



Contaminated Land Phase II Intrusive Investigation for proposed residential development at 112 Church Street, Littleborough, OL15 8AS.

Prepared for

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December 2023



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Introduction

A Phase I Desk Study Report was produced by TJ Booth Associates in April 2022 ref: rep-tjba-ward-112 church st-PHS 1 ENV-310322.docx, which identified the need for further intrusive assessment of the site due to the identification of some made ground and the historic use of the site as housing.

A site visit was subsequently made on the 29th July 2023 to undertake an intrusive investigation. Samples were taken from five locations across the site. These are shown in Figure 2. The site had been cleared at the time of the visit and foundations dug.

Five trial pits were excavated and samples taken for analysis, shallow samples were taken at approx. 300mm bgl with further sampling at approx. 600mm bgl at each locations. The samples were sent to Chemtech environmental a UKAS and MCERTs laboratory and each analysed for heavy metals, Total Petroleum Hydrocarbons and Polyaromatic Hydrocarbons, and Asbestos.



Results

The full sampling results are contained within Appendix 1, the sampling locations in Figure 2. The results were compared against the LQM/CIEH S4UL's for residential with homegrown produce scenario & the C4SL value for Lead. Soil organic matter ranged across the site ranged from 0.9-28.0%, a figure of 1% has been used within the analysis as the most conservative figure available.

Details of each trail pit, including photographs are shown in Appendix 2.

The trail pits generally identified a layer of loamy soil with stones and gravel followed by Loamy/sandy clay and gravel and stones. Some roots were also identified within the upper layer.

The results of the samples identified no Total Petroleum Hydrocarbons exceedances within the samples. However, Polyaromatic Hydrocarbons (PAH) exceedances were identified in Tail pit 1 and 4 in both samples with high lead levels found across the site (TP 1, 3, 4 & 5). Asbestos fibres were identified in the deeper sample within TP 3.

A further quantification of the asbestos was undertaken which identified a level of <0.001% w/w of Chrysotile asbestos fibres. The CL:aire Joint Industry Working Group asbestos exposure decision support tool has been used to evaluate the risk, which has identified a low risk to the future occupants. A copy of the assessment is presented in Appendix 3.

In relation to the other contaminants identified, given the constraints of the site it is recommended that a clean cover system is employed across the remaining areas consisting of at least 600mm clean cover formed by a mixture of subsoil/topsoil of hardstanding. This will involve the excavation of the material present to maintain suitable ground levels.

PAH have low volatility and are insoluble in water hence leachate off site and vapours are not considered to be a significant risk for material left under the structure.

Waste transfer notes for the excavated soils will be required, along with appropriate test certificates to show the imported material is not contaminated. Photographic evidence of the excavation and its depth will be required prior to back filling the site.



Conclusion

Based on the results of the sampling undertaken elevated levels of lead, PAH have been identified at a level which presents a significant risk of significant harm to the identified receptors; namely the future occupants. In addition, one area of low level asbestos contamination has been identified.

It is therefore recommended that remediation of the site is undertaken by removing the impacted material around the proposed development and providing a 600mm clean cover system to all landscaped and paved areas.

It is further recommended that a watching brief be maintained throughout the redevelopment of the site and any signs of contamination be fully investigated.



Updated Conceptual Model

The table represents a basic conceptual model. It highlights the potential sources of pollutants identified from the gathered information, and potential pathways in which any contaminants could reach the identified receptors.

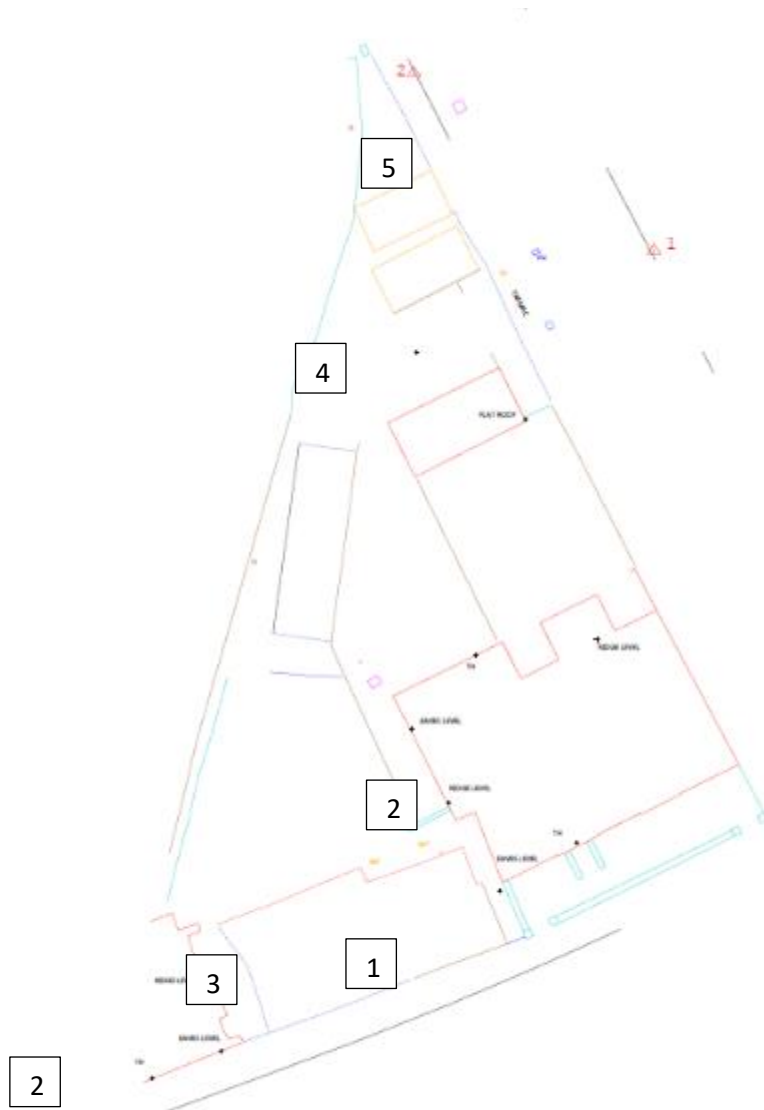
Pathway	Description	Identified sources	Receptor at risk	Likelihood
1	Run off and seepage into groundwater from any spillages	-	Watercourse/ Environment	V. Low
2	Migration of gases into the building.	-	Future users	V. Low,
3	Inhalation of gases/ vapours outside	-	Construction workers/future users	V. Low
4	Inhalation of fine particles	Heavy Metals, PAH, Asbestos	Construction workers/future users	Medium
5	Direct ingestion of contaminated soil	Heavy Metals, PAH	Construction workers	Low
6	In-direct ingestion of contaminated soil	Heavy Metals, PAH	Future users	Medium
7	Absorption via direct dermal contact with contaminated soil	-	Construction workers/future users	V. Low

Figure 1 – Aerial Photograph



Figure 2 – Sampling Location

Sampling location





Appendix 1 – Laboratory Results

Sample id			TP1a	TP1b	TP2a	TP2b	TP3a	TP3b	TP4a	TP4b	TP5a	TP5b
Depth (m)			0.30	0.65	0.30	0.62	0.30	0.52	0.30	0.60	0.30	0.62
Date sampled			29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023
Test	Method	Units										
Arsenic	\$ ^M	mg/kg	15.5	24.8	9.2	7.1	24.4	22.3	28.7	25.5	15.6	49.6
Cadmium	\$ ^M	mg/kg	0.7	1.4	0.4	0.4	7.5	6.3	1.8	0.9	0.3	0.8
Chromium	\$ ^M	mg/kg	109	189	43.0	32.9	1310	301	56.8	41.9	29.1	30.5
Copper	\$ ^M	mg/kg	73.1	274	48.9	30.5	367	515	232	171	66.2	154
Lead	\$ ^M	mg/kg	176	354	44.2	18.2	350	4140	637	570	294	1200
Mercury	\$ ^M	mg/kg	0.4	1.5	0.1	< 0.1	1.5	0.8	0.3	0.3	0.5	0.7
Nickel	\$ ^M	mg/kg	32.4	36.9	34.7	33.4	90.8	37.9	49.0	38.3	37.4	40.4
Selenium	\$ ^M	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.9	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	\$ ^M	mg/kg	127	222	80.3	95.2	455	3160	412	138	193	167
Total Organic Carbon (TOC)	CE197	% w/w C	3.5	4.8	1.4	0.5	7.1	5.6	16.5	13.7	4.9	13.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	6.0	8.3	2.3	0.9	12.3	9.7	28.4	23.7	8.5	23.2
PAH												
Naphthalene	CE087 ^M	mg/kg	0.54	0.06	0.02	<0.02	0.16	0.02	0.17	0.13	0.10	<0.02
Acenaphthylene	CE087 ^M	mg/kg	1.65	0.06	<0.02	<0.02	0.06	<0.02	0.26	0.33	0.15	<0.02
Acenaphthene	CE087 ^M	mg/kg	3.06	0.13	<0.02	<0.02	0.07	<0.02	0.26	0.32	0.14	<0.02
Fluorene	CE087 ^U	mg/kg	3.21	0.07	0.02	<0.02	0.05	<0.02	0.19	0.20	0.11	<0.02
Phenanthrene	CE087 ^M	mg/kg	35.23	1.43	0.28	<0.02	0.68	0.20	3.00	2.60	0.93	0.10
Anthracene	CE087 ^U	mg/kg	7.98	0.49	0.06	<0.02	0.17	0.03	0.96	0.51	0.16	<0.02
Fluoranthene	CE087 ^M	mg/kg	40.78	7.10	0.38	<0.02	1.83	0.46	10.74	4.61	0.93	0.17
Pyrene	CE087 ^M	mg/kg	43.54	6.88	0.39	<0.02	1.71	0.45	9.85	4.02	0.81	0.16
Benzo(a)anthracene	CE087 ^U	mg/kg	19.45	3.53	0.19	<0.02	0.92	0.28	5.26	2.27	0.44	0.09
Chrysene	CE087 ^M	mg/kg	20.74	3.87	0.22	<0.03	1.02	0.25	4.27	2.53	0.47	0.07
Benzo(b)fluoranthene	CE087 ^M	mg/kg	18.74	5.36	0.19	<0.02	1.50	0.48	7.86	3.06	0.46	0.11
Benzo(k)fluoranthene	CE087 ^M	mg/kg	7.33	2.06	0.08	<0.03	0.58	0.19	2.45	1.15	0.21	0.04
Benzo(a)pyrene	CE087 ^U	mg/kg	16.05	4.09	0.14	<0.02	1.12	0.31	6.07	2.20	0.36	0.08
Indeno(123cd)pyrene	CE087 ^M	mg/kg	7.27	3.22	0.10	<0.02	0.98	0.35	4.43	1.74	0.24	0.05
Dibenz(ah)anthracene	CE087 ^M	mg/kg	1.91	0.62	0.03	<0.02	0.21	0.07	0.90	0.41	0.07	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	7.28	2.93	0.10	<0.02	0.96	0.27	3.40	1.36	0.17	0.03
PAH (total of USEPA 16)	CE087	mg/kg	235	41.9	2.19	<0.34	12.0	3.36	60.1	27.5	5.75	0.90



TPH												
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	12	<10	<10	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	70	<1	<1	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	189	<1	<1	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	43	<1	<1	<1	<1	<1	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Subcontracted Analysis												
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	Chrysotile	NAD	NAD	NAD	NAD
Form of Asbestos	\$	-	-	-	-	-	-	Fibre Bundles	-	-	-	-
Asbestos (quantitative)	\$	% w/w	-	-	-	-	-	<0.001	-	-	-	-



ANALYTICAL TEST REPORT

Contract no: 125437(1)
Contract name: Church Street
Client reference: -
Clients name: Martin Environmental Solutions
Clients address: 14 Hermitage Way
Lytham
St Annes
FY8 4FX
Samples received: 03 August 2023
Analysis started: 18 August 2023
Analysis completed: 16 August 2023
Report issued: 16 August 2023

This is a supplementary report to report number 125437 issued 14 August 2023.

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing
NAD	No Asbestos Detected

Approved by:

E. McCulloch

Ellis McCulloch
Senior Reporting Administrator

Unit 6 Parkhead, Greencroft Industrial Park, Stanley, County Durham, DH9 7YB
Tel 01207 528578 Email customerservices@chemtech-env.co.uk
Vat Reg No. 772 5703 18 Registered in England number 4284013

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SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
125437-1	TP1a	0.30	Sandy Loamy Clay with Gravel & Roots	-	-	15.8
125437-2	TP1b	0.65	Sandy Loam with Gravel & Roots	-	-	19.1
125437-3	TP2a	0.30	Sandy Clay with Gravel	-	-	10.5
125437-4	TP2b	0.62	Sandy Clay with Gravel	-	-	10.2
125437-5	TP3a	0.30	Loam with Gravel & Roots	-	-	23.2
125437-6	TP3b	0.52	Sandy Loam with Gravel & Roots	-	-	22.0
125437-7	TP4a	0.30	Sandy Loam with Gravel & Roots	-	-	23.6
125437-8	TP4b	0.60	Sandy Loam with Gravel & Roots	-	-	24.6
125437-9	TP5a	0.30	Sandy Loamy Clay with Gravel & Roots	-	-	15.9
125437-10	TP5b	0.62	Sandy Loam with Gravel & Roots	-	-	19.1

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SOILS

Lab number			125437-1	125437-2	125437-3	125437-4	125437-5	125437-6
Sample id			TP1a	TP1b	TP2a	TP2b	TP3a	TP3b
Depth (m)			0.30	0.65	0.30	0.62	0.30	0.52
Date sampled			29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023
Test	Method	Units						
Arsenic	\$^M\$	mg/kg	15.5	24.8	9.2	7.1	24.4	22.3
Cadmium	\$^M\$	mg/kg	0.7	1.4	0.4	0.4	7.5	6.3
Chromium	\$^M\$	mg/kg	109	189	43.0	32.9	1310	301
Copper	\$^M\$	mg/kg	73.1	274	48.9	30.5	367	515
Lead	\$^M\$	mg/kg	176	354	44.2	18.2	350	4140
Mercury	\$^M\$	mg/kg	0.4	1.5	0.1	< 0.1	1.5	0.8
Nickel	\$^M\$	mg/kg	32.4	36.9	34.7	33.4	90.8	37.9
Selenium	\$^M\$	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.9
Zinc	\$^M\$	mg/kg	127	222	80.3	95.2	455	3160
Total Organic Carbon (TOC)	CE197	% w/w C	3.5	4.8	1.4	0.5	7.1	5.6
Estimate of OMC (calculated from TOC)	CE197	% w/w	6.0	8.3	2.3	0.9	12.3	9.7
PAH								
Naphthalene	CE087 ^M	mg/kg	0.54	0.06	0.02	<0.02	0.16	0.02
Acenaphthylene	CE087 ^M	mg/kg	1.65	0.06	<0.02	<0.02	0.06	<0.02
Acenaphthene	CE087 ^M	mg/kg	3.06	0.13	<0.02	<0.02	0.07	<0.02
Fluorene	CE087 ^U	mg/kg	3.21	0.07	0.02	<0.02	0.05	<0.02
Phenanthrene	CE087 ^M	mg/kg	35.23	1.43	0.28	<0.02	0.68	0.20
Anthracene	CE087 ^U	mg/kg	7.98	0.49	0.06	<0.02	0.17	0.03
Fluoranthene	CE087 ^M	mg/kg	40.78	7.10	0.38	<0.02	1.83	0.46
Pyrene	CE087 ^M	mg/kg	43.54	6.88	0.39	<0.02	1.71	0.45
Benzo(a)anthracene	CE087 ^U	mg/kg	19.45	3.53	0.19	<0.02	0.92	0.28
Chrysene	CE087 ^M	mg/kg	20.74	3.87	0.22	<0.03	1.02	0.25
Benzo(b)fluoranthene	CE087 ^M	mg/kg	18.74	5.36	0.19	<0.02	1.50	0.48
Benzo(k)fluoranthene	CE087 ^M	mg/kg	7.33	2.06	0.08	<0.03	0.58	0.19
Benzo(a)pyrene	CE087 ^U	mg/kg	16.05	4.09	0.14	<0.02	1.12	0.31
Indeno(123cd)pyrene	CE087 ^M	mg/kg	7.27	3.22	0.10	<0.02	0.98	0.35
Dibenz(ah)anthracene	CE087 ^M	mg/kg	1.91	0.62	0.03	<0.02	0.21	0.07
Benzo(ghi)perylene	CE087 ^M	mg/kg	7.28	2.93	0.10	<0.02	0.96	0.27
PAH (total of USEPA 16)	CE087	mg/kg	235	41.9	2.19	<0.34	12.0	3.36
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	12	<10	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	70	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	189	<1	<1	<1	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	43	<1	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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Church Street

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SOILS

Lab number			125437-1	125437-2	125437-3	125437-4	125437-5	125437-6
Sample id			TP1a	TP1b	TP2a	TP2b	TP3a	TP3b
Depth (m)			0.30	0.65	0.30	0.62	0.30	0.52
Date sampled			29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023	29/07/2023
Test	Method	Units						
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10	<10	<10	<10
Subcontracted Analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	Chrysotile
Form of Asbestos	\$	-	-	-	-	-	-	Fibre Bundles
Asbestos (quantitative)	\$	% w/w	-	-	-	-	-	<0.001

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Church Street
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SOILS

Lab number			125437-7	125437-8	125437-9	125437-10
Sample id			TP4a	TP4b	TP5a	TP5b
Depth (m)			0.30	0.60	0.30	0.62
Date sampled			29/07/2023	29/07/2023	29/07/2023	29/07/2023
Test	Method	Units				
Arsenic	§ ^M	mg/kg	28.7	25.5	15.6	49.6
Cadmium	§ ^M	mg/kg	1.8	0.9	0.3	0.8
Chromium	§ ^M	mg/kg	56.8	41.9	29.1	30.5
Copper	§ ^M	mg/kg	232	171	66.2	154
Lead	§ ^M	mg/kg	637	570	294	1200
Mercury	§ ^M	mg/kg	0.3	0.3	0.5	0.7
Nickel	§ ^M	mg/kg	49.0	38.3	37.4	40.4
Selenium	§ ^M	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	§ ^M	mg/kg	412	138	193	167
Total Organic Carbon (TOC)	CE197	% w/w C	16.5	13.7	4.9	13.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	28.4	23.7	8.5	23.2
PAH						
Naphthalene	CE087 ^M	mg/kg	0.17	0.13	0.10	<0.02
Acenaphthylene	CE087 ^M	mg/kg	0.26	0.33	0.15	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.26	0.32	0.14	<0.02
Fluorene	CE087 ^U	mg/kg	0.19	0.20	0.11	<0.02
Phenanthrene	CE087 ^M	mg/kg	3.00	2.60	0.93	0.10
Anthracene	CE087 ^U	mg/kg	0.96	0.51	0.16	<0.02
Fluoranthene	CE087 ^M	mg/kg	10.74	4.61	0.93	0.17
Pyrene	CE087 ^M	mg/kg	9.85	4.02	0.81	0.16
Benzo(a)anthracene	CE087 ^U	mg/kg	5.26	2.27	0.44	0.09
Chrysene	CE087 ^M	mg/kg	4.27	2.53	0.47	0.07
Benzo(b)fluoranthene	CE087 ^M	mg/kg	7.86	3.06	0.46	0.11
Benzo(k)fluoranthene	CE087 ^M	mg/kg	2.45	1.15	0.21	0.04
Benzo(a)pyrene	CE087 ^U	mg/kg	6.07	2.20	0.36	0.08
Indeno(123cd)pyrene	CE087 ^M	mg/kg	4.43	1.74	0.24	0.05
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.90	0.41	0.07	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	3.40	1.36	0.17	0.03
PAH (total of USEPA 16)	CE087	mg/kg	60.1	27.5	5.75	0.90
TPH						
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	<10	<10	<10
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	<1	<1	<1	<1
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1

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SOILS

Lab number			125437-7	125437-8	125437-9	125437-10
Sample id			TP4a	TP4b	TP5a	TP5b
Depth (m)			0.30	0.60	0.30	0.62
Date sampled			29/07/2023	29/07/2023	29/07/2023	29/07/2023
Test	Method	Units				
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10	<10
Subcontracted Analysis						
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD
Form of Asbestos	\$	-	-	-	-	-
Asbestos (quantitative)	\$	% w/w	-	-	-	-

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
§ ^M	Arsenic	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg
§ ^M	Cadmium	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg
§ ^M	Chromium	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
§ ^M	Copper	Aqua regia digest, ICP-MS	Dry	M	4	mg/kg
§ ^M	Lead	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
§ ^M	Mercury	Aqua regia digest, ICP-MS	Dry	M	0.1	mg/kg
§ ^M	Nickel	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
§ ^M	Selenium	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg
§ ^M	Zinc	Aqua regia digest, ICP-MS	Dry	M	4.5	mg/kg
CE197	Total Carbon	Carbon Analyser	Dry		0.1	% w/w C
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
§	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-



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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
\$	Asbestos (quantitative)	HSG 248, Microscopy & Gravimetry	Dry	U	0.001	% w/w



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DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
125437-1	TP1a	0.30	N	
125437-2	TP1b	0.65	N	
125437-3	TP2a	0.30	N	
125437-4	TP2b	0.62	N	
125437-5	TP3a	0.30	N	
125437-6	TP3b	0.52	N	
125437-7	TP4a	0.30	N	
125437-8	TP4b	0.60	N	
125437-9	TP5a	0.30	N	
125437-10	TP5b	0.62	N	



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ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis



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TEST REPORT REVISIONS

The table below identifies amendments that have been made to this test report for each revision.

Test Report Reference	Details of amendments to test report	Issue Date
125437	Original report issued	14 August 2023
125437(1)	Asbestos quantification added.	16 August 2023

Appendix 2 – Trail Pit Records

Trail Pit 1a



Trail Pit 1b



Trail pit 1 – South boundary by road, within foundations

0.00-0.30m loamy sandy soil, clay, stone, gravel and roots,

0.30-0.60m loamy sandy soil, stone gravel, and roots,

Trail Pit 2a





Trail Pit 2b





Trail pit 2 – Rear of neighbouring house to the west,
within foundations

0.00-0.30m Sandy Clay with stones and gravel,

0.30-0.60m Sandy clay stones and gravel

Trail Pit 3a



Trail Pit 3b



Trail pit 3 – southwest boundary adjacent to the neighbouring property

0.00-0.30m loam, gravel and roots,

0.30-0.52m loam, gravel, stones, some brick.

Trail Pit 4a



Trail Pit 4b



Trail pit 4 – northwest boundary opposite driveway entrance

0.00-0.05m	Stone surface,
0.05-0.30m	loam, gravel, stones, dark organic matter.
0.30-0.60m	loam, dark organic matter, stones

Trail Pit 5a



Trail Pit 5b



Trail pit 5 – north corner of the site

0.00-0.30m	Sandy loam, clay, gravel, dark organic matter, some roots.
0.30-0.60m	Sandy loam, clay, gravel roots dark organic matter,



Appendix 3 – CL:aire JIWG Asbestos Decision Support Tool



JIWG

Joint Industry Working Group
Asbestos in Soil and Construction & Demolition Materials

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Degraded (Significant degradation in ACM; material has lost its basic integrity)	3
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	Occasional/random occurrences of visible contamination by ACMs	1
Asbestos fibre type	Chrysotile alone	0
Sub-total		10
Hazard ranking		Low

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.



JIWG

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Asbestos in Soil and Construction & Demolition Materials

Stage 2		
Emission Factors		Score
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to <0.001 %wt/wt	0
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Activity type and effect on deterioration of ACMs	Low disturbance, minimal deterioration expected	2
Best description of primary host material matrix	Coarse to Fine Sand	2
Sub-total		7
Exposure ranking		Low



JIWG

Joint Industry **Working Group**

Asbestos in Soil and Construction & Demolition Materials

Stage 3 Pathway and Receptor Sensitivity		Score
Receptor category	Residential	No score required
Age of Receptor	Infant (under 5)	4
Duration of exposure/site occupancy	> 1hr <10 hr daily exposure (e.g. part-time to full time occupational exposure or extended daily recreational exposure)	3
Receptor ranking		7 High
Combined hazard, exposure and receptor ranking		Medium
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material buried at shallow depth, potential to be disturbed by excavation	C
Pathway ranking		4C Low
Overall ranking		Low



JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	
Site Name	Land at 112 Church Street, Littleborough
Client	Campbell Associates
Run by	Neil Martin
Date	15-Dec-23
Reviewed by	
Characterisation of scenario being evaluated	Residential development, asbestos fibres found in small area to the southwest of the site only which will be paved as the main access to the property.
Interpretation of scenario ranking by DST	Risk is low, but area to undergo some remediation in the form of clean layer in this area.