



Key Geosolutions Limited
Nova House
Audley Avenue
Newport
Shropshire
TF10 7DW

Attention:

CERTIFICATE OF ANALYSIS

Date: 22 August 2016
Customer: H_KEYGEO_NPT
Sample Delivery Group (SDG): 160810-122
Your Reference:
Location: Redington Road
Report No: 374532

We received 3 samples on Wednesday August 10, 2016 and 2 of these samples were scheduled for analysis which was completed on Monday August 22, 2016. 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.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan

Operations Manager





SDG: 160810-122
Job: H_KEYGEO_NPT-118
Client Reference:

Location: Redington Road
Customer: Key Geosolutions Limited
Attention:

Order Number:
Report Number: 374532
Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13942271	WS01		0.10 - 0.30	04/08/2016
13942272	WS01		0.20 - 0.40	04/08/2016
13942273	WS02		0.10 - 0.30	04/08/2016

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



SDG: 160810-122
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SOLID Results Legend X Test N No Determination Possible	Lab Sample No(s)	13942272	13942273	
	Customer Sample Reference	WS01	WS02	
	AGS Reference			
	Depth (m)	0.20 - 0.40	0.10 - 0.30	
	Container	400g VOC (ALE214) 400g Tub (ALE214) 250g Amber Jar (AL 1kg TUB	60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL 1kg TUB	60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL 1kg TUB
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 2	X	X
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 2	X	X
CEN Readings	All	NDPs: 0 Tests: 2	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2	X	X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 2	X	X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 2	X	X
Fluoride	All	NDPs: 0 Tests: 2	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X
Loss on Ignition in soils	All	NDPs: 0 Tests: 2	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 2	X	X



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SOLID Results Legend Test No Determination Possible	Lab Sample No(s)	13942272	13942273	
	Customer Sample Reference	W501	W502	
	AGS Reference			
	Depth (m)	0.20 - 0.40	0.10 - 0.30	
	Container	13942272 400g Tub (ALE214) 250g Amber Jar (AL 1kg TUB	13942273 60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL 1kg TUB	
Metals in solid samples by OES	All	NDPs: 0 Tests: 2		
Mineral Oil	All	NDPs: 0 Tests: 2		
NO3, NO2 and TON by KONE (s)	All	NDPs: 0 Tests: 2		
PAH by GCMS	All	NDPs: 0 Tests: 2		
PAH Value of soil	All	NDPs: 0 Tests: 2		
PCBs by GCMS	All	NDPs: 0 Tests: 2		
pH	All	NDPs: 0 Tests: 2		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2		
Sample description	All	NDPs: 0 Tests: 2		
Total Dissolved Solids	All	NDPs: 0 Tests: 2		
Total Organic Carbon	All	NDPs: 0 Tests: 2		
TPH CWG GC (S)	All	NDPs: 0 Tests: 2		



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Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
13942272	WS01	0.20 - 0.40	Dark Brown	Sandy Clay	0.063 - 2.00 mm	Stones	Vegetation
13942273	WS02	0.10 - 0.30	Dark Brown	Loamy Sand	0.063 - 2.00 mm	Stones	Fibres

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 occurring 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.



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Results Legend		Customer Sample R	WS01	WS02				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.20 - 0.40	0.10 - 0.30				
aq	Aqueous / settled sample.		Soil/Solid	Soil/Solid				
diss.filt	Dissolved / filtered sample.		04/08/2016	04/08/2016				
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		10/08/2016	10/08/2016				
(F)	Trigger breach confirmed		160810-122	160810-122				
1-5&*\$@	Sample deviation (see appendix)		13942272	13942273				
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	15	12				
Loss on ignition	<0.7 %	TM018	5.25	7.43	M	M		
Mineral oil >C10-C40	<1 mg/kg	TM061	38.6	29.8				
Mineral Oil Surrogate % recovery**	%	TM061	88.9	98.8				
Organic Carbon, Total	<0.2 %	TM132	2.14	1.02	M	M		
Soil Organic Matter (SOM)	<0.35 %	TM132	3.69	1.76	#	#		
pH	1 pH Units	TM133	6.58	7.31	M	M		
Cyanide, Total	<1 mg/kg	TM153	<1	<1	M	M		
PCB congener 28	<3 µg/kg	TM168	<3	<3	M	M		
PCB congener 52	<3 µg/kg	TM168	<3	<3	M	M		
PCB congener 101	<3 µg/kg	TM168	<3	<3	M	M		
PCB congener 118	<3 µg/kg	TM168	<3	<3	M	M		
PCB congener 138	<3 µg/kg	TM168	<3	<3	M	M		
PCB congener 153	<3 µg/kg	TM168	<3	<3	M	M		
PCB congener 180	<3 µg/kg	TM168	<3	<3	M	M		
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21	<21				
Arsenic	<0.6 mg/kg	TM181	10.2	10.3	M	M		
Barium	<0.6 mg/kg	TM181	151	38.3	#	#		
Beryllium	<0.01 mg/kg	TM181	0.818	0.563	M	M		
Cadmium	<0.02 mg/kg	TM181	0.281	0.279	M	M		
Chromium	<0.9 mg/kg	TM181	29.9	25.5	M	M		
Copper	<1.4 mg/kg	TM181	24.3	22.4	M	M		
Lead	<0.7 mg/kg	TM181	130	80.3	M	M		
Mercury	<0.14 mg/kg	TM181	<0.14	<0.14	M	M		
Nickel	<0.2 mg/kg	TM181	15.2	12.5	M	M		
Selenium	<1 mg/kg	TM181	<1	<1	#	#		
Vanadium	<0.2 mg/kg	TM181	46.4	40.5	#	#		
Zinc	<1.9 mg/kg	TM181	72.3	56.8	M	M		
ANC @ pH 4	<0.03 mol/kg	TM182	0.0916	0.115				
ANC @ pH 6	<0.03 mol/kg	TM182	0.0398	0.0413				
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213	21.1	<10				
Boron, water soluble	<1 mg/kg	TM222	<1	<1	M	M		



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TPH CWG (S)

Results Legend		Customer Sample R	WS01	WS02				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.20 - 0.40	0.10 - 0.30				
aq	Aqueous / settled sample.		Soil/Solid	Soil/Solid				
diss.filt	Dissolved / filtered sample.		04/08/2016	04/08/2016				
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		10/08/2016	10/08/2016				
1-5&*\$@	Sample deviation (see appendix)		160810-122	160810-122				
			13942272	13942273				
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	110	88				
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	<44	<44	M	M		
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5	<5	#	#		
Benzene	<10 µg/kg	TM089	<10	<10	M	M		
Toluene	<2 µg/kg	TM089	<2	<2	M	M		
Ethylbenzene	<3 µg/kg	TM089	3.51	<3	M	M		
m,p-Xylene	<6 µg/kg	TM089	<6	<6	M	M		
o-Xylene	<3 µg/kg	TM089	<3	<3	M	M		
sum of detected mpo xylene by GC	<9 µg/kg	TM089	<9	<9				
sum of detected BTEX by GC	<24 µg/kg	TM089	<24	<24				
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10				
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	<10				
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	<10				
Aliphatics >C10-C12	<10 µg/kg	TM089	<10	<10				
Aliphatics >C12-C16	<100 µg/kg	TM173	<100	<100				
Aliphatics >C16-C21	<100 µg/kg	TM173	<100	353				
Aliphatics >C21-C35	<100 µg/kg	TM173	2940	6320				
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	263				
Total Aliphatics >C12-C44	<100 µg/kg	TM173	2940	6930				
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10				
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10				
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	<10				
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10	<10				
Aromatics >EC12-EC16	<100 µg/kg	TM173	266	377				
Aromatics >EC16-EC21	<100 µg/kg	TM173	4710	1950				
Aromatics >EC21-EC35	<100 µg/kg	TM173	15800	18700				
Aromatics >EC35-EC44	<100 µg/kg	TM173	4240	4520				
Aromatics >EC40-EC44	<100 µg/kg	TM173	1510	1600				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	25100	25500				
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	28000	32400				



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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 Received SDG Original Sample Method Number	WS01 0.20 - 0.40 SOLID 04/08/2016 00:00:00 13/08/2016 11:05:40 160810-122 13942272 TM048	18/08/16	Lauren Sargeant	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS02 0.10 - 0.30 SOLID 04/08/2016 00:00:00 13/08/2016 11:09:09 160810-122 13942273 TM048	18/08/16	Lauren Sargeant	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

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CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.105
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Redington Road
Natural Moisture Content (%)	17.6
Dry Matter Content (%)	85

Case	
SDG	160810-122
Lab Sample Number(s)	13942272
Sampled Date	04-Aug-2016
Customer Sample Ref.	WS01
Depth (m)	0.20 - 0.40

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	2.14
Loss on Ignition (%)	5.25
Sum of BTEX (mg/kg)	<0.024
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	38.6
PAH Sum of 17 (mg/kg)	21.1
pH (pH Units)	6.58
ANC to pH 6 (mol/kg)	0.0398
ANC to pH 4 (mol/kg)	0.0916

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00106	<0.00051	0.0106	<0.0051	0.5	2	25
Barium	0.0139	<0.0002	0.139	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00259	<0.0012	0.0259	<0.012	0.5	10	70
Copper	0.00362	<0.00085	0.0362	<0.0085	2	50	100
Mercury Dissolved (CVAf)	0.0000129	<0.00001	0.000129	<0.0001	0.01	0.2	2
Molybdenum	<0.00062	<0.00062	<0.0062	<0.0062	0.5	10	30
Nickel	0.0013	<0.00044	0.013	<0.0044	0.4	10	40
Lead	0.00238	<0.0001	0.0238	<0.001	0.5	10	50
Antimony	0.000296	<0.00016	0.00296	<0.0016	0.06	0.7	5
Selenium	<0.00081	<0.00081	<0.0081	<0.0081	0.1	0.5	7
Zinc	0.00428	<0.0013	0.0428	<0.013	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	15.5	<5	155	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.22	<3	42.2	<30	500	800	1000

Leach Test Information

Date Prepared	15-Aug-2016
pH (pH Units)	7.98
Conductivity (µS/cm)	17.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.884

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
 Mcerts Certification does not apply to leachates

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CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.102
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Redington Road
Natural Moisture Content (%)	13.6
Dry Matter Content (%)	88

Case	
SDG	160810-122
Lab Sample Number(s)	13942273
Sampled Date	04-Aug-2016
Customer Sample Ref.	WS02
Depth (m)	0.10 - 0.30

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.02
Loss on Ignition (%)	7.43
Sum of BTEX (mg/kg)	<0.024
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	29.8
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.31
ANC to pH 6 (mol/kg)	0.0413
ANC to pH 4 (mol/kg)	0.115

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000747	<0.00051	0.00747	<0.0051	0.5	2	25
Barium	0.00336	<0.0002	0.0336	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.0012	<0.0012	<0.012	<0.012	0.5	10	70
Copper	0.0051	<0.00085	0.051	<0.0085	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.000885	<0.00062	0.00885	<0.0062	0.5	10	30
Nickel	0.00105	<0.00044	0.0105	<0.0044	0.4	10	40
Lead	0.00113	<0.0001	0.0113	<0.001	0.5	10	50
Antimony	0.000622	<0.00016	0.00622	<0.0016	0.06	0.7	5
Selenium	<0.00081	<0.00081	<0.0081	<0.0081	0.1	0.5	7
Zinc	0.00295	<0.0013	0.0295	<0.013	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	30	<5	300	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	8.45	<3	84.5	<30	500	800	1000

Leach Test Information

Date Prepared	15-Aug-2016
pH (pH Units)	7.68
Conductivity (µS/cm)	34.40
Temperature (°C)	18.70
Volume Leachant (Litres)	0.888

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Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
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		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
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		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM243		Mixed Anions In Soils By Kone		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



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Order Number:
Report Number: 374532
Superseded Report:

Test Completion Dates

Lab Sample No(s)	13942272	13942273
Customer Sample Ref.	WS01	WS02
AGS Ref.		
Depth	0.20 - 0.40	0.10 - 0.30
Type	SOLID	SOLID
ANC at pH4 and ANC at pH 6	18-Aug-2016	18-Aug-2016
Anions by Kone (soil)	19-Aug-2016	19-Aug-2016
Anions by Kone (w)	17-Aug-2016	17-Aug-2016
Asbestos ID in Solid Samples	19-Aug-2016	19-Aug-2016
Boron Water Soluble	19-Aug-2016	19-Aug-2016
CEN 10:1 Leachate (1 Stage)	15-Aug-2016	15-Aug-2016
CEN Readings	17-Aug-2016	17-Aug-2016
Cyanide Comp/Free/Total/Thiocyanate	17-Aug-2016	17-Aug-2016
Dissolved Metals by ICP-MS	18-Aug-2016	18-Aug-2016
Dissolved Organic/Inorganic Carbon	18-Aug-2016	18-Aug-2016
EPH CWG (Aliphatic) GC (S)	19-Aug-2016	19-Aug-2016
EPH CWG (Aromatic) GC (S)	19-Aug-2016	19-Aug-2016
Fluoride	18-Aug-2016	18-Aug-2016
GRO by GC-FID (S)	18-Aug-2016	18-Aug-2016
Loss on Ignition in soils	22-Aug-2016	22-Aug-2016
Mercury Dissolved	18-Aug-2016	18-Aug-2016
Metals in solid samples by OES	18-Aug-2016	18-Aug-2016
Mineral Oil	18-Aug-2016	18-Aug-2016
NO3, NO2 and TON by KONE (s)	19-Aug-2016	19-Aug-2016
PAH by GCMS	19-Aug-2016	19-Aug-2016
PAH Value of soil	16-Aug-2016	16-Aug-2016
PCBs by GCMS	18-Aug-2016	18-Aug-2016
pH	18-Aug-2016	18-Aug-2016
Phenols by HPLC (W)	18-Aug-2016	18-Aug-2016
Sample description	13-Aug-2016	13-Aug-2016
Total Dissolved Solids	17-Aug-2016	17-Aug-2016
Total Organic Carbon	19-Aug-2016	19-Aug-2016
TPH CWG GC (S)	19-Aug-2016	19-Aug-2016



SDG: 160810-122
Job: H_KEYGEO_NPT-118
Client Reference:

Location: Redington Road
Customer: Key Geosolutions Limited
Attention: Ruby

Order Number:
Report Number: 374532
Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) 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. ALcontrol Laboratories 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 Dimethylphenol, 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.

General

20. 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.

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

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

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 preservation 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 ALcontrol Laboratories (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 ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Crystalline	White Asbestos
Amphibole	Brown Asbestos
Crystalline	Blue Asbestos
Fibrous Asbestos	-
Fibrous Amphibole	-
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.