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Analytical Report Number : 20-16478

Replaces Analytical Report Number : 20-16478, issue no. 1

Additional analysis undertaken.

Project / Site name:		Samples received on:	26/06/2020
Your job number:	6075	Sample instructed/ Analysis started on:	26/06/2020
Your order number:	SRE6075 00005	Analysis completed by:	04/08/2020
Report Issue Number:	2	Report issued on:	05/08/2020
Samples Analysed:	3 leachate samples - 3 soil samples		

Signed: *A. Czerwińska*

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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The results included within the report relate only to the sample(s) submitted for testing.

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Your Order No: SRE6075 00005

Lab Sample Number				1546376	1546377	1546378		
Sample Reference				SP-012	SP-012	SP-009		
Sample Number				1	2	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				26/06/2020	26/06/2020	26/06/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	21	22	4.0		
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0		

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001		
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001		

General Inorganics

Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.14	0.13	0.53		
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	270	260	1100		
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	137	129	535		
Ammonium as NH ₄	mg/kg	0.5	MCERTS	100	130	13		

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	I/S	I/S	-		
Toluene	µg/kg	1	MCERTS	I/S	I/S	-		
Ethylbenzene	µg/kg	1	MCERTS	I/S	I/S	-		
p & m-xylene	µg/kg	1	MCERTS	I/S	I/S	-		
o-xylene	µg/kg	1	MCERTS	I/S	I/S	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	I/S	I/S	-		

Petroleum Hydrocarbons

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Your Order No: SRE6075 00005

Lab Sample Number				1546376	1546377	1546378		
Sample Reference				SP-012	SP-012	SP-009		
Sample Number				1	2	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				26/06/2020	26/06/2020	26/06/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	I/S	I/S	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	I/S	I/S	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	I/S	I/S	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	I/S	I/S	-		

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	I/S	I/S	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	I/S	I/S	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	I/S	I/S	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	I/S	I/S	-		

VOCs

Vinyl Chloride	µg/kg	1	NONE	I/S	I/S	-		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	I/S	I/S	-		
1,1-Dichloroethane	µg/kg	1	MCERTS	I/S	I/S	-		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	I/S	I/S	-		
1,2-Dichloroethane	µg/kg	1	MCERTS	I/S	I/S	-		
Trans-1,2-dichloroethene	µg/kg	1	NONE	I/S	I/S	-		
Tetrachloromethane	µg/kg	1	MCERTS	I/S	I/S	-		
Trichloroethene	µg/kg	1	MCERTS	I/S	I/S	-		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	I/S	I/S	-		
Tetrachloroethene	µg/kg	1	NONE	I/S	I/S	-		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	I/S	I/S	-		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	I/S	I/S	-		

SVOCs

Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
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Analytical Report Number: 20-16478
Project / Site name:
Your Order No: SRE6075 00005

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1546378	SP-009		162	Loose Fibres	Chrysotile	< 0.001	< 0.001

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



Analytical Report Number: 20-16478

Your Order No: SRE6075 00005

Lab Sample Number				1546379	1546380	1546381		
Sample Reference				SP-012	SP-012	SP-009		
Sample Number				1	2	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				26/06/2020	26/06/2020	26/06/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

Sulphate as SO ₄	mg/l	0.1	ISO 17025	21.9	17.8	182		
Ammonium as NH ₄	µg/l	15	NONE	5400	5900	770		



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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1546376	SP-012	1	None Supplied	Brown clay with gravel.
1546377	SP-012	2	None Supplied	Brown loam and clay with gravel.
1546378	SP-009	None Supplied	None Supplied	Brown loam and clay with gravel.

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Project / Site name:

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in leachate	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

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Sample Deviation Report



Sample ID	Other ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
SP-012	1	S	20-16478	1546376	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
SP-012	1	S	20-16478	1546376	b	Semi-volatile organic compounds in soil	L064-PL	b
SP-012	1	S	20-16478	1546376	b	Speciated EPA-16 PAHs in soil	L064-PL	b
SP-012	1	S	20-16478	1546376	b	TPHCWG (Soil)	L088/76-PL	b
SP-012	1	S	20-16478	1546376	b	Volatile organic compounds in soil	L073B-PL	b
SP-012	2	S	20-16478	1546377	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
SP-012	2	S	20-16478	1546377	b	Semi-volatile organic compounds in soil	L064-PL	b
SP-012	2	S	20-16478	1546377	b	Speciated EPA-16 PAHs in soil	L064-PL	b
SP-012	2	S	20-16478	1546377	b	TPHCWG (Soil)	L088/76-PL	b
SP-012	2	S	20-16478	1546377	b	Volatile organic compounds in soil	L073B-PL	b