



TIER 2/3 ENVIRONMENTAL RISK ASSESSMENT

LIMERICK CITY COUNCIL SITE
ST. MARY'S PARK
LIMERICK

APPENDIX 4

ANALYTICAL RESULTS

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01 AUG 2012
ENVIRONMENTAL PROTECTION
AGENCY





Verde Remediation Services
F27
Bullford Business Campus
Kilcoole
Co. Wicklow

Attention: Cyril Tynan

CERTIFICATE OF ANALYSIS

Date:	04 July 2011
Customer:	D_VERDE_KCL
Sample Delivery Group (SDG):	110623-93
Your Reference:	20476
Location:	Limerick Co Co
Report No:	137321

This report has been revised and directly supersedes 136560 in its entirety.

We received 2 samples on Thursday June 23, 2011 and 2 of these samples were scheduled for analysis which was completed on Monday July 04, 2011. 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.

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Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 110623-93
Job: D_VERDE_KCL-365
Client Reference: 20476

Location: Limerick Co Co
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 137321
Superseded Report: 138560

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3732189	20476-1-COMP A			16/06/2011
3732193	20476-1-COMP B			16/06/2011

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

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SDG: 110623-93
 Job: D_VERDE_KCL-385
 Client Reference: 20476

Location: Limerick Co Co
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 137321
 Superseded Report: 136560

SOLID Results Legend <input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> No Determination Possible	Lab Sample No(s)	3732189	3732193
	Customer Sample Reference	20476-1-COMP A	20476-1-COMP B
	AGS Reference		
	Depth (m)		
	Container	60g VOC Dublin (AL)	JAR (D) 60g VOC Dublin (AL)
ANC at pH4 and ANC at pH 6	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Anions by Kone (w)	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
CEN 2.1 Readings	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
CEN 2.1 Readings	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Dissolved Metals by ICP-MS	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Dissolved Organic/Inorganic Carbon	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Fluoride	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
TOC by GC-FID (S)	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Loss on Ignition in soils	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mercury Dissolved	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mineral Oil	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
PAH Value of soil	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
PCBs by GCMS	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
pH	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Phenols by HPLC (W)	All	NDPs 0 Tests 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

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SDG: 110623-93
 Job: D_VERDE_KCL-365
 Client Reference: 20476

Location: Limerick Co Co
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 137321
 Superseded Report: 136560

SOLID		Lab Sample No(s)		3732193	3732193
Results Legend		Customer Sample Reference		20476-1-COMP A	20476-1-COMP B
X Test N No Determination Possible		AGS Reference			
		Depth (m)			
		Container		60g VOC Dublin (AL)	JAR (D) 60g VOC Dublin (AL)
Sample description	All	NDPs: 0 Tests: 2		X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 2		X	X
Total Organic Carbon	All	NDPs: 0 Tests: 2		X	X

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CERTIFICATE OF ANALYSIS

SDG: 110623-93	Location: Limerick Co Co	Order Number: 20476
Job: D_VERDE_KCL-385	Customer: Verde Remediation Services	Report Number: 137321
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 138560

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	Grain size	Inclusions	Inclusions 2
3732189	20476-1-COMP A		Dark Brown	Silt Loam	0.063 - 0.1 mm	Stones	None
3732193	20476-1-COMP B		Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None

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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Location: Limerick Co Co
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 137321
 Superseded Report: 136560

Results Legend		Customer Sample R	20476-1-COMP A	20476-1-COMP B			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Soil/Solid	Soil/Solid			
M	mCERTS accredited.		16/06/2011	16/06/2011			
S	Non-conforming work.		23/06/2011	23/06/2011			
aq	Aqueous / settled sample.		110623-93	110623-93			
diss.filt	Dissolved / filtered sample.		3732189	3732193			
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						
Component	LOD/Units		Method				
Moisture	%	PM114	27.8	17			
Moisture content ratio	%	PM114	38.5	20.5			
Dry matter content ratio	%	PM114	72.2	83			
Loss on ignition	<0.7 %	TM018	6.46	7.27			
Mineral oil >C10-C40	<1 mg/kg	TM061	26.5	29.8	M	M	
Organic Carbon, Total	<0.2 %	TM132	1.76	2.08	#	#	
pH	1 pH Units	TM133	7.67	7.54	#	#	
B 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	µg/kg	TM168	none detected	none detected			
ANC @ pH 4	<0.03 mol/kg	TM182	0.453	0.884	#	#	
ANC @ pH 6	<0.03 mol/kg	TM182	0.0625	0.128	#	#	
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213	<10	<10			

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SDG: 110623-93
 Job: D_VERDE_KCL-365
 Client Reference: 20476

Location: Limerick Co Co
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 137321
 Superseded Report: 136560

GRO by GC-FID (S)

Results Legend			Customer Sample R	20476-1-COMP A	20476-1-COMP B					
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Soil/Solid	Soil/Solid					
M	mCERTS accredited.			16/06/2011	16/06/2011					
S	Non-conforming work.			23/06/2011	23/06/2011					
aq	Aqueous / settled sample.			110623-93	110623-93					
diss.filt	Dissolved / filtered sample.			3732189	3732189					
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									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM089	71	75						
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	2.72	2.76	M	M				
Ethylbenzene	<3 µg/kg	TM089	<3	<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 ane by GC	µg/kg	TM089	none detected	none detected						
sum of detected BTEX by GC	µg/kg	TM089	2.72	2.76						

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SDG: 110623-93
 Job: D_VERDE_KCL-365
 Client Reference: 20476

Location: Limerick Co Co
 Customer: Verde Remediation Services
 Attention: Marius Gardjan

Order Number: 20476
 Report Number: 137321
 Superseded Report: 136580

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference: Limerick Co Co
 Mass Sample taken (kg): 0.242
 Mass of dry sample (kg): 0.175
 Particle Size <4mm: >95%

Site Location: Limerick Co Co
 Moisture Content Ratio (%): 38.5
 Dry Matter Content Ratio (%): 72.2

Case: 110623-93
 SDG: 110623-93
 Lab Sample Number(s): 3732189
 Sampled Date: 16-Jun-2011
 Customer Sample Ref.: 20476-1-COMP A
 Depth (m):

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
6		10
1		
500		
100	<6 or >9	

Solid Waste Analysis

Total Organic Carbon (%): 1.76
 Ignition (%): 6.46
 Sum of BTEX (mg/kg): 0.00272
 Sum of 7 PCBs (mg/kg): none detected
 Mineral Oil (mg/kg): 26.5
 PAH Sum of 17 (mg/kg): <10.0
 pH (pH Units): 7.67
 ANC to pH 6 (mol/kg): 0.0625
 ANC to pH 4 (mol/kg): 0.453

Eluate Analysis	C ₂	C ₈	A ₂	A ₂₋₁₀	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Conc ⁿ in 2:1 eluate mg/l	Conc ⁿ in 8:1 eluate mg/l	2:1 conc ⁿ leached mg/kg	Cumulative conc ⁿ leached mg/kg			
Arsenic	0.00121	0.00102	0.00242	0.0104	0.5	2	25
Barium	0.135	0.0464	0.27	0.578	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00669	0.00511	0.0134	0.0531	0.5	10	70
Copper	0.0178	0.00499	0.0357	0.0683	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00264	0.00399	0.00529	0.0382	0.5	10	30
Nickel	0.00605	0.00237	0.0121	0.0284	0.4	10	40
Lead	0.00166	0.000689	0.00332	0.00814	0.5	10	50
Antimony	0.00232	0.00366	0.00465	0.0349	0.06	0.7	5
Selenium	0.0013	0.000952	0.00259	0.00997	0.1	0.5	7
	0.0146	0.00253	0.0293	0.0408	4	50	200
Chloride	33.7	<2	67.5	43.3	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	453	45.3	907	977	1000	20000	50000
Total Dissolved Solids	787	184	1580	2610	4000	60000	100000
Total Monohydric Phenols (W)	none detected	none detected	none detected	none detected	1	-	-
Dissolved Organic Carbon	13.6	7.66	27.1	84.2	500	800	1000

Leach Test Information	2:1	8:1
Date Prepared	27-Jun-2011	27-Jun-2011
pH (pH Units)	8.188	8.19
Conductivity (µS/cm)	1,141.00	239.00
Temperature (°C)	22.00	20.50
Volume Leachant (Litres)	0.283	1.400
Volume of Eluate VE1 (Litres)	0.225	

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
 Merits Certification does not apply to leachates
 04/07/2011 12:46:33

SDG: 110623-93
 Job: D_VERDE_KCL-385
 Client Reference: 20476

Location: Limerick Co Co
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 137321
 Superseded Report: 136560

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		Site Location	Limerick Co Co
Mass Sample taken (kg)	0.211	Moisture Content Ratio (%)	20.5
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	83.0
Particle Size <4mm	>95%		

Case
 SDG 110623-93
 Lab Sample Number(s) 3732193
 Sampled Date 16-Jun-2011
 Customer Sample Ref. 20476-1-COMP B
 Depth (m)

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste In Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
6		10
1		
500		
100		
	<6 or >9	

Solid Waste Analysis

Total Organic Carbon (%) 2.08
 on Ignition (%) 7.27
 Sum of BTEX (mg/kg) 0.00276
 Sum of 7 PCBs (mg/kg) none detected
 Mineral Oil (mg/kg) 29.8
 PAH Sum of 17 (mg/kg) <10.0
 pH (pH Units) 7.54
 ANC to pH 6 (mol/kg) 0.128
 ANC to pH 4 (mol/kg) 0.884

Eluate Analysis	C2	C8	A2	A2-10	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Conc ⁿ in 2:1 eluate	Conc ⁿ in 8:1 eluate	2:1 conc ⁿ leached	Cumulative conc ⁿ leached			
	mg/l		mg/kg				
Arsenic	0.00143	0.00106	0.00285	0.0112	0.5	2	25
Barium	0.269	0.0978	0.537	1.22	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00458	0.00349	0.00916	0.0364	0.5	10	70
Copper	0.0198	0.00585	0.0396	0.078	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00832	0.00731	0.0166	0.0745	0.5	10	30
Nickel	0.00826	0.00301	0.0165	0.0374	0.4	10	40
Lead	0.000558	0.000112	0.00112	0.00174	0.5	10	50
Antimony	0.0107	0.00852	0.0213	0.0882	0.06	0.7	5
Selenium	0.00139	0.000492	0.00277	0.00818	0.1	0.5	7
	0.0199	0.0177	0.0398	0.18	4	50	200
Chloride	61.3	4.6	123	125	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	854	204	1710	2950	1000	20000	50000
Total Dissolved Solids	1230	398	2460	5130	4000	60000	100000
Total Monohydric Phenols (W)	none detected	none detected	none detected	none detected	1	-	-
Dissolved Organic Carbon	18.3	8.23	36.6	96.4	500	800	1000

Leach Test Information	2:1	8:1
Date Prepared	27-Jun-2011	27-Jun-2011
pH (pH Units)	8.040	7.01
Conductivity (µS/cm)	1,718.00	535.00
Temperature (°C)	21.80	20.50
Volume Leachant (Litres)	0.314	1.400
Volume of Eluate VE1 (Litres)	0.245	

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
 Moerts Certification does not apply to leachates
 04/07/2011 12:46:33

SDG: 110623-93	Location: Limerick Co Co	Order Number: 20476
Job: D_VERDE_KCL-365	Customer: Verde Remediation Services	Report Number: 137321
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 136560

Table of Results - Appendix

REPORT KEY

NDP No Determination Possible	# ISO 17025 Accredited	- Subcontracted Test	M MCERTS Accredited
NFD No Fibres Detected	PFD Possible Fibres Detected	# Result previously reported (Incremental reports only)	EC Equivalent Carbon (Aromatics C8-C36)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

Method No	Reference	Description	Wet/Dry Sample*	Surrogate Corrected
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage Batch Test 2:1/8:1 Cumulative		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
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 & 802	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		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM182	CEN/TC 292 - V1 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		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

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

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SDG: 110623-93 Location: Limerick Co Co Order Number: 20476
 Job: D_VERDE_KCL-365 Customer: Verde Remediation Services Report Number: 137321
 Client Reference: 20476 Attention: Mariusz Gardjan Superseded Report: 136560

Test Completion Dates

Lab Sample No(s)	3732189	3732193
Customer Sample Ref.	20476-1-COMP A	20476-1-COMP B
AGS Ref.		
Depth		
Type	SOLID	SOLID
ANC at pH4 and ANC at pH 6	29-Jun-2011	29-Jun-2011
Anions by Kone (w)	04-Jul-2011	04-Jul-2011
CEN 2 1 Leachate (2 Stage)	27-Jun-2011	27-Jun-2011
CEN 2 1 Readings	29-Jun-2011	29-Jun-2011
CEN 8 1 Leachate (2 Stage)	29-Jun-2011	29-Jun-2011
CEN 8 1 Readings	29-Jun-2011	29-Jun-2011
Dissolved Metals by ICP-MS	01-Jul-2011	01-Jul-2011
Dissolved Organic/Inorganic Carbon	30-Jun-2011	30-Jun-2011
Fluoride	01-Jul-2011	01-Jul-2011
GRO by GC-FID (S)	02-Jul-2011	02-Jul-2011
Loss on Ignition in soils	30-Jun-2011	30-Jun-2011
Mercury Dissolved	01-Jul-2011	01-Jul-2011
Mineral Oil	30-Jun-2011	30-Jun-2011
PAH Value of soil	29-Jun-2011	29-Jun-2011
PCBs by GCMS	30-Jun-2011	30-Jun-2011
	01-Jul-2011	01-Jul-2011
Phenols by HPLC (W)	30-Jun-2011	30-Jun-2011
Sample description	24-Jun-2011	24-Jun-2011
Total Dissolved Solids	30-Jun-2011	30-Jun-2011
Total Organic Carbon	29-Jun-2011	29-Jun-2011

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SDG: 110623-93	Location: Limerick Co Co	Order Number: 20476
Job: D_VERDE_KCL-365	Customer: Verde Remediation Services	Report Number: 137321
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 136560

Chromatogram

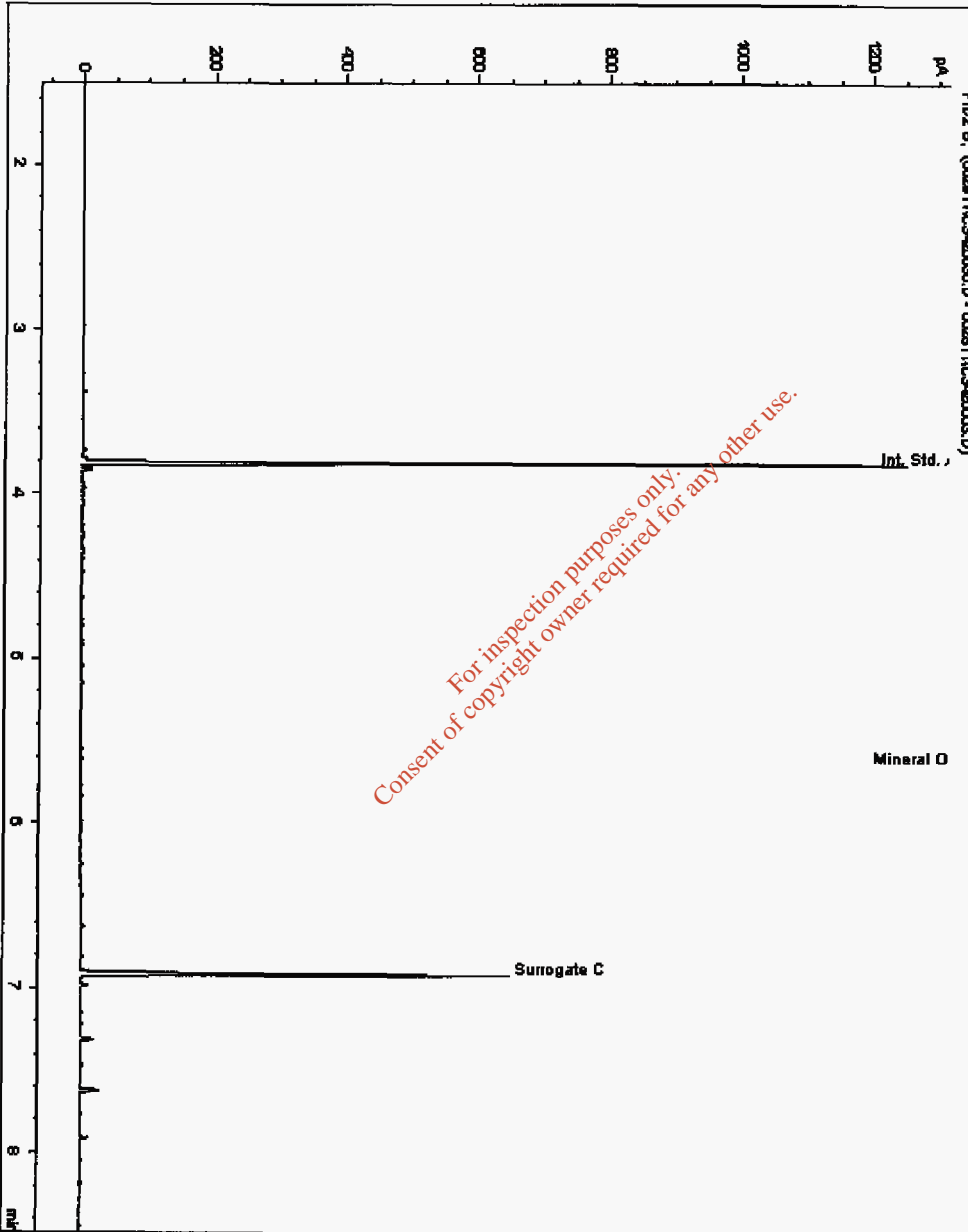
Analysis: Mineral Oil

Sample No : 3764309
 Sample ID : 20476-1-COMP B

Depth :

ALcontrol Laboratories
 Mineral Oil Range Organics (C10 - C40)

Sample Identity : 3750150-3764309
 Date Acquired : 29/06/11 21:56:14 PM
 Units : mg/kg
 Sample Multiplier : 0.000
 Dilution : 1.0



SDG: 110623-93
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Chromatogram

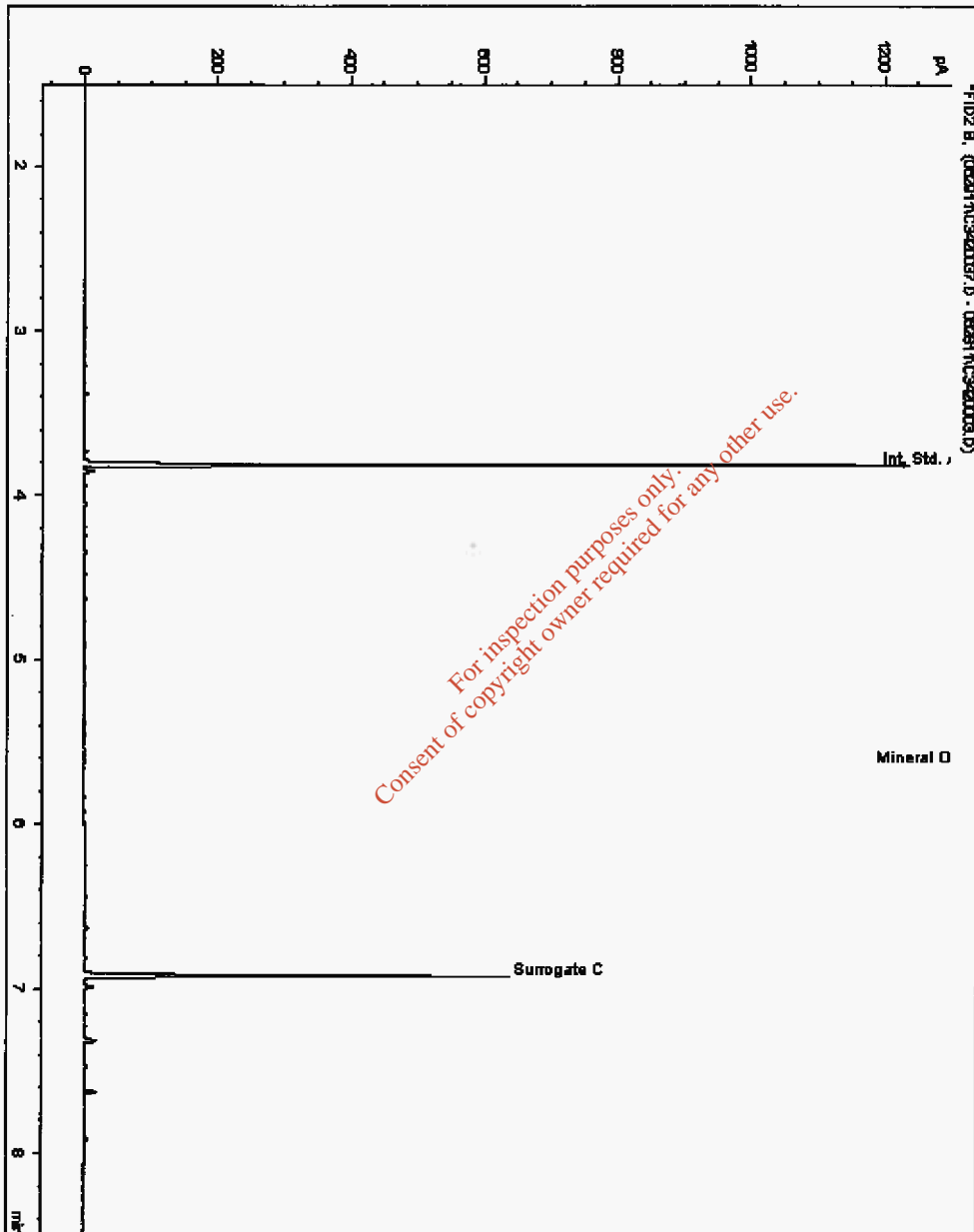
Analysis: Mineral Oil

Sample No : 3764364
 Sample ID : 20476-1-COMP A

Depth :

ALcontrol Laboratories
 Mineral Oil Range Organics (C10 - C40)

Sample Identity : 3750139-3764364
 Date Acquired : 29/06/11 22:18:12 PM
 Units : mg/kg
 Sample Multiplier : 0.000
 Dilution : 1.0 →





SDG: 110623-93
Job: D_VERDE_KCL-365
Client Reference: 20476

Location: Limerick Co Co
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
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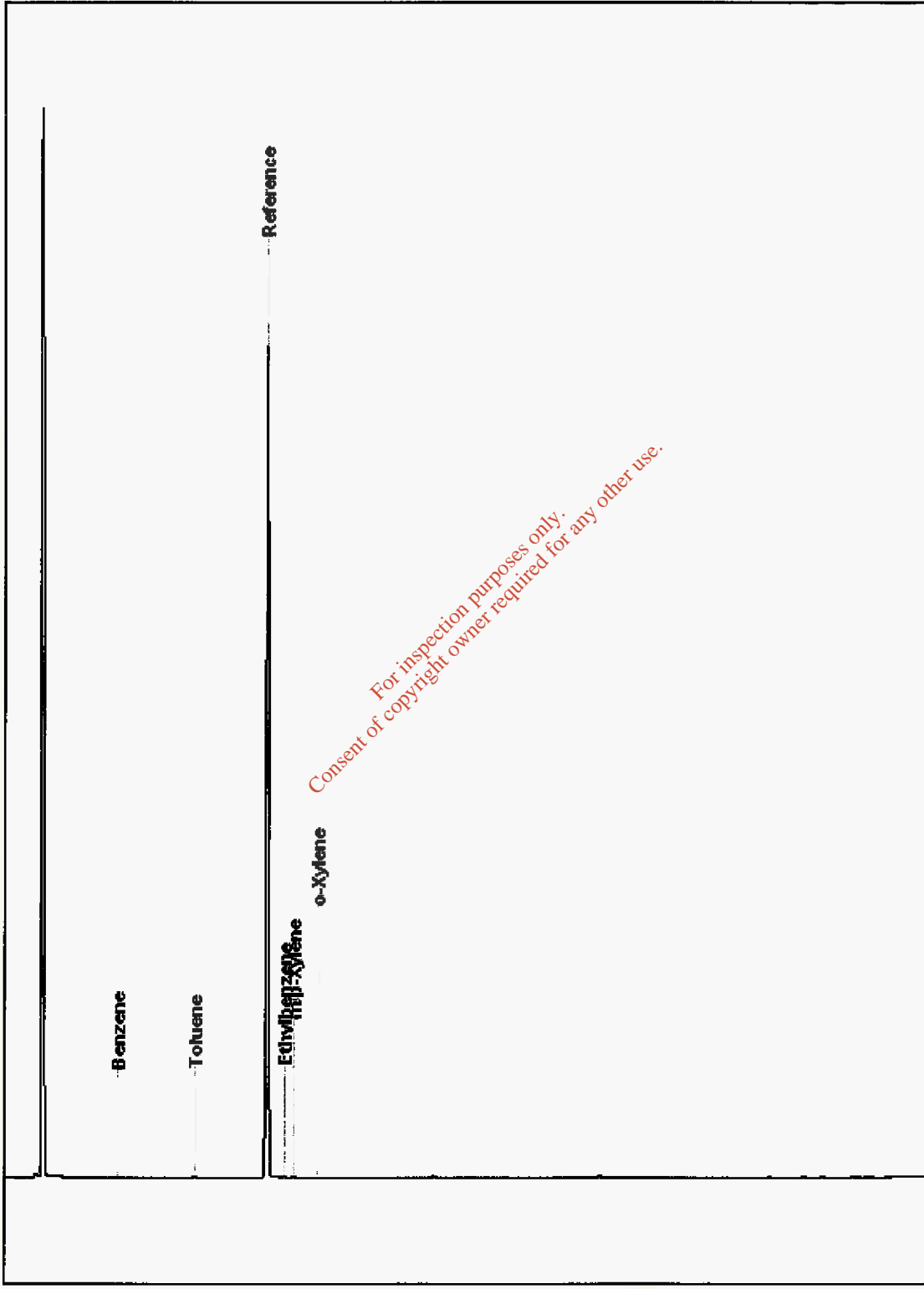
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 3732197
Sample ID : 20476-1-COMP A

Depth :

3732197_GRO_S_DATA - Chem 63 FID



SDG: 110623-93
Job: D_VERDE_KCL-365
Client Reference: 20476

Location: Limerick Co Co
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 137321
Superseded Report: 136560

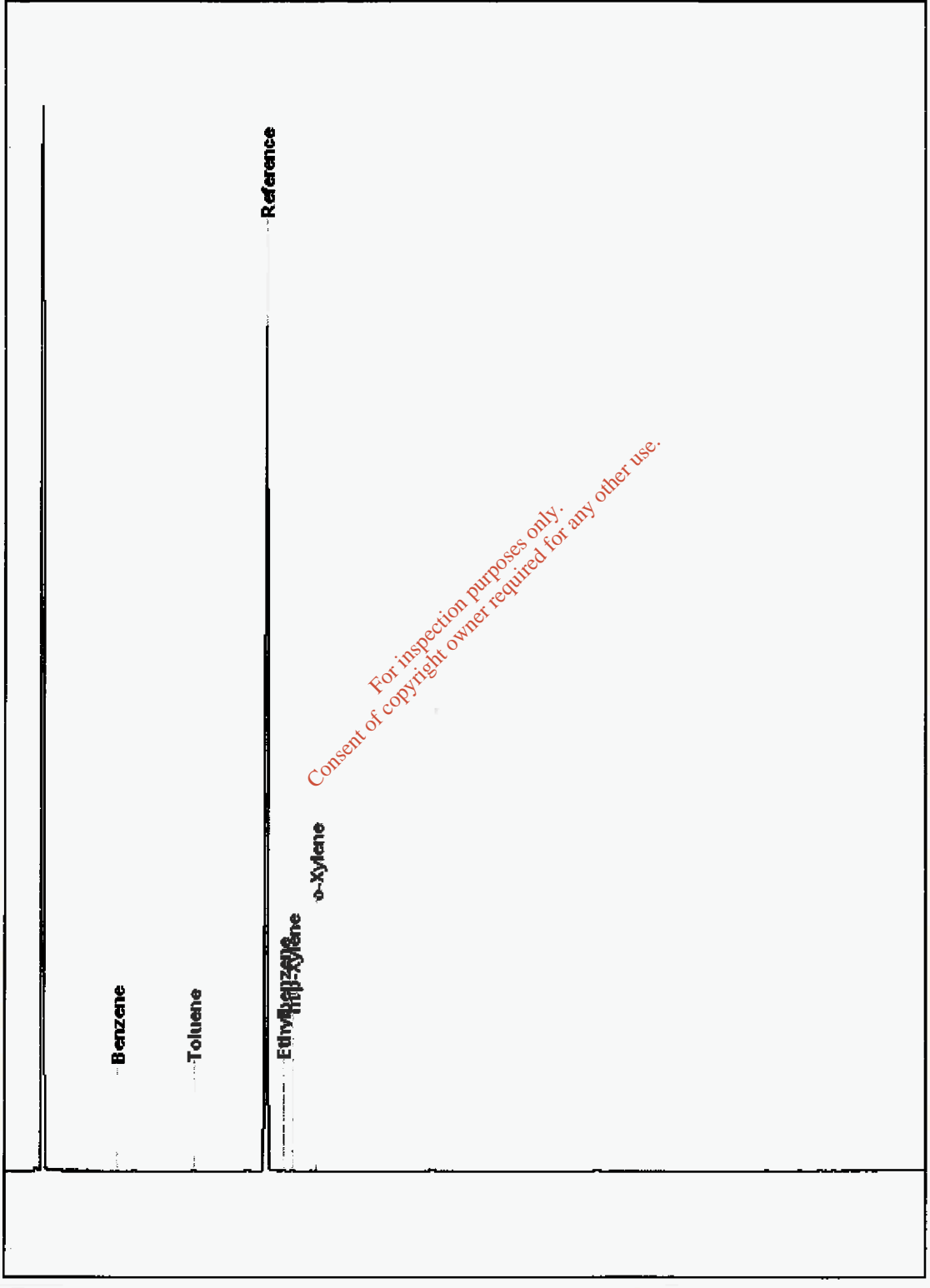
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 3732207
Sample ID : 20476-1-COMP B

Depth :

3732207_GRO_S.DATA - Chem 63 FID



SDG: 110623-93
Job: D_VERDE_KCL-365
Client Reference: 20476

Location: Limerick Co Co
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 137321
Superseded Report: 136560

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS 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 both soil jars, tubs and viallets jars. All waters and viallets jars will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos 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 screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample - similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

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 for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

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 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 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 GC/FID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

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 GC/FID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 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 GC/MS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY				
ANALYSE	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DCM	SOXHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXHERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DCM	SOXHERM	ATROSCAN
ELEMENTAL SULPHUR	D&C	DCM	SOXHERM	HPLC
PHENOLS BY GC/MS	WET	DCM	SOXHERM	GC/MS
HERBICIDES	D&C	HEXANE/ACETONE	SOXHERM	GC/MS
PESTICIDES	D&C	HEXANE/ACETONE	SOXHERM	GC/MS
EPH (GRO)	D&C	HEXANE/ACETONE	END OVER/END	GC/FID
EPH (MIN OIL)	D&C	HEXANE/ACETONE	END OVER/END	GC/FID
EPH (CLEANED UP)	D&C	HEXANE/ACETONE	END OVER/END	GC/FID
EPH O/G BY GC	D&C	HEXANE/ACETONE	END OVER/END	GC/FID
PCB TOT / PCB CON	D&C	HEXANE/ACETONE	END OVER/END	GC/MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TMBS.	GC/MS
C8-C10 (C8-C10) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GC/EZ
POLYAROMATIC HYDROCARBONS RARE GC	WET	HEXANE/ACETONE	SHAKER	GC/EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOMACETONE	SONICATE	GC/MS

LIQUID MATRICES EXTRACTION SUMMARY			
ANALYSE	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH/MS	HEXANE	STIRREDEXTRACTION (STIR-BAR)	GC/MS
EPH	HEXANE	STIRREDEXTRACTION (STIR-BAR)	GC/FID
EPH O/G	HEXANE	STIRREDEXTRACTION (STIR-BAR)	GC/FID
MINERAL OIL	HEXANE	STIRREDEXTRACTION (STIR-BAR)	GC/FID
PCB CONGENERS	HEXANE	STIRREDEXTRACTION (STIR-BAR)	GC/MS
PCB TOTAL	HEXANE	STIRREDEXTRACTION (STIR-BAR)	GC/MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC/MS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OC/POP	DCM	LIQUID/LIQUID SHAKE	GC/MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC/MS
PHENOLS/MS	DCM	SOLID PHASE EXTRACTION	GC/MS
TRH BY INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL BY IR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC/MS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
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.



Verde Remediation Services
F27
Bullford Business Campus
Kilcoole
Co.Wicklow

Attention: Cyril Tynan

CERTIFICATE OF ANALYSIS

Date: 07 July 2011
Customer: D_VERDE_KCL
Sample Delivery Group (SDG): 110621-46
Your Reference: 20476
Location: 20476 LCC
Report No: 138295

This report has been revised and directly supersedes 138284 In its entirety.

We received 14 samples on Tuesday June 21, 2011 and 14 of these samples were scheduled for analysis which was completed on Thursday July 07, 2011. 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.

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Approved By:

Sonia McWhan
Operations Manager



SDG: 110621-46	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-360	Customer: Verde Remediation Services	Report Number: 138295
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 138284

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3712899	20476-1-011B			17/06/2011
3712900	20476-1-014A			17/06/2011
3712901	20476-1-014B			17/06/2011
3712888	20476-1-01B			17/06/2011
3712889	20476-1-01C			17/06/2011
3712890	20476-1-02B			17/06/2011
3712891	20476-1-04A			17/06/2011
3712892	20476-1-04B			17/06/2011
3712893	20476-1-04C			17/06/2011
3712894	20476-1-07B			17/06/2011
3712895	20476-1-07C			17/06/2011
3712896	20476-1-08B			17/06/2011
3712897	20476-1-09A			17/06/2011
3712898	20476-1-09B			17/06/2011

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

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SDG: 110821-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

SOLID Results Legend X Test N No Determination Possible	Lab Sample No(s)	3712801 3712800	3712899 3712898 3712897	3712896 3712895 3712894	3712893 3712892 3712891 3712890 3712889 3712888			
	Customer Sample Reference	20476-1-014B 20476-1-014A	20476-1-011B 20476-1-08B 20476-1-08A	20476-1-08B 20476-1-07C 20476-1-07B	20476-1-04C 20476-1-04B 20476-1-04A 20476-1-02B 20476-1-01C 20476-1-01B			
	AGS Reference							
	Depth (m)							
	Container	JAR (D) Tube for ICP MS JAR (D)	JAR (D) JAR (D) JAR (D)	JAR (D) JAR (D) JAR (D)	JAR (D) JAR (D) JAR (D) JAR (D) JAR (D) JAR (D)			
	60g VOC Dublin (AL)							
Anions by Kone (w)	All	NDPs 1 Tests 4	X	X	X	X	N	
Boron Water Soluble	All	NDPs 0 Tests 9	X	X	X	X	X	X
CEN Readings	All	NDPs 1 Tests 4	X	X	X	X	M	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs 0 Tests 9	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs 1 Tests 4	X	X	X	X	X	N
Dissolved Organic/Inorganic Carbon	All	NDPs 1 Tests 4	X	X	X	X	M	
Easily Liberated Sulphide	All	NDPs 0 Tests 9	X	X	X	X	X	X
Fluoride	All	NDPs 1 Tests 4	X	X	X	X	N	
GRO by GC-FID (S)	All	NDPs 0 Tests 4	X	X	X	X	X	
Mercury Dissolved	All	NDPs 1 Tests 4	X	X	X	X	M	
Metals by ICap-OES (Soil)	Arsenic	NDPs 0 Tests 9	X	X	X	X	X	X
	Cadmium	NDPs 0 Tests 9	X	X	X	X	X	X
	Chromium	NDPs 0 Tests 9	X	X	X	X	X	X
	Copper	NDPs 0 Tests 9	X	X	X	X	X	X
	Lead	NDPs 0 Tests 9	X	X	X	X	X	X

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

SOLID	Results Legend		Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
	X Test	N No Determination Possible					
Metals by iCap-OES (Soil)	Mercury	NDPs 0 Tests 9	3712891 3712900	20476-1-014B 20476-1-014A			JAR (D) Tube for CP MIS JAR (D) 60g VOC Dublin (AL)
	Nickel	NDPs 0 Tests 9	3712899 3712898 3712897	20476-1-011B 20476-1-09B 20476-1-09A			JAR (D) JAR (D) JAR (D) 60g VOC Dublin (AL)
	Selenium	NDPs 0 Tests 9	3712896 3712895 3712894	20476-1-09B 20476-1-07C 20476-1-07B			JAR (D) JAR (D) JAR (D) 60g VOC Dublin (AL)
	Zinc	NDPs 0 Tests 9	3712893 3712892 3712891 3712890 3712889 3712888	20476-1-04C 20476-1-04B 20476-1-04A 20476-1-02B 20476-1-01C 20476-1-01B			JAR (D) JAR (D) JAR (D) JAR (D) JAR (D) JAR (D) 60g VOC Dublin (AL)
Mineral Oil	All	NDPs 0 Tests 4					
NO3, NO2 and TON by KONE (s)	All	NDPs 0 Tests 9					
PAH by GCMS	All	NDPs 0 Tests 4					
PAH Value of soil	All	NDPs 0 Tests 4					
PCBs by GCMS	All	NDPs 0 Tests 4					
pH	All	NDPs 0 Tests 9					
Phenols by HPLC (S)	All	NDPs 0 Tests 9					
Phenols by HPLC (W)	All	NDPs 1 Tests 4					
Phosphate (Ortho as PO4) (s)	All	NDPs 0 Tests 9					
Sample description	All	NDPs 0 Tests 14					
Solvent Extract	All	NDPs 0 Tests 9					

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

SOLID Results Legend	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
	X Test N No Determination Possible	3712801 3712900	20476-1-014B 20476-1-014A		
	3712899 3712898 3712897	20476-1-011B 20476-1-09B 20476-1-09A			60g VOC Dublin (AL) JAR (D) JAR (D) JAR (D)
	3712896 3712895 3712894	20476-1-09B 20476-1-07C 20476-1-07B			60g VOC Dublin (AL) JAR (D) JAR (D) JAR (D)
	3712893 3712892 3712891 3712890 3712889 3712888	20476-1-04C 20476-1-04B 20476-1-04A 20476-1-02B 20476-1-01C 20476-1-01B			60g VOC Dublin (AL) JAR (D) JAR (D) JAR (D) JAR (D) JAR (D)
Total Dissolved Solids on Leachates	All	NDPs 1 Tests 4			X N
Total Organic Carbon	All	NDPs 0 Tests 7			X X X X X X X
Total Sulphate	All	NDPs 0 Tests 9			X X X X X X X X X
Total Sulphur	All	NDPs 0 Tests 9			X X X X X X X X X

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SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

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	Grain size	Inclusions	Inclusions 2
3712891	20476-1-04A		Dark Brown	Silt Loam	0.063 - 0.1 mm	Stones	None
3712897	20476-1-09A		Dark Brown	Silt Loam	0.063 - 0.1 mm	Stones	None
3712900	20476-1-014A		Light Brown	Silt Loam	0.063 - 0.1 mm	Vegetation	None
3712888	20476-1-01B		Dark Brown	Silt Loam	0.063 - 0.1 mm	Stones	None
3712890	20476-1-02B		Dark Brown	Silt Loam	0.063 - 0.1 mm	None	None
3712892	20476-1-04B		Light Brown	Silt Loam	0.063 - 0.1 mm	None	None
3712894	20476-1-07B		Light Brown	Sandy Silt Loam	0.1 - 2 mm	Stones	None
3712896	20476-1-08B		Light Brown	Sandy Silt Loam	0.1 - 2 mm	Stones	None
3712898	20476-1-09B		Light Brown	Silt Loam	0.063 - 0.1 mm	None	None
3712899	20476-1-011B		Dark Brown	Silt Loam	0.063 - 0.1 mm	Stones	Vegetation
3712901	20476-1-014B		Light Brown	Silt Loam	0.063 - 0.1 mm	None	None
3712889	20476-1-01C		Light Brown	Silty Clay Loam	0.1 - 2 mm	Stones	None
3712893	20476-1-04C		Light Brown	Silt Loam	0.063 - 0.1 mm	Stones	None
3712895	20476-1-07C		Light Brown	Silt Loam	0.063 - 0.1 mm	None	None

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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SDG: 110621-46 Location: 20476 LCC Order Number: 20476
 Job: D_VERDE_KCL-360 Customer: Verde Remediation Services Report Number: 138295
 Client Reference: 20476 Attention: Mariusz Gardjan Superseded Report: 138284

Results Legend			Customer Sample R	20476-1-04A	20476-1-08A	20476-1-014A	20476-1-01B	2047C-1-02B	20476-1-04B
#	ISO17025 accredited.		Depth (m)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
M	mCERTS accredited.		Sample Type	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
S	Non-conforming work.		Date Sampled	21/06/2011	21/06/2011	21/06/2011	21/06/2011	21/06/2011	21/06/2011
aq	Aqueous / settled sample.		Date Received	110621-46	110621-46	110621-46	110621-46	110621-46	110621-46
dis.filt	Dissolved / filtered sample.		SDG Ref	3712891	3712897	3712900	3712888	3712890	3712892
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)						
*	Subcontracted test.		AGS Reference						
**	% 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								
Component	LOD/Units	Method							
Moisture	%	PM114		34	16.9	23.2			
Moisture content ratio	%	PM114		51.6	20.3	30.2			
Dry matter content ratio	%	PM114		66	83.1	76.8			
Solvent Extractable Matter (SEM)	<100 mg/kg	TM004	1360 #				1170 #		<100 #
Mineral oil >C10-C40	<1 mg/kg	TM061		34.8 #	59.3 #	304 #			
Surrogate Value	-	TM061		34	43.9	43.9			
Mineral Oil Surrogate % recovery**	%	TM061		68.1	87.8	87.7			
Alcohols, Total Detected Anhydric	mg/kg	TM062 (S)	0.0172				none detected		none detected
Organic Carbon, Total	<0.2 %	TM132		2.84 #	6.18 #	1.69 #			
Sulphur, Total	<0.02 %	TM132	0.12 #				0.12 #		0.02 #
Organic Matter, Total	<0.35 %	TM132	5.88 #						<0.35 #
pH	1 pH Units	TM133	7.23 M				6.55 M		8.18 M
Total Cyanide	<1 mg/kg	TM153	<1 M				<1 M		<1 M
PCB congener 28	<3 µg/kg	TM168		<3 M	<3 M	10.8 M			
PCB congener 52	<3 µg/kg	TM168		<3 M	<3 M	6.28 M			
PCB congener 101	<3 µg/kg	TM168		<3 M	<3 M	3.14 M			
PCB congener 118	<3 µg/kg	TM168		<3 M	<3 M	6.82 M			
PCB congener 138	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 153	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 180	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
Sum of detected PCB 7 congeners	µg/kg	TM168		none detected	none detected	27			
Sulphide, Easily liberated	<15 mg/kg	TM180	<15 #				<15 #		<15 #
Arsenic	<0.6 mg/kg	TM181	23.6 M				10.3 M		6.35 M
Cadmium	<0.02 mg/kg	TM181	1.53 M				1.27 M		0.549 M
Chromium	<0.9 mg/kg	TM181	43.1 M				33.2 M		24.1 M
Copper	<1.4 mg/kg	TM181	51 M				46.4 M		19.2 M
Lead	<0.7 mg/kg	TM181	694 M				135 M		41 M
Mercury	<0.14 mg/kg	TM181	<0.14 M				<0.14 M		<0.14 M
Nickel	<0.2 mg/kg	TM181	31.6 M				25.1 M		34.8 M
Selenium	<1 mg/kg	TM181	3.71 #				2.1 #		<1 #
Zinc	<1.9 mg/kg	TM181	82 M				134 M		56.9 M
Coronene	<2 mg/kg	TM213		<2	<2	<2			
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213		<10	<10	<10			
Sulphate, Total	<48 mg/kg	TM221	1210 M				1810 M		50.7 M
Boron, water soluble	<1 mg/kg	TM222	1.75 M				1.72 M		<1 M



CERTIFICATE OF ANALYSIS

Validated

SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

Table with columns for Customer Sample R (20476-1-04A, 20476-1-09A, 20476-1-014A, 20476-1-01B, 20476-1-02B, 20476-1-04B) and rows for Component (Phosphate, Total Oxidised Nitrogen), LOD/Units, Method, and various data points. Includes a 'Results Legend' section on the left and a large red watermark: 'For inspection purposes only. Consent of copyright owner required for any other use.'

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

Results Legend			Customer Sample R	20476-1-07B	20476-1-08B	20476-1-09B	20476-1-011B	20476-1-014B	20476-1-01C	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) ACS Reference	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
M	mCERTS accredited.			17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
S	Non-conforming work.			21/08/2011	21/08/2011	21/08/2011	21/08/2011	21/08/2011	21/08/2011	21/08/2011
AQ	Aqueous / settled sample.			110621-46	110621-46	110621-46	110621-46	110621-46	110621-46	110621-46
DIS.FIL	Dissolved / filtered sample.			3712894	3712896	3712898	3712899	3712901	3712889	
TOT.FIL	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									
Component	LOD/Units	Method								
Moisture	%	PM114	18.9							
Moisture content ratio	%	PM114	23.3							
Dry matter content ratio	%	PM114	81.1							
Solvent Extractable Matter (SEM)	<100 mg/kg	TM004		460 #	<100 #	1930 #	141 #	<100 #		
Mineral oil >C10-C40	<1 mg/kg	TM061	137 #							
Surrogate Value	-	TM061	43.8							
Mineral Oil Surrogate % recovery**	%	TM061	87.7							
Phenols, Total Detected Monohydric	mg/kg	TM062 (S)		none detected	none detected	none detected	none detected	none detected	none detected	
Organic Carbon, Total	<0.2 %	TM132	0.787 #							
Sulphur, Total	<0.02 %	TM132		0.09 #	<0.02 #	0.34 #	0.037 #	0.03 #		
pH	1 pH Units	TM133		7.82 M	8.1 M	7.03 M	7.84 M	8.03 M		
Total Cyanide	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M		
PCB congener 28	<3 µg/kg	TM168	3.24 M							
PCB congener 52	<3 µg/kg	TM168	<3 M							
PCB congener 101	<3 µg/kg	TM168	<3 M							
PCB congener 118	<3 µg/kg	TM168	<3 M							
PCB congener 138	<3 µg/kg	TM168	<3 M							
PCB congener 153	<3 µg/kg	TM168	<3 M							
PCB congener 180	<3 µg/kg	TM168	<3 M							
Sum of detected PCB 7 Congeners	µg/kg	TM168	3.24							
Phosphide, Easily liberated	<15 mg/kg	TM180		48.8 #	<15 #	33.4 #	<15 #	<15 #		
Arsenic	<0.6 mg/kg	TM181		10.3 M	11.8 M	10.2 M	3.76 M	12.9 M		
Cadmium	<0.02 mg/kg	TM181		0.774 M	0.698 M	1.36 M	0.318 M	0.896 M		
Chromium	<0.9 mg/kg	TM181		23.2 M	23.1 M	31.4 M	33 M	30.8 M		
Copper	<1.4 mg/kg	TM181		33.8 M	18.3 M	46.7 M	16.9 M	5.55 M		
Lead	<0.7 mg/kg	TM181		78.5 M	42.4 M	187 M	46.3 M	44 M		
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M		
Nickel	<0.2 mg/kg	TM181		27.3 M	34.2 M	25.1 M	26.8 M	31.3 M		
Selenium	<1 mg/kg	TM181		<1 #	<1 #	1.49 #	<1 #	1.16 #		
Zinc	<1.9 mg/kg	TM181		118 M	58.1 M	1170 M	37.5 M	44.9 M		
Coronene	<2 mg/kg	TM213	<2							
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213	<10							
Sulphate, Total	<48 mg/kg	TM221		1010 M	78.9 M	3910 M	274 M	119 M		
Boron, water soluble	<1 mg/kg	TM222		1.73 M	<1 M	2.3 M	<1 M	<1 M		
Phosphate (ortho) as PO4	<1 mg/kg	TM243		<1	<1	<1	<1	<1		



CERTIFICATE OF ANALYSIS

Validated

SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

Table with columns for Customer Sample R (20476-1-07B to 20476-1-01C), Depth (m), Sample Type, Date Sampled, Date Received, SDG Ref, Lab Sample No.(s), and AGS Reference. Includes a Results Legend and a Component table for Total Oxidised Nitrogen as N, 2:1 water soluble.

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SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

Results Legend		Customer Sample R	20476-1-04C	20476-1-07C			
#	ISO17025 accredited.	Depth (m)	Soil/Solid	Soil/Solid			
M	mCERTS accredited.	Sample Type	17/06/2011	17/06/2011			
S	Non-conforming work.	Date Sampled	21/06/2011	21/06/2011			
aq	Aqueous / settled sample.	Date Received	110621-46	110621-46			
diss.filt	Dissolved / filtered sample.	SDG Ref	371289?	3712895			
tot.unfilt	Total / unfiltered sample.	Lab Sample No.(s)					
*	Subcontracted test.	AGS Reference					
**	% 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						
Component	LOD/Units	Method					
Solvent Extractable Matter (SEM)	<100 mg/kg	TM004		<100 #			
Phenols, Total Detected monohydric	mg/kg	TM062 (S)		none detected			
Sulphur, Total	<0.02 %	TM132		<0.02 #			
Organic Matter, Total	<0.35 %	TM132	0.448 #				
pH	1 pH Units	TM133		8.22 M			
Total Cyanide	<1 mg/kg	TM153		<1 M			
Sulphide, Easily liberated	<15 mg/kg	TM180		<15 #			
arsenic	<0.6 mg/kg	TM181		5.86 M			
Cadmium	<0.02 mg/kg	TM181		0.439 M			
Chromium	<0.9 mg/kg	TM181		23.5 M			
Copper	<1.4 mg/kg	TM181		16 M			
Lead	<0.7 mg/kg	TM181		38 M			
Mercury	<0.14 mg/kg	TM181		<0.14 M			
Nickel	<0.2 mg/kg	TM181		29 M			
Selenium	<1 mg/kg	TM181		#			
Zinc	<1.9 mg/kg	TM181		47.6 M			
Sulphate, Total	<48 mg/kg	TM221		106 M			
Boron, water soluble	<1 mg/kg	TM222		<1 M			
Phosphate (ortho) as PO4	<1 mg/kg	TM243		<1 M			
Total Oxidised Nitrogen as N, 2:1 water soluble	<1 mg/kg	TM243		<1 #			

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CERTIFICATE OF ANALYSIS

Validated

SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

GRO by GC-FID (S)

Table with columns for Results Legend, Customer Sample R, and sample IDs (20476-1-08A, 20476-1-014A, 20476-1-01E, 20476-1-07B). Rows include components like Methyl tertiary butyl ether (MTBE), Benzene, Toluene, Ethylbenzene, m,p-Xylene, o-Xylene, and sum of detected mpo xylene by GC.

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SDG: 110621-46 Location: 20476 LCC Order Number: 20476
 Job: D_VERDE_KCL-360 Customer: Verde Remediation Services Report Number: 138295
 Client Reference: 20476 Attention: Mariusz Gardjan Superseded Report: 138284

PAH by GCMS

Results Legend		Customer Sample R	20476-1-08A	20476-1-014A	20476-1-015	20476-1-07B		
#	ISO17025 accredited.	Depth (m)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
M	mCERTS accredited.	Sample Type	17/06/2011	17/06/2011	17/06/2011	17/06/2011		
S	Non-conforming work.	Date Sampled	21/06/2011	21/06/2011	21/06/2011	21/06/2011		
ag	Aqueous / settled sample.	Date Received	110621-46	110621-46	110621-46	110621-46		
diss.filt	Dissolved / filtered sample.	SDG Ref	3712897	3712900	3712888	3712894		
recunfiltr	Total / unfiltered sample.	Lab Sample No.(s)						
-	Subcontracted test.	AGS Reference						
..	% 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							
Component	LOD/Units	Method						
Naphthalene-d8 % recovery**	%	TM218	91.4	103	93.9	94.3		
Acenaphthene-d10 % recovery**	%	TM218	89.6	102	94.5	93.4		
Phenanthrene-d10 % recovery**	%	TM218	86.1	99.6	91.8	91.3		
Chrysene-d12 % recovery**	%	TM218	86.4	101	98.4	98.4		
Perylene-d12 % recovery**	%	TM218	90.4	106	105	104		
Naphthalene	<9 µg/kg	TM218	71.1	1440	134	17.6		
Acenaphthylene	<12 µg/kg	TM218	<12	42.5	109	<12		
Fluorene	<8 µg/kg	TM218	<8	147	1150	<8		
Fluorene	<10 µg/kg	TM218	15.5	120	326	15.8		
Phenanthrene	<15 µg/kg	TM218	80.6	210	835	49.9		
Anthracene	<16 µg/kg	TM218	<16	49.9	241	<16		
Fluoranthene	<17 µg/kg	TM218	135	125	3820	73		
Pyrene	<15 µg/kg	TM218	109	92.2	5670	69.4		
Benzo(a)anthracene	<14 µg/kg	TM218	89.2	76.5	838	63.7		
Chrysene	<10 µg/kg	TM218	57.4	54.8	544	38.3		
Benzo(b)fluoranthene	<15 µg/kg	TM218	123	113	726	65.7		
Benzo(k)fluoranthene	<14 µg/kg	TM218	35.9	32.5	212	24.9		
Benzo(a)pyrene	<15 µg/kg	TM218	78.1	61.8	539	50		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	50.4	42.4	269	28.8		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23	<23	93.5	<23		
Benzo(g,h,i)perylene	<24 µg/kg	TM218	63.2	51.6	332	38.4		
PAH, Total Detected USEPA 16	<116 µg/kg	TM218	908	2660	15800	535		

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	20476 LCC
Mass Sample taken (kg)	0.118	Moisture Content Ratio (%)	30.2
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	76.8
Particle Size <4mm	>95%		

Case
 SDG 110621-46
 Lab Sample Number(s) 3712888
 Sampled Date 17-Jun-2011
 Customer Sample Ref. 20476-1-01B
 Depth (m)

Solid Waste Analysis	Result	Murphy LoD mg/kg dry substance
Total Organic Carbon (%) on Ignition (%)	1.69	<30,000.0 mg/kg dry substance
Sum of BTEX (mg/kg)	0.00393	<6.0
Sum of 7 PCBs (mg/kg)	0.027	<1.0
Mineral Oil (mg/kg)	304	<500.0
PAH Sum of 17 (mg/kg)	<10.0	<100.0
pH (pH Units)		
ANC to pH 6 (mol/kg)		
ANC to pH 4 (mol/kg)		

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Murphy Limits of Detection mg/kg dry
	Result	Limit of Detection	Result	Limit of Detection	
Arsenic	0.000734	<0.00012	0.00734	<0.0012	0.5
Barium	0.0438	<0.00003	0.438	<0.0003	20
Cadmium	<0.0001	<0.0001	<0.001	<0.001	0.04
Chromium	0.00218	<0.00022	0.0218	<0.0022	0.5
Copper	0.00486	<0.00085	0.0486	<0.0085	2
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01
Molybdenum	0.00551	<0.00024	0.0551	<0.0024	0.5
Nickel	0.00227	<0.00015	0.0227	<0.0015	0.4
Lead	0.000035	<0.00002	0.00035	<0.0002	0.5
Antimony	0.00117	<0.00016	0.0117	<0.0016	0.06
Selenium	<0.00039	<0.00039	<0.0039	<0.0039	0.1
Zinc	0.00578	<0.00041	0.0578	<0.0041	4
Chloride	2.7	<2	27	<20	800
Fluoride	<0.5	<0.5	<5	<5	10
Sulphate (soluble)	213	<2	2130	<20	1000
Total Dissolved Solids	383	<10	3830	<100	4000
Total Monohydric Phenols (W)	0	<0	0	<0	1
Dissolved Organic Carbon	3.99	<3	39.9	<30	500

Leach Test Information

Date Prepared 22-Jun-2011
 pH (pH Units) 7.39
 Conductivity (µS/cm) 522.00
 Temperature (°C) 22.10
 Volume Leachant (Litres) 0.873
 Volume of Eluate VE1 (Litres)

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

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	20476 LCC
Mass Sample taken (kg)	0.111	Moisture Content Ratio (%)	23.3
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	81.1
Particle Size <4mm	>95%		

Case
 SDG 110621-46
 Lab Sample Number(s) 3712894
 Sampled Date 17-Jun-2011
 Customer Sample Ref. 20476-1-07B
 Depth (m)

Solid Waste Analysis	Result	Murphy LoD mg/kg dry substance
Total Organic Carbon (%)	0.787	<30,000.0 mg/kg dry substance
on Ignition (%)	-	
Sum of BTEX (mg/kg)	0.00252	<6.0
Sum of 7 PCBs (mg/kg)	0.00324	<1.0
Mineral Oil (mg/kg)	137	<500.0
PAH Sum of 17 (mg/kg)	<10.0	<100.0
pH (pH Units)	-	
ANC to pH 6 (mol/kg)	-	
ANC to pH 4 (mol/kg)	-	

Eluate Analysis	C2 Conc ⁿ In 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Murphy Limits of Detection mg/kg dry
	Result	Limit of Detection	Result	Limit of Detection	
Arsenic	0.0023	<0.00012	0.023	<0.0012	0.5
Barium	0.0452	<0.00003	0.452	<0.0003	20
Cadmium	<0.0001	<0.0001	<0.001	<0.001	0.04
Chromium	0.00253	<0.00022	0.0253	<0.0022	0.5
Copper	<0.00085	<0.00085	<0.0085	<0.0085	2
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01
Molybdenum	0.0216	<0.00024	0.216	<0.0024	0.5
Nickel	0.00422	<0.00015	0.0422	<0.0015	0.4
Lead	0.000318	<0.00002	0.00318	<0.0002	0.5
Antimony	0.00369	<0.00016	0.0369	<0.0016	0.06
Selenium	0.000588	<0.00039	0.00588	<0.0039	0.1
Zinc	0.00121	<0.00041	0.0121	<0.0041	4
Chloride	<2	<2	<20	<20	800
Fluoride	<0.5	<0.5	<5	<5	10
Sulphate (soluble)	114	<2	1140	<20	1000
Total Dissolved Solids	310	<10	3100	<100	4000
Total Monohydric Phenols (W)	0	<0	0	<0	1
Dissolved Organic Carbon	8.55	<3	85.5	<30	500

Leach Test Information

Date Prepared 22-Jun-2011
 pH (pH Units) 7.69
 Conductivity (µS/cm) 415.00
 Temperature (°C) 22.10
 Volume Leachant (Litres) 0.879
 Volume of Eluate VE1 (Litres)

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
 Mceris Certification does not apply to leachates

07/07/2011 20:02:18
 20:02:13 07/07/2011

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	20476 LCC
Mass Sample taken (kg)	0.136	Moisture Content Ratio (%)	51.6
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	66.0
Particle Size <4mm	>95%		

Case
 SDG 110621-46
 Lab Sample Number(s) 3712897
 Sampled Date 17-Jun-2011
 Customer Sample Ref. 20476-1-09A
 Depth (m)

Solid Waste Analysis	Result	Murphy LoD mg/kg dry substance
Total Organic Carbon (%)	2.84	<30,000.0 mg/kg dry substance
on Ignition (%)	-	-
Sum of BTEX (mg/kg)	0.00308	<6.0
Sum of 7 PCBs (mg/kg)	none detected	<1.0
Mineral Oil (mg/kg)	34.8	<500.0
PAH Sum of 17 (mg/kg)	<10.0	<100.0
pH (pH Units)	-	-
ANC to pH 6 (mol/kg)	-	-
ANC to pH 4 (mol/kg)	-	-

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Murphy Limits of Detection mg/kg dry
	Result	Limit of Detection	Result	Limit of Detection	
Arsenic	0.00446	<0.00012	0.0446	<0.0012	0.5
Barium	0.0221	<0.00003	0.221	<0.0003	20
Cadmium	<0.0001	<0.000022	<0.001	<0.001	0.04
Chromium	0.00285	<0.00022	0.0285	<0.0022	0.5
Copper	0.0139	<0.00085	0.139	<0.0085	2
Mercury Dissolved (CVAf)	0.0000146	<0.00001	0.000146	<0.0001	0.01
Molybdenum	0.00615	<0.00024	0.0615	<0.0024	0.5
Nickel	0.0032	<0.00015	0.032	<0.0015	0.4
Lead	0.000905	<0.00002	0.00905	<0.0002	0.5
Antimony	0.0123	<0.00016	0.123	<0.0016	0.06
Selenium	0.000926	<0.00039	0.00926	<0.0039	0.1
Zinc	0.00716	<0.00041	0.0716	<0.0041	4
Fluoride	2.5	<2	25	<20	800
Sulphate (soluble)	<0.5	<0.5	<5	<5	10
Total Dissolved Solids	44.2	<2	442	<20	1000
Total Monohydric Phenols (W)	220	<10	2200	<100	4000
Dissolved Organic Carbon	0	<0	0	<0	1
	14.6	<3	146	<30	500

Leach Test Information

Date Prepared 22-Jun-2011
 pH (pH Units) 7.77
 Conductivity (µS/cm) 289.00
 Temperature (°C) 22.10
 Volume Leachant (Litres) 0.854
 Volume of Eluate VE1 (Litres)

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

07/07/2011 20:02:18
 20:02:13 07/07/2011

SDG: 110621-46
 Job: D_VERDE_KCL-380
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	20476 LCC
Mass Sample taken (kg)	0.108	Moisture Content Ratio (%)	20.3
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	83.1
Particle Size <4mm	>95%		

Case
 SDG 110621-46
 Lab Sample Number(s) 3712900
 Sampled Date 17-Jun-2011
 Customer Sample Ref. 20476-1-014A
 Depth (m)

Solid Waste Analysis	Result	Murphy LoD mg/kg dry substance
Total Organic Carbon (%)	6.18	<30,000.0 mg/kg dry substance
on Ignition (%)	-	-
Sum of BTEX (mg/kg)	none detected	<6.0
Sum of 7 PCBs (mg/kg)	none detected	<1.0
Mineral Oil (mg/kg)	59.3	<500.0
PAH Sum of 17 (mg/kg)	<10.0	<100.0
pH (pH Units)	-	-
ANC to pH 6 (mol/kg)	-	-
ANC to pH 4 (mol/kg)	-	-

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Murphy Limits of Detection mg/kg dry
	Result	Limit of Detection	Result	Limit of Detection	
Arsenic	0.0147	<0.00012	0.147	<0.0012	0.5
Barium	0.00784	<0.00003	0.0784	<0.0003	20
Cadmium	<0.0001	<0.0001	<0.001	<0.001	0.04
Chromium	0.00329	<0.00022	0.0329	<0.0022	0.5
Copper	0.0302	<0.00085	0.302	<0.0085	2
Mercury Dissolved (CVAF)	0.0000167	<0.00001	0.000167	<0.0001	0.01
Molybdenum	0.007	<0.00024	0.07	<0.0024	0.5
Nickel	0.00473	<0.00015	0.0473	<0.0015	0.4
Lead	0.00504	<0.00002	0.0504	<0.0002	0.5
Antimony	0.00439	<0.00016	0.0439	<0.0016	0.06
Selenium	0.00155	<0.00039	0.0155	<0.0039	0.1
Chloride	0.033	<0.00041	0.33	<0.0041	4
Fluoride	26	<2	260	<20	800
Sulphate (soluble)	<0.5	<0.5	<5	<5	10
Total Dissolved Solids	<2	<2	<20	<20	1000
Total Dissolved Solids	363	<10	3630	<100	4000
Total Monohydric Phenols (W)	0	<0	0	<0	1
Dissolved Organic Carbon	60.9	<3	609	<30	500

Leach Test Information

Date Prepared 01-Jul-2011
 pH (pH Units) 7.91
 Conductivity (µS/cm) 530.00
 Temperature (°C) 25.60
 Volume Leachant (Litres) 0.882
 Volume of Eluate VE1 (Litres)

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

07/07/2011 20:02:18
 20:02:13 07/07/2011



SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

Notification of NDPs (No determination possible)

Date Received : 21/06/2011 12:38:39

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
3712900	20476-1-014A		Dissolved Metals by ICP-MS	Insufficient Sample
3712900	20476-1-014A		Mercury Dissolved	Insufficient Sample
3712900	20476-1-014A		Anions by Kone (w)	Insufficient Sample
3712900	20476-1-014A		Fluoride	Insufficient Sample
3712900	20476-1-014A		Phenols by HPLC (W)	Insufficient Sample
3712900	20476-1-014A		Dissolved Organic/Inorganic Carbon	Insufficient Sample
3712900	20476-1-014A		Total Dissolved Solids on Leachates	Insufficient Sample
3712900	20476-1-014A		CEN 10:1 Leachate (1 Stage)	Insufficient Sample
3712900	20476-1-014A		CEN Readings	Insufficient Sample

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SDG: 110621-46	Location: 20478 LCC	Order Number: 20478
Job: D_VERDE_KCL-360	Customer: Verde Remediation Services	Report Number: 138295
Client Reference: 20478	Attention: Mariusz Gardjan	Superseded Report: 138284

Table of Results - Appendix

REPORT KEY

NDP No Determination Possible	# ISO 17025 Accredited	* Subcontracted Test	M MCERTS Accredited
NFD No Fibres Detected	PFD Possible Fibres Detected	W Result previously reported (Incremental reports only)	EC Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

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		
PM114		Leaching Procedure for CEN Two Stage Batch Test 2:1/8:1 Cumulative		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM004	Modified: US EPA Method 8321A	Solvent extraction of soil		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
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)		
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		
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		
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		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
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.

SDG: 110621-46
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	3712891 20476-1-04A	3712897 20476-1-09A	3712900 20476-1-014A	3712888 20476-1-01B	3712890 20476-1-02B	3712892 20476-1-04E	3712894 20476-1-07B	3712896 20476-1-08B	3712898 20476-1-09B	3712899 20476-1-011B
AGS Ref.										
Depth										
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Anions by Kone (w)		29-Jun-2011	07-Jul-2011	29-Jun-2011			29-Jun-2011			
Boron Water Soluble	24-Jun-2011				24-Jun-2011	24-Jun-2011		24-Jun-2011	24-Jun-2011	24-Jun-2011
CEN 10 1 Leachate (1 Stage)		22-Jun-2011	01-Jul-2011	22-Jun-2011			22-Jun-2011			
CEN Readings		28-Jun-2011	04-Jul-2011	28-Jun-2011			28-Jun-2011			
Cyanide Comp/Free/Total/Thiocyanate	23-Jun-2011				23-Jun-2011	23-Jun-2011		23-Jun-2011	23-Jun-2011	23-Jun-2011
Dissolved Metals by ICP-MS		27-Jun-2011	05-Jul-2011	27-Jun-2011			27-Jun-2011			
Dissolved Organic/Inorganic Carbon		27-Jun-2011	06-Jul-2011	27-Jun-2011			27-Jun-2011			
Easily Liberated Sulphide	23-Jun-2011				23-Jun-2011	23-Jun-2011		23-Jun-2011	23-Jun-2011	23-Jun-2011
Fluoride		27-Jun-2011	06-Jul-2011	27-Jun-2011			27-Jun-2011			
GRO by GC-FID (S)		23-Jun-2011	23-Jun-2011	28-Jun-2011			23-Jun-2011			
Mercury Dissolved		27-Jun-2011	06-Jul-2011	27-Jun-2011			27-Jun-2011			
Metals by iCap-OES (Soil)	24-Jun-2011				24-Jun-2011	24-Jun-2011		24-Jun-2011	24-Jun-2011	24-Jun-2011
Mineral Oil		30-Jun-2011	30-Jun-2011	30-Jun-2011			30-Jun-2011			
NO3, NO2 and TON by KONE (s)	27-Jun-2011				27-Jun-2011	27-Jun-2011		27-Jun-2011	27-Jun-2011	27-Jun-2011
PAH by GCMS		27-Jun-2011	27-Jun-2011	27-Jun-2011			27-Jun-2011			
H Value of soil		24-Jun-2011	24-Jun-2011	24-Jun-2011			24-Jun-2011			
CBs by GCMS		28-Jun-2011	28-Jun-2011	28-Jun-2011			28-Jun-2011			
pH	28-Jun-2011				28-Jun-2011	27-Jun-2011		28-Jun-2011	28-Jun-2011	28-Jun-2011
Phenols by HPLC (S)	24-Jun-2011				27-Jun-2011	24-Jun-2011		23-Jun-2011	23-Jun-2011	23-Jun-2011
Phenols by HPLC (W)		28-Jun-2011	06-Jul-2011	28-Jun-2011			28-Jun-2011			
Phosphate (Ortho as PO4) (s)	29-Jun-2011				29-Jun-2011	29-Jun-2011		29-Jun-2011	29-Jun-2011	29-Jun-2011
Sample description	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Solvent Extract	27-Jun-2011				27-Jun-2011	27-Jun-2011		27-Jun-2011	27-Jun-2011	27-Jun-2011
Total Dissolved Solids on Leachates		28-Jun-2011	05-Jul-2011	28-Jun-2011			28-Jun-2011			
Total Organic Carbon	24-Jun-2011	24-Jun-2011	24-Jun-2011	27-Jun-2011		23-Jun-2011	24-Jun-2011			
Total Sulphate	27-Jun-2011				27-Jun-2011	27-Jun-2011		27-Jun-2011	27-Jun-2011	27-Jun-2011
Total Sulphur	24-Jun-2011				24-Jun-2011	24-Jun-2011		24-Jun-2011	24-Jun-2011	24-Jun-2011

Lab Sample No(s) Customer Sample Ref.	3712901 20476-1-014B	3712889 20476-1-01C	3712893 20476-1-01E	3712895 20476-1-07C
AGS Ref.				
Depth				
Type	SOLID	SOLID	SOLID	SOLID
Boron Water Soluble	24-Jun-2011	24-Jun-2011		24-Jun-2011
Cyanide Comp/Free/Total/Thiocyanate	23-Jun-2011	24-Jun-2011		23-Jun-2011
Easily Liberated Sulphide	23-Jun-2011	23-Jun-2011		23-Jun-2011
Metals by iCap-OES (Soil)	24-Jun-2011	24-Jun-2011		24-Jun-2011
NO3, NO2 and TON by KONE (s)	23-Jun-2011	27-Jun-2011		27-Jun-2011
pH	28-Jun-2011	28-Jun-2011		27-Jun-2011
Phenols by HPLC (S)	23-Jun-2011	23-Jun-2011		23-Jun-2011
Phosphate (Ortho as PO4) (s)	23-Jun-2011	29-Jun-2011		29-Jun-2011
Sample description	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Solvent Extract	27-Jun-2011	27-Jun-2011		27-Jun-2011
Total Organic Carbon			24-Jun-2011	
Total Sulphate	23-Jun-2011	27-Jun-2011		27-Jun-2011
Total Sulphur	24-Jun-2011	24-Jun-2011		24-Jun-2011

SDG: 110621-46	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-360	Customer: Verde Remediation Services	Report Number: 138285
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 138284

Chromatogram

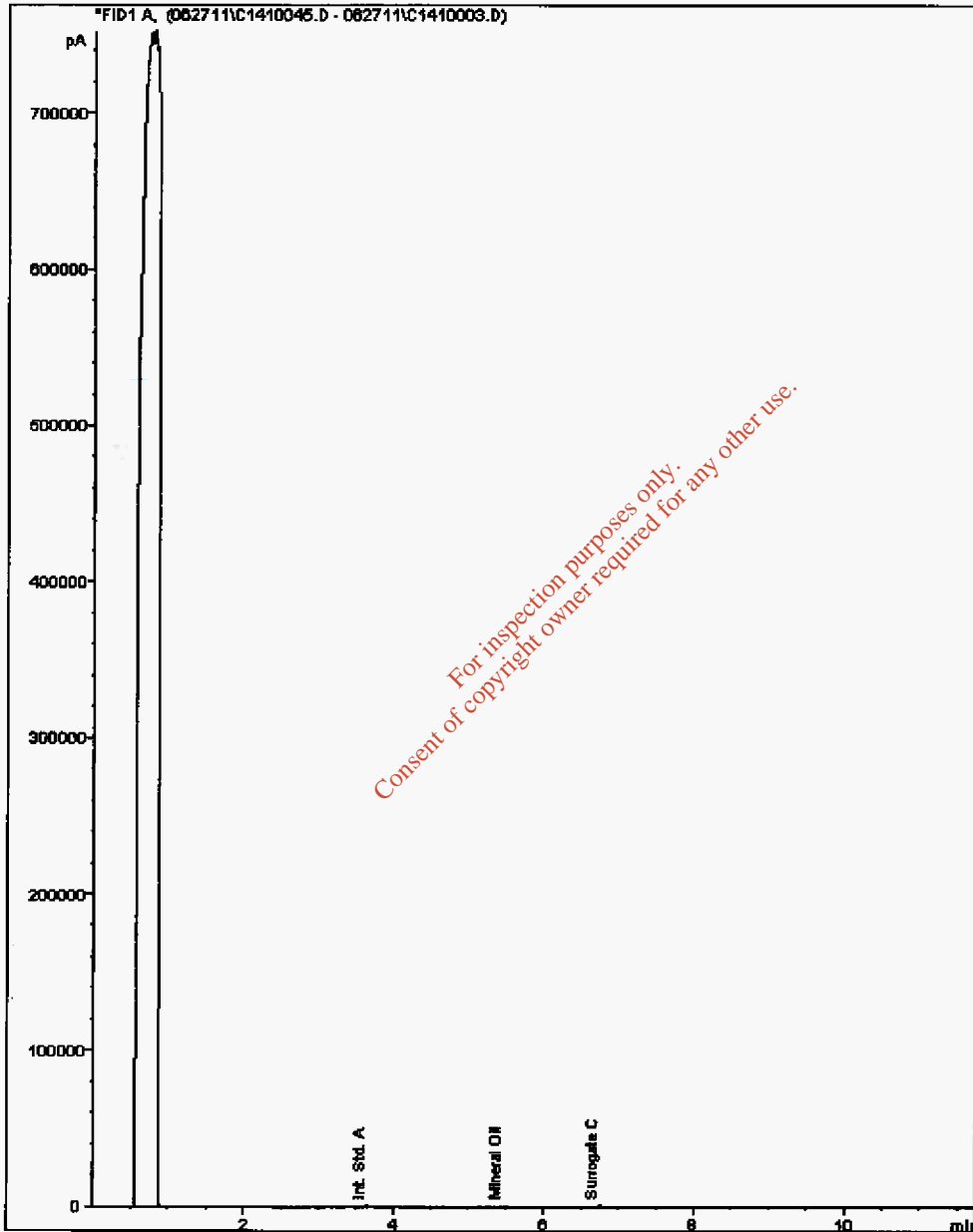
Analysis: Mineral Oil

Sample No : 3731841
 Sample ID : 20476-1-014A

Depth :

Alcontrol/Geochem Analytical Services
 Mineral Oil Range Organics (C10 - C40)

Sample Identity : 3732638-3731841
 Date Acquired : 28/06/11 01:35:34 PM
 Units : mg/kg
 Sample Multiplier : 0.000
 Dilution :





SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138264

Chromatogram

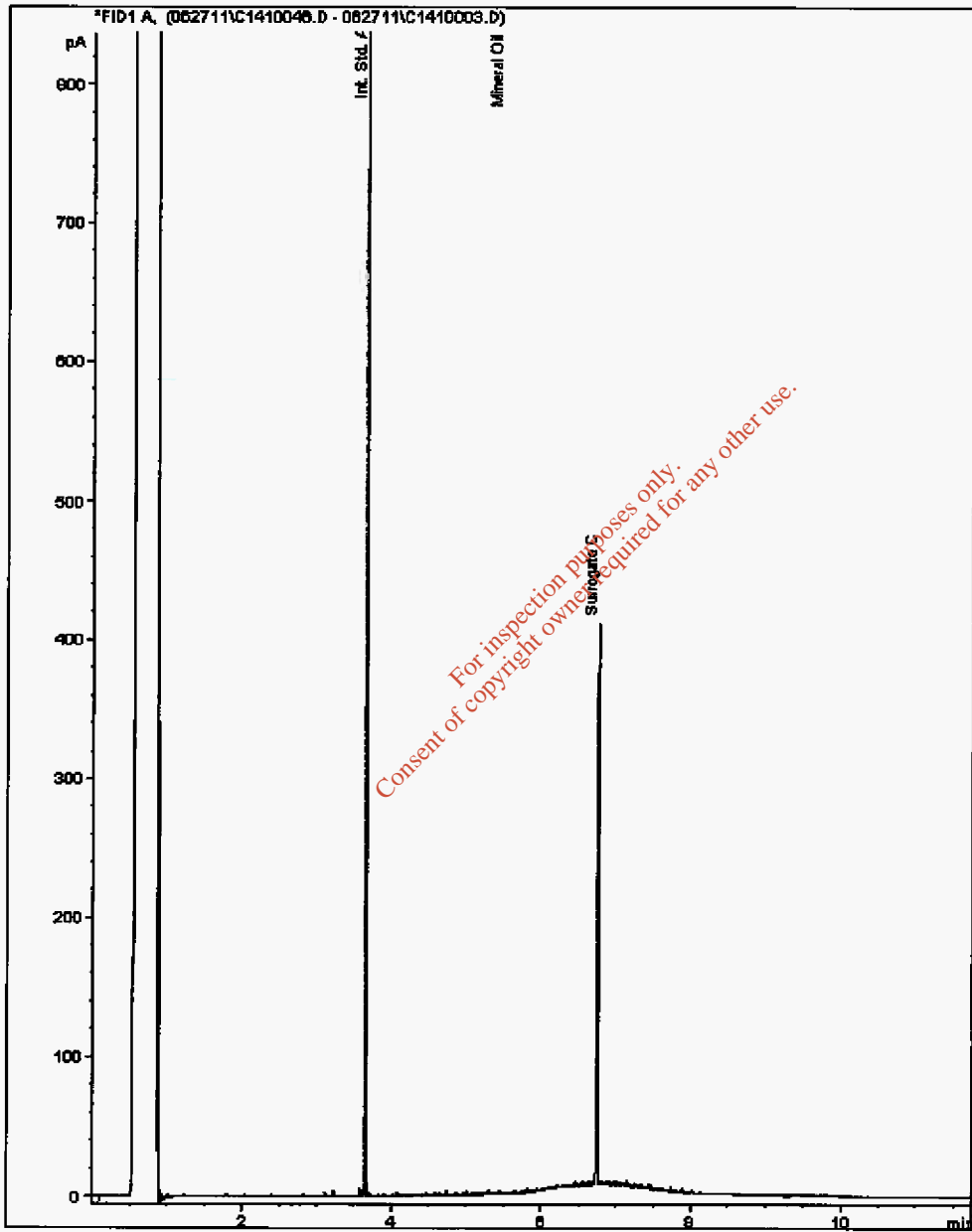
Analysis: Mineral Oil

Sample No : 3732003
Sample ID : 20476-1-07B

Depth :

Alcontrol/Geochem Analytical Services
Mineral Oil Range Organics (C10 - C40)

Sample Identity : 3732621-3732003
Date Acquired : 26/06/11 01:59:14 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

Chromatogram

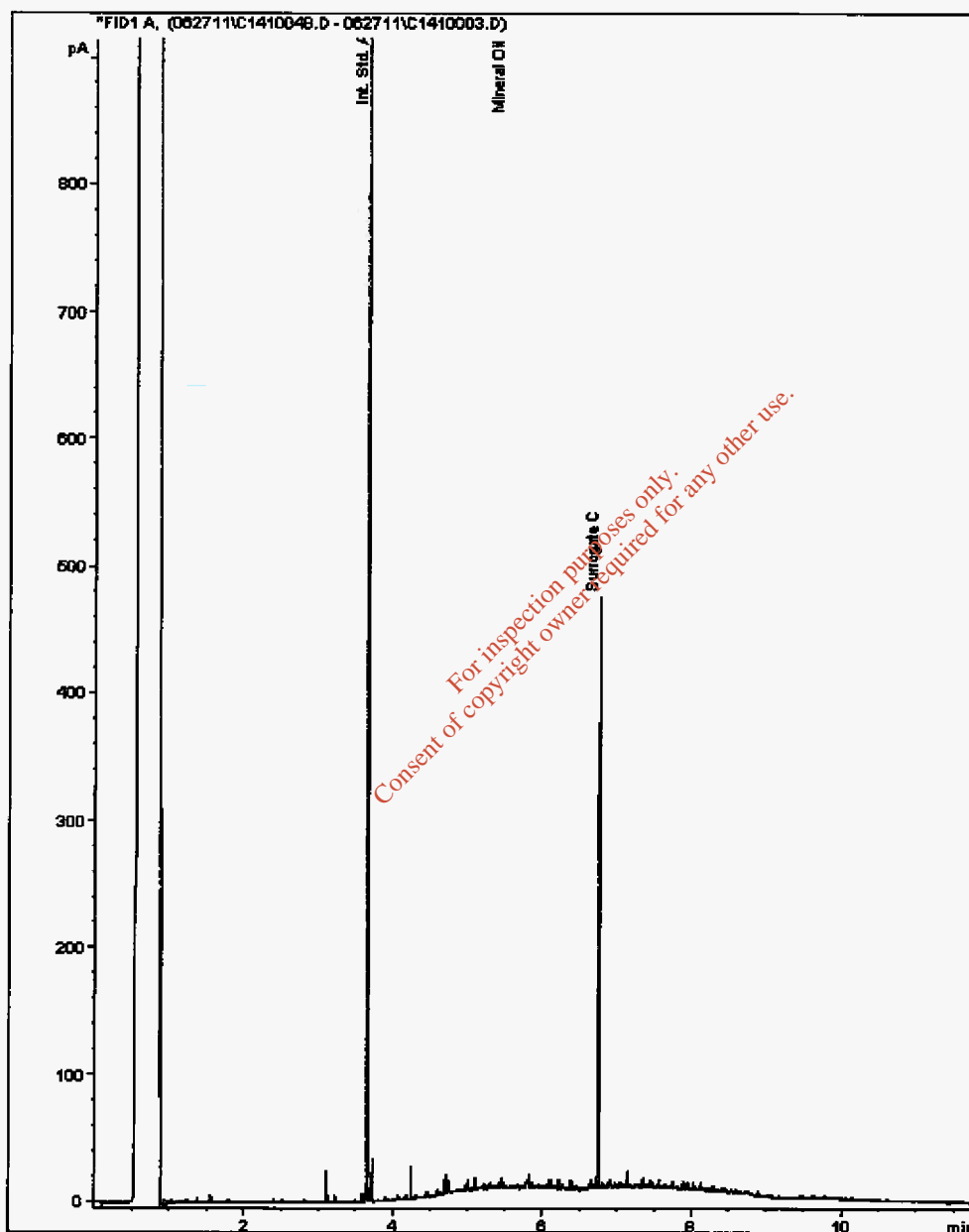
Analysis: Mineral Oil

Sample No : 3735098
Sample ID : 20476-1-01B

Depth :

Alcontrol/Geochem Analytical Services
Mineral Oil Range Organics (C10 - C40)

Sample Identity : 3732608-3735098
Date Acquired : 28/06/11 02:46:31 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



SDG: 110621-46	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-360	Customer: Verde Remediation Services	Report Number: 138295
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 138284

Chromatogram

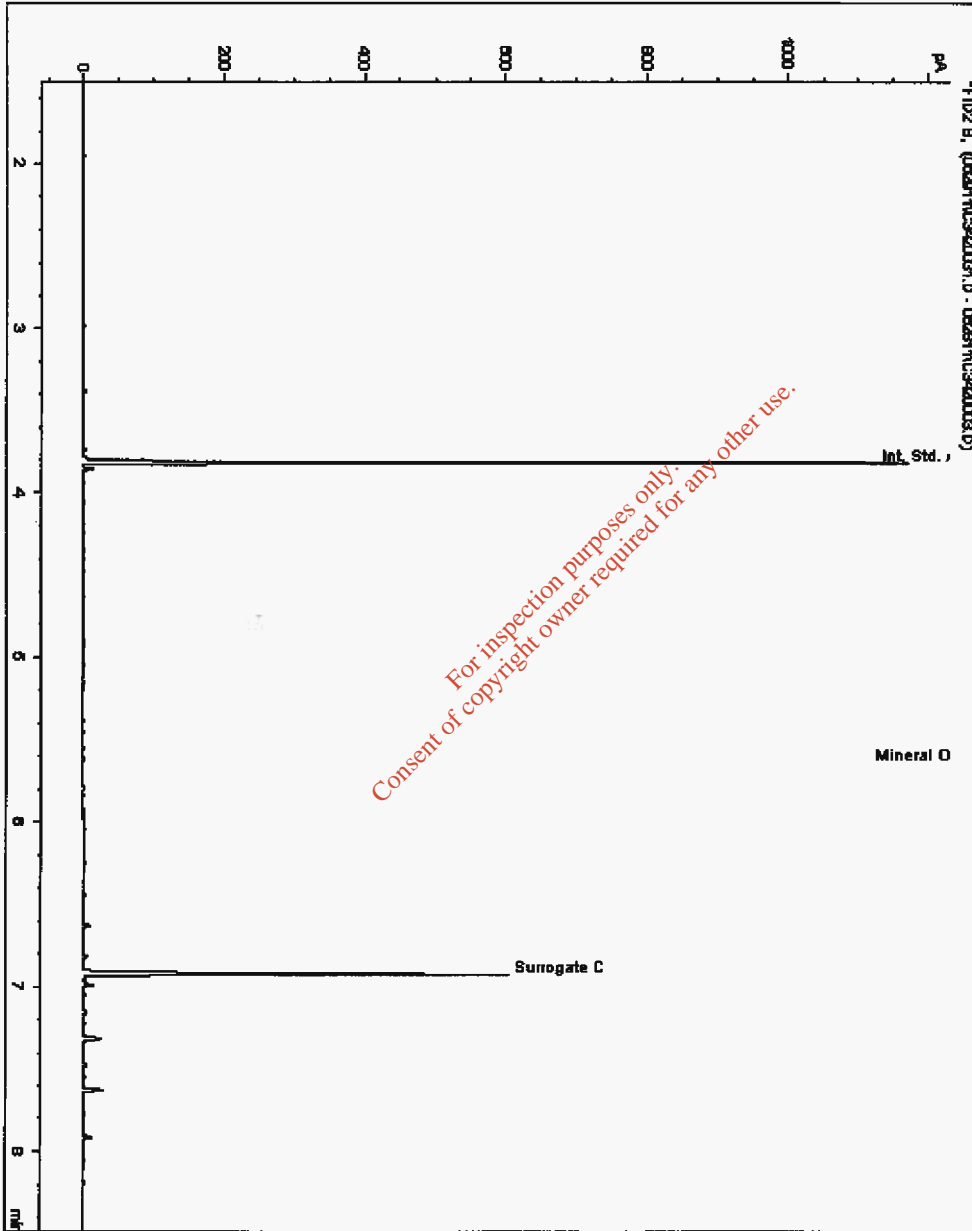
Analysis: Mineral Oil

Sample No: 3763022
 Sample ID: 20476-1-09A

Depth:

ALcontrol Laboratories
 Mineral Oil Range Organics (C10 - C40)

Sample Identity : 3775687-3763022
 Date Acquired : 29/06/11 20:05:31 PM
 Units : mg/kg
 Sample Multiplier : 0.000
 Dilution : 1.0 ->



SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

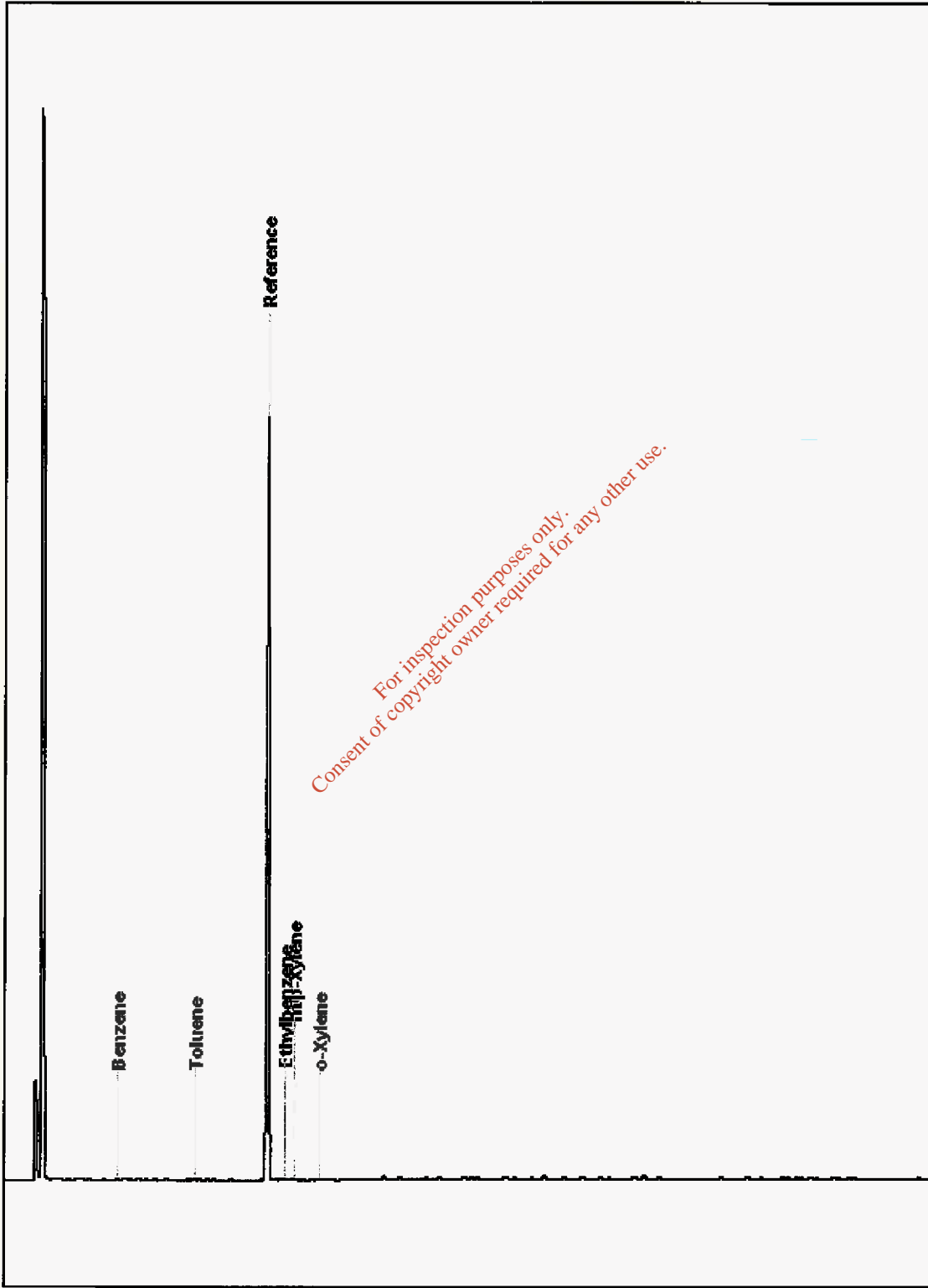
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No: 3712905
Sample ID: 20476-1-01B

Depth:

3712905_GRO_S_DATA - Chem 63 FID



SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 3712992
Sample ID : 20476-1-07B

Depth :

3712992_GRO_S_DATA - Chem 63 FID



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SDG: 110621-46	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-360	Customer: Verde Remediation Services	Report Number: 138295
Client Reference: 20476	Attention: Mariusz Gardjan	Superseded Report: 138284

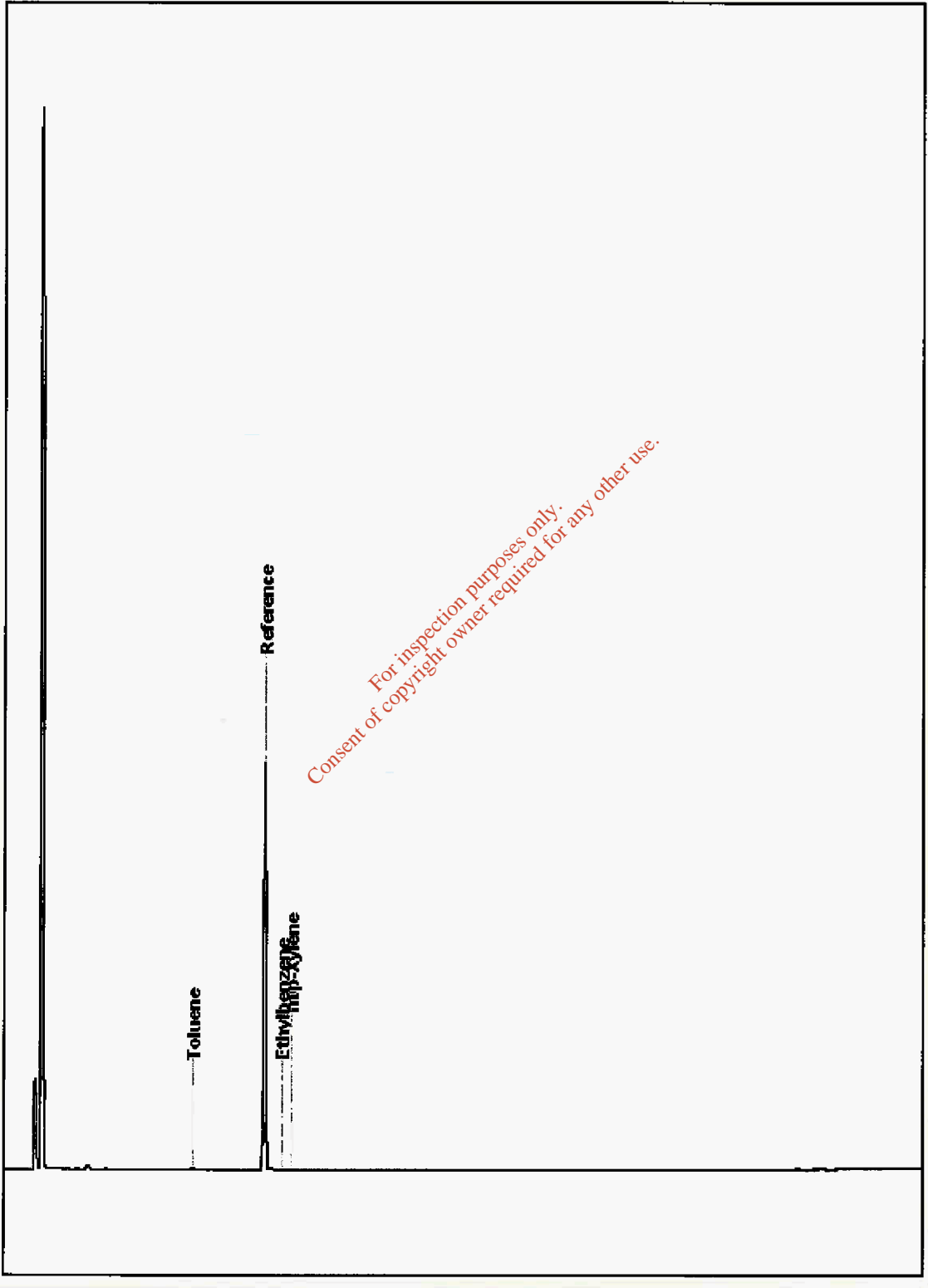
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 3713043
Sample ID : 20476-1-09A

Depth :

3713043_GRO_S_DATA - Chem 63 FID



SDG: 110621-46
Job: D_VERDE_KCL-360
Client Reference: 20476

Location: 20476 LCC
Customer: Verde Remediation Services
Attention: Mariusz Gardjan

Order Number: 20476
Report Number: 138295
Superseded Report: 138284

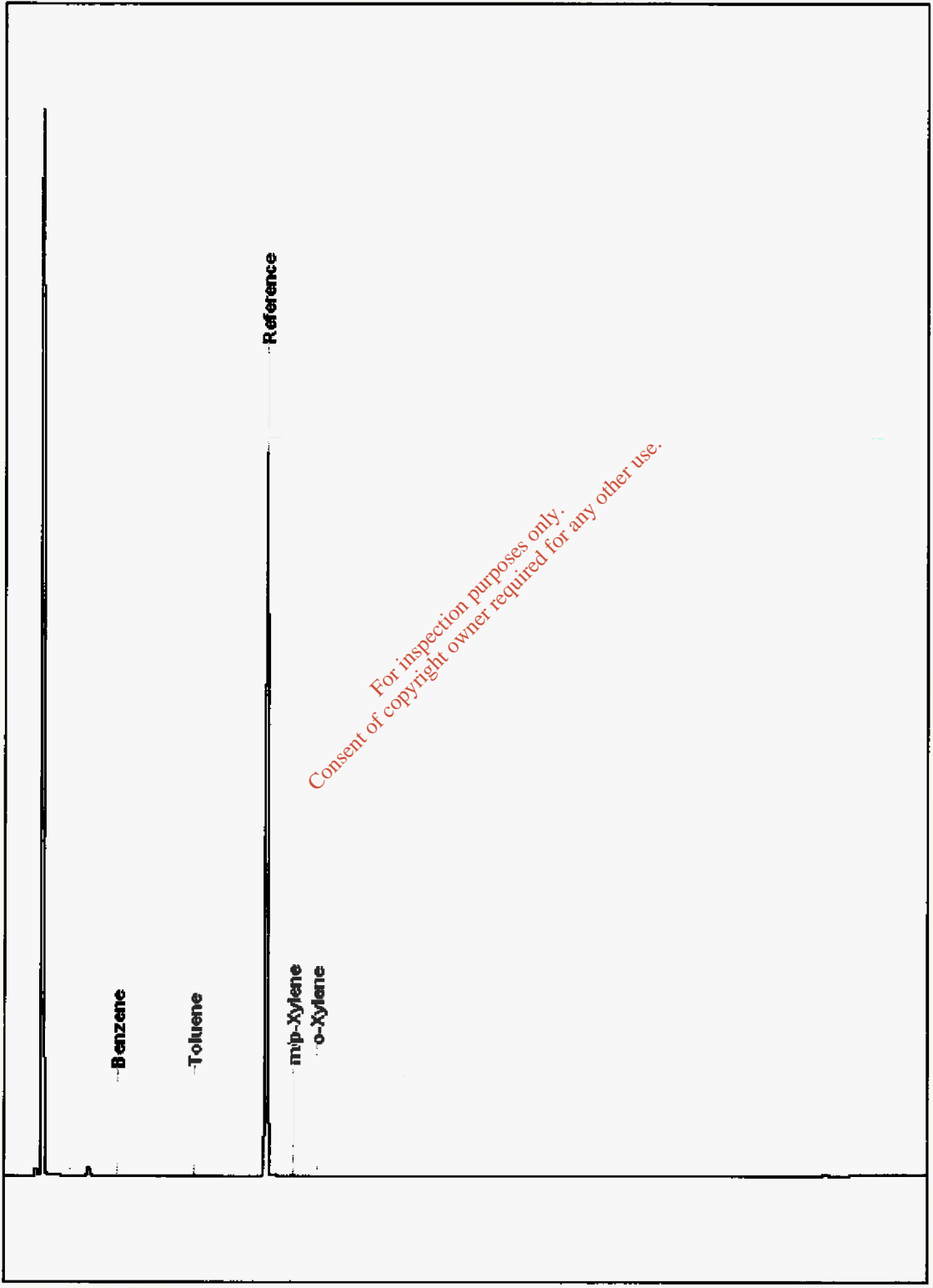
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 3713113
Sample ID : 20476-1-014A

Depth :

3713113_GRO_S.DATA - Chem 63 FID



SDG: 110621-48
 Job: D_VERDE_KCL-360
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Cyril Tynan

Order Number: 20476
 Report Number: 138295
 Superseded Report: 138284

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS 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 both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos 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 screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. To separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample - similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

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 for wet test results reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

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 seized 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 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 GC/FID/GCMS and all subcontracted analyses.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

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 GC/FID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 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 GC/MS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSE	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSE
SOVENT EXTRACTABLE MATTER	D&C	DCM	SOXTERM	GRAMMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTERM	GRAMMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DCM	SOXTERM	ATROSCAN
ENVIRONMENTAL SULPHUR	D&C	DCM	SOXTERM	HPLC
PHENOLS BY GC/MS	WET	DCM	SOXTERM	GC/MS
HERBICIDES	D&C	HEXANE/ACETONE	SOXTERM	GC/MS
PESTICIDES	D&C	HEXANE/ACETONE	SOXTERM	GC/MS
EPH (GRO)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
EPH (MIN OIL)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
EPH (CLEAN UP)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
EPH (GAS BY GC)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
PCB TOT / PCB CON	D&C	HEXANE/ACETONE	END OVER END	GC/MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TMSB.	GC/MS
CB-CAL(CB-C10) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GC/EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GC/EZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DMACETONE	SONICATE	GC/MS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSE	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSE
PAH/MS	HEXANE	STIRRED EXTRACTION (STIR BAR)	GC/MS
EPH	HEXANE	STIRRED EXTRACTION (STIR BAR)	GC/FID
EPH (GAS)	HEXANE	STIRRED EXTRACTION (STIR BAR)	GC/FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR BAR)	GC/FID
PCB 7 COGENERS	HEXANE	STIRRED EXTRACTION (STIR BAR)	GC/MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR BAR)	GC/MS
SVOC	DCM	LIQUID LIQUID SHAKE	GC/MS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST COP/OPP	DCM	LIQUID LIQUID SHAKE	GC/MS
TRIAZINE HERB	DCM	LIQUID LIQUID SHAKE	GC/MS
PHENOLS MB	DCM	SOLID PHASE EXTRACTION	GC/MS
TRP by INFRARED (IR)	TCE	LIQUID LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC/MS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

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.

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



Verde Remediation Services
F27
Bullford Business Campus
Kilcoole
Co. Wicklow

Attention: Cyril Tynan

CERTIFICATE OF ANALYSIS

Date: 28 June 2011
Customer: D_VERDE_KCL
Sample Delivery Group (SDG): 110617-107
Your Reference: 20476
Location: 20476 LCC
Report No: 136234

This report has been revised and directly supersedes 135551 in its entirety.

We received 8 samples on Friday June 17, 2011 and 8 of these samples were scheduled for analysis which was completed on Tuesday June 28, 2011. 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.

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Approved By:

Sonia McWhan
Operations Manager



SDG: 110617-107	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-358	Customer: Verde Remediation Services	Report Number: 136234
Client Reference: 20476	Attention: Owen Van den Bergh	Superseded Report: 135551

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3694528	20476-1-001D			17/06/2011
3694522	20476-1-MW1			17/06/2011
3694523	20476-1-MW2			17/06/2011
3694524	20476-1-MW3			17/06/2011
3694527	20476-1-MW5			17/06/2011
3694518	20476-1-SW1			17/06/2011
3694520	20476-1-SW2			17/06/2011
3694521	20476-1-SW3			17/06/2011

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

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SDG: 110617-107
 Job: D_VERDE_KCL-358
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Owen Van den Bergh

Order Number: 20476
 Report Number: 136234
 Superseded Report: 135551

LIQUID Results Legend <input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	
		3694528	20476-1-001D			PLAS BOT (D) 1l glass bottle (D)
		3694527	20476-1-AM5			PLAS BOT (D) 1l glass bottle (D)
		3694521	20476-1-SW3			PLAS BOT (D) 1l glass bottle (D)
		3694524	20476-1-AM3			PLAS BOT (D) 1l glass bottle (D)
	3694520	20476-1-SW2			PLAS BOT (D) 1l glass bottle (D)	
	3694523	20476-1-AM2			PLAS BOT (D) 1l glass bottle (D)	
	3694518	20476-1-SW1			PLAS BOT (D) 1l glass bottle (D)	
	3694522	20476-1-AM1			PLAS BOT (D) 1l glass bottle (D)	
Ammoniacal Nitrogen	All	NDPs 0 Tests 8			X X X X X X X X	
Anions by Kone (w)	All	NDPs 0 Tests 8			X X X X X X X X	
BOD True Total	All	NDPs 0 Tests 8			X X X X X X X X	
COD Unfiltered	All	NDPs 0 Tests 8			X X X X X X X X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs 0 Tests 8			X X X X X X X X	
Dissolved Metals by ICP-MS	All	NDPs 0 Tests 8			X X X X X X X X	
Dissolved Oxygen by Probe	All	NDPs 0 Tests 8			X X X X X X X X	
Hexavalent Chromium (w)	All	NDPs 0 Tests 8			X X X X X X X X	
Mercury Dissolved	All	NDPs 0 Tests 8			X X X X X X X X	
PAH Spec MS - Aqueous (W)	All	NDPs 0 Tests 8			X X X X X X X X	
pH Value	All	NDPs 0 Tests 8			X X X X X X X X	
Phenols by HPLC (W)	All	NDPs 0 Tests 8			X X X X X X X X	
Sulphide	All	NDPs 0 Tests 8			X X X X X X X X	
Total Organic and Inorganic Carbon	All	NDPs 0 Tests 8			X X X X X X X X	

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SDG: 110617-107 Location: 20476 LCC Order Number: 20476
 Job: D_VERDE_KCL-358 Customer: Verde Remediation Services Report Number: 136234
 Client Reference: 20476 Attention: Owen Van den Bergh Superseded Report: 135551

Results Legend		Customer Sample R	20476-1-001D	20476-1-MW1	20476-1-MW2	20476-1-MW3	20476-1-MW5	20476-1-SW1
#	ISO17025 accredited.	Depth (m)						
M	accredited.	Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
S	Non-conforming work.	Date Sampled	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
aq	Aqueous / settled sample.	Date Received	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
diss.filt	Dissolved / filtered sample.	SDG Ref	110617-107	110617-107	110617-107	110617-107	110617-107	110617-107
tot.unfilt	Total / unfiltered sample.	Lab Sample No.(s)	3694528	3694522	3694523	3694524	3694527	3694518
..	Subcontracted test.	AGS Reference						
..	% 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. Trigger levels confirmed.							
(F)								
Component	LOD/Units	Method						
BOD, unfiltered	<1 mg/l	TM045	42.6 #	2.38 #	<1 #	<1 #	<1 #	1.08 #
Oxygen, dissolved	<0.3 mg/l	TM046	<0.3 #	9.04 #	8.67 #	8.38 #	8.64 #	10.2 #
Organic Carbon, Total	<3 mg/l	TM090	25.1 \$ #	20.4 \$ #	10.5 #	8.48 \$ #	7.7 \$ #	11.3 #
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	18.8 #	11.5 #	<0.2 #	1.7 #	<0.2 #	<0.2 #
Sulphide	<0.01 mg/l	TM101	12.7 #	<0.05 #	<0.2 #	<0.1 #	<0.1 #	<0.01 #
COD, unfiltered	<7 mg/l	TM107	799 #	88.8 #	286 #	123 #	248 #	22.5 #
Arsenic (diss.filt)	<0.12 µg/l	TM152	6.54 #	4.69 #	0.768 #	1.05 #	1.49 #	0.715 #
Iron (diss.filt)	<9.4 µg/l	TM152	257 #	181 #	203 #	73.8 #	172 #	15.2 #
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1 #	<0.1 #	<0.1 #	0.141 #	0.101 #	<0.1 #
Chromium (diss.filt)	<0.22 µg/l	TM152	24.2 #	16.8 #	13.3 #	18.3 #	18.1 #	5.04 #
Copper (diss.filt)	<0.85 µg/l	TM152	1.46 #	3.28 #	3.4 #	4.77 #	5.55 #	1.32 #
Lead (diss.filt)	<0.02 µg/l	TM152	0.13 #	0.185 #	0.074 #	0.156 #	0.222 #	0.027 #
Nickel (diss.filt)	<0.15 µg/l	TM152	8.89 #	13 #	7.3 #	7.08 #	6.81 #	2.4 #
Zinc (diss.filt)	<0.41 µg/l	TM152	2 #	8.85 #	1.86 #	2.24 #	2.22 #	0.492 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
Sulphate	<2 mg/l	TM184	229 #	130 #	206 #	29.1 #	35.5 #	10.4 #
Nitrite as NO2	<0.05 mg/l	TM184	<0.05 #	<0.05 #	0.07 #	<0.05 #	<0.05 #	0.05 #
Phosphate (ortho) as PO4	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Nitrate as NO3	<0.3 mg/l	TM184	<0.3 #	<0.3 #	2.49 #	3.37 #	<0.3 #	3.53 #
Cyanide, Total	<0.05 mg/l	TM227	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03 #	0.032 #	<0.03 #	0.042 #	<0.03 #	<0.03 #
pH	<1 pH Units	TM256	7.74 #	8.44 #	7.88 #	7.96 #	8.07 #	8.68 #
Phenols, Total Detected monohydric	mg/l	TM259	none detected	none detected	none detected	none detected	none detected	none detected

SDG: 110617-107
 Job: D_VERDE_KCL-358
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Owen Van den Bergh

Order Number: 20476
 Report Number: 136234
 Superseded Report: 135551

Results Legend		Customer Sample R	20476-1-SW2	20476-1-SW3					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 17/06/2011 17/06/2011 110617-107 3694520	Water(GW/SW) 17/06/2011 17/06/2011 110617-107 3694521					
M	mCERTS accredited.								
S	Non-conforming work.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
total.filt	Total / unfiltered sample.								
sub	Subcontracted test.								
recovery	% 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								
Component	LOD/Units				Method				
BOD, unfiltered	<1 mg/l	TM045	<1	<1					
Oxygen, dissolved	<0.3 mg/l	TM046	9.96	10.3					
Organic Carbon, Total	<3 mg/l	TM090	9.81	9.7					
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2	<0.2					
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01					
COD, unfiltered	<7 mg/l	TM107	21.8	21					
Arsenic (diss.filt)	<0.12 µg/l	TM152	0.941	0.756					
Iron (diss.filt)	<9.4 µg/l	TM152	20	17					
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1					
Chromium (diss.filt)	<0.22 µg/l	TM152	4.94	5.25					
Copper (diss.filt)	<0.85 µg/l	TM152	1.23	1.28					
Lead (diss.filt)	<0.02 µg/l	TM152	0.049	0.04					
Nickel (diss.filt)	<0.15 µg/l	TM152	2.37	2.47					
Zinc (diss.filt)	<0.41 µg/l	TM152	0.887	1.23					
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01					
Sulphate	<2 mg/l	TM184	10.4	12.9					
Nitrite as NO2	<0.05 mg/l	TM184	0.05	<0.05					
Phosphate (ortho) as PO4	<0.05 mg/l	TM184	<0.05	<0.05					
Nitrate as NO3	<0.3 mg/l	TM184	3.48	3.39					
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05					
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	<0.03					
pH	<1 pH Units	TM256	8.68	8.67					
Phenols, Total Detected monohydric	mg/l	TM259	0.12	none detected					

SDG: 110617-107
 Job: D_VERDE_KCL-358
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Owen Van den Bergh

Order Number: 20476
 Report Number: 136234
 Superseded Report: 135551

PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample R	20476-1-001D	20476-1-MW1	20476-1-MW2	20476-1-MW3	20476-1-MW5	20476-1-SW1
#	ISO17025 accredited.		Depth (m)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
M	ILC ERTS accredited.		Sample Type	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
S	Non-conforming work.		Date Sampled	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011	17/06/2011
aq	Aqueous / settled sample.		Date Received	110617-107	110617-107	110617-107	110617-107	113617-107	110617-107
diss.filt	Dissolved / filtered sample.		SDG Ref	3694528	3694522	3694523	3694524	3694527	3694518
tot.unfilt	Total / unfiltered sample.		Lab Sample No.(s)						
-	Subcontracted test.		AGS Reference						
-	% 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								
Component	LOD/Units	Method							
Naphthalene (aq)	<0.1 µg/l	TM178	0.162	0.287	<0.1	<0.1	<0.1	<0.1	0.175
Acenaphthene (aq)	<0.015 µg/l	TM178	0.294	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Acenaphthylene (aq)	<0.011 µg/l	TM178	0.0839	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Fluoranthene (aq)	<0.017 µg/l	TM178	1.66	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Anthracene (aq)	<0.015 µg/l	TM178	0.147	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Phenanthrene (aq)	<0.022 µg/l	TM178	0.7	<0.022	<0.022	<0.022	<0.022	<0.022	<0.022
Fluorene (aq)	<0.014 µg/l	TM178	0.259	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Pyrene (aq)	<0.013 µg/l	TM178	1.2	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.919	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	1.18	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	1.4	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	1.37	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.181	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	0.947	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.618	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178	12.6	0.287	none detected	none detected	none detected	none detected	0.175

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SDG: 110617-107
 Job: D_VERDE_KCL-358
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Owen Van den Bergh

Order Number: 20476
 Report Number: 136234
 Superseded Report: 135551

PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	20476-1-SW2	20476-1-SW3					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 17/08/2011 17/06/2011 110617-107 3694520	Water(GW/SW) 17/06/2011 17/06/2011 110617-107 3694521					
M	HCERTS accredited.								
S	Non-conforming work.								
aq	Aqueous / settled sample.								
dis.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								
Component	LOD/Units				Method				
Naphthalene (aq)	<0.1 µg/l	TM178	0.105	0.321	#	#			
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.015	<0.015	#	#			
Acenaphthylene (aq)	<0.011 µg/l	TM178	<0.011	<0.011	#	#			
Fluoranthene (aq)	<0.017 µg/l	TM178	<0.017	<0.017	#	#			
Anthracene (aq)	<0.015 µg/l	TM178	<0.015	<0.015	#	#			
Phenanthrene (aq)	<0.022 µg/l	TM178	<0.022	<0.022	#	#			
Fluorene (aq)	<0.014 µg/l	TM178	<0.014	<0.014	#	#			
rysene (aq)	<0.013 µg/l	TM178	<0.013	<0.013	#	#			
Pyrene (aq)	<0.015 µg/l	TM178	<0.015	<0.015	#	#			
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	<0.017	<0.017	#	#			
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	<0.023	<0.023	#	#			
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	<0.027	<0.027	#	#			
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	<0.009	<0.009	#	#			
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	<0.016	<0.016	#	#			
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	<0.016	<0.016	#	#			
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	<0.014	<0.014	#	#			
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178	0.105	0.321					

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SDG: 110617-107	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-358	Customer: Verde Remediation Services	Report Number: 136234
Client Reference: 20476	Attention: Owen Van den Bergh	Superseded Report: 135551

Notification of Non-Conforming Work

Sample Number	Customer Sample Ref	Depth (m)	Matrix	Test Name	Component Name	Comment
3712033	20476-1-MW1		LIQUID	Total Organic and Inorganic Carbon	Organic Carbon, Total	Sample holding time exceeded
3712118	20476-1-MW5		LIQUID	Total Organic and Inorganic Carbon	Organic Carbon, Total	Sample holding time exceeded
3712142	20476-1-MW3		LIQUID	Total Organic and Inorganic Carbon	Organic Carbon, Total	Sample holding time exceeded
3712181	20476-1-001D		LIQUID	Total Organic and Inorganic Carbon	Organic Carbon, Total	Sample holding time exceeded

Note : Test results may be Invalid

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SDG: 110617-107	Location: 20476 LCC	Order Number: 20476
Job: D_VERDE_KCL-358	Customer: Verde Remediation Services	Report Number: 136234
Client Reference: 20476	Attention: Owen Van den Bergh	Superseded Report: 135551

Table of Results - Appendix

REPORT KEY

NDP No Determination Possible	# ISO 17025 Accredited	* Subcontracted Test	M MCERTS Accredited
NFD No Fibres Detected	PFD Possible Fibres Detected	# Result previously reported (Incremental reports only)	EC Equivalent Carbon (Aromatics C8-C36)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample	Surrogate Corrected
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter		
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		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38824 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		
TM187	Winkler, L.W, Ber Deutsch. Chem. Ges, 21,2843,1888."	Dissolved Oxygen in Natural and Waste Waters HMSO 1979 ISBN 011 751442		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
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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SDG: 110617-107
 Job: D_VERDE_KCL-358
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Owen Van den Bergh

Order Number: 20476
 Report Number: 136234
 Superseded Report: 135551

Test Completion Dates

Lab Sample No(s)	3694528	3694522	3694523	3694524	3694527	3694518	3694520	3694521
Customer Sample Ref.	20476-1-001D	20476-1-MW1	20476-1-MW2	20476-1-MW2	20476-1-MW5	20476-1-SW1	20476-1-SW2	20476-1-SW3
AGS Ref.								
Depth								
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Ammoniacal Nitrogen	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011
Anions by Kone (w)	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011
BOD True Total	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011
COD Unfiltered	20-Jun-2011	19-Jun-2011	20-Jun-2011	21-Jun-2011	20-Jun-2011	19-Jun-2011	19-Jun-2011	19-Jun-2011
Cyanide Comp/Free/Total/Thiocyanate	22-Jun-2011	21-Jun-2011	21-Jun-2011	21-Jun-2011	21-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Dissolved Metals by ICP-MS	22-Jun-2011	22-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Dissolved Oxygen by Probe	23-Jun-2011	22-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Hexavalent Chromium (w)	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Mercury Dissolved	24-Jun-2011	24-Jun-2011	24-Jun-2011	24-Jun-2011	24-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
PAH Spec MS - Aqueous (W)	27-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011	28-Jun-2011
pH Value	23-Jun-2011	24-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	24-Jun-2011	24-Jun-2011	24-Jun-2011
Phenols by HPLC (W)	27-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	22-Jun-2011	23-Jun-2011
Sulphide	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011	22-Jun-2011
Total Organic and Inorganic Carbon	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011	23-Jun-2011

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CERTIFICATE OF ANALYSIS

Validated

SDG:	110617-107	Location:	20476 LCC	Order Number:	20476
Job:	D_VERDE_KCL-358	Customer:	Verde Remediation Services	Report Number:	138234
Client Reference:	20476	Attention:	Owen Van den Bergh	Superseded Report:	135551

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SDG: 110617-107
 Job: D_VERDE_KCL-358
 Client Reference: 20476

Location: 20476 LCC
 Customer: Verde Remediation Services
 Attention: Mariusz Gardjan

Order Number: 20476
 Report Number: 136234
 Superseded Report: 135551

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TDF-MS 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 both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos 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 screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

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 for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

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 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 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 GC/FID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

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 GC/FID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C₄-C₁₀ 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.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSE	QC ON VET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DCM	SOXTERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DCM	SOXTERM	NITROSCAN
ELEMENTAL SULPHUR	D&C	DCM	SOXTERM	HPLC
PHENOLS BY GCMS	VET	DCM	SOXTERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOXTERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOXTERM	GCMS
EPH (CR)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
EPH (MIN OIL)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
EPH (CLEANED UP)	D&C	HEXANE/ACETONE	END OVER END	GC/FID
EPH CNG BY GC	D&C	HEXANE/ACETONE	END OVER END	GC/FID
PCB TOT / PCB CON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	VET	HEXANE/ACETONE	MICROWAVE TMS	GCMS
CB/C40(C6-C10) EZ FLASH	VET	HEXANE/ACETONE	SHAKER	GC/EZ
POLYAROMATIC HYDROCARBONS RARD GC	VET	HEXANE/ACETONE	SHAKER	GC/EZ
SEM VOLATILE ORGANIC COMPOUNDS	VET	DCM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSE	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC/FID
EPH CNG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC/FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC/FID
PCB 700 ISOMERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST COPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GCMS
TRH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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	Current Name
Crocidolite	White Asbestos
Amosite	Brown Asbestos
Chrysotile	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: -
 Traca -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.