



2139

Certificate of Analysis



Certificate Number: 13-83653

Date: 01/07/2013

Client: Terra Firma (Wales) Ltd
5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HB

Our Reference: 13-83653

Client Reference: 12226B

Contract Title: Crugmore

Description: 6 soil samples

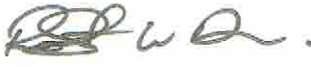
Date Received: 24 June 2013

Date Started: 24 June 2013

Date Completed: 01 July 2013

Test Procedures: Identified by prefix DETSh, details available upon request.

Notes: Observations and interpretations are outside the scope of UKAS accreditation

Approved By: 
Rob Brown, Business Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Information in Support of the Analytical Results

Analysis

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425um sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 280C +/-20C.

Key

- * Denotes test not included in laboratory scope of accreditation
- # Denotes test that holds MCERTS accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
- \$ Denotes tests completed by an approved subcontractor
- I/S Denotes insufficient sample to carry out test
- U/S Denotes that the sample is not suitable for testing

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month

Liquids - 2 weeks

Asbestos (test portion) - 6 months

Summary of Chemical Analysis
Matrix Descriptions

Our Ref: 13-83653
Client Ref: 12226B
Contract Title: Crugmore

Sample ID	Depth	Sample No	Completed	Matrix Description
TP1	0.30	526837	01/07/2013	Brown gravelly sandy CLAY
TP2	0.50	526838	01/07/2013	Brown gravelly sandy CLAY
TP3	0.40	526839	01/07/2013	Brown gravelly sandy CLAY
TP4	0.15	526840	01/07/2013	Brown gravelly sandy CLAY with numerous rootlets
TP5	0.30	526841	01/07/2013	Brown gravelly sandy CLAY
TP6	0.40	526842	01/07/2013	Brown gravelly sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref: 13-83653
 Client Ref: 12226B
 Contract Title: Crugmore

				Lab No.	526837	526838	526839	526840
				Sample ID	TP1	TP2	TP3	TP4
				Depth	0.30	0.50	0.40	0.15
				Sample Ref				
				Sample Type				
				Sampling Date	20/06/2013	20/06/2013	20/06/2013	20/06/2013
				Sampling Time				
Test	Units	DETSxx	LOD					
Mercury	mg/kg	DETSC 2325#	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	mg/kg	DETS 042#	0.2	15	21	21	21	14
Cadmium	mg/kg	DETS 042#	0.1	0.6	0.8	0.9	0.7	0.7
Chromium	mg/kg	DETS 042#	0.15	29	34	43	27	27
Chromium III	mg/kg	DETS 042*	0.15	29	34	43	27	27
Copper	mg/kg	DETS 042#	0.2	12	13	25	10	10
Nickel	mg/kg	DETS 042#	1	18	27	35	13	13
Lead	mg/kg	DETS 042#	0.3	11	16	20	20	20
Selenium	mg/kg	DETS 042#	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	1	51	57	71	45	45
Cyanide total	mg/kg	DETSC 2130#	0.1	0.2	< 0.1	< 0.1	0.3	0.3
Organic matter	%	DETSC 2002#	0.1	1.4	1.1	1.2	3.2	3.2
Total Sulphate as SO4	%	DETSC 2321#	0.01	0.03	0.03	0.02	0.05	0.05
pH		DETSC 2008#		7.1	7.4	7.3	6.3	6.3
PAH	mg/kg	DETSC 3301	1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenol - Monohydric	mg/kg	DETSC 2130#	0.3	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Hexavalent Chromium	mg/kg	DETSC 2204*	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Soil Samples

Our Ref: 13-83653

Client Ref: 12226B

Contract Title: Crugmore

				Lab No.	526841	526842
				Sample ID	TP5	TP6
				Depth	0.30	0.40
				Sample Ref		
				Sample Type		
				Sampling Date	20/06/2013	20/06/2013
				Sampling Time		
Test	Units	DETSxx	LOD			
Mercury	mg/kg	DETSC 2325#	0.05		< 0.05	< 0.05
Arsenic	mg/kg	DETS 042#	0.2		20	17
Cadmium	mg/kg	DETS 042#	0.1		1.0	0.7
Chromium	mg/kg	DETS 042#	0.15		46	29
Chromium III	mg/kg	DETS 042*	0.15		46	28
Copper	mg/kg	DETS 042#	0.2		21	8.4
Nickel	mg/kg	DETS 042#	1		29	17
Lead	mg/kg	DETS 042#	0.3		21	13
Selenium	mg/kg	DETS 042#	0.5		< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	1		57	43
Cyanide total	mg/kg	DETSC 2130#	0.1		< 0.1	0.2
Organic matter	%	DETSC 2002#	0.1		1.0	1.5
Total Sulphate as SO4	%	DETSC 2321#	0.01		0.03	0.03
pH		DETSC 2008#			6.9	6.6
PAH	mg/kg	DETSC 3301	1.6		< 1.6	< 1.6
Phenol - Monohydric	mg/kg	DETSC 2130#	0.3		< 0.3	< 0.3
Hexavalent Chromium	mg/kg	DETSC 2204*	1		< 1.0	< 1.0

Sample Comments

DETS cannot be held responsible for the integrity of sample(s) received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating.

Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note "Guidance on Deviating Samples".

All samples received are listed below. However, those samples that have additional comments in relation to hold time and/or inappropriate containers are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations.

If no sampled date (soils) or date/time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters), this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Lab No.	Sample ID	Date Sampled	Containers Received	Deviating due to holding time being exceeded for test(s)		Deviating due to headspace presence in container for test(s)
				test(s)	test(s)	
526837	TP1 0.30 SOIL	20/06/2013	Glass Jar 250ml (250ml), Plastic Tub 1 litre (1kg)			
526838	TP2 0.50 SOIL	20/06/2013	Glass Jar 250ml (250ml), Plastic Tub 1 litre (1kg)			
526839	TP3 0.40 SOIL	20/06/2013	Glass Jar 250ml (250ml), Plastic Tub 1 litre (1kg)			
526840	TP4 0.15 SOIL	20/06/2013	Glass Jar 250ml (250ml), Plastic Tub 1 litre (1kg)			
526841	TP5 0.30 SOIL	20/06/2013	Glass Jar 250ml (250ml), Plastic Tub 1 litre (1kg)			
526842	TP6 0.40 SOIL	20/06/2013	Glass Jar 250ml (250ml), Plastic Tub 1 litre (1kg)			

Appendix A - Details of Analysis

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

<u>Method</u>	<u>Name of Parameter</u>	<u>Units</u>	<u>Limit of Detection</u>	<u>Sample Preparation</u>	<u>Sub-Contracted</u>	<u>UKAS</u>	<u>MCERTS</u>
DETS 002	Organic Matter	%	0.01	Air Dried	No	Yes	Yes
DETS 003	Loss on Ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 004	Total Sulphate	%	0.01	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate	%	0.01	Air Dried	No	Yes	Yes
DETS 2004	Water Soluble Sulphate	mg/l	10.00	Air Dried	No	Yes	Yes
DETS 2076	Water Soluble Sulphate	mg/l	10.00	Air Dried	No	Yes	Yes
DETS 2006	Chloride	mg/kg	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	0.10	Air Dried	No	Yes	Yes
DETS 042	Selenium	mg/kg	0.50	Air Dried	No	Yes	Yes
DETS 2119	Ammonia	mg/kg	0.02	Air Dried	No	Yes	Yes
DETS 020	Boron (Water Soluble)	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10.00	Air Dried	No	Yes	Yes
DETS 042	Antimony	mg/kg	1.00	Air Dried	No	No	No
DETS 042	Arsenic	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Barium	mg/kg	1.50	Air Dried	No	Yes	Yes
DETS 042	Beryllium	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Cadmium	mg/kg	0.10	Air Dried	No	Yes	Yes
DETS 042	Cobalt	mg/kg	0.70	Air Dried	No	Yes	Yes
DETS 042	Copper	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS 042	Iron	mg/kg	1.00	Air Dried	No	Yes	No

Appendix A - Details of Analysis

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

<u>Method</u>	<u>Name of Parameter</u>	<u>Units</u>	<u>Limit of Detection</u>	<u>Sample Preparation</u>	<u>Sub-Contracted</u>	<u>UKAS</u>	<u>MCERTS</u>
DETS 042	Lead	mg/kg	0.30	Air Dried	No	Yes	Yes
DETS 042	Manganese	mg/kg	20.00	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 042	Molybdenum	mg/kg	0.40	Air Dried	No	Yes	Yes
DETS 042	Nickel	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Thallium	mg/kg	1.00	Air Dried	No	No	No
DETS 042	Vanadium	mg/kg	0.80	Air Dried	No	Yes	Yes
DETS 042	Zinc	mg/kg	1.00	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (Free)	mg/kg	0.50	As Received	No	Yes	Yes
DETSC 3301	PAH by GC-FID	mg/kg	0.10	As Received	No	Yes	No
DETSC 3311	TPH (C10 - C40)	mg/kg	20.00	As Received	No	Yes	Yes
DETSC 3401	PCB	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Easily Liberatable Cyanide	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Complex Cyanide	mg/kg	0.30	Air Dried	No	Yes	No
DETSC 2130	Total Cyanide	mg/kg	0.40	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes

Appendix A - Details of Analysis

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

<u>Method</u>	<u>Name of Parameter</u>	<u>Units</u>	<u>Limit of Detection</u>	<u>Sample Preparation</u>	<u>Sub-Contracted</u>	<u>UKAS</u>	<u>MCERTS</u>
DETSC 3431	VOC	mg/kg	0.01	As Received	No	No	No
DETSC 3303	PAH by GC/MS (see list below)						
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Anthracene	mg/kg	0.03	As Received	No	Yes	No
DETSC 3303	Chrysene	mg/kg	0.03	As Received	No	Yes	No
DETSC 3303	Fluorene	mg/kg	0.03	As Received	No	Yes	No