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Manor Road (off Manor Lane)
Hawarden
Deeside
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Apex Testing Solutions Limited
Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Attention: Ruth Figgis

CERTIFICATE OF ANALYSIS

Date:	30 April 2018
Customer:	H_APEXTEST_BRG
Sample Delivery Group (SDG):	180424-52
Your Reference:	D7036-17
Location:	Project Yellow
Report No:	454110

We received 6 samples on Monday April 23, 2018 and 6 of these samples were scheduled for analysis which was completed on Monday April 30, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
17433470	SAMPLE1	D		20/04/2018
17433473	SAMPLE2	D		20/04/2018
17433475	SAMPLE3	D		20/04/2018
17433477	SAMPLE4	D		20/04/2018
17433479	SAMPLE5	D		20/04/2018
17433480	SAMPLE6	D		20/04/2018

Maximum Sample/Coolbox Temperature (°C) : **15.6**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)																			
			17433470			17433473			17433475			17433477			17433479			17433480				
			Customer Sample Reference																			
			SAMPLE1			SAMPLE2			SAMPLE3			SAMPLE4			SAMPLE5			SAMPLE6				
			AGS Reference																			
			D			D			D			D			D			D				
			Depth (m)																			
			Container																			
			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)		
			Sample Type																			
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Anions by Kone (soil)	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 6	X			X			X			X			X			X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
Easily Liberated Sulphide	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
Elemental Sulphur	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6			X			X			X			X			X				X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
PAH by GCMS	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
pH	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
Sample description	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
Total Organic Carbon	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			
TPH CWG GC (S)	All	NDPs: 0 Tests: 6		X			X			X			X			X			X			

Validated

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	17433470			17433473			17433475			17433477			17433479			17433480		
Customer Sample Reference	SAMPLE1			SAMPLE2			SAMPLE3			SAMPLE4			SAMPLE5			SAMPLE6		
AGS Reference	D			D			D			D			D			D		
Depth (m)																		
Container	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
VOC MS (S) / All / NDPs: 0 Tests: 6			X			X			X			X			X			X

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
17433470	SAMPLE1		Dark Brown	Sandy Loam	Stones	Vegetation
17433473	SAMPLE2		Dark Brown	Loamy Sand	Stones	Vegetation
17433475	SAMPLE3		Dark Brown	Loamy Sand	Vegetation	Crushed Brick
17433477	SAMPLE4		Dark Brown	Sandy Loam	Stones	Vegetation
17433479	SAMPLE5		Dark Brown	Sandy Loam	Stones	Vegetation
17433480	SAMPLE6		Dark Brown	Loamy Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SAMPLE1	SAMPLE2	SAMPLE3	SAMPLE4	SAMPLE5	SAMPLE6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018
			Sample Time	.	.	.	.	.	.
			Date Received	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018
			SDG Ref	180424-52	180424-52	180424-52	180424-52	180424-52	180424-52
			Lab Sample No.(s)	17433470	17433473	17433475	17433477	17433479	17433480
			AGS Reference	D	D	D	D	D	D
Moisture Content Ratio (% of as received sample)	%	PM024		7.9	6.1	12	12	11	12
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Soil Organic Matter (SOM)	<0.35 %	TM132		2.41 #	2.65 #	4.15 #	4.29 #	3.05 #	3.31 #
pH	1 pH Units	TM133		8.51 M	8.36 M	8.17 M	8.18 M	8.51 M	8.29 M
Sulphur, Elemental	<10 mg/kg	TM136		43.6 M	30.7 M	47.1 M	31 M	21.3 M	26 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Thiocyanate	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Sulphide, Easily liberated	<15 mg/kg	TM180		<15 @ M	<15 M	<15 @ M	<15 @ M	20.6 M	<15 M
Arsenic	<0.6 mg/kg	TM181		8.89 M	9.39 M	17.7 M	13.7 M	8.23 M	8.33 M
Boron	<0.7 mg/kg	TM181		7.6 #	6.25 #	6.29 #	6.13 #	7.57 #	7.19 #
Cadmium	<0.02 mg/kg	TM181		0.634 M	0.64 M	0.703 M	0.689 M	0.448 M	0.48 M
Chromium	<0.9 mg/kg	TM181		7.72 M	8.73 M	7.93 M	11.9 M	9.91 M	6.85 M
Copper	<1.4 mg/kg	TM181		18.1 M	23.4 M	30.2 M	31.1 M	13.5 M	14.9 M
Lead	<0.7 mg/kg	TM181		52.2 M	74.5 M	65.7 M	67.1 M	29.7 M	34.7 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		15.4 M	17.4 M	20.3 M	21.5 M	11.5 M	12.2 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Zinc	<1.9 mg/kg	TM181		145 M	125 M	140 M	134 M	94.1 M	107 M
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243		0.138 M	0.179 M	0.144 M	0.0916 M	0.442 M	1.17 M

Validated

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SAMPLE1	SAMPLE2	SAMPLE3	SAMPLE4	SAMPLE5	SAMPLE6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018
			Sample Time	.	.	.	.	.	.
			Date Received	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018
			SDG Ref	180424-52	180424-52	180424-52	180424-52	180424-52	180424-52
			Lab Sample No.(s)	17433470	17433473	17433475	17433477	17433479	17433480
			AGS Reference	D	D	D	D	D	D
Naphthalene-d8 % recovery**	%	TM218		98.5	104	107	99.7	100	99.5
Acenaphthene-d10 % recovery**	%	TM218		91.3	101	102	95	95.1	94.4
Phenanthrene-d10 % recovery**	%	TM218		93.6	103	104	98.1	99	97.5
Chrysene-d12 % recovery**	%	TM218		91.6	108	106	102	105	103
Perylene-d12 % recovery**	%	TM218		84.9	105	105	101	106	101
Naphthalene	<9 µg/kg	TM218		120 M	149 M	144 M	54.6 M	236 M	<90 M
Acenaphthylene	<12 µg/kg	TM218		<60 M	54 M	40.5 M	<60 M	71.3 M	<120 M
Acenaphthene	<8 µg/kg	TM218		197 M	161 M	161 M	88.9 M	2670 M	129 M
Fluorene	<10 µg/kg	TM218		205 M	204 M	174 M	104 M	3250 M	189 M
Phenanthrene	<15 µg/kg	TM218		915 M	1020 M	1230 M	784 M	12400 M	1020 M
Anthracene	<16 µg/kg	TM218		256 M	317 M	330 M	254 M	2780 M	332 M
Fluoranthene	<17 µg/kg	TM218		1660 M	1960 M	2460 M	1950 M	9350 M	1420 M
Pyrene	<15 µg/kg	TM218		1180 M	1410 M	1920 M	1520 M	5390 M	1030 M
Benz(a)anthracene	<14 µg/kg	TM218		938 M	1320 M	1600 M	1280 M	4680 M	745 M
Chrysene	<10 µg/kg	TM218		897 M	1190 M	1420 M	1170 M	4190 M	738 M
Benzo(b)fluoranthene	<15 µg/kg	TM218		1460 M	1970 M	2510 M	2140 M	5100 M	1030 M
Benzo(k)fluoranthene	<14 µg/kg	TM218		486 M	637 M	758 M	697 M	1740 M	275 M
Benzo(a)pyrene	<15 µg/kg	TM218		860 M	1210 M	1560 M	1370 M	2820 M	640 M
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		563 M	759 M	962 M	823 M	1580 M	337 M
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		235 M	321 M	383 M	344 M	792 M	<230 M
Benzo(g,h,i)perylene	<24 µg/kg	TM218		670 M	861 M	1110 M	1000 M	1690 M	446 M
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		10600	13500	16800	13600	58800	8340

Validated

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SAMPLE1	SAMPLE2	SAMPLE3	SAMPLE4	SAMPLE5	SAMPLE6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018
			Sample Time	.	.	.	.	.	.
			Date Received	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018
			SDG Ref	180424-52	180424-52	180424-52	180424-52	180424-52	180424-52
			Lab Sample No.(s)	17433470	17433473	17433475	17433477	17433479	17433480
			AGS Reference	D	D	D	D	D	D
GRO Surrogate % recovery**	%	TM089		55	57	54	54	58	58
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089		59.7	<44	<44	<44	226	221
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10	<10	<10	25.8	30.8
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10	<10	<10	21.3	19.4
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10	<10	<10	38.1	30.8
Aliphatics >C10-C12	<10 µg/kg	TM089		<10	<10	<10	<10	58.2	61.6
Aliphatics >C12-C16	<100 µg/kg	TM173		235	3700	1050	854	5400	7770
Aliphatics >C16-C21	<100 µg/kg	TM173		6970	11200	4890	4920	20800	27400
Aliphatics >C21-C35	<100 µg/kg	TM173		104000	97200	57200	45300	378000	476000
Aliphatics >C35-C44	<100 µg/kg	TM173		112000	60600	28700	28000	226000	311000
Total Aliphatics >C12-C44	<100 µg/kg	TM173		224000	173000	91800	79100	630000	822000
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		14.1	10.7	<10	<10	33.6	26.2
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	<10	<10	<10	38.1	41
Aromatics >EC12-EC16	<100 µg/kg	TM173		4290	4680	962	827	8820	6830
Aromatics >EC16-EC21	<100 µg/kg	TM173		27500	27100	14500	12900	44200	40600
Aromatics >EC21-EC35	<100 µg/kg	TM173		229000	205000	106000	120000	426000	561000
Aromatics >EC35-EC44	<100 µg/kg	TM173		270000	163000	67900	92700	390000	523000
Aromatics >EC40-EC44	<100 µg/kg	TM173		125000	71100	28800	40600	175000	232000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		530000	399000	189000	227000	868000	1130000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		754000	572000	281000	306000	1500000	1950000

Validated

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SAMPLE1	SAMPLE2	SAMPLE3	SAMPLE4	SAMPLE5	SAMPLE6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018	20/04/2018
			Sample Time	.	.	.	.	.	.
			Date Received	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018	23/04/2018
			SDG Ref	180424-52	180424-52	180424-52	180424-52	180424-52	180424-52
			Lab Sample No.(s)	17433470	17433473	17433475	17433477	17433479	17433480
			AGS Reference	D	D	D	D	D	D
Dibromofluoromethane**	%	TM116		101	100	99.8	103	100	102
Toluene-d8**	%	TM116		98.7	97.2	99.3	98.7	98.7	84.9
4-Bromofluorobenzene**	%	TM116		93.5	92.3	96.5	96.5	98.4	74.3
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<100 M	<100 M	<100 M	<100 M	<100 M	<10 M
Benzene	<9 µg/kg	TM116		<90 M	<90 M	<90 M	<90 M	<90 M	<9 M
Toluene	<7 µg/kg	TM116		<70 M	<70 M	<70 M	<70 M	<70 M	<7 M
Ethylbenzene	<4 µg/kg	TM116		<40 M	<40 M	<40 M	<40 M	<40 M	<4 M
p/m-Xylene	<10 µg/kg	TM116		<100 #	<100 #	<100 #	<100 #	<100 #	<10 #
o-Xylene	<10 µg/kg	TM116		<100 M	<100 M	<100 M	<100 M	<100 M	<10 M

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SAMPLE1 D SOLID 20/04/2018 00:00:00 25/04/2018 14:56:57 180424-52 17433470 TM048	30/04/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SAMPLE2 D SOLID 20/04/2018 00:00:00 25/04/2018 14:36:10 180424-52 17433473 TM048	30/04/2018	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SAMPLE3 D SOLID 20/04/2018 00:00:00 25/04/2018 15:00:02 180424-52 17433475 TM048	30/04/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SAMPLE4 D SOLID 20/04/2018 00:00:00 25/04/2018 14:37:30 180424-52 17433477 TM048	30/04/2018	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SAMPLE5 D SOLID 20/04/2018 00:00:00 25/04/2018 14:58:26 180424-52 17433479 TM048	30/04/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SAMPLE6 D SOLID 20/04/2018 00:00:00 25/04/2018 14:40:13 180424-52 17433480 TM048	30/04/2018	Lucy Caroe	Soil containing ACM debris	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Table of Results - Appendix

Method No	Reference	Description
ASB_PREP		
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM136	Method 17.10, Second Site property, March 2003	Determination of Sulphur by HPLC
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)'	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM243		Mixed Anions In Soils By Kone

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	180424-52	**Client Reference:**	D7036-17	**Report Number:**	454110
Location:	Project Yellow	**Order Number:**		**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	17433470	17433473	17433475	17433477	17433479	17433480
Customer Sample Ref.	SAMPLE1	SAMPLE2	SAMPLE3	SAMPLE4	SAMPLE5	SAMPLE6
AGS Ref.	D	D	D	D	D	D
Depth						
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
Asbestos ID in Solid Samples	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
Cyanide Comp/Free/Total/Thiocyanate	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
Easily Liberated Sulphide	30-Apr-2018	27-Apr-2018	30-Apr-2018	30-Apr-2018	27-Apr-2018	27-Apr-2018
Elemental Sulphur	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018
EPH CWG (Aliphatic) GC (S)	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
EPH CWG (Aromatic) GC (S)	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
GRO by GC-FID (S)	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018
Metals in solid samples by OES	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018
PAH by GCMS	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
pH	26-Apr-2018	26-Apr-2018	26-Apr-2018	26-Apr-2018	26-Apr-2018	26-Apr-2018
Phenols by HPLC (S)	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018
Sample description	25-Apr-2018	25-Apr-2018	25-Apr-2018	25-Apr-2018	25-Apr-2018	25-Apr-2018
Total Organic Carbon	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018
TPH CWG GC (S)	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018	30-Apr-2018
VOC MS (S)	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018	27-Apr-2018

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.