

**ARP Geotechnical Ltd** 5 & 6 Northwest Business Park, Servia Hill, Leeds, LS6 2QH  
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PS & SP Kershaw  
Bradley villa farm  
Bradford Rd  
Huddersfield  
HD2 2JY

BY E-MAIL

Our Ref: PSK/01/11/WW

13<sup>th</sup> January 2025

Dear Richard

Bradley Villa Farm  
Contamination Investigation Results

In accordance with our commission, we attended site to investigate the areas around the existing former chicken shed for the presence of contamination within soils with respect to providing additional information to enable the approval of a change of use to commercial end use. Further details are provided below.

## **Background**

The site has been subjected to Stage 1 assessment (Lithos Preliminary Geoenvironmental Investigation report no 4929/1 dated February 2024). The existing chicken shed is located in the centre of the site and is to be subdivided and converted into four industrial units (see attached plan). The Lithos Stage 1 Report did not deem Stage 2 investigation necessary. However, the Local planning authority requested soil sampling for the purposes of contamination around the chicken shed and this investigation is detailed below.

## **Ground Investigations**

Site investigation was undertaken by ARP Geotechnical Ltd on 18<sup>th</sup> of December 2024. The purpose of the investigation was to produce an assessment of contamination on the site in accordance with BS10175 : 2011 + A2 : 2017 "Investigation of potentially contaminated sites - Code of practice". Six trial pits (TP1 to TP6) were excavated, to depths of between 0.2m and 1.4m at which point sandstone bedrock was recorded.

The trial pits were organised, undertaken and logged by an Engineer from ARP Geotechnical Ltd. Logs and trial pit location plan are attached at the end of this letter.

Six soil samples were issued to UKAS accredited laboratories at Eurofins Chemtest Ltd in Newmarket for the suite of testing (As, Cd, Cr (VI), Cr(III), Cu, Hg, Ni, Pb, Se, Zn, Total Sulphate, Water



Soluble Sulphate, pH, Phenol-monohydric, Speciated PAH, Total TPH, Asbestos, and Organic Matter). The testing comprised three samples of made ground from TP1, TP2, TP3 and TP6; one topsoil sample from TP5; and one sample of natural cohesive soils from TP4. The test certificates are attached at the end of this letter.

## **Laboratory Results**

### **Topsoil /Natural Clay**

None of the samples of topsoil or natural clay strata returned any results with exceedances of the screening values with regards to a commercial development, and no asbestos was detected. This material can, therefore, be regarded as suitable for re-use on site, in terms of human health and environmental risks.

### **Made ground**

All four made ground samples tested recorded exceedances of relevant screening values for total TPH and subsequently underwent speciation testing which found to be there to be no exceedances for the TPH bandings.

One minor exceedance for benzo(b)fluoranthene, 86mg/kg, was recorded when compared to the commercial screening criteria of 45mg/kg. The dataset supports the use of benzo(a)pyrene (BaP) as a surrogate marker. Therefore, the other genotoxic PAH compounds are not considered further individually, in accordance with C4SL guidance. All BaP concentrations were below the C4SL screening value (77mg/kg commercial end use). Therefore, remedial measures are not considered necessary for the made ground.

## **Conclusions**

In the light of the above, there are no contamination sources identified within the soils on the site, with respect to the proposed development, and a clean cover system is not required for contamination purposes given the proposed development.

However, as with all previously developed sites, there is a slight risk that contamination or made ground may be present that has not been identified as part of the site investigation. If any unexpected, suspected contamination is encountered, work on the material should cease, and samples taken by an Engineer for laboratory contamination testing. The results should be assessed, and any remedial action taken, if necessary.

Any imported soils used on the site will need to be verified as suitable by inspection and testing, in accordance with guidance supplied in the document produced by the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG): "Guidance on the Verification Requirements for Cover Systems".

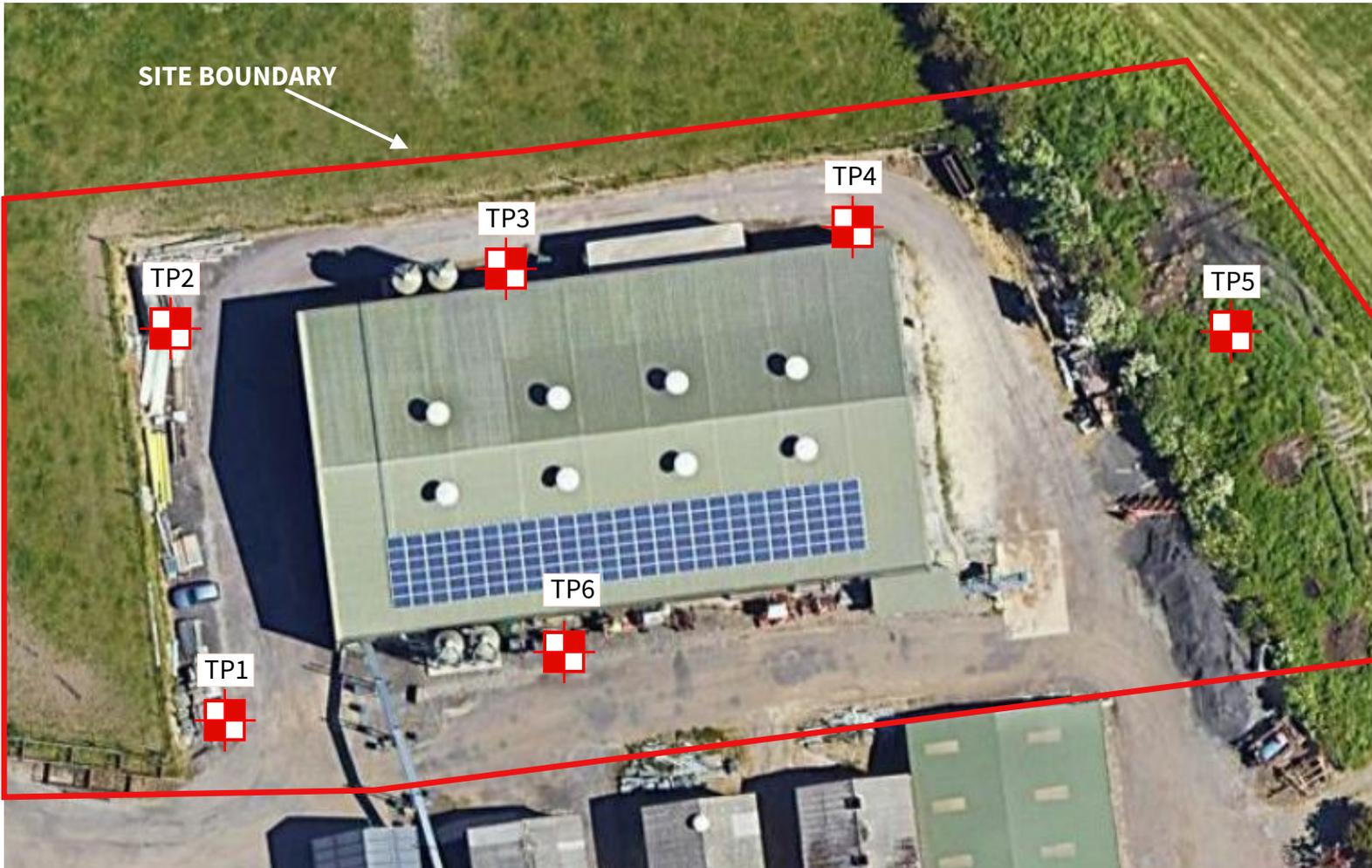


We trust the above, and attachments, are acceptable, but if you have any queries, please do not hesitate to contact us.

Yours sincerely for ARP GEOTECHNICAL LTD

A handwritten signature in black ink that reads "William Watkins". The signature is written in a cursive style and is enclosed in a light blue rectangular box.

W Watkins  
Encs



0m 20m  
Approximate Scale

KEY  
 ARP Dec 2024 Trial Pit Location



ARP GEOTECHNICAL LTD  
 CHARTERED CONSULTING ENGINEERS  
 Northwest House 5-6 Northwest Business Park\* Servia Hill \* Leeds LS6 2QH  
 Telephone : 0113 245 8498 Fax : 0113 244 3864\* E-Mail : leeds@arpassociates.co.uk

Project  
 BRADLEY VILLA FARM,  
 HUDDERSFIELD

Client  
 PS & SP KERSHAW

Title  
 SITE INVESTIGATION PLAN

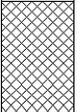
Date  
 DECEMBER 2024

Drawn WW	Scale AS SHOWN
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Job No.  
**PSK/01**



<b>Excavation Method</b> JCB 3CX with 1ft toothed bucket	<b>Dimensions</b> 0.40 x 2.00	<b>Ground Level (mOD)</b>	<b>Client</b> PS & SP Kershaw	<b>Job Number</b> PSK/01
	<b>Location</b>	<b>Dates</b> 18/12/2024	<b>Engineer</b> W.W	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.10	D				(0.15)	MADEGROUND: Dark brown slightly sandy fine to coarse subangular gravel of basalt.		
					0.15 (0.05) 0.20	Yellowish grey fine SANDSTONE. Arisings recovered as fine to coarse angular gravel, with low cobble content. Complete at 0.20m		

No image available	<b>Remarks</b> Trial Pit finished at 0.20m on sandstone. Pit walls stable. No groundwater encountered. Ground checked for services with CAT prior to drilling. Back filled with arisings to surface.		
	<b>Scale (approx)</b> 1:10	<b>Logged By</b>	<b>Figure No.</b> PSK/01.TP1



<b>Excavation Method</b> JCB 3CX with 1ft toothed bucket	<b>Dimensions</b> 0.40 x 2.00	<b>Ground Level (mOD)</b>	<b>Client</b> PS & SP Kershaw	<b>Job Number</b> PSK/01
	<b>Location</b>	<b>Dates</b> 18/12/2024	<b>Engineer</b> W.W	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.10	D				(0.15)	MADEGROUND: Dark brown slightly sandy fine to coarse subangular gravel of basalt.		
					0.15 (0.05) 0.20	Yellowish grey fine SANDSTONE. Arisings recovered as fine to coarse angular gravel, with low cobble content. Complete at 0.20m		

No image available	<b>Remarks</b> Trial Pit finished at 0.20m on sandstone. Pit walls stable. No groundwater encountered. Ground checked for services with CAT prior to drilling. Back filled with arisings to surface.		
	<b>Scale (approx)</b> 1:10	<b>Logged By</b>	<b>Figure No.</b> PSK/01.TP2



<b>Excavation Method</b> JCB 3CX with 1ft toothed bucket	<b>Dimensions</b> 0.40 x 2.00	<b>Ground Level (mOD)</b>	<b>Client</b> PS & SP Kershaw	<b>Job Number</b> PSK/01
	<b>Location</b>	<b>Dates</b> 18/12/2024	<b>Engineer</b> W.W	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.20	D				(0.25)	MADEGROUND: Dark brown slightly sandy fine to coarse subangular gravel of basalt.		
					0.25 (0.05) 0.30	Yellowish grey fine SANDSTONE. Arisings recovered as fine to coarse angular gravel, with low cobble content. Complete at 0.30m		

No image available	<b>Remarks</b> Trial Pit finished at 0.30m on sandstone. Pit walls stable. No groundwater encountered. Ground checked for services with CAT prior to drilling. Back filled with arisings to surface.		
	<b>Scale (approx)</b> 1:10	<b>Logged By</b>	<b>Figure No.</b> PSK/01.TP3



<b>Excavation Method</b> JCB 3CX with 1ft toothed bucket	<b>Dimensions</b> 0.40 x 2.00	<b>Ground Level (mOD)</b>	<b>Client</b> PS & SP Kershaw	<b>Job Number</b> PSK/01
	<b>Location</b>	<b>Dates</b> 18/12/2024	<b>Engineer</b> W.W	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.90-0.90	D				(0.20)	MADEGROUND: Dark brown slightly sandy fine to coarse subangular gravel of basalt.		
					0.20	Firm yellowish brown grey mottley slightly sandy CLAY. Sand is fine.		
					(0.80)			
					1.00 (0.10)	Yellowish grey fine SANDSTONE. Arisings recovered as fine to coarse angular gravel, with low cobble content.		
					1.10	Complete at 1.10m		

No image available

**Remarks**

Trial Pit finished at 1.1m on sandstone.  
Pit walls stable. No groundwater encountered.  
Ground checked for services with CAT prior to drilling.  
Back filled with arisings to surface.

<b>Scale (approx)</b> 1:10	<b>Logged By</b>	<b>Figure No.</b> PSK/01.TP4
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<b>Excavation Method</b> JCB 3CX with 1ft toothed bucket	<b>Dimensions</b> 0.40 x 2.00	<b>Ground Level (mOD)</b>	<b>Client</b> PS & SP Kershaw	<b>Job Number</b> PSK/01
	<b>Location</b>	<b>Dates</b> 18/12/2024	<b>Engineer</b> W.W	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.20	D				0.30	Dark brown slightly sandy clayey TOPSOIL, frequent roots and rootlets.		
					1.00	Firm yellowish brown grey mottley slightly sandy CLAY. Sand is fine.		
					1.30 (0.10) 1.40	Yellowish grey fine SANDSTONE. Arisings recovered as fine to coarse angular gravel, with low cobble content.		
						Complete at 1.40m		

No image available	<b>Remarks</b> Trial Pit finished at 1.4m on sandstone. Pit walls stable. No groundwater encountered. Ground checked for services with CAT prior to drilling. Back filled with arisings to surface.		
	<b>Scale (approx)</b> 1:10	<b>Logged By</b>	<b>Figure No.</b> PSK/01.TP5



<b>Excavation Method</b> JCB 3CX with 1ft toothed bucket	<b>Dimensions</b> 0.40 x 2.00	<b>Ground Level (mOD)</b>	<b>Client</b> PS & SP Kershaw	<b>Job Number</b> PSK/01
	<b>Location</b>	<b>Dates</b> 18/12/2024	<b>Engineer</b> W.W	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-0.15	D				(0.20)	MADEGROUND: Dark brown slightly sandy fine to coarse subangular gravel of basalt.		
					0.20	Firm yellowish brown grey mottley slightly sandy CLAY. Sand is fine.		
					(0.35)			
					0.55 (0.05) 0.60	Yellowish grey fine SANDSTONE. Arisings recovered as fine to coarse angular gravel, with low cobble content.		
						Complete at 0.60m		

No image available

**Remarks**

Trial Pit finished at 0.6m on sandstone.  
Pit walls stable. No groundwater encountered.  
Ground checked for services with CAT prior to drilling.  
Back filled with arisings to surface.

<b>Scale (approx)</b> 1:10	<b>Logged By</b>	<b>Figure No.</b> PSK/01.TP6
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# Amended Report

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<b>Report No.:</b>	24-42036-2		
<b>Initial Date of Issue:</b>	06-Jan-2025	<b>Date of Re-Issue:</b>	09-Jan-2025
<b>Re-Issue Details:</b>	This report has been revised and directly supersedes 24-42036-1 in its entirety		
<b>Client</b>	ARP Geotechnical Ltd		
<b>Client Address:</b>	5/6 Northwest Business Park Servia Hill Leeds Yorkshire LS6 2QH		
<b>Contact(s):</b>	William Watkins		
<b>Project</b>	PSK/01: Bradley Villa Farm		
<b>Quotation No.:</b>	Q24-33517	<b>Date Received:</b>	20-Dec-2024
<b>Order No.:</b>	PSK/01	<b>Date Instructed:</b>	20-Dec-2024
<b>No. of Samples:</b>	6		
<b>Turnaround (Wkdays):</b>	9	<b>Results Due:</b>	13-Jan-2025
<b>Date Approved:</b>	09-Jan-2025		

**Approved By:**



**Details:** David Smith, Technical Director

**For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report**

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## Results - Soil

**Project: PSK/01: Bradley Villa Farm**

Client: ARP Geotechnical Ltd		Chemtest Job No.: 24-42036									
Quotation No.: Q24-33517		Chemtest Sample ID.: 1912612									
		Sample Location:		TP1		TP2		TP3		TP4	
		Sample Type:		SOIL		SOIL		SOIL		SOIL	
		Bottom Depth (m):		0.1		0.1		0.2		0.15	
		Date Sampled:		18-Dec-2024		18-Dec-2024		18-Dec-2024		18-Dec-2024	
		Asbestos Lab:		NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB	
Determinand	HWOL Code	Accred.	SOP	Units	LOD						
ACM Type		U	2192		N/A	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected					
Moisture		N	2030	%	0.020	14	11	18	29	38	18
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones	Stones and Roots	None	Stones	Stones
Soil Texture		N	2040		N/A	Sand	Sand	Sand	Clay	Sand	Sand
pH at 20C		M	2010		4.0	8.5	8.8	9.4	7.4	7.5	9.2
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.035	0.037	0.034	0.099	0.026	0.13
Sulphate (Total)		U	2430	mg/kg	100	4100	2600	3700	720	4200	9900
Arsenic		M	2455	mg/kg	0.5	4.5	5.6	5.0	4.5	20	7.8
Cadmium		M	2455	mg/kg	0.10	0.26	0.97	0.52	< 0.10	0.34	1.7
Chromium		M	2455	mg/kg	0.5	76	230	680	52	38	3800
Copper		M	2455	mg/kg	0.50	54	41	26	48	64	61
Mercury		M	2455	mg/kg	0.05	0.05	< 0.05	< 0.05	< 0.05	0.28	< 0.05
Nickel		M	2455	mg/kg	0.50	65	43	27	44	24	71
Lead		M	2455	mg/kg	0.50	33	35	23	25	92	53
Selenium		M	2455	mg/kg	0.25	0.55	0.36	0.63	0.72	0.92	4.2
Zinc		M	2455	mg/kg	0.50	150	1400	95	110	150	270
Chromium (Trivalent)		N	2490	mg/kg	1.0	76	230	680	52	38	3800
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10			< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25			< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	4.6	< 2.0	2.6			< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	5.9			< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	18			9.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0			< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10			< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0	< 5.0	29			13
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	29			13
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05			< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25			< 0.25

## Results - Soil

**Project: PSK/01: Bradley Villa Farm**

Client: ARP Geotechnical Ltd		Chemtest Job No.:											
Quotation No.: Q24-33517		24-42036		24-42036		24-42036		24-42036		24-42036		24-42036	
Chemtest Sample ID.:		1912612		1912613		1912614		1912615		1912616		1912617	
Sample Location:		TP1		TP2		TP3		TP4		TP5		TP6	
Sample Type:		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Bottom Depth (m):		0.1		0.1		0.2		0.9		0.2		0.15	
Date Sampled:		18-Dec-2024		18-Dec-2024		18-Dec-2024		18-Dec-2024		18-Dec-2024		18-Dec-2024	
Asbestos Lab:		NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB	
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0				< 1.0	
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	58				12	
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	8.5	9.5	490				390	
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	6.0	6.6	510				940	
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	420	500	580				250	
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	14	16	1100				1300	
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	440	520	1600				1600	
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50				< 0.50	
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	19	18	1100				1400	
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	440	520	1700				1600	
Organic Matter		M	2625	%	0.40	10	15	17	0.47	12		12	
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	4600	9800	3900	76	110		6000	
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.20		< 0.10	
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	0.27	< 0.10	< 0.10		< 0.10	
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.39	< 0.10	0.38		3.9	
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.23	< 0.10	0.24		< 0.10	
Phenanthrene		M	2800	mg/kg	0.10	0.49	0.24	2.5	0.18	2.4		50	
Anthracene		M	2800	mg/kg	0.10	0.21	< 0.10	0.88	< 0.10	0.60		11	
Fluoranthene		M	2800	mg/kg	0.10	1.4	0.59	5.5	0.39	3.9		140	
Pyrene		M	2800	mg/kg	0.10	1.4	0.56	4.7	0.35	3.3		130	
Benzo[a]anthracene		M	2800	mg/kg	0.10	0.76	< 0.10	2.7	< 0.10	1.9		62	
Chrysene		M	2800	mg/kg	0.10	0.68	< 0.10	2.3	< 0.10	1.9		65	
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	1.6	< 0.10	4.0	< 0.10	2.3		86	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	0.55	< 0.10	1.4	< 0.10	0.89		33	
Benzo[a]pyrene		M	2800	mg/kg	0.10	1.3	< 0.10	3.6	< 0.10	1.9		61	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	1.0	< 0.10	2.5	< 0.10	1.3		50	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	0.15	< 0.10	0.45	< 0.10	0.30		< 0.10	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	1.4	< 0.10	2.3	< 0.10	1.2		47	
Total Of 16 PAH's		N	2800	mg/kg	2.0	11	< 2.0	34	< 2.0	23		740	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10		< 0.10	

## Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

## **Report Information**

### **Key**

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U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at  $\leq 30^{\circ}\text{C}$  prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

### **Sample Deviation Codes**

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- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

### **Sample Retention and Disposal**

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All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

### **Water Sample Category Key for Accreditation**

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- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

## **Report Information**

PL - Prepared Leachate  
PW - Processed Water  
RE - Recreational Water  
SA - Saline Water  
SW - Surface Water  
TE - Treated Effluent  
TS - Treated Sewage  
UL - Unspecified Liquid

### **Clean Up Codes**

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NC - No Clean Up  
MC - Mathematical Clean Up  
FC - Florisil Clean Up

### **HWOL Acronym System**

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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 - Aromatic only  
2D - GC-GC – Double coil gas chromatography  
#1 - EH\_2D\_Total but with humics mathematically subtracted  
#2 - EH\_2D\_Total but with fatty acids mathematically subtracted  
+ - Operator to indicate cumulative e.g. EH+EH\_Total or EH\_CU+HS\_Total

If you require extended retention of samples, please email your requirements to:  
[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



**ARP GEOTECHNICAL LIMITED**  
**SOIL CONTAMINANT SCREENING VALUES**  
**SITES FOR COMMERCIAL USE**

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	640			640		
Cadmium	190			410		
Chromium (trivalent)	8600					
Chromium (hexavalent)	33			49		
Copper	68000					
Lead				2300		
Inorganic Mercury	1100			5100		
Nickel	980					
Selenium	12000					
Zinc	730000					
Acidity (pH)	*Should be Greater Than 5					
	1% SOM	2.5% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Naphthalene**	190	460	1100	1600	3700	8400
Acenaphthylene	83000	97000	100000			
Acenaphthene	84000	97000	100000			
Fluorene	63000	68000	71000			
Phenanthrene	22000	22000	23000			
Anthracene	520000	540000	540000			
Fluoranthene	2300	2300	2300			
Pyrene	54000	54000	54000			
Benzo(a)anthracene	170	170	180			
Chrysene	350	350	350			
Benzo(b)fluoranthene	44	44	45			
Benzo(k)fluoranthene	1200	1200	1200			
Benzo(a)pyrene	35	35	36			77
Indeno(1,2,3-cd)pyrene	500	510	510			
Dibenzo(a,h)anthracene	3.5	3.6	3.6			
Benzo(g,h,i)perylene	3900	4000	4000			
Phenols	440	690	1300			
Total TPH	*Above 2000, speciate and compare with values below:					
C5 to C6 Aliphatic	3200	5900	12000			
C6 to C8 Aliphatic	7800	17000	40000			
C8 to C10 Aliphatic	2000	4800	11000			
C10 to C12 Aliphatic	9700	23000	47000			
C12 to C16 Aliphatic	59000	82000	90000			
C16 to C35 Aliphatic	1600000	1700000	1800000			
C35 TO C44 Aliphatic	1600000	1700000	1800000			
C5 to C7 Aromatic (Benzene)	26000	46000	86000			
C7 to C8 Aromatic (Toluene)	56000	110000	180000			
C8 to C10 Aromatic	3500	8100	17000			
C10 to C12 Aromatic	16000	28000	34000			
C12 to C16 Aromatic	36000	37000	38000			
C16 to C21 Aromatic	28000	28000	28000			
C21 TO C35 Aromatic	28000	28000	28000			
C35 TO C44 Aromatic	28000	28000	28000			
Asbestos	*Should be None Detected			*Should be None Detected		

\* In House Value/Approach, S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

\*\*C4SI exceeds the CLEA calculated soil saturation concentrations. Where free phase is suspected risk from direct contact and vapour inhalation should be considered separately.