# **Appendix 3**

Soil Sampling Analysis Results

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Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

# **CERTIFICATE OF ANALYSIS**

 Date:
 12 August 2018

 Customer:
 D\_FTIM\_DUB

 Sample Delivery Group (SDG):
 180804-62

 Your Reference:
 P1444

 Location:
 Cartron Big

 Report No:
 468044

We received 1 sample on Saturday August 04, 2018 and 1 of these samples were scheduled for analysis which was completed on Sunday August 12, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:

Sonia McWhan
Operations Manager









ALS

 SDG:
 180804-62
 Client Reference:
 P1444
 Report Number:
 468044

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

**Received Sample Overview** 

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18060638	TP11		0.90 - 0.90	03/08/2018

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

13.6

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

Validated

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

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**CERTIFICATE OF ANALYSIS** SDG: Report Number: Superseded Report: 180804-62 Client Reference: P1444 468044 Cartron Big Order Number: Location:

Results Legend  X Test	Lab Sample I	No(s)			18060638	
N Determination Possible	Custome Sample Refe				TP11	
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	nce				
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m)				0.90 - 0.90	
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	r	1kg TUB	lar	ری	
	Sample Ty	pe	v	v	v	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		Х		And tedrical for any other use.
Anions by Kone (w)	All	NDPs: 0 Tests: 1	Х			oses of to any
CEN Readings	All	NDPs: 0 Tests: 1	Х		octio	Nut requir
Coronene	All	NDPs: 0 Tests: 1	Ý	of the	ight o	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	ent of			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	Х			
Fluoride	All	NDPs: 0 Tests: 1	Х			
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	Х			
Mineral Oil	All	NDPs: 0 Tests: 1		X		
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 1		X		
PAH by GCMS	All	NDPs: 0 Tests: 1		Х		
PCBs by GCMS	All	NDPs: 0 Tests: 1		Х		
рН	All	NDPs: 0 Tests: 1		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	Х			

Validated

468044

Report Number: Superseded Report:

#### **CERTIFICATE OF ANALYSIS**

(ALS)	

SDG: 180804-62 Client Reference: P1444 Location: Cartron Big Order Number: **Results Legend** 18060638 Lab Sample No(s) X Test No Determination Possible Customer TP11 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.90 - 0.90 SA - Saline Water Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other action purposes only any other use. Sample Type S S Sample description All NDPs: 0 X Total Dissolved Solids All NDPs: 0 Tests: 1 Х Total Organic Carbon All NDPs: 0 Tests: 1

NDPs: 0 Tests: 1

16:16:21 12/08/2018

VOC MS (S)

All



P1444

Validated Validated

SDG: 180804-62 Location: Cartron Big

Client Reference: Order Number: Report Number: Superseded Report:

#### 468044 t:

# Sample Descriptions

#### **Grain Sizes**

very fine	<0.063mm	fine	0.063mm - 0.1mm	nedium	0.1mm	- 2mm co	oarse	2mm - 1	0mm	very coarse	>10mm
Lab Sample No	s) Custom	er Sample Ref	. Depth (m)	Cole	our	Description	I	nclusions	Inclu	sions 2	
18060638		TP11	0.90 - 0.90	Dark E	Brown	Silt Loam		Stones	Vege	etation	

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

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

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

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 SDG:
 180804-62
 Client Reference:
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 468044

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

						1	
Results Legend # ISO17025 accredited.	C	ustomer Sample Ref.	TP11				
M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.90 - 0.90				
tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)				
* Subcontracted test.     ** % recovery of the surrogate standa		Date Sampled	03/08/2018				
check the efficiency of the method.	The	Sample Time Date Received	04/08/2018				
results of individual compounds wi samples aren't corrected for the rec	ithin	SDG Ref	180804-62				
(F) Trigger breach confirmed	covery	Lab Sample No.(s)	18060638				
1-5&+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units	Method					
Moisture Content Ratio (% of as	%	PM024	18				
received sample)							
Loss on ignition	<0.7 %	TM018	3.58				
			M				
Mineral oil >C10-C40	<1 mg/kg	TM061	50.3				
Mineral Oil Surrogate %	%	TM061	75.1				
	/0	110001	75.1				
recovery**	40.00/	TN4400	0.040	-			
Organic Carbon, Total	<0.2 %	TM132	0.948				
		<del>                                     </del>	M				
pH	1 pH Units	TM133	7.86				
			M				
PCB congener 28	<3 µg/kg	TM168	<3				
			M				
PCB congener 52	<3 µg/kg	TM168	<3				
	פיייפייי י		M				
PCB congener 101	<3 µg/kg	TM168	<3				
FOR condense 101	∼o μg/kg	1 101 100	<3 M				
707							
PCB congener 118	<3 µg/kg	TM168	<3	inspection purposes	.01*		
			M		Juse.		
PCB congener 138	<3 µg/kg	TM168	<3		inet		
			M		100		
PCB congener 153	<3 µg/kg	TM168	<3		ally all?		
Ĭ	100		М	ے	or for		
PCB congener 180	<3 µg/kg	TM168	<3	-020	50		
1 OB congener 100	×ο μg/kg	1101100	- S	alt Pali			
0 (11 1 1000 7	-04 ()	T14400	-04	20,100			
Sum of detected PCB 7	<21 µg/kg	TM168	<21	diorner			
Congeners				SOC SALL			
ANC @ pH 4	<0.03	TM182	0.555	instite			
	mol/kg		<b>&amp;</b> (	N THE			
ANC @ pH 6	< 0.03	TM182	0.0721	96,			
	mol/kg		<10 content	Y .			
PAH Total 17 (inc Coronene)	<10 mg/kg	TM410	<10				
Moisture Corrected	. 5.5		3050				
Coronene	<200 µg/kg	TM410	< <del>2</del> 00				
Colonelle	~200 μg/kg	1101410	<b>\200</b>				
		<del>                                     </del>					
		<del>                                     </del>					
		<del>                                     </del>					
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Validated

# **CERTIFICATE OF ANALYSIS**

SDG: Report Number: Superseded Report: 180804-62 Client Reference: P1444 468044 Cartron Big Order Number: Location:

DVT	W GCMS							
PAH	by GCMS		Customer Sample Ref.	TD44	i			
#	Results Legend ISO17025 accredited.		Customer Gample Rei.	TP11				
M aq	mCERTS accredited. Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.		Depth (m) Sample Type	0.90 - 0.90 Soil/Solid (S)				
	Total / unfiltered sample. Subcontracted test.		Date Sampled	03/08/2018				
**	% recovery of the surrogate standa check the efficiency of the method.	rd to	Sample Time					
	results of individual compounds wi	thin	Date Received SDG Ref	04/08/2018 180804-62				
(F)	samples aren't corrected for the rec Trigger breach confirmed	covery	Lab Sample No.(s)	18060638				
	Trigger breach confirmed Sample deviation (see appendix)		AGS Reference					
Compo	nent	LOD/Units		40	-			
WAC		mg/kg	TM218	10				
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						othe		
						213, 213		
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					202	20		
					MIT ALL			
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SDG: 180804-62 Client Reference: P1444 Report Number: 468044

Location: Cartron Big Order Number: Superseded Report:

VOC MS (S)							
Results Legend	C	ustomer Sample Ref.	TP11				
# ISO17025 accredited.  M mCERTS accredited.							
aq Aqueous / settled sample.		Depth (m)	0.90 - 0.90				
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)				
* Subcontracted test.     ** % recovery of the surrogate standa	ard to	Date Sampled Sample Time	03/08/2018				
check the efficiency of the method. results of individual compounds wi	. The	Date Received	04/08/2018				
samples aren't corrected for the re-	covery	SDG Ref	180804-62 18060638				
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	1000000				
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	102				
Toluene-d8**	%	TM116	92				
4-Bromofluorobenzene**	%	TM116	79.5				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M				
Benzene	<9 µg/kg	TM116	<9 M				
Toluene	<7 µg/kg	TM116	<7 M				
Ethylbenzene	<4 µg/kg	TM116	<4 M				
p/m-Xylene	<10 µg/kg	TM116	<10 #				
o-Xylene	<10 µg/kg	TM116	<10				
				Kinstellionnet redit	se.		
					other		
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**Criteria Limits** 





Case SDG SDG: 180804-62 Client Reference: P1444 Report Number: 468044
Location: Cartron Big Order Number: Superseded Report:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# WAC ANALYTICAL RESULTS Client Reference Site Location Cartron Big Natural Moisture Content (%) Mass of dry sample (kg) 0.090 Dry Matter Content (%) 82 Particle Size <4mm >95%

180804-62

Lab Sample Number(s) 18060638 Stable 03-Aug-2018 **Sampled Date** Non-reactive Inert Waste Hazardous **TP11** Hazardous Waste Customer Sample Ref. Landfill Waste Landfill in Non-0.90 - 0.90Depth (m) Hazardous Landfill Result Solid Waste Analysis 0.948 Total Organic Carbon (%) Loss on Ignition (%) 3.58 Sum of BTEX (mg/kg) <0.021 Sum of 7 PCBs (mg/kg) 50.3 Mineral Oil (mg/kg) 500 PAH Sum of 17 (mg/kg) <10 100 7.86 pH (pH Units) ANC to pH 6 (mol/kg) 0.0721 0.555 ANC to pH 4 (mol/kg)

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	0:1 eluate (mg/l)	A2 1011 conc	n leached (mg/kg)	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00214	<0.0005	Q <sup>1</sup> 0 <sub>2</sub> 0214	<0.005	0.5	2	25
Barium	0.0655	<0.0002	10 net 0.655	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.004	<0.01	<0.01	0.5	10	70
Copper	0.0034	<0.00030	0.034	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0,00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0106	0.003	0.106	<0.03	0.5	10	30
Nickel	0.00177	<0.0004	0.0177	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	0.00258	<0.001	0.0258	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	7.6	<2	76	<20	1000	20000	50000
Total Dissolved Solids	172	<5	1720	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.87	<3	58.7	<30	500	800	1000

#### **Leach Test Information**

Date Prepared	07-Aug-2018
pH (pH Units)	8.05
Conductivity (µS/cm)	220.00
Temperature (°C)	20.20
Volume Leachant (Litres)	0.880

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates 12/08/2018 16:16:34





Report Number: Superseded Report: SDG: 180804-62 Client Reference: P1444 468044 Cartron Big Location: Order Number:

**Table of Results - Appendix** 

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
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 - WI 292046-chacterization 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
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soil by GCMS
al testing (unless	subcontracted) performed at ALS Life Sciences Ltd Hawarden	(Method codes TM) of ALSP ife Sciences Ltd Aberdeen (Method codes S).  (Method codes TM) of ALSP ife Sciences Ltd Aberdeen (Method codes S).  (Method codes TM) of ALSP ife Sciences Ltd Aberdeen (Method codes S).
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 SDG:
 180804-62
 Client Reference:
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 Cartron Big
 Order Number:
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# **Test Completion Dates**

Lab Sample No(s) 18060638  Customer Sample Ref.  AGS Ref. Depth Type   0.90 - 0.90  ANC at pH4 and ANC at pH 6 08-Aug-201	0
AGS Ref. Depth Type Soil/Solid (	•
AGS Ref.  Depth Type Soil/Solid (	•
Depth         0.90 - 0.90           Type         Soil/Solid (6	•
Type Soil/Solid (	•
Type Soil/Solid (	•
• • • • • • • • • • • • • • • • • • • •	
ANC at pH4 and ANC at pH 6	(د
ANC at print and ANC at print	8
Anions by Kone (w) 09-Aug-201	8
CEN 10:1 Leachate (1 Stage) 07-Aug-201	8
CEN Readings 08-Aug-201	8
Coronene 09-Aug-201	8
Dissolved Metals by ICP-MS 10-Aug-201	8
Dissolved Organic/Inorganic Carbon 10-Aug-201	8
Fluoride 10-Aug-201	8
Loss on Ignition in soils 10-Aug-201	8
Mercury Dissolved 10-Aug-201	8
Mineral Oil 10-Aug-201	8
PAH 16 & 17 Calc 09-Aug-201	8
PAH by GCMS 09-Aug-201	8
PCBs by GCMS 08-Aug-201	8
pH 07-Aug-201	8
Phenols by HPLC (W) 10-Aug-201	8
Sample description 06-Aug-201	8
Total Dissolved Solids 09-Aug-201	8
Total Organic Carbon 12-Aug-201	8
VOC MS (S) 09-Aug-201	8



180804-62 468044 SDG: P1444 Client Reference: Report Number: Superseded Report: Location: Cartron Big Order Number:

Appendix

# General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on received.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals total metals must be requested separately.

  11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 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).
- Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clav and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

#### Sample Deviations

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

	1	Container with Headspace provided for volatiles analysis
	2	incorrect container received
I	~ 3. K	Deviation from method
ş	N. CO.	Holding time exceeded before sample received
2	5	Samples exceeded holding time before presevation was performed
	§	Sampled on date not provided
I	•	Sample holding time exceeded in laboratory
ĺ	@	Sample holding time exceeded due to sampled on date
	&	Sample Holding Time exceeded - Late arrival of instructions.

#### Asbestos

Identification of Asbestos in Bulk Materials & Soils

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

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

Asbe stos Type	Common Name		
Chrysof le	White Asbesbs		
Amosite	Brown Asbestos		
Cro di dolite	Blue Asbe stos		
Fibrous Act nolite	-		
Fib to us Anthop hyll ite	-		
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.

16:17:53 12/08/2018 Modification Date: 12/08/2018 EPA Export 05-10-2021:03:00:54 Consent of copyright owner required for any other use.



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

Fehily Timoney 3rd Floor North Park Offices North Park Business Park North Road Dublin Dublin 11

Attention: Daniel Hayden

# **CERTIFICATE OF ANALYSIS**

 Date:
 13 August 2018

 Customer:
 D\_FTIM\_DUB

 Sample Delivery Group (SDG):
 180803-55

 Your Reference:
 P1444

 Location:
 Cartron Big

 Report No:
 468081

We received 4 samples on Friday August 03, 2018 and 4 of these samples were scheduled for analysis which was completed on Monday August 13, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:

Sonia McWhan
Operations Manager









Validated

 SDG:
 180803-55
 Client Reference:
 P1444
 Report Number:
 468081

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18053550	TP1		1.80 - 1.80	31/07/2018
18053555	TP3		2.50 - 2.50	31/07/2018
18053560	TP4		1.20 - 1.20	31/07/2018
18053565	TP5		1.80 - 1.80	31/07/2018

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

19.8

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

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



468081

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG: P1444 180803-55 Client Reference: Report Number: Location: Cartron Big Order Number: Superseded Report: Results Legend 18053550 18053560 18053565 Lab Sample No(s) X Test No Determination Possible Customer TP5 코 TP3 Ŧ Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 2.50-1.80 1.20-.80 SA - Saline Water Depth (m) - 2.50 TE - Trade Effluent 1.80 1.20 1.80 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 250g Amber Jar DW - Drinking Water Non-regulatory (ALE210) 1kg TUB UNL - Unspecified Liquid 1kg TUB SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S ANC at pH4 and ANC at pH 6 All NDPs: 0 Tests: 4 X X Χ Anions by Kone (w) All NDPs: 0 Tests: 4 X X Χ Χ CEN Readings All NDPs: 0 Tests: 4 Х Х All Coronene NDPs: 0 Tests: 4 X X Χ Dissolved Metals by ICP-MS All NDPs: 0 Tests: 4 X X Χ Х Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 4 Χ Х Х Х Fluoride All NDPs: 0 Tests: 4 Χ Χ Х Х Loss on Ignition in soils All NDPs: 0 Tests: 4 Х Х Х Х Mercury Dissolved All NDPs: 0 Tests: 4 Χ X Х Χ Mineral Oil All NDPs: 0 Tests: 4 X X X X PAH 16 & 17 Calc All NDPs: 0 Tests: 4 X Х X Х PAH by GCMS All NDPs: 0 Tests: 4 Χ Х Х X PCBs by GCMS All NDPs: 0 Tests: 4 Χ Х Х Х All рΗ NDPs: 0 Tests: 4 Х Х Х Х Phenols by HPLC (W) All NDPs: 0 Tests: 4 Χ X X X

Validated

468081

#### **CERTIFICATE OF ANALYSIS**

(ALS)	

SDG: Client Reference: P1444 180803-55 Report Number: Location: Cartron Big Order Number: Superseded Report: Results Legend 18053550 18053565 Lab Sample No(s) X Test No Determination Possible Customer Ħ TP3 TP4 TP5 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 1.80-1.80-2.50 - 2.50 1.20-SA - Saline Water Depth (m) TE - Trade Effluent 1.80 1.20 1.80 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 1kg TUB DW - Drinking Water Non-regulatory UNL - Unspecified Liquid 1kg TUB SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S S Sample description All NDPs: 0 X Х X Χ Solited for any Total Dissolved Solids All NDPs: 0 Tests: 4 Х Χ Total Organic Carbon All NDPs: 0 Tests: 4 Х X X VOC MS (S) All NDPs: 0 Tests: 4 Χ Χ X



ALS

 SDG:
 180803-55
 Client Reference:
 P1444
 Report Number:
 468081

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

# **Sample Descriptions**

#### **Grain Sizes**

very fine <0.0	0.00 fine 0.00	63mm - 0.1mm <b>m</b> e	edium 0.1mm	n - 2mm coar	se 2mm - 1	0mm very coa	rse >10mm
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2	
18053550	TP1	1.80 - 1.80	Black	Sludge	Stones	None	
18053555	TP3	2.50 - 2.50	Black	Loamy Sand	Vegetation	Oil/Petroleum	
18053560	TP4	1.20 - 1.20	Dark Brown	Loamy Sand	Stones	Vegetation	
18053565	TP5	1.80 - 1.80	Dark Brown	Loamy Sand	Stones	Vegetation	

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

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

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

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 SDG:
 180803-55
 Client Reference:
 P1444
 Report Number:
 468081

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

Positive to see all		Suntamas Camala Daf					
Results Legend # ISO17025 accredited.		Customer Sample Ref.	TP1	TP3	TP4	TP5	
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	1.80 - 1.80 Soil/Solid (S)	2.50 - 2.50 Soil/Solid (S)	1.20 - 1.20 Soil/Solid (S)	1.80 - 1.80 Soil/Solid (S)	
* Subcontracted test.		Date Sampled	31/07/2018	31/07/2018	31/07/2018	31/07/2018	
** % recovery of the surrogate standa check the efficiency of the method.	The	Sample Time Date Received	03/08/2018	03/08/2018	03/08/2018	03/08/2018	
results of individual compounds wi samples aren't corrected for the rec		SDG Ref	180803-55	180803-55	180803-55	180803-55	
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	18053550	18053555	18053560	18053565	
Component	LOD/Units	Method					
Moisture Content Ratio (% of as	%	PM024	35	44	56	50	
received sample)	2 - 2/	=,,,,,,					
Loss on ignition	<0.7 %	TM018	15.7 #	18.9 M	36.7 M	22.4 M	
Mineral oil >C10-C40	<1 mg/kg	TM061	898	1080	1160	2390	
Willieral Oil 20 10-040	~ i ilig/kg	TIVIOOT	030	1000	1100	2330	
Mineral Oil Surrogate %	%	TM061	76.4	80.7	77.8	71.4	
recovery**							
Organic Carbon, Total	<0.2 %	TM132	4.13	7.08	10.7	7.17	
			#	M	M	M	
рH	1 pH Units	TM133	8.68	7.02	7.77	7.67	
PCB congener 28	<3 µg/kg	TM168	<15	<3	<3	<15	
1 OD CONGENER ZO	~o µg/kg	1101100	<15 #	<3 M	<3 M	<15 M	
PCB congener 52	<3 µg/kg	TM168	<15	<3	<3	<15	
3	ביישיו -		#	M	M	M	 
PCB congener 101	<3 µg/kg	TM168	<15	<3	<3	<15	
			#	М	M	М	
PCB congener 118	<3 µg/kg	TM168	<15	<3	<3	<15	
202	0 "	T14400	#	M	Ne <sup>®</sup> M	M	
PCB congener 138	<3 µg/kg	TM168	<15 #	<3 M	<3 her M	<15	
PCB congener 153	<3 µg/kg	TM168	<15	<3	92 053 W	<15	
T OB Congener 100	το μg/kg	1101100	*10	M=	orly arts	113 M	
PCB congener 180	<3 µg/kg	TM168	<15	<3 philosophic with	<3	<15	
			#	caputo di secondo di s	М	М	
Sum of detected PCB 7	<21 µg/kg	TM168	<105	CON OF TO	<21	<105	
Congeners				Secr. Wille			
ANC @ pH 4	<0.03	TM182	2.01	Institute 1.57	1.3	0.837	
ANIO G. 11.0	mol/kg	T14400	0.005	0.0936	0.454	0.400	
ANC @ pH 6	<0.03 mol/kg	TM182	0.235	o.0936	0.154	0.192	
PAH Total 17 (inc Coronene)	<10 mg/kg	TM410	<10 contraction	<10	<10	<10	
Moisture Corrected			ONSO,				
Coronene	<200 µg/kg	TM410	<200	<200	<200	<200	
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Validated

# **CERTIFICATE OF ANALYSIS**

180803-55 Cartron Big SDG: Report Number: Superseded Report: Client Reference: P1444 468081 Order Number: Location:

DVH	by GCMS							
РАП	Results Legend		Customer Sample Ref.	TP1	TP3	TP4	TP5	
#	ISO17025 accredited.		ouotomor oumpio itom	IF!	IFS	154	IFS	
M aq	mCERTS accredited. Aqueous / settled sample.		Donth (m)			400 400	400 400	
diss.filt	Dissolved / filtered sample. Total / unfiltered sample.		Depth (m) Sample Type	1.80 - 1.80 Soil/Solid (S)	2.50 - 2.50 Soil/Solid (S)	1.20 - 1.20 Soil/Solid (S)	1.80 - 1.80 Soil/Solid (S)	
	Subcontracted test.		Date Sampled	31/07/2018	31/07/2018	31/07/2018	31/07/2018	
**	% recovery of the surrogate standa check the efficiency of the method.		Sample Time	03/08/2018	03/08/2018	03/08/2018	03/08/2018	
	results of individual compounds wi	thin	Date Received SDG Ref	180803-55	180803-55	180803-55	180803-55	
(F)	samples aren't corrected for the red Trigger breach confirmed Sample deviation (see appendix)	covery	Lab Sample No.(s)	18053550	18053555	18053560	18053565	
		1.00/11-14-	AGS Reference					
WAC	ment	LOD/Units mg/kg	Method TM218	10	10	10	10	
WAG		mg/kg	TIVIZIO	10	10	10	10	
L								<u>                                       </u>
						only and other use.		
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#### Validated

# **CERTIFICATE OF ANALYSIS**

ALS

 SDG:
 180803-55
 Client Reference:
 P1444
 Report Number:
 468081

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

(ALS)			0.00	· Number:		•		
VOC MS (S)								
Results Legend	(	Customer Sample Ref.	TP1	TP3	TP4	TP5		
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample.		Depth (m)	1.80 - 1.80	2.50 - 2.50	1.20 - 1.20	1.80 - 1.80		
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
* Subcontracted test.		Date Sampled	31/07/2018	31/07/2018	31/07/2018	31/07/2018		
** % recovery of the surrogate standa		Sample Time			,			
check the efficiency of the method results of individual compounds w		Date Received	03/08/2018	03/08/2018	03/08/2018	03/08/2018		
samples aren't corrected for the re		SDG Ref	180803-55 18053550	180803-55 18053555	180803-55 18053560	180803-55 18053565		
(F) Trigger breach confirmed 1-5&•§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	1000000	1000000	10055500	1000000		
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	102	105	102	99.7		
Bisioniolidoromotilario	,,,	1111110	102	100	102	00.1		
T   10**	0/	T14440	00.0	00.4	05.0	00.4		
Toluene-d8**	%	TM116	98.2	96.1	95.6	96.1		
4-Bromofluorobenzene**	%	TM116	95.4	95.1	86.4	91.7		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<100	<100	<100	<100		
.,, .,	1,3,3		#	М	М	М		
Benzene	<9 µg/kg	TM116	<90	<90	<90	<90		
Delizerie	√3 µg/kg	1101110						
	- "		#	M	M	M		
Toluene	<7 µg/kg	TM116	<70	<70	<70	<70		
			#	М	М	М		
Ethylbenzene	<4 µg/kg	TM116	117	<40	<40	<40		
			#	М	М	М		
p/m-Xylene	<10 µg/kg	TM116	<100	<100	<100	<100		
F	49/19		#	#	#	#		
o-Yylene	<10 µg/kg	TM116	<100	<100	<100	<100		
o-Xylene	∼ io μg/kg	TIVITIO	<b>\100</b>	`100	\100 **	\100 		
		+	#	M	M Oilly and other use.	M		
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SDG: 180803-55 Client Reference: P1444 Report Number: 468081 Location: Cartron Big Order Number: Superseded Report:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

WAC ANALYTICAL RES	ULTS		REF : BS EN 12457/		
Client Reference		Site Location	Cartron Big		
Mass Sample taken (kg)	0.138	Natural Moisture Content (%)	53.8		
Mass of dry sample (kg)	0.090	<b>Dry Matter Content (%)</b>	65		
Particle Size <4mm	>95%				
Case			Landfill Waste Acceptance		
SDG	180803-55		Criteria Limits		

,50	100000 00				
ab Sample Number(s)	18053550				
Sampled Date	31-Jul-2018			Sta Non-r	
Customer Sample Ref.	TP1		Inert Waste Landfill	Hazardou in N	
Depth (m)	1.80 - 1.80	1.80 - 1.80			
Solid Waste Analysis	Result			Landf	
tal Organic Carbon (%)	4.13		3	5	
oss on Ignition (%)	15.7		-	-	
ım of BTEX (mg/kg)	_		-	-	
ım of 7 PCBs (mg/kg)	<0.105		1	-	
ineral Oil (mg/kg)	898		500	-	
AH Sum of 17 (mg/kg)	<10		100	-	
H (pH Units)	8.68	<u>ي</u> ق.	-	>6	
NC to pH 6 (mol/kg)	0.235	aller lise.	-	-	
ANC to pH 4 (mol/kg)	2.01	ther	-	-	

				O			
Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	.0:1 eluate (mg/l)	es xto	n leached (mg/kg)	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 I/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.0371	<0.0005	Q <sup>1</sup> Q <sup>3</sup> 71	<0.005	0.5	2	25
Barium	0.0244	<0.0002	10 net 0.244	<0.002	20	100	300
Cadmium	0.000431	<0.00008	0.00431	<0.0008	0.04	1	5
Chromium	0.541	<0.003	5.41	<0.01	0.5	10	70
Copper	0.0213	<0.00038	0.213	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000295	<0,00001	0.000295	<0.0001	0.01	0.2	2
Molybdenum	0.0284	0.003	0.284	<0.03	0.5	10	30
Nickel	0.0617	<0.0004	0.617	<0.004	0.4	10	40
Lead	0.016	<0.0002	0.16	<0.002	0.5	10	50
Antimony	0.00387	<0.001	0.0387	<0.01	0.06	0.7	5
Selenium	0.00184	<0.001	0.0184	<0.01	0.1	0.5	7
Zinc	0.048	<0.001	0.48	<0.01	4	50	200
Chloride	812	<10	8120	<100	800	15000	25000
Fluoride	0.604	<0.5	6.04	<5	10	150	500
Sulphate (soluble)	<10	<10	<100	<100	1000	20000	50000
Total Dissolved Solids	3100	<10	31000	<100	4000	60000	100000
Total Monohydric Phenols (W)	7.58	<0.016	75.8	<0.16	1	-	-
Dissolved Organic Carbon	188	<12	1880	<120	500	800	1000

#### **Leach Test Information**

Date Prepared	06-Aug-2018
pH (pH Units)	8.41
Conductivity (µS/cm)	3,980.00
Temperature (°C)	20.40
Volume Leachant (Litres)	0.852

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

#### **CERTIFICATE OF ANALYSIS**



Case

SDG: 180803-55 Client Reference: P1444 Report Number: 468081 Location: Cartron Big Order Number: Superseded Report:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

WAC ANALYTICAL RES	REF : BS EN 12457/2		
Client Reference		Site Location	Cartron Big
Mass Sample taken (kg)	0.161	Natural Moisture Content (%)	78.6
Mass of dry sample (kg)	0.090	<b>Dry Matter Content (%)</b>	56
Particle Size <4mm	>95%		

BDG	180803-55			Criteria Limi
Lab Sample Number(s)	18053555			
Sampled Date	31-Jul-2018			Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Customer Sample Ref.	TP3		Inert Waste Landfill	
Depth (m)	2.50 - 2.50		Landini	
Solid Waste Analysis	Result			Landini
Total Organic Carbon (%)	7.08		3	5
Loss on Ignition (%)	18.9		-	-
Sum of BTEX (mg/kg)	-		-	-
Sum of 7 PCBs (mg/kg)	<0.021		1	-
Mineral Oil (mg/kg)	1080		500	-
PAH Sum of 17 (mg/kg)	<10		100	-
pH (pH Units)	7.02	·61.	-	>6
ANC to pH 6 (mol/kg)	0.0936	aller use.	-	-
ANC to pH 4 (mol/kg)	1.57		_	

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	0:1 eluate (mg/l)	2 es xx	n leached (mg/kg)		s for compliance le EN 12457-3 at L/S	
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00665	<0.0005	QV 0.0665	<0.005	0.5	2	25
Barium	0.0657	<0.0002	10 net 0.657	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.003	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.00030	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0,00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0546	<b>€</b> 0.003	0.546	<0.03	0.5	10	30
Nickel	0.00134	<0.0004	0.0134	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	0.00192	<0.001	0.0192	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	4.7	<2	47	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	44.1	<2	441	<20	1000	20000	50000
Total Dissolved Solids	298	<5	2980	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	20.6	<3	206	<30	500	800	1000

#### **Leach Test Information**

Date Prepared	06-Aug-2018
pH (pH Units)	8.11
Conductivity (µS/cm)	394.00
Temperature (°C)	20.50
Volume Leachant (Litres)	0.829

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
13/08/2018 08:51:34





Case

SDG: 180803-55 Client Reference: P1444 Report Number: 468081 Location: Cartron Big Order Number: Superseded Report:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# WAC ANALYTICAL RESULTS Client Reference Mass Sample taken (kg) 0.205 Mass of dry sample (kg) Particle Size <4mm Site Location Cartron Big Natural Moisture Content (%) 127 Dry Matter Content (%) 44 Particle Size <4mm Particle Size <4mm

SDG	180803-55
Lab Sample Number(s)	18053560
Sampled Date	31-Jul-2018
Customer Sample Ref.	TP4
Depth (m)	1.20 - 1.20
Solid Waste Analysis	Result
Total Organic Carbon (%)	10.7
Loss on Ignition (%)	36.7
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	1160
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.77
ANC to pH 6 (mol/kg)	0.154
ANC to pH 4 (mol/kg)	

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	0:1 eluate (mg/l)	2 es xx	n leached (mg/kg)		s for compliance le EN 12457-3 at L/S	
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00705	<0.0005	0.0705	<0.005	0.5	2	25
Barium	0.0935	<0.0002	10 net 0.935	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.004	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.00030	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0,00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0117	0.003	0.117	<0.03	0.5	10	30
Nickel	0.00207	<0.0004	0.0207	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00205	<0.001	0.0205	<0.01	4	50	200
Chloride	21.3	<2	213	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	15.3	<2	153	<20	1000	20000	50000
Total Dissolved Solids	319	<5	3190	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	14.7	<3	147	<30	500	800	1000

#### **Leach Test Information**

Date Prepared	06-Aug-2018
pH (pH Units)	8.11
Conductivity (µS/cm)	408.00
Temperature (°C)	19.90
Volume Leachant (Litres)	0.786

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

#### **CERTIFICATE OF ANALYSIS**



Case

SDG: 180803-55 Client Reference: P1444 Report Number: 468081 Location: Cartron Big Order Number: Superseded Report:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

WAC ANALYTICAL RESI	ULTS		REF : BS EN 12
Client Reference		Site Location	Cartron Big
Mass Sample taken (kg)	0.180	Natural Moisture Content (%)	100
Mass of dry sample (kg)	0.090	<b>Dry Matter Content (%)</b>	50
Particle Size <4mm	>95%		

SDG	180803-55			Criteria Limi
Lab Sample Number(s)	18053565			
Sampled Date	31-Jul-2018			Stable Non-reactive
Customer Sample Ref.	TP5		Inert Waste Landfill	Hazardous Waste
Depth (m)	1.80 - 1.80		Landini	in Non- Hazardous Landfill
Solid Waste Analysis	Result			Landini
Total Organic Carbon (%)	7.17		3	5
Loss on Ignition (%)	22.4		-	-
Sum of BTEX (mg/kg)	-		-	-
Sum of 7 PCBs (mg/kg)	<0.105		1	-
Mineral Oil (mg/kg)	2390		500	-
	2390 <10		500 100	-
PAH Sum of 17 (mg/kg)		.و٠		- - >6
Mineral Oil (mg/kg) PAH Sum of 17 (mg/kg) pH (pH Units) ANC to pH 6 (mol/kg)	<10	ather tise.	100	

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 1	0:1 eluate (mg/l)	es XV	leached (mg/kg)		s for compliance lea EN 12457-3 at L/S	•
	Result Limit of Detection		Result Limit of Detection				
Arsenic	0.00382	<0.0005	Q <sup>VV</sup> Q <sub>2</sub> 0382	<0.005	0.5	2	25
Barium	0.0249	<0.0002	10 net 0.249	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.004	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.00030	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0,00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0627	<b>€</b> 0.003	0.627	<0.03	0.5	10	30
Nickel	0.00287	<0.0004	0.0287	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	0.00244	<0.001	0.0244	<0.01	0.06	0.7	5
Selenium	0.00192	<0.001	0.0192	<0.01	0.1	0.5	7
Zinc	0.00264	<0.001	0.0264	<0.01	4	50	200
Chloride	5.1	<2	51	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	314	<2	3140	<20	1000	20000	50000
Total Dissolved Solids	670	<5	6700	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	14.2	<3	142	<30	500	800	1000

# **Leach Test Information**

Date Prepared	06-Aug-2018
pH (pH Units)	7.96
Conductivity (µS/cm)	869.00
Temperature (°C)	21.30
Volume Leachant (Litres)	0.810

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



Report Number: Superseded Report: SDG: 180803-55 Client Reference: P1444 468081 Cartron Big Location: Order Number:

**Table of Results - Appendix** 

Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos
	Containing Material
	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:11 Step
BS 1377: Part 3 1990	Determination of Loss on Ignition
Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
In - house Method	ELTRA CS800 Operators Guide
BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
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
EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
by HPLC	Determination of Phenols in Waters and Leachates by HPLC
Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
subcontracted) performed at ALS Life Sciences Ltd Hawarden (	(Method codes TM) grad & Life Sciences Ltd Aberdeen (Method codes S).  A tip of the children of the code of the co
	Dept. of EP, 1998  Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060  Method 4500F, AWWA/APHA, 20th Ed., 1999  Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602  BS 2690: Part 121:1981  In - house Method BS 1377: Part 3 1990;BS 6068-2.5  Method 3125B, AWWA/APHA, 20th Ed., 1999  EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3  EPA Methods 325.1 & 325.2,  Shaker extraction - EPA method 3546. by HPLC



 SDG:
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 468081

 Location:
 Cartron Big
 Order Number:
 Superseded Report:

# **Test Completion Dates**

				P - O - O -
Lab Sample No(s)	18053550	18053555	18053560	18053565
Customer Sample Ref.	TP1	TP3	TP4	TP5
·				
AGS Ref.				
Depth	1.80 - 1.80	2.50 - 2.50	1.20 - 1.20	1.80 - 1.80
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	06-Aug-2018	06-Aug-2018	06-Aug-2018	06-Aug-2018
Anions by Kone (w)	09-Aug-2018	09-Aug-2018	10-Aug-2018	09-Aug-2018
CEN 10:1 Leachate (1 Stage)	06-Aug-2018	06-Aug-2018	06-Aug-2018	06-Aug-2018
CEN Readings	07-Aug-2018	07-Aug-2018	07-Aug-2018	07-Aug-2018
Coronene	08-Aug-2018	08-Aug-2018	08-Aug-2018	08-Aug-2018
Dissolved Metals by ICP-MS	09-Aug-2018	09-Aug-2018	09-Aug-2018	10-Aug-2018
Dissolved Organic/Inorganic Carbon	10-Aug-2018	09-Aug-2018	10-Aug-2018	09-Aug-2018
Fluoride	08-Aug-2018	08-Aug-2018	08-Aug-2018	08-Aug-2018
Loss on Ignition in soils	09-Aug-2018	09-Aug-2018	09-Aug-2018	09-Aug-2018
Mercury Dissolved	09-Aug-2018	09-Aug-2018	09-Aug-2018	09-Aug-2018
Mineral Oil	09-Aug-2018	10-Aug-2018	09-Aug-2018	10-Aug-2018
PAH 16 & 17 Calc	08-Aug-2018	13-Aug-2018	08-Aug-2018	13-Aug-2018
PAH by GCMS	08-Aug-2018	08-Aug-2018	08-Aug-2018	10-Aug-2018
PCBs by GCMS	09-Aug-2018	08-Aug-2018	08-Aug-2018	09-Aug-2018
pH	07-Aug-2018	07-Aug-2018	07-Aug-2018	07-Aug-2018
Phenols by HPLC (W)	10-Aug-2018	09-Aug-2018	09-Aug-2018	09-Aug-2018
Sample description	03-Aug-2018	03-Aug-2018	03-Aug-2018	03-Aug-2018
Total Dissolved Solids	08-Aug-2018	08-Aug-2018	08-Aug-2018	08-Aug-2018
Total Organic Carbon	12-Aug-2018	12-Aug-2018	12-Aug-2018	12-Aug-2018
VOC MS (S)	10-Aug-2018	10-Aug-2018	10-Aug-2018	10-Aug-2018

10-Aug-2018 10-Aug-2018

10-Aug-2018 10-Aug-2018

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180803-55 468081 SDG: P1444 Client Reference: Report Number: Superseded Report: Location: Cartron Big Order Number:

Appendix

# General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on received.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals total metals must be requested separately.

  11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 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).
- Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clav and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

#### Sample Deviations

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

	1	Container with Headspace provided for volatiles analysis	
	2	incorrect container received	
I	~ 3. K	Deviation from method	
ş	N. CO.	Holding time exceeded before sample received	
2	5	Samples exceeded holding time before presevation was performed	
	§	Sampled on date not provided	
I	•	Sample holding time exceeded in laboratory	
ĺ	@	Sample holding time exceeded due to sampled on date	
	&	Sample Holding Time exceeded - Late arrival of instructions.	

#### Asbestos

Identification of Asbestos in Bulk Materials & Soils

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

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

Asbe stos Type	Common Name
Chrysof le	White Asbests
Amosite	Brown Asbestos
Cro di dolite	Blue Asbe stos
Fibrous Act nolite	-
Fib to us Anthop hyll ite	-
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.

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