1	
Cadmium	mg/kg	11	2	
Chromium (III)	mg/kg	910	1	
Chromium (VI)	mg/kg	6	2	
Copper	mg/kg	2,400	2	
Lead	mg/kg	200	1	Category 4 Screening Level (C4SL) utilising exposure parameters from CLEA SR3 report.
Mercury	mg/kg	40	1	LQM CIEH Suitable for Use Levels (S4UL) 2015- Inorganic Mercury
Nickel	mg/kg	180	1,2	LQM CIEH Suitable for Use Levels (S4UL) 2015
Selenium	mg/kg	250	1,2	
Vanadium	mg/kg	410	2	
Zinc	mg/kg	3,700	2	
General Inorganics				
Total Cyanide*	mg/kg	50	1	Dutch Intervention Values 2010
Asbestos	%	0.001%	6	OEC Derived Value based on ICRL
General Organics				
Phenol	mg/kg	280	2	LQM CIEH Suitable for Use Levels (S4UL) 2015 1%SOM
PAHs				
Naphthalene	mg/kg	2.3	2	LQM CIEH Suitable for Use Levels (S4UL) 2015 based on a sandy loam as defined in SR3 (EA 2009) 1% SOM
Acenaphthylene	mg/kg	170	2	
Acenaphthene	mg/kg	210	2	
Fluorene	mg/kg	170	2	
Phenanthrene	mg/kg	95	2	
Anthracene	mg/kg	2,400	2	
Fluoranthene	mg/kg	280	1,2	
Pyrene	mg/kg	620	1,2	
Benzo(a)Anthracene ^l	mg/kg	7.2	1	
Chrysene	mg/kg	15	1	
Benzo(b)Fluoranthene	mg/kg	2.6	1	
Benzo(k)Fluoranthene	mg/kg	77	1	
Benzo(a)Pyrene	mg/kg	2.2	1	
Indeno(123-cd)Pyrene	mg/kg	27	1	
Dibenzo(a,h)Anthracene	mg/kg	0.24	1	

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Determinant	Unit	GAC	Exposure Pathway	Origin of Risk Assessment Value
Benzo(ghi)Perylene	mg/kg	320	1	
BTEX & MTBE				
Benzene	mg/kg	0.087	4	LQM CIEH Suitable for Use Levels (S4UL) 2015 1%SOM
Toluene	mg/kg	130	2,4	
Ethylbenzene	mg/kg	47	2,4	
Xylenes	mg/kg	56	2,4	LQM CIEH Suitable for Use Levels (S4UL) 2015 1% SOM o-Xylene
MTBE	mg/kg	49	4	Soil Generic Assessment Criteria for Human Health Risk Assessment (2010)
TPH-CWG				
Aliphatic				
Aliphatic EC 5-6	mg/kg	42	4	LQM CIEH Suitable for Use Levels (S4UL) 2015 based on a sandy loam as defined in SR3 (EA 2009) 1% SOM
Aliphatic EC >6-8	mg/kg	100	4	
Aliphatic EC >8-10	mg/kg	27	4	
Aliphatic EC >10-12	mg/kg	130 ^(vap)	4	
Aliphatic EC > 12-16	mg/kg	1,100 ^(sol)	4	
Aliphatic EC > 16-35	mg/kg	65,000 ^(sol)	1	
Aliphatic EC >35-44	mg/kg	65,000 ^(sol)	1	
Aromatic				
Aromatic EC 5-7	mg/kg	70	4	LQM CIEH Suitable for Use Levels (S4UL) 2015 based on a sandy loam as defined in SR3 (EA 2009) 1% SOM
Aromatic EC>7-8	mg/kg	130	4	
Aromatic EC> 8-10	mg/kg	34	4	
Aromatic EC> 10-12	mg/kg	74	2	
Aromatic EC> 12-16	mg/kg	140	2	
Aromatic EC> 16-21	mg/kg	260	2	
Aromatic EC> 21-35	mg/kg	1,100	1	
Aromatic EC> 35-44	mg/kg	1,100	1	
Banded TPH				
TPH EC 5-6**	mg/kg	42	4	LQM CIEH Suitable for Use Levels (S4UL) 2015 based on a sandy loam as defined in SR3 (EA 2009) 1% SOM, utilising the most conservative of the Ali/Aro chain lengths.
TPH EC >6-8**	mg/kg	100	4	
TPH EC >8-10**	mg/kg	27	4	
TPH EC> 10-12**	mg/kg	74	2	
TPH EC> 12-16**	mg/kg	140	2	
TPH EC> 16-21**	mg/kg	260	1	
TPH EC> 21-35**	mg/kg	1,100	1	

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	DOC REF	DOCUMENT NAME
	TECH11101	Residential End Use with Homegrown Produce

Determinant	Unit	GAC	Exposure Pathway	Origin of Risk Assessment Value
TPH EC> 35-44**	mg/kg	1,100	1	

Notes

Abbreviations: GAC = General Assessment Criteria, n = number of samples, MC = Maximum Concentration; Loc of Ex = Location of Exceedance.

Main Exposure Pathways: 1 = Ingestion of Soil & Indoor Dust, 2 = Consumption of Homegrown Produce & Attached Soil; 3 = Dermal Contact (Indoor & Outdoor); 4 = Inhalation of Vapour (Indoor & Outdoor); 5 = Inhalation of Dust (Indoor & Outdoor), 6 = Inhalation of Fibres

* Total cyanide Tier 1 GAC is taken from the Dutch Intervention Value (2010) for complex cyanide.

** The Tier 1 GAC for the banded hydrocarbon fraction is derived from the CIEH/S4UL assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. OEC has utilised the lowest of the aliphatic and aromatic chain lengths in order to adopt a conservative approach, which is considered satisfactory for the protection of human health.

(sol) – GAC presented exceeds the solubility saturation limit.

(vap) – GAC presented exceeds the vapour saturation limit.

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